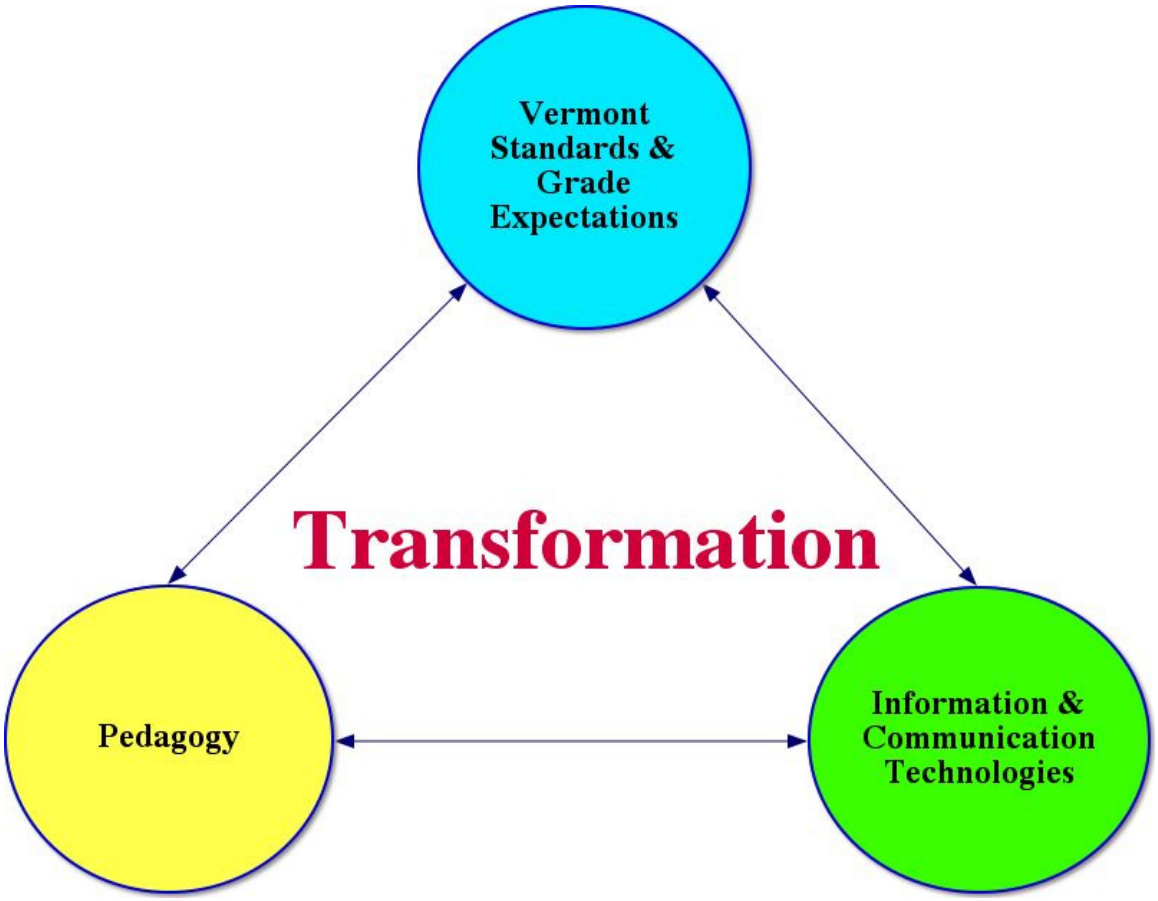
Transformation & Technology:
A New Way of Learning



Classroom Scenarios

Second Edition

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A New Way of Learning – Classroom Scenarios

Second Edition

Introduction

In the recently published "**Opportunity to Learn:** ***Defining Vermont Education for a New Generation of Learners,"*** which is the *"Final Report of Policy Recommendations Education Transformation Policy Commission*" submitted to the **Vermont Board of Education** in December 2009, the introduction states:

> **"New and multiple ways of deep learning** – Our children need interdisciplinary and collaborative educational environments that support them as they explore and inquire, draw critical interpretations from multiple information sources, and interact with local, national, and global experts as they build and apply knowledge and skill."

We believe that Vermont educators would benefit from seeing "pictures" of these new learning environments. Additionally, we feel that technology must play a strong role in supporting these environments. The *National Education Technology Standards for Students (NETS-S)* "refreshed" in 2007 provide us with guidance on how technology, when combined with effective pedagogy and strong content standards can get us to that desired end.... the transformed classroom.

This document is intended to paint "verbal pictures" or scenarios of transformed classrooms supported through technology. Our goal in creating these scenarios is to provide Vermont educators with examples of *"new and multiple ways of deep learning"* throughout the K-12 continuum, while emphasizing how information and communication technologies, based on the refreshed *NETS-S*, could facilitate these learning environments.

It is not the intention of this document to provide units or lessons for teachers to use, since these scenarios lack the level of specificity required for immediate implementation. We would suggest, however, that there are many ideas contained in them that may be ripe for "plucking." Through the presentation of these scenarios, we offer a picture of sound pedagogical practices supported with effective technology integration. It is our hope that these "pictures" will assist interested educators in furthering discussion to transform their own lessons and units, by incorporating technology to better meet the needs of 21st Century learners.

We recognize the problematic nature of identifying specific software tools and Internet sites in the scenarios... here today, gone tomorrow. Yet, we felt that in order to make them as relevant as we possibly could, it was necessary to include them in the scenarios. As the technology evolves, as it surely will, these scenarios can be adapted to meet new opportunities.

School leaders will play a critical role in transforming education. We hope that they find these scenarios a useful tool in engaging educators in an extended conversation regarding the important links between content, pedagogy, technology and transformation.

These scenarios represent both the imagination and creativity of the writers as well as ideas they received from fellow teachers throughout the state who have actually implemented, at least to some extent, the main ideas in these scenarios. We wish to acknowledge and thank all who contributed.

The Layout

This document is arranged into sections, first by the NETS standard and then by the Grade Cluster. There are six *NETS-S* technology standards. The sixth standard, which deals with technology operations and concepts, is embedded in the scenarios of the other five standards. Additionally, each standard has four performance indicators. Throughout the scenarios you will see references to both the standards and the performance indicators that are listed at the end of each scenario. For example – (6a, 3b) – indicates that that part of the scenario covers standard 6, performance indicator (a) and standard 3 performance indicator (b).

Each of the five standards is divided into four sections designated by grade cluster (K-2, 3-5, 6-8, 9-12). For example: in *NETS-S* 1 there are three scenarios in grade cluster K-2, three in 3-5, three in 6-8 and three more in 9-12. The same pattern exists for the other standard areas. There are a total of sixty scenarios.

You will notice that most of the scenarios address multiple *NETS-S*. In order to avoid confusion, we decided to only note the "targeted" standards in each scenario.

At the end of each scenario there is a reference to the *National Education Technology Standards for Teachers (NETS-T)* that would be addressed by the teacher who implemented the scenario.

The Glossary & Index

It is possible that the scenarios contain terms and tools that some readers may not be familiar. Consequently, this document is followed by a Glossary. Each time you see an *italicized* word in one of the scenarios that word can be found in the Glossary. In addition, each item in the Glossary is indexed to the various pages where it appears in the scenarios. In this way, if someone is interested in seeing how an indexed item is used in multiple ways they could easily locate them in the scenarios.

The Importance of Pedagogy

Throughout this document we refer to the importance of effective teaching practices and strategies. If there is one thing that we have learned over the past decade, as it relates to effective technology integration, is the importance of pedagogy. The *Vermont Transformation* focused on the concept of "student-centered learning." We believe this idea is one of the key elements that unlock the door to effective technology integration. What is student-centered learning in a 21st Century context? How does this concept, coupled with project/inquiry-based learning and differentiated instruction, allow for a true transformation of our schools? Investing in technology without critically examining our teaching practices could be a poor investment that produces little or no change.

It is our hope that these scenarios represent a shift away from a more teacher-centered learning environment to one that is more student-centered. In these scenarios, we envision students engaged in authentic learning tasks that are relevant to their lives. Students collaborate with others beyond the walls of the classroom in their desire to create new knowledge. Student choice is evident as teachers strive to meet the individual learning style of each child.

It is very important to note that these scenarios represent a range of transformative possibilities, from the "just starting" to "fully" transformed.

Content Standards and Grade Expectations

In this Second Edition of *"Transformation & Technology: A New Way of Learning – Classroom Scenarios*" we have added the appropriate *Vermont Content Grade Expectations* based on the *Vermont Standards*. The scenario writers have identified those content grade expectations that they would assess if they implemented this scenario. However, they acknowledge that it may be possible to assess several other content grade expectations from various other disciplines, as well.

The scenarios are grouped by NETS-S standards. In each one we have identified those Performance Indicators addressed only for that particular standard, even though it would have been very possible in most scenarios to have identified performance indicators for several, if not all, of the NETS-S standards. We focused on only one standard at a time to minimize confusion while reading the scenarios. Likewise, we could have identified the concepts, knowledge and skills that comprise the various content grade expectations in order to introduce or practice them in the scenario. Once again, in order to avoid confusion by overwhelming the reader, we chose to only identify those content grade expectations that would be assessed.

As we know, true learning doesn't typically break into neat disciplines like science, math, or reading. It often incorporates all of these disciplines interacting with each other, sometimes in complex ways. Since we envision many "transformed classrooms" engaging students in real world problem solving, the scenarios are often interdisciplinary. We ask teachers, even specific content area teachers, to look at them through this lens. In many of them, there is (potentially) something for everyone. If you are a science teacher and you don't see any science grade expectations identified, we urge you to look deeper.

The potential may well be there, but the scenario writer just may not have just not have focused in that area. Additionally, these scenarios are only "quick pictures." If you like the ideas in any of them, revise them, add the content grade expectations you wish to address, and make them your own.

Although possible, these scenarios are not intended for teachers use as they are written. The idea is to use the scenarios as "seeds for change;" to plant ideas to show teachers that on how using effective pedagogy, supported by technology, and connected to addressing strong content grade expectations, can transform their own classrooms using their own transformed curriculum and instruction.

A Final Thought

Twelve different educators developed these scenarios. Consequently, they are written in different styles and have varying levels of detail. Yet, each one tells a story. Some stories are based on units or projects that these or other educators have implemented. Others are creations of the mind… of what could be. Some may be tempted to dismiss them as unrealistic or undoable given their present circumstance. We urge you to look at the potential, not the limitations. We acknowledge that there may be hurdles in the way of implementing scenarios like these. Every journey starts with a dream. Dream… and ask yourself "why not?"

There is a journey that must be taken; one that traverses the uncharted terrain between teacher-centered and student-centered learning, between "one size fits all" and true differentiation. The struggle that occurs along the path, the support of each other as we travel the road of doubt, and the gradual ascent up the ladder of understanding, will ultimately bring us to a true transformation. It will take time, patience, and a concerted effort. We will all need to support each other on this journey. There are no shortcuts.

As you read the scenarios, imagine the excitement that exists in these "classrooms." Imagine the student engagement in learning and student ownership of that learning. Would you want your own child in these classrooms? Do these scenarios reflect the "picture" of the classrooms in your school? If not, they could!

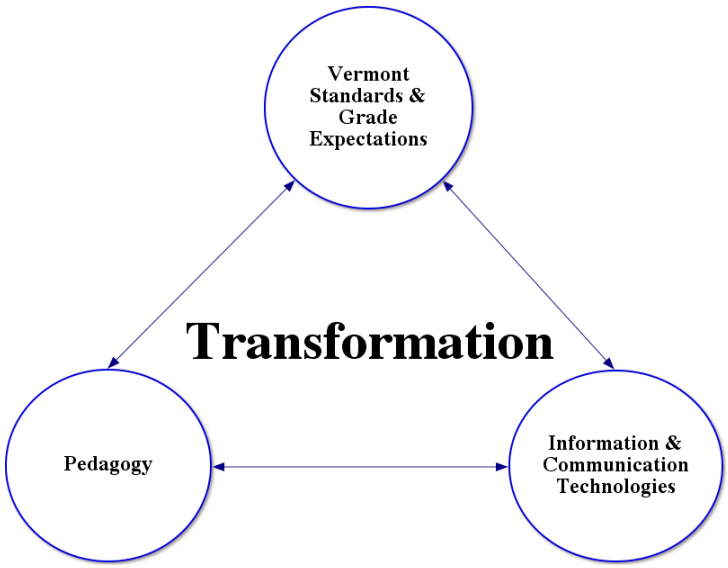
National Technology Standards for Students

Standard 1

Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:

a. apply existing knowledge to generate new ideas, products, or processes.
b. create original works as a means of personal or group expression.
c. use models and simulations to explore complex systems and issues.
d. identify trends and forecast possibilities



NETS-S – 1

Creativity & Innovation

Grade Cluster

K-2

Where's MY House?

Grade Cluster - K-2

NETS-S – 1 - Creativity and Innovation

Quick Look:

In a study of their local community, students create a *Google Earth* tour of their homes, using images they created in a paint program.

Scenario:

Upon entering their classroom, students are excited to see a very large map of their community, printed from *Google Earth*, in the center of the Morning Meeting circle. "Where's my house?" is repeatedly heard. The teacher shows the children where their school is located and students take turns using the map to retrace their paths from school back to their homes.

"Did you know that we can see maps like this on the computer?" the teacher asks. Using an *interactive whiteboard*, the teacher uses *Google Earth* to "fly" to their school. Students take turns entering their street addresses and "flying" to their homes. A *Google Earth* pushpin place mark is inserted at each stop (1c).

"That pushpin doesn't look like my house," one student remarks. The teacher asks if the class would like to draw pictures of their homes to replace the pushpin icons. After some discussion, the class decides that they will use a *drawing and painting* program to draw their home AND put themselves into the scene, using a digital photograph. Students use a digital camera to take a photograph of one of their classmates (6a). Students decide to include their whole body in case they want to be standing outside their home in their picture. The student who took the first photograph teaches the next student and so on until the entire class has taken a picture and has been photographed. These images are cropped and resized by the students, with the help of the teacher. Students use a *drawing and painting* program to draw a picture of their house and insert their digital photograph into the scene (1b, 6b). Some students decide to show themselves looking through a window; others are shown standing outside their home. The student or teacher saves the finished pictures as jpgs.

With the guidance of their teacher, in small groups, students insert the pictures they created in the *Google Earth* place marks (1a). Everyone inserts his or her own picture. They also create a custom icon for the place mark, using the picture they drew of their home. In the small groups, students take turns writing or dictating a couple of sentences about their homes and adding it in the *Google Earth* place mark (6d). A *Google Earth* tour of student homes is created. Upon viewing the finished map showing everyone's home, students discuss their findings, sharing such things as which classmates live closest to or farthest from school, who lives in new developments, where might the city build a new park, which route might you use to walk to school or your friend's house, etc. (1d).

Based upon the group discussion, students select a topic and write about their finding or recommendation. An image of the map showing all the student homes in *Google Earth* is uploaded into *VoiceThread*. Cropped pictures of the students are also added (6d). Students take turns recording their finding/recommendation into the *VoiceThread* project until the entire class is represented (1b).

With parent consent, both the *Google Earth* tour of student homes and the *VoiceThread* findings/recommendations are presented at Open House for parents and friends, and shared with other classes in the school.

Student Standards – The following NETS-S are noted in the scenario:

1. Creativity and Innovation – A. B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C
5. Engage in Professional Growth and Leadership – B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Physical and Cultural Geography
H&SS1-2:11 Students interpret geography and solve geographic problems by…

- Writing their names and addresses.
- Identifying characteristics of a neighborhood or community using resources such as road signs, landmarks, models, maps, photographs and mental mapping.
- Identifying the locations of places within the community on a prepared map, and suggesting why particular locations are used for certain human activities (e.g., parks, school, shops, etc.).
- Using a simple map to find something (e.g., locating the teacher's desk on a map of their classrooms).

Visual Arts Skill Development
A1-2:10 Students show skill development when CREATING art by…

- Using line in various media (e.g., pencil, marker, cut-outs, etc.) to create shape and image.

"3,2,1...Action!"

Grade Cluster - K-2

NETS-S – 1 - Creativity and Innovation

Quick Look:

Following a Response to Literature writing unit, students scan or draw pictures related to a favorite book and create book trailers.

Scenario:

It's early Monday morning and children are filing in the classroom door. Excitement is in the air as the latest new releases have hit the theaters. Children are buzzing about the view from the front row seats where they sat most recently, to watch the big screen with mom and dad. Once settled in, Morning Meeting begins as usual with a greeting and sharing. Students can't help but share the plot of the movies they saw the previous night. Then, in response to student excitement, the teacher turns to the interactive whiteboard where a photograph of one of the lead characters from a popular movie is on display. At that point, as if the class were taking a commercial break, a link is selected which takes the class directly to the movie trailer of the very same movie they raved about only minutes earlier. The excitement builds as students are reminded of key points in the movie, while students who have not yet seen the movie twist and turn with anticipation. When the trailer ends, students share their thoughts and feelings about the two-minute summary they just saw. "What parts of the trailer did you like?" "Why did you like them?" "What made this trailer catch your attention?" These are a few questions asked by the teacher. The teacher then connects this "commercial break" to several of the recent reading lessons focusing on retelling. Students are ready to start responding to literature in writing.

The teacher explains to students that they, too, can entice readers to choose their book by writing an exciting summary about their book that highlights their favorite parts, just as the movie trailer generated excitement about watching the movie. As an end-of-unit project, groups of students will create a book trailer for the book of their group's choice, using information they've learned about this genre. The teacher shares several examples of movie trailers throughout the week using various web sites (1c). Groups of students persuade their audience to want to read their book as they write, by incorporating the "trailer techniques" reviewed in the introductory lesson. Then, using a *digital voice recorder*, they work together to pre-record a script for the trailer that includes their favorite part of the book, as well as highlights from throughout the story (1a, 1b). They also discuss which visual images they want to include. Younger students might only choose one or two images from the book, or ones they have created. Motivated students, who may have more experience importing selected images, may choose three or more images from the text. Once the groups decide on a book, students

scan various illustrations from the story into a new, teacher-created folder labeled with the group name and project title. Students may also choose to illustrate their own pages using *Microsoft Paint*, *HyperStudio*, *KidPix*, or another paint program. Images are saved as jpgs and into the folder. Students also take digital pictures of each other to include at the end of the trailer to identify themselves as the authors of their book trailers (6a, 6b). All images are then imported into *Microsoft Photo Story 3*, (1d). Once pictures and photos are sequentially arranged in *Photo Story*, students add music, narration and transitions (6d). When the photo story is saved, all of the pictures, narrations and music are compiled into a video file.

Book trailers are then shared with parents and families using an *interactive whiteboard* or projector as part of a publishing celebration. The teacher may also choose to showcase the trailers much like a commercial advertisement during daily Morning Meeting. Students and teacher publicly display student work by showcasing the trailers at the local library during a weekend sharing time, or air the trailers on a local access television station.

Resources

Movie Trailer Sites

www.apple.com/**trailers**
www.**trailer**addict.com
www.imdb.com/Sections/**Trailers/**

Student Standards – The following NETS-S are noted in the scenario:

1. Creativity and Innovation – A, B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C
5. Engage in Professional Growth and Leadership – B, C

Content Grade Expectations

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1.3 Reading Comprehension

R2: 10 Demonstrate initial understanding of elements of literary texts by…

- Identifying or describing character(s), setting, problem, solution, or major events, as appropriate to text
- Retelling the key elements of a story
- Sequencing key events in order

R2: 15 Generates a personal response to what is read through a variety of means by…

- Comparing stories or other texts to related personal experience, prior knowledge, or other books

R1: 13 Analyze and interpret elements of literary texts read aloud or read independently, citing evidence where appropriate by…

- Making predictions about what might happen next, and telling why the prediction was made
- Identifying possible motives of characters
- Identifying relevant physical characteristics or personality traits of main characters.

A1-2:10 Students show skill development when CREATING art by….

- Using line in various media(e.g., pencil, marker, cut-outs, etc.) to create shape and image

A1-2:11 Students demonstrate PERFORM/COMMUNICATE skills in visual arts by…

- Using media and materials to convey feeling, idea, or thought.

Butterflies and their Beauty

Grade Cluster – K-2

NETS-S – 1 - Creativity and Innovation

Quick Look:

Students are studying Monarch butterflies. They have observed the butterflies from the cocoon stage until they emerge as beautiful, colorful butterflies. Students will draw a Monarch butterfly and also report on the stages of its development. They will also raise funds to preserve Monarch butterflies in the world.

Scenario:

A great fall activity for students, as they begin the school year, is to study Monarch butterflies. This activity incorporates technology and introduces students to some interesting technology tools that can be used later on throughout the school year.

Teachers and students use the Journey South website to gather information about Monarch butterflies. Students can keep track of their sightings of Monarch butterflies and record them on the Journey South website. Additionally, as part of the overall project, this class will collaborate with other students by participating in the Symbolic Monarch program, whereby children will send a butterfly drawing to Mexico and will receive one back in the spring. These drawings are produced using *Paint* or a similar program. As Monarch caterpillars become available, the students prepare to gather them to put in their classrooms. Students use the Internet to research from teacher-selected sites what the requirements would be for a Monarch butterfly living environment. (6a,b) Another group of students is in charge of constructing the appropriate living environment for their caterpillars and butterflies, so that they will survive while they are in the classroom. Once they put their caterpillars in these newly constructed environments, students prepare to observe them closely. Students record in their journals how the caterpillars change and transform into butterflies. Students record these changes by using *Kidspiration*, a student-friendly graphic organizer.

The students use the Monarch Watch website to participate in a global activity. Students also use a digital camera or video camera to record the changes that are occurring. They use their photos to make a digital story of the stages of metamorphosis using *Photo Story*. They do this working in groups. Students use some excellent webquests that have been developed on Monarch butterflies including Monarch Butterfly webquest(1c).

Using a *Paint* program students draw Monarch butterflies. First, they draw one side of their butterfly and then using the program, duplicate that side and flip it to get a butterfly with symmetrical markings. (1b, 1c) Students then write a sentence about their butterfly. (1b)

As students finish their art projects, the teacher uses this opportunity to teach students some basic operations of the computer by having them complete the Monarch maze, which encourages students to use the arrow keys on the keyboard. This site also has some primary level games which will further their development of basic computer skills. (6a, 6b) Students can use these activities on an *interactive white board*, in order to also become familiar with the use of the interactive whiteboard.(6b)
Students use a class blog to share all of their work with their parents. They post the butterflies they have drawn on the blog. Additionally, all of the butterfly drawings are published in a book on *lulu,* and post-publication, parents have the opportunity to purchase copies of the book as part of the class fundraiser. Money generated from the sale of the class book is donated to an organization dedicated to butterflies, chosen by the students.

Student Standards – The following NETS-S are noted in the Scenario:

1. Creativity and Innovation –B, C
6. Technology Operations and Concepts – A, B,

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity-A, B
2. Design and Develop Digital-Age Learning Experiences and Assessments-A, C
3. Model Digital-Age Work and Learning – B, C, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, D
5. Engage in Professional Growth and Leadership -

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Art
A1-2:10 Students show skill development when CREATING art by…
Using line in various media (e.g., pencil, marker, cut-outs, etc.) to create shape and image.).

Science
S1-2:1 -Students demonstrate their understanding of SCIENTIFIC QUESTIONING by…

- Posing observational questions that compare things in terms of number, shape, texture, size, weight, color, motion, etc. (e.g., How fast does a Lady Beetle move compared to a Bess Beetle?).

- Investigating and completing questions to identify a variable that can be changed (e.g., What will happen if…? or I wonder if I change…?).

S 1-2: 2 Students demonstrate their understanding of PREDICTING AND HYPOTHESIZING by…

- Predicting a logical outcome to a situation, using prior knowledge, experience and/or evidence.
- Explaining reasons for that prediction.

H&SS1-2:4 Students conduct research by…

- Following directions to complete an inquiry.
- Asking questions and observing during the investigation process.

Recording observations with words, numbers, symbols, and/or pictures (e.g., drawing or labeling a diagram, creating a title for a drawing or diagram, recording data provided by the teacher in a table).

S1-2:30 Students demonstrate their understanding of Structure and Function-Survival Requirements by…

- Observing and recording the parts that make up living things (i.e., roots, stems, leaves, flowers, legs, antennae, tail, shell).

NETS-S – 1

Creativity & Innovation

Grade Cluster

3-5

Picture Book Authors

Grade Cluster - 3-5

NETS-S- 1- Creativity and Innovation

Quick Look:

Students collaborate on writing and publishing a children's picture storybook to share with students, parents, and community.

Scenario:

Our class has been partner reading with a first grade class since September. We had a great time getting to know these students and the kind of books they like to have read to them. Our class decided to write our own picture books that could be located in the library and shared with all the primary students in our school.

Since literacy is a main focus for our school I knew that writing and publishing a picture storybook would be a way to work on literacy skills. Our first activity was to gather together a selection of children's picture storybooks written by different authors (Eric Carle, Peter Reynolds, Maurice Sendak, Tomie DePaola, Gail Gibbons, Jan Brett, etc.) and spend several sessions reading and looking at the picture books.

During the next few days the students discuss the elements of picture storybooks and the different techniques authors use in their books (characters, setting, main conflict, theme, style, use of pictures, color and word choice). I created a *wiki* for the class to use as the place where, students working in small groups would share their lists of characteristics of storybooks. These lists were shared to the larger group using an *electronic white board.* (1a, 1c, 1d) Students then created a list of book characteristics that seemed to be common to all the books they had read.

I arranged with a local children's author to visit our classroom and talk to the students about planning and writing a storybook. She discussed with the class the writing techniques, use of color and illustrations, story theme, and story elements used by authors.

Next, the students formed small groups, and decide on 1 or 2 authors they would like to investigate in more depth, chosen from the authors they have been reading. To select books written by these authors the students choose books from the school and local library, read their books online, or download them to a *Kindle* to read. (1a, 6a) Each group picks one of the books discussed and prepares a *multimedia presentation* for the class explaining and showing the story elements the author uses in the book. (6a, 6b) The class discusses the similarities and differences between the different authors' books.

Next, the small groups look at their books again and discuss the kinds of information that is published on the book itself (copyright date, publishing company, back cover, dedication, etc.). Groups share their information in a large group report out using an

electronic whiteboard. (6a) Next, the information is discussed and the ideas are compiled into a list and the list is saved in a shared folder.

The students form new groups of two and each group selects one author they would like to research in more depth. Students spend time reading and discussing additional books written by their author, visit the author's website, and *email* questions to the author with the purpose of gathering information about the author. Students use *Skype* to *videoconference* with the author, and meet the author in a *chat room.* (1a, 6a, 6b) Using *Glogster*, students create an informational poster based on their author research. (1b, 6a, 6b, 6d) The author posters are displayed on the class *blog*. (6a, 6b, 6d)

Next, comes the planning and writing stage. Each group uses a *graphic organizer* to plan a picture book that they will write, illustrate and publish, based on the style of their chosen author.(1b, 6b) Students use *Google Docs* to collaborate on writing the text for the story. Students choose how they want to illustrate their work. Some students use a *paint program* to draw all their pictures, others use a *digital camera* and photo editing software for their pictures.(1b, 6a, 6b) The completed story text is imported into *Wordle* and the page is saved electronically to be included in the book. (1a, 1b, 6a, 6d)

The final part of publishing the book is making sure that the book is organized with a cover, copyright date, dedication page, story text, pictures, back cover, and includes the *Wordle* page. A hard copy is printed in color, and the book is published online using *issuu* and is posted to the class *blog*. (1b, 6a, 6b, 6d)

The students know that all young students may not be able to read their stories so they use *Photo Story* to create *digital storybooks* from their recently published books. The students use *Audacity* to narrate the text so the students in the younger grades can look at the pictures and hear the story being read to them. They also create a link on the class *blog* to their *Photo Story* so their parents and the community can enjoy their stories. (1b, 6a, 6b, 6d) They decide to contact, via *email*, the kindergarten, first and second grade teachers to arrange a time when they could come to their classrooms and read their books to the younger children. (6a, 6b) Students practice reading their stories out loud, using good voice and eye contact as reading to an audience can be scary.

A hard copy of the book is placed in the school and town library and copies are placed in the classroom library so students can take the book home to read to their families or enjoy reading themselves.

Student Standards – The following NETS-S are noted in the Scenario:

1. Creativity and Innovation – A, B, C, D
6. Technology Operations and Concepts- A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments-A, B, C
3. Model Digital-Age Work and Learning- A, B, C
4. Promote and Model Digital Citizenship and Responsibility- A, B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Standard 5.13: Responding to Text
Initial Understanding of Literary Text

R4: 10 Demonstrate initial understanding of key elements of literary text by…

- Identifying or describing character(s), setting, problem/solution, major events, or plot, as appropriate to text.

R4: 11 Demonstrate initial understanding of author's craft used in literary texts by…

- Identifying literary devices as appropriate to genre: rhyme, alliteration, simile, description, or dialogue.

Standard 5.12: Literate Community
R3: 19 Demonstrates participation in a literate community by…

- Participating in appropriate discussions about text by offering comments and supporting evidence, and recommending books and other materials.

Writing Grade Expectations: Grade 3, 4, 5
Standard 1.5: Writing Dimensions
W4: 1 Students use prewriting, drafting, revising, editing, and critiquing to produce final drafts of written products.

Standard 5.11: Literary Elements and Devices
Expressive Writing: Narratives

W4: 11 In written narratives, students organize and relate a story line plot/series of events by…

- Creating a clear, understandable story line with a beginning, middle, and end.
- Establishing a problem and solution.

W4: 12 Students demonstrate use of narrative strategies by…

- Using relevant and descriptive details

H&SS3-4:4 Students conduct research by…

- Referring to and following a plan for an inquiry.
- Locating relevant materials such as print, electronic, and human resources.

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

Wanted: Local Heroes and Heroines

Grade Cluster - 3-5

NETS-S-1 - Creativity and Innovation

Quick Look:

Students create a public service announcement that calls for community members to put forth names of local heroes and heroines who ought to be recognized in their community. Student groups select, interview, and make a movie about one of the heroes or heroines.

Scenario:

A Bette Midler song, "Wind Beneath My Wings", is playing in the class as the students enter morning meeting. As Bette is singing, "Did you ever know that you're my hero?" a student remarks, "What's a hero or heroine?" and a class discussion about heroes and heroines follows. The class asks if they can do a project on this topic, and "Wanted, Local Heroes and Heroines" develops as a writing project.

A teacher-created, multimedia presentation of people who are considered to be heroic, such as Helen Keller, Mother Teresa, or Abraham Lincoln, is presented to the class using the web site "Heroism in Action". The site describes how to select a hero/heroine and articulates four characteristics of a hero or heroine. (1c)

"How can these characteristics apply to a local community member?" asks the teacher. Referring to the teacher's presentation on heroes/heroines, and using a *graphic organizer*, small groups of students develop their own individual lists of ideas about the characteristics of a local hero. Each group projects their concept map on an *electronic whiteboard* to show and discuss their respective characteristics list. (1a, b) (6b)

As a class, the students develop a comprehensive list of traits that defines heroic qualities and characteristics. Students vote on a common set of hero characteristics, using a *student response system*. The list of characteristics is saved as "Local Heroes and Heroines," in a shared document in *Google Docs*. (1b) (6a)

The teacher invites a news reporter to the class to talk about being a writer, an interviewer, and how local people are selected for feature articles.

In small groups, students create a plan to have the community at large help them identify local community members who could be considered a hero or heroine. Students develop a list of ways to notify the community about the project and a way for the community to nominate a community member. They prepare a call for nominations, the criteria for nominating the hero/heroine, and the appropriate contact information, all of which they publish in the school and local newspapers, and in their class web page and *blog*. (1b) (6a)

Once the hero/heroine nominations from the community are submitted to the students, the nominations are divided between the small groups. The groups read each nomination and discuss the pros and cons for considering this person a local hero/heroine candidate. The class works together to identify five people who best exemplify the qualities outlined above. From this list, each group chooses a local hero to interview.

To help them, the local news reporter coaches the students about the interview process. Student groups prepare a list of questions to ask in an interview, and review these questions with the news reporter.

Students then contact their hero or heroine and arrange an interview. Students record the interview using *digital cameras* and *voice recorders*. Once finished, students collectively write articles for the class *blog*, local newspapers, and create a "local heroes/heroines" multimedia presentation that contains pictures, video, and/or audio of their hero/heroine. (1a, b), (6a, b)

Students plan a recognition ceremony for their heroes and heroines, and present them with a "Local Hero/Heroine" certificate. Students contact their mentor reporter to help them publish their work and recognize the "Local Heroes and Heroines" in the local paper. They create posts on their class *blog* and entries on the class web page. (1a)

Resources:

Heroism in Action
http://library.thinkquest.org/C001515/design/index.html

Student Standards – The following NETS-S are noted in the Scenario:

1. Creativity and Innovation – A. B, C
6. Technology Operations and Concepts – A, B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C
5. Engage in Professional Growth and Leadership – B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Standard 1.8: Reports

Informational Writing: Reports

W4: 10 In reports, students demonstrate use of a range of elaboration strategies by…

- Including facts and details relevant to focus/controlling idea
- Including sufficient details or facts for appropriate depth of information: naming, describing, explaining, comparing, or use of visual images

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

H&SS3-4:3 History and Social Sciences Inquiry- Students design research by…

- Identifying resources for finding answers to their questions
- Identifying tasks and how they will be completed
- Planning how to organize information so it can be shared.

H&SS3-4:7 History and Social Sciences Inquiry

- Student communicate their findings by giving an oral, written, or visual presentation that summarizes their findings

Making Our School Green

Grade Cluster - 3-5

NETS-S-1 - Creativity and Innovation

Quick Look:

Students help the school community create an awareness of the benefits of becoming a "green" school and develop an action plan to address areas of concern.

Scenario:

As part of an environmental studies unit, students participate in activities that help them develop an awareness and understanding of what it means to have a green environment in their school, with the eventual goal of having them develop a plan to "green up" their school.

As an introductory and awareness activity, students take the Back to School quiz at http://www.thegreenguide.com/kids/school-age/school-quiz and discuss what they learned and how students can make a difference in the school. (1a)
Using the information they gained from the awareness activity, students identify areas of the school that will be assessed for "greenness" and suggest ways to help make those areas greener. The Four R's (reduce, reuse, recycle, rot) will be addressed.
Some areas of concern are:

1. Classroom materials- Use of pencils, markers, etc.
2. Paper- Consumption and waste
3. Cafeteria- Left-over food scraps
4. Janitorial- Use of cleaning chemicals
5. School grounds- Safety and sanitation
6. Transportation- Taking the bus vs. driving individually to and from school

Students work in teams to address one of the above issues and begin by researching the Internet for further information on their topic. (6b) Additionally, they create and implement a survey, using *Google Forms*, and score the results in a spreadsheet that they can use to analyze the information. (6b, 1c) All information is stored in a common folder or in *Google Docs*, so all members of the team have access to the data. (6a) Teams present their findings to the class using the *interactive whiteboard* and receive feedback on their results. (6a)

After the class presentation on each area of concern around the school, students use a *digital camera* or *camcorder*, to document their concerns. (6b) As part of the research process, students identify an adult in the school who is responsible for the oversight of these areas using *email* and set up an interview. (6b) The interview is recorded using a *digital camcorder*. (6b)

Based on the data collected, students create an action plan with a list of suggestions to make the area of concern a greener environment. Students use a program like *InspireData* to record the data. (1a) Students share their findings with identified adult and create an action plan, which is shared with the school community and posted on the class *blog*. (1a, 1b, 1d) After, students use a publishing program to support their action plan, to create posters to be displayed around the school to bring awareness to the issues. (1b)

In order to prepare for their next activity, students view videos from http://www.greenschoolsalliance.org/. With the information and photos they gathered, students create a digital story using *Photo Story*, describing the problem, the importance of making the school a greener place, and how it can be accomplished. (1b, 6b) The videos are posted on the classroom *blog*. (6d)

Students then create *Photo Stories* to present their finding to their peers and gain their support for their projects. (6a) Students write articles to the local newspaper, the school paper, and present information to the PTA and school board and other community services, to bring awareness to 'green up' of the school. (1b)

Student Standards- The following NETS-S are noted in the Scenario:

1. Creativity and Innovation- A, B, C, D
6. Technology Operations and Concepts- A, B, D

Teachers Standards- Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, C, D
2. Design & Develop Digital-Age Learning Experiences & Assessments- A, B, C
3. Model Digital-Age Work and Learning- A, B, C
4. Promote and Model Digital Citizenship and Responsibility- B, C
5. Engage in Professional Growth and Leadership- B

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS3-4:1 History and Social Sciences Inquiry - Student initiate an inquiry by..

- Asking relevant and focusing questions based on what they have seen, what they have read, what they have listened to, and/or what they have researched

H&SS3-4:3 History and Social Sciences Inquiry - Students design research by…

- Identifying resources for finding answers to their questions
- Identifying tasks and how they will be completed, including a plan for citing sources

- Planning how to organize information so it can be shared.

H&SS3-4:7 History and Social Sciences Inquiry

Student communicate their findings by giving an oral, written, or visual presentation that summarizes their findings

H&SS3-4:12 Physical & Cultural Geography - Students show understanding of human interaction with the environment over time by…

- Identifying and participating in ways they can contribute to preserving natural resources.

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

NETS-S – 1

Creativity & Innovation

Grade Cluster

6-8

Life After Vermont Yankee

Grade Cluster – 6-8

NETS-S – 1 - Creativity and Innovation

Quick Look:

Vermonters will be faced with a difficult choice in the next few years. If the Vermont Yankee nuclear power plant is not relicensed, Vermonters will need to find a replacement to produce its amount of electricity. This could be done through alternative energy sources and/or through the reduction of energy consumption. Following a unit on electricity, middle school students (Grades 6-8) investigate alternative energy solutions, energy conservation, and efficiency strategies for their communities, in order to develop a sustainable solution.

Scenario:

Student teams research current electricity resources in their community and determine positive and negative factors of such, including cost, efficiency, environmental impact, sustainability, and practicality. Students also investigate whether VT Yankee should be allowed to continue to operate, and they discuss the pros and cons of continued operation. The class consensus is that Vermont Yankee should not be relicensed, that alternative energy resources should be found, and that Vermonters need to reduce energy consumption. Students decide to not only investigate energy consumption, in order to educate the public in ways to conserve energy, but to also examine alternative energy sources to potentially replace Vermont Yankee power.

Students form teams to gather information and data from interviews with experts in the field, local electric power companies, and through Internet research with use of *RSS feeds*. Teams compile and analyze electricity resource data using a spreadsheet tool such as *Microsoft Excel* or *Google Forms* (6a, 6b, 6c, 6d).

Next, each team chooses to research household, school, or community electricity consumption, in order to determine specifics, such as amount used, cost, and efficiency. Students work with local electric companies to get devices for monitoring electric usage. They also use *Google Forms* or *Survey Monkey* to collect electricity consumption data from other students and staff members (1d, 6a, 6b). Students analyze the collected data, via spreadsheets, to build energy consumption models for their homes, school, or the community, and identify areas that are consuming excessive power and predict future trends (1c, 1d).

Students work in teams to research alternative electricity sources and strategies for increasing efficiency through Internet research and through interviews with field experts such as Efficiency Vermont. Each team focuses on finding an alternative energy solution for their household, school, or community. Students use the data they collect and their models to support their proposals for an alternative energy solution (1a, 1b, 1c). Student teams collaborate using a *wiki* such as *PBWorks* or the *wiki* feature in *Moodle* to develop

solutions and present a persuasive argument to support recommendations for alternatives, conservation, and efficiency (1a, 1b, 6a, 6b).

Student teams showcase their work by creating *podcasts* or videos using digital tools such as *digital voice recorders* and *Flip cameras* to present their sustainable solutions (1a, 1b, 6b, 6c). The products are presented to the appropriate audience through public service announcements, school board presentations, or presentations to the legislature. Students share their projects with a greater audience by uploading videos and/or *podcasts* to *YouTube* or *iTunes*, or by contributing to a national student competition like http://www.ignitingcreativeenergy.org/ (6b, 6c).

Resources

Central Vermont Public Service: http://www.cvps.com/
Efficiency Vermont: http://www.efficiencyvermont.com
Green Mountain Power: http://www.greenmountainpower.com/
Treehugger energy efficiency alternatives:
http://www.treehugger.com/files/2005/12/smart_power_str.php
Vermont Electric Cooperative: http://www.vermontelectric.coop/
VELCO Vermont Electric Power Company: http://www.velco.com/Pages/Default.aspx
Vermont Yankee: http://www.safecleanreliable.com

Student Standards – The following NETS-S are noted in the Scenario:

1. Creativity and Innovation—A, B, C
6. Technology Operations and Concepts—A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity—A, B, D
2. Design and Develop Digital-Age Learning Experiences and Assessments—A, B, C, D
3. Model Digital-Age Work and Learning—A, B, D
4. Promote and Model Digital Citizenship and Responsibility—B
5. Engage in Professional Growth and Leadership—C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

S7-8:4 Students demonstrate their ability to conduct experiments by…

- Accurately quantifying observations using appropriate measurement tools.
- Using technology to collect, quantify, organize, and store observations

S7-8:5 Students demonstrate their ability to present data by…

- Using technology to enhance a representation.

S7-8:7 Students demonstrate their ability to explain data by…

- Using scientific concepts, models, and terminology to report results, discuss relationships, and propose new explanations.
- Generating alternative explanations.
- Sharing conclusion/summary with appropriate audience beyond the research group.
- Using mathematical analysis as an integral component of the conclusion.

S7-8:8 Students demonstrate their ability to apply results by…

- Explaining relevance of findings to local environment
- Devising recommendations for further investigation and making decisions based on evidence.

H&SS7-8:6 Students make connections to research by…

- Formulating recommendations and/or making decisions based on evidence.
- Using their research results to support or refute the original research statement.
- Proposing solutions to problems based on their findings, and asking additional questions.

H&SS7-8:7 Students communicate their findings by…

- Developing and giving oral, written, or visual presentations for various audiences.

Let the Students Teach

Grade Cluster – 6-8

NETS-S - 1 - Creativity and Innovation

Quick Look:

Students provide a needed community service as they take procedural writing skills to a new level. They create a permanent learning tool that can be shared with community members who are having difficulty understanding challenging concepts or mastering difficult skill sets.

Scenario:

Eighth grade students create procedural pieces during their language arts class that require they use their proficiency at a specific skill or understanding of a concept to devise the best way to teach that skill or concept to an authentic audience. They are given the option of a short, one-time assignment for either a very specific teaching task (for example: How do I average a column of figures in *Excel*?) or a whole range of related skills or concepts (for example: How can I create a digital story about my family using *Photo Story* and old photos and cassette tape recordings of my relatives' voices?). Through this project, students become teachers as they determine the best way to help another person understand a concept or become adept at a skill.

Students create a Google survey, which is sent to homes for the elderly and elder care organizations. (6b, 6c) The range of topics the class feels competent to deliver is clearly outlined in the message that accompanies the survey. Student teams select a request from the respondents that they feel competent to address. They discuss the needs of their audience, and ask follow–up questions, if necessary. Students work in teams to create an appropriate learning tool based on prior knowledge, technology skills, equipment and software available to the learner. (1a, 1b, 6b, 6c, 6d) Students create an electronic lesson for their "clients" in one of the following ways:

- Students use *Jing* and a digital microphone to create *screencasts* with narration to guide recipients through computer-oriented instruction. A combination of Jing and a *SMART board* or a drawing tablet allows for instruction in any lesson that requires free-hand drawing or writing. (1a, 1b, 6a, 6b, 6c, 6d)
- Students use *Google Earth's* recording feature to narrate geography tutorials, travel-logs or other instruction with a geographic component. (1a, 1b, 6a, 6b, 6c, 6d)
- Students create *podcasts,* with a digital microphone or a digital voice recorder and an audio editing program like *Audacity*. These podcasts are produced for language instruction, audio guides for historic tours around a community, or other lessons for which the audio component is essential. (1a, 1b, 6a, 6b, 6c, 6d)
- Students create printed instructional materials with word processing or desktop publishing programs, augmented with screen shots, scanned drawings, or digital photos. (1a, 1b, 6a, 6b, 6c, 6d)

- Students produce animated tutorials, in the style of a *Common Craft* video, with student artwork and narration and a document camera or mounted video camera. (1a, 1b, 6a, 6b, 6c, 6d)
- Students use the online collaboration tool *VoiceThread* to fashion a set of instructional visuals with narration to which their clients can easily add questions or comments. (1a, 1b, 6a, 6b, 6c, 6d)
- Students produce instructional videos, with themselves in the role of characters or instructors, with a *Flip video camera* and *Windows Moviemaker*, a video-editing program. (1a, 1b, 6a, 6b, 6c, 6d)

During the creation of their educational tools, students use digital still and video cameras, digital voice recorders, art software, digital drawing tablets, desktop publishing programs, document cameras and editing software to capture and edit their own graphics, audio, video and text. Students also use content found online, such as editable video from the *Discovery Streaming* library or digital photographs from online photo collections like *Flickr* (with appropriate *Creative Commons* licenses), royalty free music from sites like Public Domain Music or the Free Music Archive or sites like Jam Studio, that allow students to create their own music. (6b, 6c, 6d)

Students and their teacher use *Rubistar*, an online rubric generator, to create a rubric with baseline standards required for the release of their educational tools. Products that do not reach a specified baseline level of quality are not released.

During the next phase of the project, products are tested, evaluated and revised before release. After completing the educational tool, but before its distribution, students acquire a Creative Commons license for their educational product and decide on the correct level of licensure. Also, before the release of their creations, the appropriate parental permissions are obtained. Students determine the best way to distribute their tools, depending on the intended audience. Tools for a very specific audience are delivered as e-mail attachments. Those intended for more general distribution are linked to an appropriate Web site or delivered on multiple CDs or flash drives. (6a, 6b, 6c, 6d)

Every delivered educational tool includes a link to an online Google survey, written specifically for that product and used to modify the product, and create better learning tools in the future. (6b, 6c, 6d)

Student Standards – The following NETS-S are noted in the scenario:

1. Creativity and Innovation – A, B
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C, D
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility - B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

W6: 13 - In written procedures, students organize steps of procedures by…

- Providing a purpose by giving context to let the reader know when the procedure is appropriate
- Using a variety of transitions to arrange the steps in a logical manner
- Using details and examples to help the reader understand and visualize the process
- Providing a list of specific materials, if appropriate
- Providing a conclusion that advances the reader's understanding or appreciation of the process

W6: 14 - In written procedures, students anticipate the readers' needs by…

- Addressing problems that might arise for the reader
- Creating a format that is easy to follow

Choices and Challenges: Journey to America

Grade Cluster – 6 – 8

NETS-S – 1 - Creativity and Innovation

Quick Look:

Students study immigration from both historical and present day perspectives. They create digital diaries that document the push/pull factors that cause people to leave their native country and the struggles of people who resettle in America. Interviews with current day immigrants and study of the current political issues provide information for students to consider how the struggles of early immigrants compare and contrast with modern immigrants' issues. Culminating projects include proposals to politicians via live interviews, informative podcasts, and opinion pieces shared with local media.

Scenario:

Msiba, from Kenya, and Thien, from Vietnam, are two new students in Ms. Jackson's eighth grade class. Neither can speak English. Other students are concerned about the difficulty in conversing with these newly enrolled students. A class discussion begins about why these students came to America and how difficult it must be to be immersed in a whole new culture. Students begin to question who is "really" an American and their own status as American citizens. They decide to research this topic based upon their own family history.

Students begin the study by confirming that most Americans are immigrants. Students interview family members to find out when and from what countries the first of their relatives came to the United States. Some students create a family tree online using *Geni.com*, while others use online graphic organizers such as *Mindomo* and *Bubbl.us* which allow distant family members to contribute information. (6a, 6b, 6d) Students also use digital media recording tools such as *digital voice recorders* and *Flip* video cameras to obtain family history from relatives who live nearby. As students study their family trees, they place markers on a class *Google Map* to pinpoint their families' countries of origin. Msiba and Thien work with the ESL teacher and their interpreters to plot their countries of origin.

Using the *Google Map* to find groupings of students' ancestors, teams of two to four students are formed based on country of origin. In the groups, students research the reasons why people left their native countries to move to the United States (e.g., war, famine, and lack of jobs). All teams record the reasons people left a country in a *Google Docs Spreadsheet* and then analyze this information to look for similarities and common threads. (1d) Using a new copy of an online graphic organizer, students document problems and opportunities faced by the immigrants. With help from the ESL teacher and interpreters, Msiba and Thien also add their reasons for leaving their countries so other students can look for commonalities between their ancestors and their new

classmates.

Students are then assembled into teams of ten "friends" to create digital *social networks* to document the journeys of the immigrants using a tool agreed upon by the group such as *Facebook*, or *Ning*. (6b) Each individual student creates a "profile" of an immigrant traveling to America, preferably based on a real ancestor, including information such as age, gender, marital status, occupation, and home address. Posts are used to create a travel diary/journal, beginning with the decision to leave their home and ending with finding a place to live in America. "Friends" within the network comment upon these virtual journeys. Photos include copies of actual documents collected from sites such as www.ellis.org (e.g., ship log and passenger record) or prototype documents that are created using a word processing or publishing tool. (1b, 6a, 6b) Msiba and Thien are included in the same project as members of a team, supported by their interpreters and the ESL teacher, as they document their journey to America.

As the journals are being created, several immigrants are invited to "visit" the class either virtually or in person. Digital visits take place via *Skype* or the *Learning Network of Vermont Video Conferencing System (LNV).* (6a, 6b) Msiba and Thien send "invitations" to the people who helped them travel to America, as well as people from their culture that have already assimilated to American life.

Upon completion of the travel diaries and visits from immigrants, newly created groups of four students each research current day political issues related to immigration (e.g., the impact of illegal immigration on health care reform, custom detention centers, border enforcement, and public benefits for immigrants). As they research the current issues of immigration, they add to the graphic organizer they created earlier to compare and contrast problems and opportunities faced by earlier immigrants with today's immigrants. (1a, 1c, 6a) Each student finds at least one current events article or *podcast*/newscast relating to these issues to link to the class chart/*wiki* to support his/her contribution.

As a culminating project, each group of students does more in-depth research on a current immigration issue and completes one of the following projects:
1) Research politicians' positions on the chosen immigration issue, create a prioritized list of questions for the politician using a *wiki*, and arrange for an interview to be shared with the entire class, using a video-conferencing tool such as *Skype* or *LNV* (1a, 1b);
2) Create a persuasive *podcast* or *vodcast* with a convincing argument for one side of an issue dealing with immigration (1a, 1b);
3) Create a *wiki* with all of their information included and summarize their findings in a document that is e-mailed to local news media as well as their state representatives (1a, 1b).

Student Standards – The following NETS-S are noted in the scenario:

1. Creativity and Innovation – A, B, C, D
6. Technology Operations and Concepts – A, B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, C
3. Model Digital-Age Work and Learning – B, D
4. Promote and Model Digital Citizenship and Responsibility – B

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

W7:11 In written narratives, students organize and relate a story line plot/series of events by…

- Creating a clear and coherent (logically consistent) story line
- Using a variety of effective transitional devices to enhance meaning
- Establishing context, character motivation, problem/conflict/ challenge, and resolution, and maintaining point of view

W7:12 Students demonstrate use of narrative strategies by…

- Creating images, using relevant and descriptive details and sensory language to advance the story line (purpose)
- Using voice appropriate to purpose
- Maintaining focus
- Controlling the pace of the story

H&SS7-8:1 Students initiate an inquiry by…

- Asking focusing and probing questions that will lead to independent research and incorporate concepts of personal, community, or global relevance.

H&SS7-8:6 Students make connections to research by…

- Formulating recommendations and/or making decisions based on evidence.
- Proposing solutions to problems based on their findings, and asking additional questions.

H&SS7-8:7 Students communicate their findings by…

- Developing and giving oral, written, or visual presentations for various audiences.
- Soliciting and responding to feedback.

H&SS7-8:12 Students show understanding of human interaction with the environment over time by…

- Recognizing patterns of voluntary and involuntary migration in the U.S. and world.
- Using information to make predictions about future migration.

H&SS7-8:14 Students act as citizens by…

- Identifying the various ways people become citizens of the U.S.
- Identifying problems, proposing solutions, and considering the effects of a course of action in the local community, state, nation, or world.

NETS-S – 1

Creativity & Innovation

Grade Cluster

9-12

History Alive

Grade Cluster - 9-12

NETS-S - 1 - Creativity and Innovation

Quick Look:

Students share stories of their community after using technology to conduct research and create engaging presentations. They include descriptions of legacies in their community that need to be maintained for future generations.

Scenario:

"My name is Molly, an Irish name, because my great-grandmother grew up in Ireland and my family likes to stay in touch with the Irish history. My cousins have all traveled back to the farm where she was born." Sam uses a digital voice recorder and camera to record Molly's story, practicing the effective use of those tools and aiding Sam in reporting Molly's story to the whole group. Ms. Farrell observes that history is really about telling stories and that the students have actually just practiced being historians. In the next class, Ms. Farrell asks students to quickly draw a map of their town center from memory, including as many details as they can remember. The group then takes a walk to compare what they see with what they had remembered. They record observations on a voice recorder, camera, cell phone, video camera or paper and pencil. Maps are modified upon return and classes discuss the experience of "looking intentionally at a place." (1a)(6d)

Donning headphones and working as a team, Sam and Molly interact with a series of *multimedia presentations* (movies, slide shows, audio recordings, *VoiceThread*, etc.) previously created by other students and stored in the class-shared file.

"Hey, that is the lady who owns the store...I know her! I didn't know the store is 100 years old," comments Molly.

"I like listening to the stories. I wonder how people used to travel to the store and what kinds of things they used to buy. I wonder what our story is going to be like?" Sam adds.

Research is the focus of the following classes. Students are divided into teams based on their hometowns. Guided by their classroom teachers in history and English, reading specialist, librarian, and educational technologist, they begin to research their town and take notes to post on the class wiki. Small groups rotate through several learning stations that focus on the following areas:

- how to evaluate sources
- how to take notes
- how to navigate the course wiki and use proper file management

- how to effectively search the Internet
- digital citizenship protocols (cite sources, be appropriate)
- how to use digital tools to conduct ethnographic interviews
- how to tell stories using a storyboard

A *wiki* is set up for collaboration among all tenth grade students in all classes. They are given the role of "writer" which allows them to create new pages and to edit other pages. In order to foster collaboration across classrooms, teachers take care in setting up the files and the sidebar, so students are able to easily navigate the site. Teachers routinely post daily lesson plans, assignments, and assessments on the wiki, as well as useful links for research. Each day a different student is assigned to be the class note-taker for any of the whole group events, so even if a student is absent they can later access the group's information. (6a)

Molly finds some compelling photos of an old inn that no longer exists in a library book. She posts them to the wiki and asks Sam if he, too, wants to study the inn that had burned down long ago. Together, they access and assess a variety of resources, (print, electronic, human) about 19th and 20th century town histories. As they post their notes on the wiki, Ms. Farrell provides ongoing formative assessment, prompting them to think critically (for example, observing bias and perspective in interpreting sources.) The guiding question is "In what ways has your community stayed the same or changed?" Finally, students are ready for field trips!

Each small group visits their town hall, historical society and library. They then fan out across the town, observing and interviewing folks involved in some aspect of their town, from large dairy farms to small organic farmers, or from the clerk at the local store to the owner of a pottery business. Students decide upon each location during the research phase, sharing notes and thoughts on the wiki. Molly and Sam head to the parking lot that used to house the inn. "The Old Farts Club" has agreed to meet the team at the local coffee shop, and regales the team with stories they remembered about the inn. Sam snaps photos while Molly manages the digital voice recorder. The hour flies by. They return to the Town Hall to get photos of the original deeds for the inn.

Upon return to class they upload the information to a shared workspace and begin to create a storyboard for a one-to-three minute presentation. (1b) Once all permissions for publication are received, the projects are posted on a public page on the wiki, on the school web page, and the town's web page. (6b) Molly invites her parents and an elderly neighbor to the celebration of student work where all of the projects are viewed. In focus groups, everyone discusses their recommendations for what legacies need to be protected. (1d) Molly's group thinks the town web page should post the student products and set up a *blog* where all community members debate preserving these town legacies. It is too late to save the inn, but not to late to save the memories!

Molly's class belongs to *EPals*, so they post a request to classes in other countries to share their legacies. Each week throughout the year students check for new posts from global friends. "Here's a story from a town in Peru! They have some farms just like us! Hey, it is summer there! Their church doesn't look much like ours." Exploring the

differences and similarities reminds them of the unique fragility of their own communities.

Student Standards – The following NETS-S are noted in the Scenario:

1. Creativity and Innovation – A. B, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B,C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C,D
3. Model Digital-Age Work and Learning – B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C,D
5. Engage in Professional Growth and Leadership –A, B,
6.

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS 9-12:3 Students design research by…

- Identifying tools and procedures needed for collecting, managing, and analyzing information, including a plan for citing sources (e.g., establishing a time line or schedule for research, identifying places to find possible sources).
- Determining the best ways to present data (e.g., Power-Point, hypercard, report, graph, etc.).

H&SS 9-12:4 Students conduct research by…

- Locating relevant materials such as print, electronic, and human resources.
- Describing evidence and recording observations using notecards, videotape, tape recorders, journals, or databases.
- Revising the research plan and locating additional materials and/or information, as needed.
- Citing sources

H&SS 9-12:9 Students show understanding of how humans interpret history by…

- Locating appropriate primary and secondary sources in order to find evidence to support his or her hypothesis.
- Evaluating the credibility of differing accounts of the same event(s), and recognizing any existing bias in their own writing about historical events (e.g., comparing accounts of an event in history textbook written in the early 1900s to the same account described in a more recent history text).
- Using technology to interpret history (e.g., using technology to access and interpret historical data).

Is It Getting Warm in Here?

Grade Cluster - 9 – 12

NETS-S - 1 - Creativity and Innovation

Quick Look:

Students in World Issues, a multi-disciplinary science/social studies, *project-based learning* course, voice serious concerns about global warming and how it may significantly impact their future. They decide to collaborate with four other schools to explore how Vermonters can tackle global warming. They analyze Vermont's greenhouse gas production, use *simulations* to explore ways to reduce it, and draft legislation based on their research during this ten week project.

Scenario:

Like a growing number of people around the world, students in World Issues, a multi-disciplinary science and social studies, *project-based learning* course, voice serious concerns about global warming and how it could significantly impact their future. They decide to focus their next project on exploring how Vermonters could tackle global warming by reducing their greenhouse gas emissions.

The students begin the project with two sessions brainstorming the issue with *Mindomo* online *concept mapping software*. They quickly realize that global warming is a problem too big for them to tackle by themselves. They decide they need to enlist the help of students at four other schools around Vermont with whom they have previously collaborated. (6A, 6B)

The students hold a virtual meeting using the *Learning Network of Vermont* video conferencing system. They begin the meeting with a short video they found on *TeacherTube* about global warming. Next they share their brainstorm and invite the other students to add to it. They use *Mindomo* to first rearrange and group related topics and ideas from their original brainstorm, and then to brainstorm a research plan. They decide to divide into ten-person research teams containing representatives from each of the five schools. They decide that one of the collaborative teams will research how they can use *Google Spreadsheets* to simulate energy use and greenhouse gas production. They briefly discuss how *simulations* work and decide to meet periodically to learn more about *simulations*, to share highlights of their research, and to address any holes in their research plan. (6A, 6B)

Each research team studies one of the major topic areas (e.g., transportation, space heating, and electricity production). They perform online research on the Internet; they use *Skype* to meet with experts in energy production, renewable energy, transportation technologies, etc.; they conduct interviews with local and state officials about local and state energy use; and they collect energy usage data from their peers and their families

using a *Google Form* (online survey). They save their research results in a collaborative *Google Spreadsheet*. (6A, 6B)

The *simulation* team uses the Internet and experts around the country to learn all they can about how to build *simulations*. They develop a set of *Google Spreadsheets* to serve as examples for the research teams. (1C, 6A, 6B)

At least once a week for the ten weeks of the project, all the students take part in virtual meetings to update each other and to learn how to build *simulations*. The *simulation* team shares an *iTunes U* video they found that provides a great introduction to *simulations*. They also share examples of simple *simulations*, tips for collecting and organizing the kind of data needed for the project *simulation*, and steps for building the different parts of the *simulation*. (6A, 6B)

Each collaborative team also meets as needed using *Skype* to update each other and to identify next steps in their research. (6A, 6B)

After four weeks of research, the students build their *simulation*. Each team creates a complex set of *Google Spreadsheets* that simulate their part of the overall model of energy use and greenhouse gas production in Vermont. Their spreadsheets use inputs such as number of people in different age groups, average miles travelled per person per year, and average electricity consumption per household to calculate the quantity of greenhouse gases produced. The *simulation* team acts as consultants and assists each of the other teams, using *Skype* to communicate. (1C, 6A, 6B)

Once the students complete their *simulation* of the current state, they develop a series of scenarios that explore how alternative sources of energy (e.g., wind power and photovoltaics), different transportation technologies and strategies (e.g., electric cars and improved mass transit), etc. could reduce greenhouse gas production in Vermont. (1C, 1D, 6A, 6B)

After reviewing the way local ordinances and statewide bills are enacted, the classes at each school use what they have learned with their *simulations* to draft proposals for local ordinances and state laws to reduce Vermont's greenhouse gas emissions. The students hold a virtual meeting on the *Learning Network of Vermont* to decide which proposed laws they will present to the Vermont legislature and who will present which ones. (1A, 6A, 6B)

Finally, the students develop multi-media presentations (including *digital stories* and animations of their *simulations*) that summarize their findings and that argue the merits of their proposals. They present these proposals to city and state officials. (1A, 1B, 6A, 6B)

The five local selectboards are currently working on ordinances and zoning regulations based on the students' work and the House and Senate Energy and Environment Committees are working on bills based on the students' proposals.

Student Standards: The following NETS-S are noted in this scenario:

1. Creativity and Innovation – A, B, C, D

6. Technology Operations and Concepts – A, B

Teacher Standards: Teachers who teach this unit address the following:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C, D
3. Model Digital-Age Work and Learning – A, B, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, C
5. Engage in Professional Growth and Leadership **–** B

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Math:

MHS: 30 Demonstrate understanding of mathematical problem solving and communication by…

- approach and reasoning, execution, observations and extensions, mathematical communication, and presentation.

Science:

S9-12:5 Students demonstrate their ability to REPRESENT DATA by…

- Representing data quantitatively to the appropriate level of precision through the use of mathematical calculations.

S9-12:7 Students demonstrate their ability to EXPLAIN DATA by…

- Considering multiple variables when interpreting mathematical analysis

S9-12:8 Students demonstrate their ability to APPLY RESULTS by…

- Using technology to communicate results effectively and appropriately to others.
- Predicting/recommending how scientific conclusions can be applied to civic, economic or social issues.

History and Social Sciences:

H&SS9-12:14 Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, proposing solutions, considering the effects of and implementing a course of action in the local community, state, nation, or world.
- Explaining and defending their own point of view on issues that affect themselves and society, using information gained from reputable sources.

H&SS9-12:15 Students show understanding of various forms of government by…

- Evaluating how and why rules and laws are created, interpreted, and changed.

Also: RHS: 12; **WHS:** 8, 9, 10; **MHS:** 1, 4, 15, 21; **H&SS9-12:** 1, 2, 3, 4, 5, 6, 7, 12

The Jazz Age

Grade Cluster - 9-12

NETS - 1 - Creativity and innovation

Quick Look:

High school students participate in an online music composition project and learn about music history in the process.

Scenario:

High school students work with their music and history teachers to learn about the Jazz Age. Through this process, they grow in their understanding of music theory, music history and create an original music composition using technology.

In their history class, students study the period of time following WWI often referred to as the Jazz Age. The teacher and students use resources such as http://www.pbs.org/jazz/ and http://www.smithsonianjazz.org/ to learn about the history behind the music. Students use *Twitter* during and outside of class to describe what they are learning about the Jazz Age. They *Skype* or use the *Learning Network of Vermont (LNV)* to speak with historians and university professors about this significant time period in the history of jazz. Small groups of students work collaboratively with an interactive whiteboard or laptop lab to develop a multimedia timeline for jazz history, or design an interactive graphic organizer with links that allow the user to listen to jazz, read about jazz greats, and view images and historic video clips.

During music class, students examine jazz through the eyes of a composer. Notation software such as Sibelius and Finale are used by the music teacher to write or adapt music for students, or create exercises to help students learn particular concepts about jazz. Just as the notation software helps reinforce some concepts, music theory software is used by the teacher to focus on the how and why of music composition. Some programs are simply a tutorial, some include games to drill concepts, and some even include tests designed to measure student progress (1c). Using the Internet, students visit teoria.com or musictheory.net to learn more about theory and become stronger composers.

The teacher uses an *interactive whiteboard* to show the scores of listening assignments so that students can see, hear and interact with complex materials or scoring techniques. In small groups, students use the interactive whiteboard to work on notation and collaboratively generate new compositions (1a, 1b, 2d). Students also learn to use notation software such as Sibelius to take their knowledge and extend their thinking beyond paper and pencil music composition. In some cases, they orchestrate for a small ensemble or even a large group such as a full concert band or orchestra (1a, 1b, 6c). Some students choose to download open source music notation software at home, so that they can continue developing their composition outside the classroom.

The opportunity for reflection and critique is a powerful tool in music composition, as well as in writing. Students share their work in the music classroom using a classroom *Wiki* and through online mentoring by experts and professional composers. High school students upload their in-progress compositions to an online discussion. Here they are asked probing questions and receive suggestions and encouragement. This process helps the student reflect on their work to better understand their intent and revise their composition (1a, 1b). This mentoring experience is provided by the Vermont MIDI project. As part of MIDI project, students and teachers can participate in workshop sessions provided by professional composers and musicians (2a). These topics are specialized to address different areas of interest that young people may display. This opportunity is provided through the use if the *LNV*. In the history classroom, student share their multimedia timelines and graphic organizers through the teacher's webpage. They use *Twitter* to write snippets about their jazz discoveries and to direct their audience to primary resources and other interesting historical and modern jazz information.

Final products are presented in a public forum:

- Student work is made available on the web for both listening and to view the original work (2a, 2b).
- Live performances of the student's composition are posted to *YouTube* and other online locations.
- The school's music fan page on *Facebook* posts information about the composition with links to the live performances.
- A virtual ensemble performs the student compositions using the *LNV* or webcams (2d).
- Groups of students share their graphic organizers and timelines on the web.
- Students tweet on *Twitter* about jazz history and composition.

Student Standards: The following NETS-S are noted in this scenario:

1. Creativity and Innovation – A,B,C
2. Communication and Collaboration – A,B,C
6. Technology Operations and Concepts –C

Teacher Standards: Teachers who teach this unit address the following:

1. Facilitate and Inspire Student Learning and Creativity – A,B
2. Design and Develop Digital-Age Learning Experiences and Assessments -A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

APHS: 4 Students show skill development when CREATING music by…

- Improvising short songs and instrumental pieces using a variety of techniques, (e.g., changes in tone color, dynamics, and pitch bending).
- Composing and arranging for voices and various acoustic and electronic instruments, demonstrating

APHS: 16 Students make connections between/among the arts and disciplines outside the arts by…

- Creating art work to show understandings of a discipline (e.g., show understanding of music through history, show understanding of dance through anatomy, show understanding of theatre through literature).

APHS: 18 - Students show understanding of how the arts shape and reflect various cultures and times by…

- Creating or performing a work of art that communicates a cross cultural or universal theme.
- Classifying art works by style, genre, historical period, and explaining why each is representative.

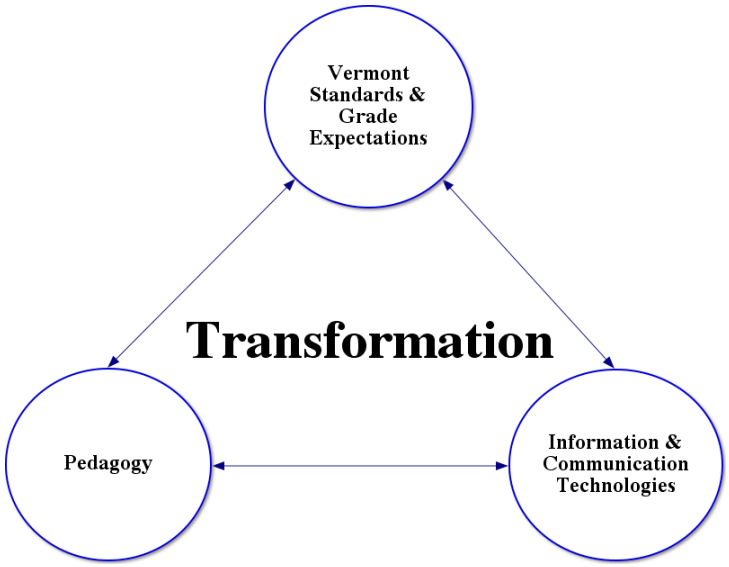
National Technology Standards for Students

Standard 2

Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:

a. interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.
c. develop cultural understanding and global awareness by engaging with learners of other cultures.
d. contribute to project teams to produce original works or solve problems.



NETS-S – 2

Communications & Collaboration

Grade Cluster

K-2

What's the Weather Like Today?

Grade Cluster - K-2

NETS-S – 2 - Communication & Collaboration

Quick Look:

Students observe and record the daily weather conditions and share their findings with global partners.

Scenario:

"Weather Teams, it's time for your Friday reports," calls out the teacher. Every morning this week, students have been working in small groups with *digital voice recorders* and digital cameras, keeping track of daily general weather information, including such items as clouds, wind, temperature and precipitation. They have recorded their findings in a table they created using one of the class *netbooks*. "Which team would like to share first?" The Cloud Team reports that Monday and Tuesday had dark rain clouds. Wednesday and Thursday had lots of puffy white clouds, but there were no clouds today, just lots of sunshine. The team shares prints of the digital images that they took each morning and the class hears a playback of the daily audio recording and sees the group's information displayed in a large format through the *interactive whiteboard* (6a). The Wind, Temperature, and Precipitation groups also share their aspects of the days' weather (2b).

After each group has shared, using a projection system for all to see, the teacher adds the facts to a monthly online calendar, using weather codes and symbols that students have created (2d). Digital images of the weather and audio files are also added to the class' weather web page (2a). The class dictates to the teacher a brief weather summary, including a description of how the weather affected their choice of clothing and activities during the past week (2b, 6b).

"I wonder how our week's weather compares with our partner school in Argentina," comments the teacher. For the past several weeks, the class has been communicating with a partner school they found through *Global SchoolNet* (2c). The class checks their partner school's weather web site and then use *Skype* to talk with their Argentine friends about the weather they've observed (2b).

Later in the day, the class works with upper grade science buddies to assemble a weather station where students learn how to use different weather instruments to measure and record the temperature, wind direction, precipitation and humidity using *Pasco sensors* (6d). Data is collected and represented on graphs that they may later share on their web page for their global pals (2a, d).

Student Standards - The following NETS-S are noted in the Scenario:

2. Communication and Collaboration – A. B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards - Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design & Develop Digital-Age Learning Experiences/Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C, D
5. Engage in Professional Growth and Leadership – A, B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Earth/Space Science

SPK-K:48 Students demonstrate their understanding of Processes and Change over Time within Earth Systems by…

- Observing and describing weather daily throughout a school year.

S1-2:48

- Observing and recording weather data through the seasons and identifying and drawing conclusions based on the **patterns** in the data collected.

Science Inquiry

S1-2:1 Students demonstrate understanding of SCIENTIFIC QUESTIONING by…

- Posing observational **questions** that compare things in terms of number, shape, texture, size, weight, color, motion, etc. (e.g., How fast does a Lady Beetle move compared to a Bess Beetle?).
- Investigating and completing **questions** to identify a variable that can be changed (e.g., What will happen if…? or I wonder if I change…?).
- Generating new **questions** that could be explored at the end of an investigation.Mathematics Grade Expectations: Grade 2

Standard 7.9: Data, Statistics, and Probability Concepts

M2: 23 Interprets a given representation (pictographs with one-to-one correspondence, line plots, tally charts, or tables) to answer questions related to the data, or to analyze the data to formulate conclusions.

M2: 25 Organizes and displays data using diagrams, models, tally charts, or tables to answer questions related to the data, to analyze the data to formulate conclusions.

Government & Society

H&SS1-2:14 Students act as citizens by…

- Describing what it means to be a responsible member of a group.
- Demonstrating positive interaction with group members (e.g., working with a partner to complete a task).
- Participating in setting and following the rules of the group, school, community.

A Walk Through Our Town

Grade Cluster - K-2

NETS-S – 2 - Communication & Collaboration

Quick Look:

Students compare local businesses, schools, and public places to those of other communities by visiting and researching various places in their town and then sharing information with classes from other communities.

Scenario:

Prior to kickoff of the Community Unit, the teacher connects with other teachers around the state who are interested in comparing communities. Teachers can contact each other through *Epals.*

"Boys and girls, what are some places you might find in any community?" asks the teacher, as she tells the class they are going to begin an exciting thematic unit called "Communities." Students begin brainstorming a list of generic places they might find in any community (grocery stores, offices, restaurants, banks, etc.). Once a list is generated, students gather into small groups and turn their focus towards various local sites within each category. Students then identify a specific place within each category. For example, under the category of restaurants, they might list a local pizza shop or fast food restaurant. The teacher creates a map using *Google Earth* and tags specific sites the class will later visit on a walking tour of the community. This will be shared with the class prior to the upcoming community field trip.

In the meantime, students learn how to take a photograph using a digital camera. Students take turns focusing on small objects, each other, and larger areas in order to get the best picture possible. Now the students are ready to take this new skill out into the field. On the day of the community walking field trip, students will photograph their site of choice (2a, 6a). This is done in small groups and individually (2d). They take several pictures of each place to ensure an accurate visual representation of their site.

Upon returning to the classroom, students research the answers to basic questions about their site. For example: What is the name of your site? What is its physical address? When was your site built? What is its significance to our community? Answers are found using *Google Maps,* by making phone calls to business owners or by interviewing local citizens. Students create a short report based on the information that they learn, which will later be digitally recorded and saved as an *MP3* file (6a). Now it's time to pull it all together. Using *Microsoft PhotoStory*, site pictures are inserted into a slideshow (6d). MP3 files are then added to the corresponding images to provide narration for the slideshow (2a). The final presentation is now ready to be used to compare and contrast their community with another similar community within the state.

The teacher uploads the project to classroom website for viewing by parents, the public, and the partner classes around the state (2b). The partner class then views the information while simultaneously sharing similar facts about their community. This is communicated through *Skype*. Students discuss similarities and differences between communities using a Venn diagram.

Student Standards – The following NETS-S are noted in the Scenario:

2. Communication and Collaboration – A, B, D
6. Technology Operations and Concepts – A, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C, D
5. Engage in Professional Growth and Leadership – A, B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS1-2:4 History and Social Sciences - Students conduct research by...

- Recording observations with words, numbers, symbols and/or pictures, (e.g., drawing or labeling a diagram, creating a title for a drawing or diagram, recording data provided by the teacher in a table.

H&SS1-2:7 - Students communicate their findings by...

- Speaking, using pictures, (including captions) or creating a simple report or "painted essay" containing a focus statement, details and a conclusion.

Square of Life

Grade Cluster - K-2

NETS-S – 2 - Communication & Collaboration

Quick Look:

Students will examine squares in their schoolyard to observe what living and non-living items they find. They share this information in a collaborative database online. Additionally, they share their observations with another school located in another state or country.

Scenario:

The teacher explains to the class that they are going to be starting a new, collaborative project called Square of Life. She explains that, using the Square of Life website, the class will share information about their location, their school, and the living and non-living things found in their schoolyard. This is going to be shared with other schools in other states. The students are very excited about this new project and the impending opportunity to learn more about what is in their own backyards, as well as other schools. Before students collect the information about the living and non-living things in their Square Meter, they make some predictions about what they might find and record this in a *Google Doc*. Students then plot a square meter in their school yard and record the living and non-living things that they find. Students, working in groups of three or four, record what they find in their square meter. They compare this to their original predictions and discover they had overlooked a lot! One student in the group videotapes the area, while the other students in the group describe what they are seeing. Since each group will be presenting to a wider audience, students know that they will need to edit these digital images prior to the inclusion in the subsequent presentation to their peers, community members, parents and other collaborating schools in the project. (2a, 2b, 6a, 6b)

Students will use the Biokids Critter Catalog to help identify insects in their square. Students will use sites found in the Square of Life Reference Center and selected by teachers, to help identify the soil and plants they may find in their square. Knowing that students may still need help identifying everything in their square, the teacher arranges for guest speakers from the local Natural Resources office or local college department to visit the class and talk to the students about the things they found in their square. These folks will help identify items the students couldn't identify.

Students will use *Google presentation* to present a short slide show of their findings and send out the link to several different schools that are part of the project. (6b) The information collected in their square is shared in a database on the project database website for all the schools participating to view. (2a) Information collected will also be shared on the class *blog.*

Each group presents information about their location, shares a map of their area using *Google Maps*, and provides specific information about the living and non-living things in their squares. Then, using the database of information, each group will choose one other school that has video conferencing capabilities or *Skype*, with whom to compare and contrast their information. The teacher shows students on a Google Map where their collaborating schools are located.(2a, 2b, 6b, 6d) Once they learn this, students show a cluster map (widget on their blog) describing where all the collaborating schools are located. (2d) Students will include this comparison in their presentation, which will be posted to the project web site. They will also present their findings to the collaborating schools.

The students are very excited about their projects, and also want to present their work to other classrooms in the building. Students in the other classrooms marvel at the wondrous living and non-living things found in their own backyard!

Student Standards – The following NETS-S are noted in the Scenario:

2. Communication and Collaboration –A,B, D
6. Technology Operations and Concepts – B,D

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- B, D
2. Design and Develop Digital-Age Learning Experiences and Assessments- B, C,
3. Model Digital-Age Work and Learning – B, C, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, D
5. Engage in Professional Growth and Leadership

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Science

S 1-2: 2 - Students demonstrate their understanding of PREDICTING AND HYPOTHESIZING by…

- Predicting a logical outcome to a situation, using prior knowledge, experience and/or evidence.
- Explaining reasons for that prediction.

S1-2:46 - Students demonstrate their understanding of Processes and Change over Time within Systems of the Universe by…

- Observing, describing and comparing color and texture of different types of rocks and soils.
- Conducting tests on how different types of soils retain

S1-2:4 - Students demonstrate their ability to CONDUCT EXPERIMENTS by…

- Referring to and following a simple plan for an investigation.
- describing observations using senses rather than feelings (e.g., The snail has a hard shell with wavy, brown lines, rather than the snail is awesome).
- Recording observations of similarities and differences.
- Drawing scientifically:
  a. Recording relative proportion (e.g., Eyes are approximately the right size when compared to the head) including focus on finer details, and differentiating all parts observed.
  b. Labeling significant aspects of a scientific drawing or diagram with words provided.
  c. Creating a title for a scientific drawing or diagram.
- Recording data (in a table provided by the teacher) generated from the use of simple science equipment, as well as nonstandard and standard measurement tools.

NETS-S – 2

Communication & Collaboration

Grade Cluster

3-5

School Playgrounds Around the World

Grade Cluster - 3-5

NETS-S - 2 - Communication and Collaboration

Quick Look:

A group of students want to know about the kind of playgrounds that kids at other schools have to play on. They wondered if the location and environment had any impact on their playground designs. Students create a global project to find the answer to the question, "What are school playgrounds like in other places and how does the environment impact the structures and design of their playground?"

Scenario:

Students were looking at the latest national Geographic Magazine when they stumbled across a very different looking playground. They wondered why it was built the way it was and how the different pieces of equipment were used. One student noted that it looked very hot and dry there. They began discussing their playground and wondering what kids in other schools had for playgrounds. They wondered what a playground might be like in a hot, dry climate, a wet climate or a cold, snowy climate.

We were just beginning a study of children in other cultures and this was a great topic for a global studies project. We decided to create an *Internet* project to answer the question of, "What playgrounds are like at other schools around our country or even the world?" Students spent several sessions discussing playgrounds, their design, size, structures, locations, and what impact the climate might have on a playground's design and equipment. They decide to invite nine classrooms to join them in learning about each other's playgrounds. Thus began the project "School Playgrounds Around the World." (2c)

The students begin by writing a description of their project and then submitting it to *Global Schools Network.* We create a Tweet on my *Twitter* account to help spread the word of the project. The goal of the project is to find out how the climate and the environment impact the design and structure of a school's playgrounds. The classrooms analyze the data collected, create charts and graphs from the information, and work together on a *Google Presentation* that highlights each school's playground. Students use the information they learn about playgrounds to design a new playground for their school. All the classes have access to the same information, so each participating classroom can use the information the way it works best for them. (2a, 2b, 2c,2d) Throughout the project all the work completed by the groups is posted on the class *blog*, so the parents, community members and participating schools can follow the progress of the project.

The students know they need to get information about the participating schools so they work in small groups using a *graphic organizer* to create a list of questions to ask the participants. Using the *electronic white board* to share their questions, the class votes on the questions they will ask. (For example, name of school and address, grade level,

number of students in the class, teacher's email address, kinds of equipment on playground, how is the playground used, playground size, etc.) They also create a list of questions related to the environment and climate where the school is located. They specifically want to know what impact the environment has on the design of the playground. (6a, 6b)

Project descriptions are developed (contact resources, create presentations, data collectors.) and students choose the group he/she wants to be in. The groups begin their assigned tasks. All groups meet weekly to share the work they have been doing, to discuss and solve problems and revise the plan if needed. The following groups are formed.

The "Communications" group is responsible for communicating with the teacher and students in the other classrooms. They use *email* to keep everyone informed on the progress of the project. They notify the groups when the shared documents are ready for everyone to use, ask questions of the participants and respond to the other classes' questions. The teachers work with this group to set up several "Skype Days". On these prearranged days the classrooms communicate together using *Skype*. (2b, 6b)

The "Forms Creator" group creates a *Google Forms* shared document that participating classrooms fill out, based on the questions the students developed. The "Forms" group is in charge of collecting the information and pictures that schools send about their playgrounds, and organize the information into a book using a publishing program. The book is published in *issuu* and is titled Playgrounds of the World. (2a)

The "*Google Presentation*" group is in charge of making sure that the participating schools complete their slides for the presentation. The slides include the name and address of the school and the class, playground pictures and description and facts about their environment. The group designs the slides representing our school. They use the *digital camera* to take pictures of our playground and write the text for the slides. (2a, 2d)

The "*Google Earth*" group locates each participating school on *Google Earth*, identifies the school and puts in a picture of that school's playground. The ".klm" file is shared with the participating schools. (2c, 6b)

The "Reporters" group analyzes all the playground data. They use the Venn diagram format from a *graphic organizer* to compare and contrast their playground with those of the other schools. The work they create is shared with the class through a *Google Presentation*, and is posted on the class *blog* and print outs of the information are posted in the classroom. (2b)

After analyzing all the playground information, the "Design a Playground" group leads a class discussion on what a new playground for their school might look like and the kinds of equipment that would be on the playground. The "Design" group uses *Google SketchUp* to design one or two new playgrounds for their school. Their final designs and a short narrative describing their new playgrounds are published on the class *blog*. The designs are printed out in color and are displayed in the classroom and the front hall of the school. The information is shared with the School Playground Parent Committee. (2a, 2b, 2c)

All the playground designs created by the participating classrooms are shared in a *Google Docs* file and the file is uploaded to *issuu* to create a book, titled Playground Designs. The link to the book is shared with all the participants and is put on individual class *blogs* for sharing with parents. (2a, 2d)

Students realize they can extend this project by having schools submit a school location and a playground picture and they add this information to the *Google Earth* map they have created. They use *Twitter* to let the world know about the project. (2c)

Student Standards – The following NETS-S are noted in the Scenario:

2. Communication and Collaboration –A, B, C, D
6. Technology Operations and Concepts- A, B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments- A, C
3. Model Digital-Age Work and Learning- A, B
4. Promote and Model Digital Citizenship and Responsibility- D
5. Engage in Professional Growth and Leadership-A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS 3-4:1 Students initiate an inquiry by…

- Asking relevant and focusing questions based on what they have seen, what they have read, what they have listened to, and/or what they have researched.

H&SS 3-4:2 Students develop a hypothesis, thesis, or research statement by…

- Using prior knowledge to predict results or proposing a choice about a possible action.

H&SS 3-4:3 Students design research by…

- Identifying resources for finding answers to their questions.
- Identifying tasks and how they will be completed, including a plan for citing sources.
- Planning how to organize information so it can be shared

H&SS 3-4:5 Students develop reasonable explanations that support the research statement by…

- Organizing and displaying information in a manner appropriate to the research statement through tables, graphs, maps, dioramas, charts, narratives, and/or posters.
- Classifying information and justifying groupings based upon observations, prior knowledge, and/or research.

H&SS 3-4:14 Civics, Government and Society

Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

Mathematics Grade Expectations: Grades 3, 4, 5

Standard 7.9: Data, Statistics, and Probability Concepts

- M4: 23 Interprets a given representation (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.

S3-4:1 Students demonstrate their understanding of SCIENTIFIC QUESTIONING by…

- Identifying at least one variable that affects a system and using that variable to generate an experimental question that includes a cause and effect relationship.

Contributing to the *Cloud*

Grade Cluster - 3-5

NETS-S- 2 - Communication and Collaboration

Quick Look:

As part of a Vermont Studies unit, students collaborate with another Vermont classroom to research the existing Vermont state symbols, create an article to update the symbols information on the Vermont State Symbols *Wikipedia* page, and make recommendations for potential new state symbols.

Scenario:

"Can students really change what is on *Wikipedia*?" asks a student at morning meeting. The class looks up the Vermont article on *Wikipedia*. When looking at the symbols section of the article, students notice the Honey Bee is missing in the list of state symbols. (2a, b)(6c)

While in a *chat room* with our on-line partner class, the students choose to work together on an on-line project to update the Vermont Symbols *Wikipedia* article. (2c)(6a, b)

Each class discusses Vermont symbols and creates a list of existing symbols. They enter the symbols in a *Google Form* and use this form to select three Vermont Symbols they would like to research. The teachers review the forms with their students and create student groups comprised of two students from each classroom. Each student group chooses a different symbol or symbols to research, based on their listing of popular student choices. (2a, b, c)(6a, b)

Paired groups collaborate using different *chat rooms* on the school's server to introduce themselves and share strategies for gathering information and preparing the *Wikipedia* section about their symbol. (2a, b, c, d) For example, "What is the origin of the symbol?" is a question that warrants further investigation. The items are entered in a *Google Document* for both classes to share. (2a)

Using sites such as the Vermont Secretary of State Kid's Page and the State Symbols USA web pages, students research information needed for the articles that are eventually to be inserted in *Wikipedia* under the Vermont Symbols page. (2a, b, d)(6d)

Each group is assigned a mentor teacher. These groups meet on-line in a private *chat room* to develop their plans, share research, and share ideas about the focus of their articles. The teachers review these ideas and comment back to the students. The students revise their draft ideas plans as necessary. Students collaborate using *Google Docs* to outline and write their articles. Students add their symbol articles to the *Wikipedia* article on Vermont symbols, and on each of the class blogs. (2a, b, c)(6a, b, d)

During the research process, students also identify other states' symbols and determine which symbols other states have that Vermont does not. For example, they learn that Louisiana has a state poem, a state museum, state jellies and even state donuts. Each student group then also proposes the creation of a new state symbol for Vermont, and justifies why they have made that choice.

Each class reviews what each group has suggested, and then together, the class selects a new symbol to officially propose as a state symbol. They compose a persuasive letter that describes the new symbol and the reasons why it should become an official Vermont symbol. They send an email to our state representatives and state senators seeking their support to officially propose the new symbol. (2a, b, c, d)

The classes are very proud of their work to update the Vermont State Symbols page and are now ready to display what they have accomplished. They update the *Wikipedia* page and that night they go home and share with their families what they have been collectively working on in school. (2b)(6b, d)

Resources:

Wikipedia Vermont State Symbols
http://en.wikipedia.org/wiki/List_of_Vermont_state_symbols
Vermont Secretary of State Kid's Page
http://www.sec.state.vt.us/Kids/symbols.html
State Symbols USA
http://www.statesymbolsusa.org/

Student Standards – The following NETS-S are noted in the Scenario:

2. Communication and Collaboration – A. B, C, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A,B,C,D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A,B,C,D
3. Model Digital-Age Work and Learning – A, B,C,D
4. Promote and Model Digital Citizenship and Responsibility – A,B,C,D
5. Engage in Professional Growth and Leadership – A,B,C,D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage

you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Standard 1.11: Persuasive Writing*

Informational Writing: Persuasive Writing

W5: 16 In persuasive writing, students present and coherently support judgments or solution(s) by…

- Providing appropriate facts and details
- Addressing the reader's potential concerns or counterarguments

History & Social Science

H&SS3-4: Inquiry - Students conduct research by…

- Referring to and following a plan for an inquiry.
- Locating relevant materials such as print, electronic, and human resources.
- Describing evidence and recording observations using note cards, videotape, tape recorders, journals, or databases.
- Citing sources

H&SS3-4:7 History and Social Sciences Inquiry

- Student communicate their findings by giving an oral, written, or visual presentation that summarizes their findings

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

Flying With The Monarchs

Grade Cluster - 3-5

NETS-S - 2 - Communication and Collaboration

Quick Look:

Students participate in the yearlong "Journey South and Monarch Watch" program, tracking Monarch butterflies from Vermont to the butterfly sanctuaries in Mexico, while collaborating with other students around North America.

Scenario:

The butterflies outside the classroom window have captured the interest of the students. The teacher decides to create a unit on the migration of the Monarch butterflies from Vermont to Mexico, by collaborating with children around the US.

The beginning of the school year starts with students learning how to identify a monarch butterfly by its distinctive field marks and unique characteristics. Students use a class *wiki* to keep track of monarchs they see around their community, noting location, time of day, and weather. (6a) The collected information is put into a graphing program, so the students can examine the data. (6a, 6b)

Next, the butterfly sightings are reported in Journey South's Monarch Migration Sighting site http://www.learner.org/jnorth/monarch/index.html, which is viewed in Journey South's real-time Migration Maps. (2a, 2b, 2d, 6a, 6d) These maps show active sightings from around North America and allow the students to read other observers' comments. (2a) Students continue to monitor the migration of the butterflies to Mexico throughout the fall.

During the sighting process, students collect monarch caterpillars and chrysalises from milkweed plants around their community. They document the collection process and caterpillar metamorphosis with *digital cameras* and *camcorders*. (6b) Using their pictures, students create digital stories in *Photo Story* and create paper books that will be published in *Issuu*, an online publishing site, to show the different stages of the metamorphosis. They publish their issue stories on their class *blog*, and later in the year send their *digital stories* to share with students in Mexico who do not get to see the metamorphosis of the butterflies. (2b, 2d, 6b)

Meanwhile, the teacher joins the Monarch Watch http://www.learner.org/cgi-bin/jnorth/jn-sightings and purchases monarch tags that the students will use to tag their butterflies. When the butterflies hatch, students learn how to properly tag a monarch butterfly. Small groups of students create short *multimedia* presentations about tagging the monarch for use in other classrooms. (6b) The students make predictions on the survival rate of their butterflies and the length of time the migration will take. During the

fall the students track their butterflies to Mexico using the Monarch Watch Tag Recovery Database. (6a, 6d) To manage this, a small group of students will use Google Calendar to develop a weekly schedule when each group will access the Monarch Watch Database website. (6a, 6b) Students will create a *Google Earth* journey to document the butterflies' migration path from VT to Mexico. (6a, 6b, 6d)

To learn more about Mexico, students partake in a *Webquest*, http://www.madison.k12.ky.us/ms/webquest/Mexico/Mexico.htm. (6a, 6d) They learn about the butterfly sanctuaries, Mexican life, and some basic Spanish words. Students participate in the online Symbolic Monarch Migration by creating butterflies in *Gimp*, an open-source program for digital image composition. (2a, 6a, 6d) They use an online translator to translate their messages into Spanish. (2b, 6a, 6d) Journey South then distributes the butterflies to schools throughout Mexico. When the butterflies are sent out, the class fills in the Symbolic Migration Map, so their school will appear on the online tracking map. (2a, 6b) They see other classes participating in the journey. (2a)

In the spring, students receive student-created digital butterflies from classes around North America. To end the yearlong project, students create a "Flying With the Monarchs" *multi-media presentation*. They include the pictures and videos they took during the butterfly collection process and caterpillar metamorphosis, graphs they created from the data they collected in the *wiki*, *Google documents*, and their butterflies created in *Gimp* and the ones they received back, to show the migration process from view of the northern butterfly flight. (6b) The video is then shared with the classes on Journey North and shared with local senior citizens at a special presentation at the town library. (2a, 2d)

Student Standards- The following NETS-S are noted in the Scenario:

2. Communication and Collaboration- A, B, C, D
6. Technology Operations and Concepts- A, B, C, D

Teacher Standards- Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments- A, B, C, D
3. Model Digital-Age Work and Learning- A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility- A, B, C, D
5. Engage in Professional Growth and Leadership- A, C, D

Content Grade Expectations

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Standard 1.6: Writing Conventions, Grades 3, 4, 5
W4: 2 In independent writing, students demonstrate command of appropriate English conventions by…

- Identifying grammatical errors
- Applying basic capitalization rules
- Using end punctuation correctly in a variety of sentence structures

Standard 7.9: Data, Statistics, and Probability Concepts

M4: 28 In response to a teacher - or student-generated question or hypothesis, collects appropriate data, organizes the data, displays/represents the data, analyzes the data to draw conclusions about the questions or hypothesis being tested.

S3-4:30 Life Science - Students demonstrate their understanding of Structure and Function-Survival Requirements by…

- Explaining how the physical structure/characteristic of an organism allows it to survive and defend itself

H&SS 3-4:14 Civics, Government and Society -Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

NETS-S – 2

Communication & Collaboration

Grade Cluster

6-8

Collaborative Geography:
Creating an Interactive Map of Vermont

Grade Cluster – 6-8

NETS-S - 2 - Communication and Collaboration

Quick Look:

During a four-week collaboration students from around the state will work together to create an interactive Google Earth map of Vermont. The map will include information about the geography of each region of the state delivered in a multimedia format.

Scenario:

Students in Mr. Coughlin's 7th grade social studies class are doing more than studying Vermont geography; they are making that topic more interesting and accessible for other Vermont children. After their introduction to the principles of geography, the students are engaged in a collaborative effort, designed to help them gain a better understanding of the geography of Vermont, through research and the creation of a *Google Earth* map with interactive elements.

Mr. Coughlin's students are working with six other classes from around the state, who joined the project after responding to an invitation posted on the Vermont Social Studies Educator Network. A *Ning* social network is used as the home base for the entire project. It serves as the central location for teacher planning, assessment tools, communication strategies, student work, and feedback. The students and teachers use the Ning forum to determine the types of geographic information they want to collect about Vermont's geography. The topics may include Vermont's physiographic regions, geology, physical features, weather, animals, trees, rocks and minerals and the cultural geography of the state.

Mr. Coughlin's students have been divided into small work groups. Each group is responsible for conducting research on their geographic topic for the northwest region of the state. Along with online research on sites such as NetState, the Vermont Geography Portal and Wikipedia, students will be encouraged to communicate via e-mail or Skype with the Vermont Center for Geographic Information, the geography departments at UVM, St. Michael's College, Middlebury College, and other educational institutions in Vermont, in order to gather information and have their questions answered. (2a, 2b) Students share their information with the teams from the other participating schools who are researching the same topic. For example, the school from the central region of Vermont shares what they have learned about the geology of that region with the geology teams from the other schools. Each team compares and contrasts the information sent by the other schools with their own information.

Students submit the first drafts of their reports for editing via *EtherPad*, an online, collaborative real-time editor, to students in two of the other participating schools. (2a, 2b, 2d, 6b, 6c, 6d) Students use feedback on their writing to revise their content and then record audio versions of their reports with *Audacity*. If time allows, royalty free music, from sites like MusOpen, is located or created online with JamStudio, and added to enhance the recordings. The audio versions of the research reports are uploaded to the project Ning and students receive feedback on the quality of their recordings and make revisions as needed. (2a, 2b, 2d, 6a, 6b, 6c, 6d)

Students compile graphics to accompany their information. They create and scan original artwork, use digital cameras to capture relevant photographs or locate photographs on *Flickr*. Flickr photographs have appropriate *Creative Commons* licenses. Students also use *Google Earth* or *Google Map* screen shots, to clarify their information. (6a, 6b, 6c, 6d)

Students upload their recordings and accompanying images to *ed.Voicethread*. The resulting Voicethreads are added to placemarks in Google Earth, along with image overlays that help to identify key locations and explain important geographic features. All of the placemarks and overlays created by a school for a particular region are saved as a single *KMZ file*. The collection of KMZ files from all the regions are combined into a single Google Earth KMZ file by the initiating teacher and shared with all the participants. This file includes an introduction to the project and explanation of how Vermont teachers and students can make use of this interactive map of Vermont in their studies. (2a, 2b, 2d, 6a, 6c, 6d)

All of the participating schools visit the other regions of the state through this resulting interactive map of Vermont and leave constructive comments and/or questions for clarification on each of the *Voicethreads*. Students are given opportunities to respond to these comments and questions for as long as the discussion warrants. (2a, 2b, 2d)

The finished project is submitted for use by all Vermont students to the resources section of Vermont's Riverdeep Learning Village, the Vermont Center for Geographic Information, and The Vermont Social Studies Educator Network. (2a, 2b)

As a culminating activity, students will be brought together through the *Learning Network of Vermont* for an online videoconference between all seven schools. Students will have a chance to see and speak to each other directly, talk about the high and low points of the project, and make suggestions for the best ways to improve on the project as other students build upon what they started. (2a, 2b, 2d, 6a, 6c, 6d)

Student Standards – The following NETS-S are noted in the scenario:

2. Communication and Collaboration **-** A, B, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments - A
3. Model Digital-Age Work and Learning – A, B, C, D
5. Engage in Professional Growth and Leadership – A, B, D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS7-8:11 - Students interpret geography and solve geographic problems by…

- Identifying characteristics of states, countries, and continents using resources such as landmarks, models, and different kinds of maps, photographs, atlases, internet, video, reference materials, GIS and mental mapping.
- Using absolute and relative location to identifying major mountain ranges, major rivers, and major climate and vegetation zones and the effects of these on settlement patterns
- Interpreting a variety of effective representations of the earth such as maps, globes, and photographs and project future changes (e.g., physical, political, topographic, computer generated, and special purpose maps).
- Identifying and using basic elements of a variety of maps.
- Using grid systems to locate places on maps and globes
- Comparing and contrasting spatial patterns or landforms using geographic resources (e.g., comparing water usage between nations).

H&SS7-8:12 - Students show understanding of human interaction with the environment over time by…

- Examining multiple factors in the interaction of human and the environment (e.g., population size, farmland, and food production

Cultural Investigations

Grade Cluster – 6 - 8

NETS-S – 2 - Communication and Collaboration

Quick Look:

Chittenden County's student population is growing more diverse, as families move in from all over the world. As part of a study of world geography and cultures, student teams select a country and work together to research aspects of the country's culture including education, religion, politics, government, and holidays/cultural traditions, as compared to the United States. Students conduct research using the Internet and through communication with other students (in the country they are studying) via email, *wikis*, and *videoconferencing*. They create online resources such as websites, *wikis*, *podcasts*, videos, or multimedia posters using *Glogster* to be shared with families relocating to the area.

Scenario:

Students discuss the changing population in their school and community as the result of refugee resettlement, the changing economy, and other factors. Questions arise as to whether or not people from other countries celebrate the same holidays, observe the same religions, receive the same education, have the same government, and more. How is the United States similar to and different from other countries? Students develop a genuine interest in learning more about other countries in general, as well as the countries of origin of their classmates.

Students divide into teams, each of which selects a country to study. The students work collaboratively with their teammates to research aspects of the country's culture including education, religion, politics, government, and holidays/cultural traditions in comparison to the United States. Members of each team select which cultural aspect they wish to study. Teams use a *wiki* or a *graphic organizer* to generate questions to guide their research and organize the information they collect (2d, 6a).

Students begin with Internet research. Members of each team collect and share information with each other in a wiki (2a, 6a).

With the guidance of their teacher, students search for connections with other students or classrooms using sites like *ePals* (6a, 6d). The students communicate with students in other countries through email and *videoconferencing* using *Skype* (2a, 2b, 2c, 6a, 6c). Using an online graphic organizer such as *Mindomo*, students create collaborative graphic organizers, to compare and contrast aspects of their countries' cultures with American culture. (2c, 6a, 6b) Students use photo sites such as *Flickr* to share pictures with and collect pictures from students in other countries. They assemble collections of pictures that illustrate their countries' cultures (6a).

Student teams work together to create a brochure using a publication resource such as http://www.mybrochuremaker.com/. In addition, teams create an additional compilation of all their work to share using their choice of a website, video, *blog*, *podcast,* or *Glogster* (2a, 2b, 2d, 6a, 6b, 6c). Resources are shared with families who move to the school from another country and are also distributed through refugee resettlement programs. In addition, final products are shared by teams at a school Cultural Fair and posted online (2a, 2b, 2d, 6a, 6b, 6d).

Student Standards – The following NETS-S are noted in the Scenario:

2. Communication and Collaboration A, B, C, D
6. Technology Operations and Concepts—A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity—A, B, D
2. Design & Develop Digital-Age Learning Experiences & Assessments—A, B, C, D
3. Model Digital-Age Work and Learning—A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility—B, C, D
5. Engage in Professional Growth and Leadership—B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS7-8:1 Students initiate an inquiry by…

- Asking focusing and probing questions that will lead to independent research and incorporate concepts of personal, community, or global relevance

H&SS7-8:3 Students design research by…

- Identifying the quality and quantity of information needed, including primary and secondary sources.
- Identifying tools and procedures needed for collecting, managing, and examining information, including a plan for citing sources
- Determining possible ways to present data H&SS7-8:5 Students develop reasonable explanations that support the research statement by…
- Choosing and using appropriate methods for interpreting information, such as comparing and contrasting, summarizing, illustrating, generalizing, sequencing, synthesizing, analyzing, and/or justifying

H&SS7-8:7 Students communicate their findings by…

- Developing and giving oral, written, or visual presentations for various audiences.

H&SS7-8:13 Students analyze how&why cultures continue & change over time by…
Identifying and comparing expressions of culture in Vermont, the U.S., and the world through analysis of various modes of expression such as poems, songs, dances, stories, paintings, and photographs

Carry Me to the Park: Digital Field Guides for Mills Riverside Park

Grade Cluster – 6 – 8

NETS-S – 2 - Communication and Collaboration

Quick Look:

Students at Browns River Middle School work with experts from the University of Vermont and the State of Vermont Department of Natural Resources to research animal and plant life, geology, pond and stream ecology or other scientific areas of interest as they study science and park stewardship at Mills Riverside Park. The final product of their study is a collection of digital field guides for visitors that can be downloaded to a digital device and referred to during a park visit.

Scenario:

On a recent visit to Mills Riverside Park, several students noticed a lot of garbage in the fields and around the river. They also noticed places where visitors had cut birch bark from trees and trampled vegetation. They even found some dead fish floating in the pond. In addition, funding for Mills Riverside Park has become uncertain during the economic downturn, so maintaining the park has become a local issue. Most of the students have enjoyed park visits throughout elementary school and have learned to be good park stewards, but they want to know what they can do to educate the public, while at the same time teaching them about the natural habitats within the park.
Using *a graphic organizer* on their classroom *SMART Board,* students brainstorm the problems associated with uneducated visitors. They also record ideas about how they can educate the public. As they discuss and record ideas, they decide to create park guides that include information about the habitat, how to take care of the park and how to support the park fund. They brainstorm the various types of field guides that might be used to educate the public while visiting a natural area (e.g. “Field Guide to” -- trees, plants, woodland animals, reptiles, birds, field animals, insects, the pond, the river, geology – “at Mills Riverside Park”), noting that each field guide will include a list of "good stewardship" information.

At the beginning of the study, students spend a half-school-day visiting the park, recording and observing “science” as well as stewardship areas of concern. Groups of four students are formed, each accompanied by a parent or teacher chaperone. Each group of students is given a specific location to explore and examine during the visit (e.g., the pond, one of the fields, the river, or a specific location in the woods). Some groups are given a map, a *digital voice recorder*, a *digital camera,* a *GPS,* and some type of note-taking device, while other students carry a smart handheld device, such as an *iPhone,* with the ability to record sound, take pictures, identify *GPS* points, and record notes. Each student is given a scientific role to play: botanist, biologist, geologist, or ecologist. Based on his/her particular role, each student observes and records plants,

animals (or evidence of), geological formations, or other observations that might be included in a field guide to the park, as well as notes about how visitors are misusing the park. (2a, 2d, 6a, 6b, 6d) As students collect information, they set the *GPS* location for each piece of data and/or note taken. (6a) Students also record their "I wonder" questions as they explore the park. (2d, 6b)

Upon returning to the classroom, each group sorts their notes and questions in the *visual organizer*, organizing the work by topic (geology, biology, botany, ecology). (2a, 2d, 6a) Students group their pictures and post them on *Picasa* indicating the *GPS* location, *tagging* the picture with the topic (geology, botany, biology, ecology), working to avoid duplication, and agreeing on the "best" pictures. (2a, 2d, 6a, 6b) Finally, the groups combine all their work, joining their *visual organizer* files to form a large graphic organizer and an album of pictures to which additional work will be added during the course of the project. (2a, 2d) This larger organizer is used later as students zero in on the topic they wish to research for their field guides.

Students spend a day or two studying all findings, questions, and pictures, in order to decide the scientific area on which they wish to focus. Each student develops one or two questions for further research. Teams of two to four students are formed, based on topics chosen, to create field guides. Students return to the park several times to collect specific information related to their topics, using the same digital devices used during the first visit. (2a, 2d, 6a, 6b)

During the course of this study, groups of students collaborate with experts based on the topic of study (biology, geology, botany, ecology). Students work with UVM graduate students, UVM professors, and scientists from the State of Vermont Department of Natural Resources. Communication with these experts takes place via *e-mail*, *Skype*, in person during classroom and field visits, and through comments placed within a *wiki* where students are collecting the information needed to complete their field guides. (2a, 2d) Students record information, with the permission of the expert, to add to the field guides as appropriate.

As students collect information, groups working on each field guide continue to record, draft, and refine the information in a *wiki* and on their *Picasa* albums to prepare for the final product. (2a, 2b, 2d, 6a, 6b) *VoiceThreads* are created with comments from experts added as the students record information. Each group of students has at least one face-to-face visit with an expert during a study at the park.

Each group creates a final group product in the form of a map of the park, with *GPS* locations identified accompanied by an audio or video field guide for specific scientific topics, as well as a printed poster that advertises their work that is laminated and hung inside the covered bridge at the park. Each field guide and poster also includes information about caring for the park with an additional piece about how to contribute to the park fund. These guides are posted on a website and designed so that park visitors can download them to a portable digital device, such as a *GPS,* prior to a visit, or access them live, and interactively, with a portable web-enabled device such as an *iPhone*. (2a, 2b, 2d)

Student Standards – The following NETS-S are noted in the scenario:

2. Communication and Collaboration – A, B, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

S:36 Students demonstrate their understanding of equilibrium in an ecosystem.

S:38 Students demonstrate their understanding of classification of organisms.

S:48 Students demonstrate their understanding of processes and change over time within earth systems.

S:49 Students demonstrate their understanding of processes and change within natural resources.

H&SS7-8:1 Students initiate an inquiry by…

- Asking focusing and probing questions that will lead to independent research and incorporate concepts of personal, community, or global relevance.

H&SS7-8:6 Students make connections to research by…

- Formulating recommendations and/or making decisions based on evidence.
- Proposing solutions to problems based on their findings, and asking additional questions.

H&SS7-8:7 Students communicate their findings by…

- Developing and giving oral, written, or visual presentations for various audiences.

H&SS7-8:12 Students show understanding of human interaction with the environment over time by…

- Generating information related to the impact of human activities on the physical environment in order to draw conclusions and recommend actions.

H&SS7-8:14 Students act as citizens by…

- Identifying problems, proposing solutions, and considering the effects of a course of action in the local community, state, nation, or world.

NETS-S – 2

Communication & Collaboration

Grade Cluster

9-12

What's Up with the Frogs?

Grade Cluster - 9 – 12

NETS-S - 2 - Communication and Collaboration

Quick Look:

Students in several schools around the world collaboratively explore the health of amphibian populations in this interdisciplinary science and math project. They share their findings with government wildlife agencies and the general public.

Scenario:

Susan finds a video on *YouTube* that shows frogs with extra legs and other deformities. She's simultaneously grossed out and concerned. After a quick Internet search, she discovers that amphibians are not only suffering from unexplained deformities, but are also experiencing significant population declines. She posts a question in the discussion forum of the *Ning* for her Environmental Issues course asking her peers if they've heard about these problems. She invites them to join her in learning more, as part of the course's upcoming group research project. (2A, 2B, 6A, 6B)

Five other students, Pavel, Nina, Bob, Jaida, and Isaac, decide to join Susan. Because the course only meets in person at school once a week, they decide to get a jump start on the project by setting up a conference call on *Skype* to brainstorm the project. Pavel creates a blank *Mindomo* concept map and invites the other students to share it so that they can all simultaneously view their brainstorm and collaboratively edit it while they talk on *Skype*. (2A, 2B, 2D, 6A, 6B)

The initial brainstorming session goes very well. The students decide to build a *wiki* to document what they learn. Nina logs in to *PBWorks.com* and creates a new *wiki* for this project and invites her teammates to join the *wiki* as editors, so that everyone can share the responsibility for creating new pages and managing the *wiki* as needed. Nina also recommends that everyone subscribe to the *wiki's RSS feed* so that they can easily track additions and changes to the *wiki*. (2A, 2B, 2D, 6A, 6B)

Nina remembers that the team decided to invite students from schools in Costa Rica, South Africa, and France to join them in this project. She realizes that managing such a big project by herself could be a little daunting and decides to make Bob an administrator of the *wiki*, too. (2A, 6A, 6B)

Jaida decides to reach out to her *Facebook* community to see if she can find anyone who knows students in Costa Rica, South Africa, and France to join the project. Within days she has connected with peers in each of the other countries. Her Spanish isn't very strong, but she has no problem communicating with the Costa Rican team with the help of the *Google Translate gadget* and *FreeTranslation.com.* (2A, 2B, 2C, 6A, 6B)

Isaac sets up a videoconference using the *Learning Network of Vermont* system so that all the project participants can meet each other and discuss the objectives of the project. Again using *Mindomo,* the students brainstorm a list of the data they will collect. Isaac has invited a prominent amphibian biologist at UC Berkeley to join them. The biologist shares information about his research and his thoughts on the students' data collection plan. (2A, 2B, 6A, 6B)

Each team of students in each country conducts research about the amphibians they are likely to encounter in their study area and develops an online field guide in the project *wiki*. Each page in the *wiki* describes a different species and includes common name, genus and species, several pictures, a list of key identifying markings, audio of the different calls the amphibian makes, and information on habitat and geographic range. Where possible, the students compile historical data on local amphibians. (2A, 2B, 2D, 6A, 6B)

Next, the students conduct their field study. They use the course *iPhones* to record the locations of their study sites (with the built-in *GPS*) and to document their findings with both still pictures and videos. As needed, they use the *iPhones* to check their field guide *wiki* to help identify the amphibians they observe. In addition to the numbers of each amphibian found, the students use *Vernier data collection probes* connected to the *iPhones* to collect environmental data such as pH, air temp, water temp, dissolved Oxygen, alkalinity, etc. at each study site. Students record this data in a shared *Google Spreadsheet*. (2A, 6A, 6B)

The students begin to analyze their data with *Google Spreadsheets*, but they quickly realize that *Google Spreadsheets* doesn't have adequate analytical tools. So, they transfer their data to *Microsoft Excel,* where they can combine their historical and current data to generate population trend lines. They also use the statistical analysis tools in *Excel* to search for correlations between the different environmental data they have collected and amphibian population numbers and/or frequency of amphibian deformities, and to determine if any trends or differences they discover are statistically significant. (2A, 2D, 6A, 6B)

When their analysis is complete, the students post their best pictures, video, graphs, and research results on the *wiki* to share with their peers. They hold another virtual meeting to share their findings. They discuss how they can share what they've learned with the general public and decide that each country's team will create a *digital story* that highlights their concerns. They post their completed *digital stories* on *YouTube,* with a link to the project *wiki* for more information. They also use *Google Earth* to create a *KMZ* file that others can download from the *wiki* to view the study results by location on the planet. (2A, 2B, 2C, 2D, 6A, 6B)

Finally, the students contact their local newspapers, radio stations, and TV stations to publicize their work, and they present their findings and recommendations to government wildlife agencies. (2B, 6A, 6B)

The students realize this is only a first step, and so they commit to helping next year's Environmental Issues class continue this research.

Student Standards: The following NETS-S are noted in this scenario:

2. Communication and Collaboration – A, B, C, D
6. Technology Operations and Concepts – A, B

Teacher Standards: Teachers who teach this unit address the following:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C, D
3. Model Digital-Age Work and Learning – A, B, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, C, D
5. Engage in Professional Growth and Leadership **–** B

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Math:

MHS: 24 Analyzes patterns, trends, or distributions in single variable and two variable data in a variety of contexts by determining or using measures of central tendency, dispersion, outliers, quartile values, or regression line or correlation to analyze situations, or to solve problems; and evaluates the sample from which the statistics were developed.

MHS: 28 In response to a question, designs investigations**,** considers how data-collection methods affect the nature of the data set; collects data using observations, surveys and experiments; proposes and justifies conclusions and predictions based on the data.

Science:

S9-12:5 Students demonstrate their ability to REPRESENT DATA by…

- Representing data quantitatively to the appropriate level of precision through the use of mathematical calculations.

S9-12:7 Students demonstrate their ability to EXPLAIN DATA by…

- Considering multiple variables when interpreting mathematical analysis

History and Social Sciences:

H&SS9-12:7 Students communicate their findings by…

- Developing and giving oral, written, or visual presentations for various audiences.
- Soliciting and responding to feedback.
- Pointing out possibilities for continued or further research.

Also: RHS: 12; **WHS:** 1, 8, 9, 10; **MHS:** 1, 21, 30; **S9-12:** 8; **H&SS9-12:** 1, 3, 4, 5, 6, 14

Bonjour! Welcome to Vermont

Grade Cluster - 9-12

NETS- S-2 - Communication and Collaboration

Quick Look:

Students in their French class create two-minute presentations describing aspects of their own culture, spoken in the French language, to share with their international *ePal* students, and conversely their French-speaking ePals create similar vignettes in English.

Scenario:

"Did you see American Idol last week? Oh, man I can't believe what some people try to get away with."

"Yeah, but the judges are even worse! I can't stand hearing them!"

"Oh, come on, there is some good music on that show."

Ms. Jacob responds, "Did you know there is an American Idol show in West Africa?" The students respond with disbelief; however, a quick YouTube search reveals a show very similar to the U.S. one. After only a few minutes, many questions are raised about the culture.

"Why is that judge so mad? What kind of music is that? Who is this guy Fela they are talking about?" After a lively discussion, Ms. Jacob asks, "What stereotypes do you have about countries in West Africa? And what stereotypes do you think they have about us? And while we're on the topic, which countries in Africa speak French?"

Once a month, the students in this French class decide on a part of their Vermont community they would like to share with the world. As a whole group, they learn the vocabulary of some aspect of culture (food, entertainment, recreation, history, etc.). Each student selects one component and creates a short, one-to-three minute script for an audio recording using *Audacity.* For example, if the class has decided to study food, one student might report on a local restaurant, another might report on a local berry farm, another on a local organic gardener, another on a shopping trip to Hannaford's in a neighboring large town. They have learned some of the techniques of ethnography in their social studies class, some of the components of good story telling in their English class, and the basics of using Audacity in their Tech Ed class. Now they can apply that knowledge to their French class!

The teacher and students together chose an *ePals* classroom in Côte d'Ivoire, a country that speaks French and is in the region where West African Idol is filmed and shown. The students there are embarking on the same observation/recording of culture as are the Vermont students, and each month they converse with the Vermont students about this project. Collectively, they decide on one broad cultural component – in this case food. The Vermont students send the West African students their written drafts for their audio recordings, as do the West African students, via the ePals email structure. (2a) Each student reads their ePal's written report and edits it for accurate vocabulary, but more importantly, for a sense of authentic voice and sentence structure. Does it "sound

right" in writing? Students receive the critiques and move on to edit their rough drafts. (2d)

Now they are ready to create a *podcast!* After revising their scripts and practicing them, they read it to a classmate who helps them with timing and intonation. Each student then records and makes preliminary edits to their report using Audacity and then saves it to a shared folder on the school network. Each student has a "nom de plume" that allows for anonymity and also begins to establish a *digital footprint*, so they may use that name in many future Internet applications, yet still not reveal personal information. The teacher reviews the recordings and suggests necessary editing. As time allows, some students may add appropriate music, if permissions are given. Each month, a different student is given the job of "Podcast Uploader", and that person sends the audio recordings to an established *iTunes* site. People from around the world can hear the reports if they subscribe to the podcast. (2b) Some of the most important listeners will be their ePals buddies! Other students in other French classes, from down the hall to Texas and on to China, can hear the broadcast. Once the Vermont podcasts are posted, the class listens to their West Africa ePals' English podcasts describing that culture. The teacher sets up a *graphic organizer* for students to compare/contrast the various cultural responses. (2c)

Once the podcasts become routine, students may want to add a visual component to their work. Using cameras or cell phones they take pictures of the subjects they discuss. (2b) Imagine the surprise and delight of their colleagues in West Africa to see snow! or pumpkins! or spring bulbs! Likewise, the Vermont students will delight in the photos of everyday life in West Africa.

Student Standards – The following NETS-S are noted in the Scenario:

2. Communication and Collaboration A,B,C,D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B,C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility –A,,C
5. Engage in Professional Growth and Leadership – A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

NNL9-10:1 Students show skill development in interpersonal communication by…

- Participating in conversations, improvised dialogues, interviews, etc.
- Asking clarifying questions
- Expressing self on various topics using a variety of transitions, sentence structures and time frames
- Describing and comparing self with others, using details
- Creating oral and written texts, using familiar vocabulary, oral and written texts to obtain information or reply to re- quests, (e.g., emails, personal letters, telephone messages, invitations, and cards).

NNL9-10:4 Students demonstrate understanding of the customs, beliefs, cultural differences, and traditions by…

- Comparing and contrasting products and practices in target culture and own culture by asking and answering questions (e.g. dating, family relationships, special foods)
- Identifying and describing the meaning (aspects) of cultural practices and symbols of cultural expression (e.g., education, weddings, mourning).

NNL9-10:9 Students employ appropriate social strategies in language learning by …

- Using peers and advanced or native speakers to practice and validate language use.
- Cooperating in a group or partnership to maintain an environment of safety, confidence, mutual esteem, and support.
- Responding and collaborating constructively as members of a partnership, group and audience.

(Cross referenced with 5.20, 5.21,4.2, 4.3, 5.20, 5.21, 6.9, 6.13)

The Elizabethan Era

Grade Cluster - 9-12

NETS - 2 - Communication and Collaboration

Quick Look:

High school students participate in an integrated unit of study featuring history, literature and theater. The integrated learning experience is less bound by traditional schedules and periods, as teachers collaborate, team-teach, and utilize 21st Century Learning tools.

Scenario:

High school students study the Elizabethan period and its art, religion, architecture, historic figures, literature, government, geography and social issues. They examine the contributions made during this time period to exploration and adventure, the arts, and the founding of permanent colonies in the United States. This time period was a turning point in world history and served to establish England as the largest empire in history. "The sun never sets on the British Empire," became a famous phrase about England's world dominance.

Small groups of students focus on specific aspects of the period (e.g. the arts, daily life) and their teachers' direct students to carefully pre-selected resources on the Internet where they will conduct research. Students use online graphic organizers such as http://bubbl.us/ to develop an outline for their research, document their learning, share and collaborate. (1b, 2a).

Students draw from their study of history and literature to consider the following:

- What does the literature of a time period reveal about people's values or culture?
- How do we gauge a people's quality of life from a period's literature?
- What causes literature to endure?
- How do authors use language and imagery to impact the reader?

Students read and/or listen to a number of pre-selected literary works from the period including selections from the comedy, tragedy and sonnets of William Shakespeare. They delve deeply into the writing, focusing on paraphrasing, summary and analysis of several works. As part of their experience, students correspond with their teachers on a *Ning* social network about the Elizabethan era. Using sonnet format, students are required to write or voice record information about what they are currently reading in class. The *Ning* is also a place where students collaborate, post class notes, *blog*, and *chat* (2a, 2b). Students construct new understanding of Elizabethan culture and society by engaging in the use of the period's language. They learn to speak like Shakespeare in class http://www.talklikeshakespeare.org/ and *tweet* like Shakespeare at http://twitter.com/shakespearesays .

Small groups of students select and write a ten-minute film script adaption of one of Shakespeare's works that have read, holding true to the language of the bard. As part of the process, students speak with members of the Royal Shakespeare Company in London during a special *Skype* session. The high school students dialogue with experts about adapting and performing Shakespeare. Members of the Royal Shakespeare Company critique their script adaptations, ask questions, and provide feedback (2c). The students collaborate with the theater class to act, film, light and produce their ten-minute videos. The video is posted to *YouTube,* and the *Ning* (2d).

Final products are presented in a public forum:

- The students' videos are posted to *YouTube* and other online locations.
- The school's Theatre *Facebook* account posts information with links to the live performances.
- Students save their *graphic organizers* as .jpg files and post them to the school's website and the classroom *Ning.*
- Students *tweet* on *Twitter* with people from around the globe using the Shakespeare Says website.

Student Standards: The following NETS-S are noted in this scenario:

1. Creativity and Innovation (A)
2. Communication and Collaboration (A,B,C,D)

Teacher Standards: Teachers who teach this unit address the following:

1. Facilitate and Inspire Student Learning and Creativity (A,D)
2. Design and Develop Digital-Age Learning Experiences and Assessments (A)

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

AAHS: 18 Students show understanding of how the arts shape and reflect various cultures and times by…

- Applying techniques from a culture to create or perform a work of art.
- Creating a piece based on an established genre or style.

Standard 1.23: Poetry

Standard 5.11: Literary Elements and Devices

Expressive Writing: Poetry

WHS: 19 In writing poetry, use language effectively by…

- Selecting vocabulary according to purpose or for effect on audience
- Using rhyme, rhythm, literary elements, or figurative language EXAMPLES: simile, personification, alliteration, onomatopoeia, metaphor
- Selecting and manipulating words, phrases, or clauses, for their shades of meaning and impact

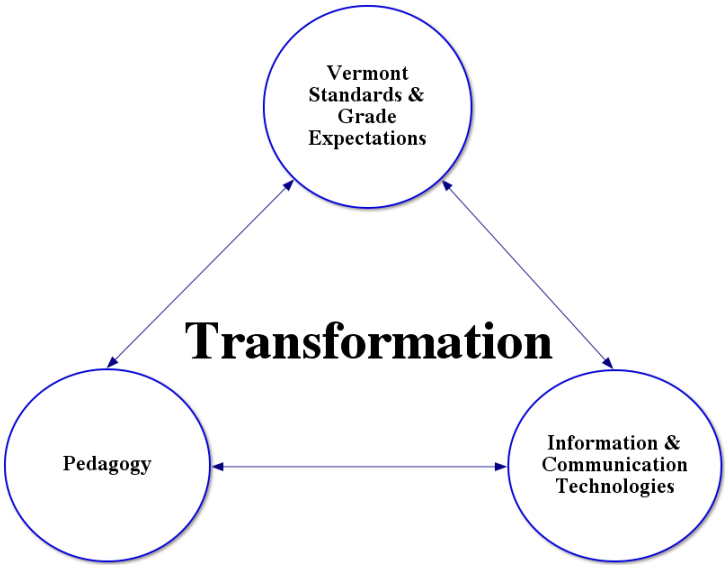
National Technology Standards for Students

Standard 3

Research and Information Fluency

Students apply digital tools to gather, evaluate, and use information. Students:

a. plan strategies to guide inquiry.
b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
c. evaluate and select information sources
d. process data and report results.



NETS-S – 3

Research & Information Fluency

Grade Cluster

K-2

Score One for Oman

Grade Cluster - K-2

NETS-S – 3 - Research and Information Fluency

Quick Look:

Students go on the offense to research Asian countries competing in soccer's World Cup. With assists from their upper grade literacy buddies, the students SCORE! by creating online posters about their teams that they share during their own World Cup celebration.

Scenario:

Soccer is on the mind of every young student in Ms. Kay's class. Many students play on local soccer teams, however today's the day they get to pick their global teams for a month-long research project. The kickoff was last Friday when Ms. Kay showed the students the FIFA (Fédération Internationale de Football Association) web site, illustrating that all the continents of the world would be represented in the next World Cup. Using an *interactive whiteboard*, students took turns selecting a continent, and then clicking on the team's link to see which countries are involved in the games (6a). Students are now beginning to understand the difference between a continent and a country.

Students anxiously gather in the Morning Meeting circle to find out which continent the class will be further exploring, as well as which country teams of students will be researching, and representing in the class's own World Cup celebration next month. Cheers rise from the group as Ms. Kay announces that the continent they will be studying is Asia. Using the *interactive whiteboard*, Ms. Kay brings up the FIFA site for Asia. She informs the students of the makeup of their two-person study team and the pairs proceed to decide which of the 43 Asian countries competing for the World Cup they will be investigating. Once the groups determine their country, they draw their country's flag and write its name on a piece of white paper, and then proudly hang their flag on the wall outside their class where Ms. Kay had previously set up the space with a World Cup Soccer banner she had created.

Ms. Kay contacts the University of Vermont's Asian Studies Outreach Program to borrow books, audio-visuals, units, and cultural kits. She also schedules guests who will help to bring the flavor of the Asian world to her class (3b). She has found these people not only through the Asian Studies program, but also by a request through the school's parent email system.

With upper grade literacy buddies acting as coaches for the teams, students use a *visual organizer*, with such topics as native food, clothing, shelter, climate, music, landforms and landmarks to help them organize their information (3a). After the *visual organizers* have been created, students and their buddies use a *safe search* to locate information on their topics (3b). Facts are added to the "bubbles" in their *visual organizer*. Source URLs

are included, as well. Once the teams have completed and shared their research with each other, they use a *visual organizer* to create Venn diagrams to compare and contrast Asian countries (6b, d). The teams' completed *visual organizers* are printed in color to be used for the remainder of the project, and shared during the upcoming class World Cup celebration.

Students search *Creative Commons* for copyright free images to use in their Asian country presentations (3b, c). These images are saved in the students' network spaces (6a). The soccer teams, with the help of their upper grade coaches, use *Glogster* to create an online poster of all their country information with the saved images (3d). The teams remember to cite their sources to give proper credit for the facts they've used.
In order to find out more about soccer in Asia, students choose five nations they've studied and use *ePals* to locate classrooms in these countries. They ask the contacted students such questions as: "Do you play any sports? Does your climate affect when you play? Is soccer popular where you live? Do both girls and boys play soccer?" Students use *Google Earth* to locate where their Asian friends live (6b). When the online *glogs* are completed, the students "visit" with their Asian ePals using *Skype*, verifying information they have learned through their studies (6a).

Ms. Kay coordinates a class soccer tournament with the school's PE teacher. It's East meets West and North versus South the teams representing Asian countries rearrange themselves for the two matches. The tournament is held during the class's World Cup celebration, when students display their visual organizers and glogs, sharing their new learning with family, friends, and fellow schoolmates, as well as their flag-waving, cheerleading upper-grade, literacy buddies.

Resources:

FIFA web site - http://www.fifa.com/worldcup/preliminaries/
FIFA web site for Asia - http://www.fifa.com/worldcup/preliminaries/asia/teams/index.html
University of Vermont's Asian Studies Outreach Program web site - http://www.uvm.edu/~outreach/
ePals for Asia - http://www.epals.com/search/maps/asia/

Student Standards – The following NETS-S are noted in the Scenario:

3. Research and Information Fluency – A. B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C, D
5. Engage in Professional Growth and Leadership – A, B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

History and Social Sciences GEs: **Grades 1 – 2**

H&SS1-2:1 Students initiate an inquiry by…

- Asking questions based on what they have seen, what they have read, what they have listened to, and/or what they have researched as a class (e.g., How is living in Vermont different than living in Florida?).

H&SS1-2:3 Students design research by…

- Identifying resources for finding answers to their questions (e.g., books, videos, people, and the Internet).
- Planning how to organize information so it can be shared.

H&SS1-2:4 Students conduct research by…

- Following directions to complete an inquiry.
- Asking questions and observing during the investigation process.
- Recording observations with words, numbers, symbols, and/or pictures (e.g., drawing or labeling a diagram, creating a title for a drawing or diagram, recording data provided by the teacher in a table).

H&SS1-2:5 Students develop reasonable explanations that support the research statement by…

- Organizing and displaying information (e.g., table, chart, graph).
- Classifying information and justifying groupings based on observations, prior knowledge, or experience.

H&SS1-2:7 Students communicate their findings by…

- Speaking, using pictures, (including captions) or creating a simple report or "painted essay" containing a focus statement, details, and conclusions.

Government and Society

H&SS1-2:14 Students act as citizens by…

- Demonstrating positive interaction with group members (e.g., working with a partner to complete a task).
- Participating in setting and following the rules of the group, school, community.

Physical Education Grade Expectations

Grades 1-2

GE 12: Students show appropriate social interactions by…

- Demonstrating responsibility for following simple game rules safely, with good sports like behavior (with and without direct teacher supervision).
- Demonstrating a willingness to work with any child in the class.
- Demonstrating cooperation by taking turns, sharing, and giving encouragement to others (verbally and nonverbally).

Sky Gazers

Grade Cluster – K-2

NETS-S- 3 - Research and Information Fluency

Quick Look:

Students will observe and record what they see in the sky at night over the course of one month. They will create their own explanations for changes they observe in the moon and compare their explanations to the facts.

Scenario:

"Wow! Did you see the moon last night?" says Maria as she shares the spectacular sight she witnessed with a classmate. This is the day the class will launch a Sky Gazers science unit with a particular focus on the changes in the moon. The students have been excitedly talking about it for a week.

"Students, over the next month we will be acting like real scientists by using our observation skills to track the changes we see in the night sky," says the teacher. Throughout the year, students in Room 28 have been graphing weather patterns during Morning Meeting. Today, the teacher shares with the students that they will soon add the cycles of the moon to their daily routine. The children are excited to participate in this new homework project. "Each night, before you head to bed, I'd like you to take a peek at the night sky." The teacher then tells the children to draw a quick sketch of what the moon looks like each night. These sketches will be shared during the morning meeting time.

That night, the children draw a sketch of the moon as is looks at that moment along with any other stars or clouds they might see in the sky. The following morning, the children gather for Morning Meeting with their sketches. As expected, the drawings all look very similar. Maria anxiously raises her hand to share her drawing using the *document camera.* "Hey, that looks just like mine," the students shout as they recognize the sketch.

"Now, let's confirm your observations," says the teacher. Maria clicks on the link at the bottom of today's message, which takes the class directly to Google Moon. Everyone claps for Maria because her drawing is almost exactly like the photograph of the current phase of the moon (3c). This new routine of sketching the moon and checking Google Moon continues for the remainder of the lunar cycle (about a month's time). Each morning, after students compare their drawings to what they find on Google Moon, students take turns copying and pasting the Google Moon image into a class calendar. This way the children can see the changes occurring with the moon.

Later that day, the children roll in from recess. This is a favorite time of day for most children because it means that Mrs. F. is going to read a new story to them. Children can't wait to find out what they will hear today. Mrs. F. pulls out a copy of Janet Ruth Heller's How the Moon Regained Her Shape. This is a legend about the sun bullying the moon, which leads to her disappearing. After the moon regains confidence, she slowly reappears back to her full size. Mrs. F. then shares with the students that they will have to opportunity to come up with their own explanation of why the moon changes its shape. "Boys and girls, I want to give you the chance to share your thoughts about why you believe the moon looks different each night." Students turn and talk, sharing their beliefs for a brief moment as Mrs. F. slowly tiptoes to the corner of the room where a large sheet conceals her next surprise.

A chime rings, reminding the children to stop, look, and listen. The students turn their attention to Mrs. F. as she unveils the large selection of children's books; all of which focus on the night sky. She shares that these stories are available to the children during reading time. Some of the stories are more challenging for the young readers, so fifth grade reading buddies will help with this. Mrs. F. has also selected a variety of web sites for students to visit and learn more about the moon. These sites are neatly compiled into a "Moon folder" using NetTrekker. Students use these sites on a regular basis (6a), so they understand how to navigate from the folders to sites. Students can develop their own theories from pictures, facts, and interactive sites. "Boys and girls, your job is to come up with your own idea of why the moon changes. You can read from any of these stories, or look online with your reading buddy to find out what other people might believe, but I'm curious to hear your explanations"(3a,b,c).

That day Mrs. F. sets up a *VoiceThread* with a large picture of the moon in its current phase. Students develop their own stories and explanations and record them into their own *VoiceThread*. Each child illustrates a picture along with the story. These are inserted into their *VoiceThread*. During literacy time, students are fully immersed in the Sky Gazers theme. They read with buddies, write their own stories, and comment on the stories of their peers on the *VoiceThread*, (3d, 6d). The *VoiceThread* is later made available to parents who can comment on their child's theory of the changing moon.

At the end of the unit, students publish their stories with the help of their big buddies. These spectacular stories are compiled into a class book. Copies are made for each student and the class dedicates one of the copies to the school library. Parents and families are invited to a family sharing night in the classroom. As they walk through the door of the room, black lights emphasize the glowing stars and half-moon illuminating the ceiling. The mood is set and students read their original stories projected on the interactive whiteboard to parents (3d).

Student Standards – The following NETS-S are noted in the Scenario:

3. Research and Information Fluency– A, B, C, D
6. Technology Operations and Concepts – A, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C
5. Engage in Professional Growth and Leadership – B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

SP1-2:44 Students demonstrate their understanding of characteristics of the solar system by...

- Observing and describing qualitatively how the sky looks at different times and
- Keeping a journal record of the shape of the moon each night for a month.

H&SS1-2:2 Students develop a hypothesis, thesis or research statement by...

- Using prior knowledge to share ideas about possible answers to questions.

Let it Snow, Let it Snow

Grade Cluster - K-2

NETS-S - 3 - Research and Information Fluency

Quick Look:

Wilson Bentley was born and raised in Jericho, Vermont and is best known as Snowflake Bentley. His research about rain and snow was published extensively in newspapers and magazines during the 1800's. Students research his life and his work using several resources and present the information in digital form.

Scenario:

Snow is falling outside. Nobody really notices the flakes as they drift down. The teacher encourages her class to look outside, and then shares some information about a famous local character. "Wilson Bentley, better-known as "The Snowflake Man," loved snow and loved studying it! Did you know that he didn't go to school until he was fourteen years old? Isn't that amazing? And when he was fifteen, his mother bought him a microscope, which he used to look at snowflakes really closely. He was so fascinated by their different shapes, that at age seventeen he got a camera so he could start photographing the snowflakes before they melted!"

The students clamor for more. "Who was the Snowflake Man? Where did he live and how did he do his research on snowflakes?" The teacher tells the students that they should use some *kid-friendly search engines*, like Internet search Engines for Kids and Safe Search Engines, to find out the answers to these questions, as well learn more interesting information about him, and then share that information with their peers and parents. (3b, 3c, 6b) The class can hardly wait to begin!

Before they get started, the teacher reads aloud to the class the books, Snowflake Bentley, by Mary Azarian and My Brother Loved Snowflakes, by Mary Bahr. Students use the information from these two stories to brainstorm a list of more questions they have about Snowflake Bentley. This information is displayed in a *graphic organizer* for reference during their research. Some students comment that they can just ask their parents for answers to their questions, since they are confident that their parents know everything. "Really?" asks the teacher, "Let's find out about that."

A *Google Form* is developed to send out to their parents to quiz their parents' knowledge about Snowflake Bentley. (3a) This will be sent out via email and posted on the class *wiki or blog*. Additionally, students develop more questions from the research they do about Snowflake Bentley. The questions developed by the students are also used when they invite other classrooms to come and learn about Snowflake Bentley. (3a) Students will use *response systems* to quiz the other students about their knowledge of Snowflake

Bentley. They use this data to report on the wiki, "How much do our parents and friends really know about Snowflake Bentley?"

As part of their research, students take the virtual tour at the Snowflake Bentley Museum and record what they learn about Snowflake Bentley as a result. They record important dates, personal information about his life, information about how he took pictures of the snowflakes, as well as any answers to questions that they have generated. This new information is added to the information that they are gathering from their research of other web sites. They use a *simple graphic organizer* to record all of this information and keep track of it. Since the reading level of the websites is too advanced for some students, they listen to parts of the websites using the program *ReadPlease*. (3b, 6b)

The detailed pictures of snowflakes that they see fascinate the students. Using these pictures as a springboard, the teacher and students discuss symmetry and the characteristics of a snowflake. They also record this information in their *graphic organizer*. They are excited to learn that more photographs of snowflakes can be found at Snowcrystals.com. After looking at photographs as a large class, students will compare the photographs of snowflakes to actual snowflakes that they collect on black construction paper. Students soon gain a new appreciation for the work of Snowflake Bentley, since capturing just one snowflake and getting a clear image of that snowflake is much harder to do than they initially thought! They share their observations on a class *wiki*. Students will write short poems about the snowflakes and record their poems into *Photostory*, using drawings they have made, or photos they have taken of their snowflakes. The students' drawings will also be placed on the class blog.

"Just think, all these tiny snowflakes clump together to make all that snow!" marvel the students. "Just how much snow do you think we will get over the next month?" asks the teacher. Wanting to find out, students record how much snow falls over a period of a month. They document the changes over the time period with *digital cameras*. (6a, 6b) The data that they record is represented in a graph using *Inspiradata* and posted in their classroom. (3d) The information that students collect is posted in a *wiki* to share with parents. Each day, students post a weather report on the school's website as a podcast.

As a culminating activity for their research and data collection on weather, students invite community and family members to a WinterFest Celebration to watch their *Photostories* and share the information they discovered about Snowflake Bentley. Soon, the whole community gains a new appreciation for this famous Vermonter!

Student Standards – The following NETS-S are noted in the Scenario:

3. Research and Information Fluency – A, B, C
6. Technology Operations and Concepts – A, B

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- B, D
2. Design and Develop Digital- Learning Experiences and Assessments- B, C,
3. Model Digital-Age Work and Learning – B, C, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, D
5. Engage in Professional Growth and Leadership

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

R1: 7 Uses comprehension strategies (flexibly and as needed) while <u>reading</u> or listening to literary and informational text.
EXAMPLES of reading-comprehension strategies might include:

- using prior knowledge;

H&SS1-2:6 - Students make connections to research by…

- Discussing if their findings answered their research question.
- Proposing solutions to problems and asking other questions.

H&SS1-2:7- Students communicate their findings by…

- Speaking, using pictures, (including captions) or creating a simple report or "painted essay" containing a focus statement, details, and conclusions.
- predicting and making simple text-based inferences;
- generating clarifying questions;
- constructing sensory images (e.g., making pictures in one's mind); or making connections (text to self, text to text, and text to world)

R1: 12 Demonstrate initial understanding of informational texts (expository and practical texts) by…

- Obtaining information, using text features such as title and illustration (e.g., "From the title, what do we think this book will tell us?")
- Using explicitly stated information to answer questions
  EXAMPLE: "Where do penguins live?"

H&SS1-2:7- Students communicate their findings by…

- Speaking, using pictures, (including captions) or creating a simple report or "painted essay" containing a focus statement,

H&SS 1-2:6 - Students make research to connections by...

- Discussing if their findings answered their research question.
- Proposing solutions to problems and asking other questions.
- Establishing a clear topic
- <u>Distinguishing among a variety of types of text (e.g., informational texts: children's magazines, children's</u> <u>newspapers, lists, simple directions</u>)

Standard 1.23: Poetry
Standard 5.11: Literary Elements and Devices
Expressive Writing: Poetry
W2: 19 In writing poetry, use language effectively by…

- Using simple images and forms to describe
  EXAMPLES: concrete poems, shape poems, rhymes

NETS-S – 3

Research & Information Fluency

Grade Cluster

3-5

The Vermont Virtual Zoo

Grade Cluster - 3-5

NETS-S- 3 - Research and Information Fluency

Quick Look:

Everyone loves to visit a zoo to see the animals up close and personal and to learn all about them. BUT, what do you do if your state doesn't have a zoo to visit? These students create the first zoo in Vermont, a virtual zoo!

Scenario:

"Can we take a field trip to the zoo and see the kinds of animals that live in Vermont," asked the students in the class. We are starting a research project on Vermont animals as part of our Vermont studies unit and the students are really excited about visiting a Vermont zoo to see the kinds of animals that live in the Green Mountain State. Two students quickly search the Internet to locate a zoo in Vermont. Guess what! Vermont is one of three states that don't have a zoo. The students were concerned that kids around our state, country and world had no way to learn about Vermont animals. The students knew they couldn't solve the problem about building a real zoo, so they discussed the tasks that needed to be addressed to start a virtual zoo (researching virtual zoos, finding resources and experts to talk to, and planning how to organize our zoo). Thus, the beginning of Vermont's first Virtual Zoo was started. (3a, 3d)

Students, each using his/her *netbook*, take several Internet field trips to visit virtual zoos (see list below). Students use *email* to contact several of the virtual zoos to request an online conversation with zoo personnel about developing a virtual zoo. *Skype* is used for conversing with the zookeepers. They put together a *multimedia presentation* that highlights interesting areas of the different virtual zoos. They create a *web page* of links to virtual zoo sites and this is added to the class *web page*. (3b, 6b)

Students send an invitation, via *email,* to the VT Fish and Wildlife department (http://www.vtfishandwildlife.com), inviting an agency member to visit our classroom to talk about their program. (6a, 6b) They request a classroom set of the state's field identification guide called "Today's Wildlife", videos from the VT Fish & Game video library, a set of nature posters and other literature related to Vermont animals. The group creates a web page that links to animal sites and to the VT Fish and Game Wildlife site. The VT Fish and Game department agrees to mentor the class and provides help as needed by the students.

Using the "Vermont Critters Curriculum" site students develop a short *multimedia presentation* on the kinds of information that is found on this site. (6a, 6b) The students generate a list of information they would include about the animals. (physical characteristics, habitat, food, life cycle and photographs) They classify the animals by groups (birds, fish, mammals, reptiles and amphibians) and indicate if the animal is endangered or a threatened species. If the animal is an endangered or threatened species

they will include information on the population sizes and how these species are being protected. They include the location of the animal on the food chain.

Students meet in groups based on the animals of their interest and discuss how they are going to work together to complete the project. They chose four to six animals they are going to research and start searching the *Internet* for information. They use *graphic organizers* to help them organize the information, *Google Docs* to write collaboratively about their animals, and enter animal facts into a shared data base. Students share their written work with graduate students from the University of Vermont's Environment and Natural Resources program, who read and critique their work. (3 b, 3d) The final documents are read by VT Fish and Wildlife personnel for accuracy of information. Students save their files in shared folders.

After the research is completed the students use *PhotoStory* to create a one minute movie on each of their animals. If possible, they include a recording of the sounds the animal makes. (3b, 3d)

The final part of the project is to share the work. A web page is designed where all the information is located, and is linked to the class's main web page. The class *blog* is updated notifying the parents on the progress of the virtual zoo. The copyright free pictures the students have gathered are uploaded to the class *Picasa* album. Punch Bowl is used to send invitations to the VT Fish and Wildlife agency, UVM students, school administrators and parents inviting them to join the class for a virtual zoo opening celebration ceremony. (6a, 6b)

The class presents their project to the students in the school and explains to them how they can add animals to the zoo. They use the teacher's *Twitter* account to let others know about this project and invite students around the state to join them in contributing to their virtual zoo. (6b)

Resources:

List of United States Zoos
http://www.touristinformationdirectory.com/zoo/list_of_zoos.htm
Virtual Zoos list http://www.zooschool.ecsd.net/virtual%20zoos.htm
World Association of Zoos and Aquariums
http://www.waza.org/home/index.php?main=home
Lincoln Park Zoo- http://www.lpzoo.org/index.php
List of well known zoos http://www.ed.sc.edu/caw/toolboxzoo.html
Vermont Fish & Wildlife Department http://www.vtfishandwildlife.com
Vermont Critter and Curriculum http://www.vtfishandwildlife.com/vtcritters/index.cfm

Student Standards – The following NETS-S are noted in the Scenario:

3. Research and Information Fluency- A, B, D
6. Technology Operations and Concepts- A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments- A
3. Model Digital-Age Work and Learning- A, C
4. Promote and Model Digital Citizenship and Responsibility- A
5. Engage in Professional Growth and Leadership- A

Content Grade Expectations

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S3-4:38 Students demonstrate their understanding of Classification of Organisms by…

- Describing and sorting plants and animals into groups based on structural similarities and differences.

Informational Writing: Reports, Grades 3, 4, 5
W4: 10 In reports, students demonstrate use of a range of elaboration strategies by…

- Including facts and details relevant to focus/controlling idea
- Including sufficient details or facts for appropriate depth of information: naming, describing, explaining, comparing, or use of visual images

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

Lake Champlain by the Numbers

Grade Cluster - 3-5

NETS-S-3 - Research and Information Fluency

Quick Look:

As part of an interdisciplinary project, students research and collect a list of interesting numerical facts and graphs that describe Lake Champlain. Student groups then select one topic to identify trends and make a prediction about the lake from the data they have collected.

Scenario:

The students have just returned to the classroom from a ferryboat trip across Lake Champlain, which began an interdisciplinary project of Lake Champlain. "How are we going to use math to study the lake?" the students asked. They start to discuss how numbers could describe Lake Champlain and soon students are working together using their *netbooks* to search the *Internet* for numerical information about Lake Champlain. Very soon, questions like "Did you know there are over 300 historic shipwrecks on the bottom of Lake Champlain?" and "Can you believe the lake has over 80 species of fish?" are heard in the classroom. (3a, b)

The students are familiar with project-based learning and create groups, quickly assigning tasks to each person (scribe, editor/leader, graphic artist, media manager). The class takes a field trip to the ECHO Lake Aquarium and Science Center and works in the Resource Room to gather information and get ideas for their projects with a math focus. Students work with ECHO center staff to select a topic for their final project and identify organizations that might be interested in their projects. Additionally, students decide to create short, (30-60 second), public information videos and numerical trivia questions for the ECHO web site based on their research of Lake Champlain by the Numbers. (3a, b, c, d)

With teacher support, each student group contacts an organization and identifies an expert to mentor their project. Students spend several sessions in small groups planning, locating and recording their data using *Google Docs* that is shared with their mentor. The teacher is working with each group to help them develop their topics, insuring they have a project where they can make a prediction and making sure, they cite their sources. Students continue to develop their project, work with their "expert", and select appropriate software to create their public information video. (3a, b, c) (6b)

As each group finishes, they create an entry in the class *blog* describing their project, listing their Lake Champlain facts, embedding their project video, and sharing their prediction. All the student work is presented to the ECHO center for possible inclusion in the ECHO Center exhibits and the ECHO Center web site. It is also available for others under the *Creative Commons license*. (3d) (6a, b, c, d)

A sample student project might look like this:

Using a *spreadsheet*, graph the dates when Lake Champlain froze over for the past 180 years.

Prediction:

In the first 100 years of the graph, the lake did not freeze-over 3 times. In the past 30 years, the lake did not freeze-over 16 times. If the trend continues, the lake will reach a point where the lake will not freeze-over again.

Actual Fact:

Students' research is factually based from several reliable sources.

Video Clip:

Students have created a short video clip that is highly entertaining about the truth of this data.

(3a, b, c, d) (6a, b, d)

Resources:

ECHO Lake Aquarium and Science Center
http://www.echovermont.org/

Student Standards – The following NETS-S are noted in the Scenario.

3. Research and Information Fluency – A. B, C, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T.

1. Facilitate and Inspire Student Learning and Creativity - A,B,C
2. Design and Develop Digital-Age Learning Experiences and Assessments – A,B,C,D
3. Model Digital-Age Work and Learning – A,B
4. Promote and Model Digital Citizenship and Responsibility – A,B,C
5. Engage in Professional Growth and Leadership – A,B,D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Standard 7.9: Data, Statistics, and Probability Concepts

M4: 23 Interprets a given representation (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.

M4: 24 Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using measures of central tendency (median or mode), or range.

M4: 25 Organizes and displays data using line plots, bar graphs, tally charts and frequency charts, or tables to answer questions related to the data, to analyze the data to formulate or justify conclusions, or to make predictions.

H&SS3-4:7 History and Social Sciences Inquiry

Student communicate their findings by giving an oral, written, or visual presentation that summarizes their findings

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

H&SS3-4:12 - Students show understanding of human interaction with the environment over time by…

- Describing a community or state environmental issue (e.g., creating a slide show describing the environmental issues surrounding Lake Champlain).

Fall into Color

Grade Cluster - 3-5

NETS-S -3 - Research and Information Fluency

Quick Look:

Students learn how and why leaves lose their colors in the fall in Vermont. They create a 'Fall Into Color' *wiki* about the different changing leaves around the world and invite students from around the world to collaborate on the project.

Scenario:

During the fall as the leaves start their spectacular color show, students wonder why the leaves change color and if this happens in other places. The class decides this will make a great investigation project. To start the project off, the class discusses the creation of a 'Fall Into Color' *wiki*. They decide on the type of information they would like collected from students around the world; specifically, tree type, how/if leaves change, and the geographic location of these trees. The class then creates the *wiki* and posts requests for participation on *ePals* and *Global School Network*. (3a)

Once the *wiki* is set up, it is time for the students to collect leaves and document the changes in the leaves in their natural environment outside the school. Students spend one week taking digital pictures of the leaves and gathering them. (3c, 6b) In the classroom, students sort the different types of leaves they find and use the *document camera* to project their leaves on the *whiteboard*. (3b, 6c) The *interactive whiteboard* captures a picture of each student's collected leaves. (6b) Using a *graphic organizer*, images from the *interactive whiteboard*, their *netbooks*, and the foliage internet site, http://www.foliage-vermont.com/foliage_leaves_1.htm, students identify the characteristics of their leaves and the trees from which they came. (3c, 3d, 6a, 6b) This information is posted on their *wiki.*

As it so happens, the teacher had also signed the class up to become a Foliage Spotter at http://www.foliagenetwork.com/ and now the class creates a schedule for updating the information in Google Calendar. (6b) The class follows the Foliage Network's maps of New England and use their *wiki* to collaboratively predict when the leaves will be in peak colors around their school. (3d, 6a, 6b) The class reads the updated newsletter twice a week on their *Kindle*. (6b) Using a *digital camera*, students continue to document the trees as they change color.

Following the updated maps on the Foliage newsletter, students see live *streaming videos* of the foliage color on the *New England Web Cams*, set up around VT. (3b) Students use *Jing* to capture the computer screen streaming the web cams. (3b, 6b) They will use the captured videos in their final project and also post their videos on their wiki. To help students understand why the leaves are changing colors, students view NEO K12

Educational Videos for an explanation of photosynthesis. Students use a *digital voice recorder* to narrate what they learned on the NEO videos. These *mp3s* are saved for their final project. (6d)

To further help the students understand why the leaves change color; students are divided into groups of four and are given a live plant. Students select four geometric shapes found on the website Enchanted Learning, and save these images in the common folder. They then use *Picnik*, a picture manager, to make sure the images are large enough to cover 1/2 of a leaf. (3b, 3c, 6a) Students print and cut out the geometric shapes to create geometric stencil templates. Using these templates, students then cut stencils from cardboard or aluminum. The shapes are fastened to individual leaves with a paper clip. They leave the plants in a window where they will get plenty of sunlight. Students use *Google Docs* and their *netbooks* to make observations beginning each day (include weather notes) and predict what will happen to the leaves. (3a, 3d, 6b) After four days, the geometric stencils are removed from the leaves. Students compare the areas on the leaf that were covered with the shape to the rest of the leaf, and the changes are recorded in *Google Docs.* The plants are then put back in the window with the shapes removed. For the next week, students observe the plants to see what happens when they are exposed to sunlight again. The entire process is documented with a *digital camera.* (3d)

After the students have experimented with light and the absence of light on plants, students use their *netbooks* to make observations about the trees around the school and discuss why the change of leaves happens in the fall. They create a new page in their *wiki* to add their pictures, observations, and information collected in *Google Docs*.

Students look at the information gathered on their *wiki* from students around the world. They discuss how climate affects foliage in different geographic areas.

To show what the students have learned in the unit, each student creates a *ScrapBlog*. They use their *digital images*, *Jing captured videos, digital voice recordings* and written observations to tell the story about why the leaves lose their color. (3d, 6a, 6b, 6d) The *ScrapBlogs* are published to the class *blog* and posted on the *wiki*, and the mystery of the changing colors outside is solved.

Student Standards- The following NETS-S are noted in the Scenario:

3. Research and Information Fluency- A, B, C, D
6. Technology Operations and Concepts- A, B, C, D

Teacher Standards- Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, C
2. Design and Develop Digital-Age Learning Experiences and Assessments- A, B, C, D
3. Model Digital-Age Work and Learning- A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility-A, B
5. Engage in Professional Growth and Leadership- B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

Standard 7.7: Geometry and Measurement Concepts

M4: 9 Recognizes symmetrical figures and uses symmetry to identify and classify figures.

S3-4:38 Life Science -Students demonstrate their understanding of Classification of Organisms by…

- Describing and sorting plants and animals into groups based on structural similarities and differences.

S3-4: Life Science - Students demonstrate their understanding of Evolution/Natural Selection by…

Identifying differences in characteristics of a certain type of organism

A3-4:11 Students demonstrate PERFORM/COMMUNICATE skills in visual arts by…

- Participating in group art activities
- Experimenting with media and materials to convey feelings or ideas

NETS-S – 3

Research & Information Fluency

Grade Cluster

6-8

Even More Awesome Stories

Grade Cluster – 6-8

NETS-S - 3 - Research and Information Fluency

Quick Look:

Student use primary sources to examine the life and work of a famous artist and create interactive reports that connect the information they have gathered with the primary and secondary resources from which it was taken.

Scenario:

Mrs. McCormack's seventh grade art students begin every class with a short, "Meet the Artists" activity. Students are given a brief overview of an artist's life, a look at some of their most notable work and an explanation of the influence the artist has had on their field. After they have been introduced to twenty artists in this way, students choose the artist they find the most interesting to investigate more deeply.

Students are shown examples, from a Web site called Awesome Stories, of stories about famous people and events that include links to the primary sources the story was drawn from. They see how a report can be made richer by providing the reader with direct connections to images, maps, audio, video and primary documents that directly relate to the story being told. Mrs. McCormack leads a discussion about the ways in which the students will incorporate the "Awesome Stories" presentation style into their own research reports.

Mrs. McCormack introduces students to effective search strategies with *YouTube videos* such as Web Search Strategies in Plain English and Google's Web Search lessons and slideshows . She shows them how to use NoodleQuest to develop a customized search strategy for their specific topic and together they try a variety of searches with Boolify, which allows them to easily modify *Boolean operators* and see how it impacts on their search results. (3a, 6a, 6d) She also uses a variety of legitimate and fake Web sites to reinforce the message that students need to look critically at every site they plan to use and make sure the information is from a credible source. Together they build a list of criteria to use to determine the quality of any Web site. (3b, 3c, 6a, 6d)

Only one student within each class conducts research on a specific artist but, after they have had several opportunities to research their artist, students from her four classes meet and compare results with others who have been researching the same artist. (3a, 6a, 6b, 6c, 6d) They compare the information they have gathered and discuss the results they received using various search strategies and discuss how they determined the quality of the sites they have decided to use. (3b, 3c) They use *Delicious* to swap primary and secondary resources.

They create their artist reports in a Word document with active links to the primary and secondary sources from which they pull their information. Students use the online tool, Son of Citation Machine, to create the necessary citations to add to their projects. (3b, 3d) The documents are uploaded to *EtherPad* and the students researching the same artist read each others' reports and give suggestions for improvements, both within the document and in the Etherpad chat window. (6c, 6d) They also meet in groups to discuss the discrepancies they have found in their research and use their links to primary sources to determine which facts to include and which to discard. (6b, 6c) After their teacher has reviewed the final drafts, and after both she and the students have used a rubric to score the report, they are converted into PDF files and posted online as links from the Mrs. McCormack's art page. (6a, 6b, 6c, 6d)

The students who researched the same artist go to the *Wikipedia* entry about their artist and read it carefully for errors and omissions. They edit the entry, if appropriate, and include links to the resources they used to locate their information. (3b, 6a, 6d) Student also attach a *Creative Commons* license to their reports and, with their teacher's assistance, send out invitations to art museums throughout the U.S., encouraging them to incorporate the reports into the museums' online educational programs for children. (3b) They start with UVM's Fleming Museum and extend the invitations out to more and more museums until they receive a positive response. The students promote the idea of "Students Teaching Students about Art" with "testimonials" from other children who have read the reports, used the online connections, and have positive things to say about their increased understanding of our greatest artists.

Student Standards – The following NETS-S are noted in the scenario:

3. Research and Information Fluency - A, B, C, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B
3. Model Digital-Age Work and Learning – A, B, C, D
5. Engage in Professional Growth and Leadership – A, D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

A7-8:12 - Students show understanding of visual arts CONCEPTS and VOCABULARY by…

- Identifying and describing different motivations and purposes of artists and their art work, demonstrating an understanding of their context in time and place.

A7-8:18 - Students show understanding of how the arts shape and reflect various cultures and times by…

- Identifying significant artists and their works from various times and places.

W7:8 In reports, students organize information/concepts by…

- Obtaining information from multiple locations or sources when appropriate
- Listing and citing sources, using accepted form, if appropriate

W7:10 In reports, students demonstrate use of a range of elaboration strategies by…

- Including facts and details relevant to focus/controlling idea, and excluding extraneous information
- Including sufficient details or facts for appropriate depth of information: naming, describing, explaining, comparing, use of visual images

Personal Learning Projects

Grade Cluster - 6-8

NETS-S- 3 - Research and Information Fluency

Quick Look:

Middle school students in grades 6-8 research self-selected topics of interest using a variety of print and electronic resources. Students learn how to develop focus questions and research plans. Each student configures and maintains a *blog* to collect and organize information, obtain feedback, and to present their research findings. Students communicate with experts in the field about their selected topics via email, face-to-face interviews, or *videoconferencing*. Feedback is provided to students from teachers, field experts, and peers through the comments feature of a *blog*. Students learn about the research process, including strategies for finding and evaluating materials.

Scenario:

Middle school students' self-select topics of interest (anything from global warming in Vermont to the first female to hike Mount Everest) and develop a focus question to research. With the help of a teacher, students create their own *blog* using *Edublogs* (or a similar *blog* host) to collect and organize information, obtain feedback, and to showcase their final research projects (3a, 6a, 6d). The teacher creates a model *blog* as well, as a place for daily directions, resources, questions, and research components (questions, notes, interview, reading log, vocabulary, works cited, and report as a finished product). Students set up their *blogs* to have pages or sections for each component of the research (6a). *Blogs* are further customized by students adding relevant *widgets* (such as videos, images, *RSS feeds*, etc.), selecting themes (background colors and fonts), and adding images (6a, 6b, 6c, 6d).

Students use a graphic organizer tool such as *Mindomo* to brainstorm and outline their research. They include a focusing question, a thesis statement, and the main topics for their research (3a, 6a, 6d). Then, students work with their teacher and the library media specialist to practice research strategies for finding information and evaluating materials using resources such as Alan November's Information Literacy Resources http://novemberlearning.com/resources/information-literacy-resources/ (3c). They learn effective research strategies (Boolean searches, advanced searches, keywords, etc.) and how to determine the reliability of a web site (examining, URL extensions, http://easywhois.com, finding authors, etc.) and then apply their knowledge to their own research (3a, 3c, 6b). Students also set up *RSS feeds* on their *blogs* from sites pertaining to their research. (3b, 3c, 6a, 6d). In addition, students set up interviews with experts on their topics of interest. Students communicate with their experts through email, *videoconferencing*, or a face-to-face personal interview that is recorded with a digital voice recorder (3b, 3c, 6a, 6b, 6c). As students collect information, they record questions, facts, and sources in appropriate pages or sections of their *blogs* (3b). The class has ongoing discussions regarding fair use and proper citations.

Throughout the research process, students are required to give feedback using the comments feature of the *blogs*. The teacher and experts also provide feedback using *blog* comments. Students incorporate the feedback they receive to guide their continued research and to develop their final report.

Students synthesize all the information and feedback they collect over time to create a final "report" of their research (3b, 3d). The report could be presented in various formats including writing, video, multimedia presentation, etc. as decided by the student. The reports are posted on a separate section of the blog.

Each student selects a person or organization related to his or her topic with whom to share his or her study. In addition, all *blogs* are linked to the teacher's *blog* so students can review others' research (3d). Finally, students present their reports during a community open house where members of the community are invited to view projects and ask questions.

Resources

http://easywhois.com
http://novemberlearning.com/resources/information-literacy-resources/

Student Standards – The following NETS-S are noted in the Scenario:

3. Research and Information Fluency—A, B, C, D
6. Technology Operations and Concepts—A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity—A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments—A, B, C, D
3. Model Digital-Age Work and Learning—A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility—A, B, C
5. Engage in Professional Growth and Leadership—B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

W7:8 In reports, students organize information/concepts by…

- Using an organizational text structure appropriate to focus/controlling idea
- Selecting appropriate information to set context, which may include a lead/hook.
- Using transition words or phrases appropriate to organizational text structure.

- Writing a conclusion that provides closure.
- Obtaining information from multiple locations or sources when appropriate.
- Listing and citing sources, using accepted form, if appropriate.

W7:9 In reports, students effectively convey a perspective on a subject by…

- Stating and maintaining a focus/controlling idea.
- Writing with a sense of audience, when appropriate.

W7:10 In reports, students demonstrate use of a range of elaboration strategies by…

- Including facts and details relevant to focus/controlling idea, and excluding extraneous information**.**
- Including sufficient details or facts for appropriate depth of information: naming, describing, explaining, comparing, use of visual images.
- Commenting on the significance of the information, when appropriate.

H&SS7-8:1 Students initiate an inquiry by…

- Asking focusing and probing questions that will lead to independent research and incorporate concepts of personal, community, or global relevance

H&SS7-8:4 Students conduct research by…

- Locating relevant materials such as print, electronic, and human resources.
- Applying criteria from the plan to analyze the quality and quantity of information gathered
- Citing sources

H&SS7-8:7 Students communicate their findings by…

- Developing and giving oral, written, or visual presentations for various audiences.
- Soliciting and responding to feedback.

H1N1: Truth or Rumor? Get the Facts!

Grade Cluster - 6 - 8

NETS-S- 3 - Research and Information Fluency

Quick Look:

Students in a middle school class became very concerned about the H1N1 flu virus, its impact on children in their age group, and the media attention to the vaccination being offered at their school. As a result, they decide to do research on this disease. They share the results of their research through posters placed around the community, at the local hospital, in pediatricians' offices, and through multimedia presentations shared on the Internet.

Scenario:

During a study of human body systems, students in a middle school science class express a great deal of concern about the H1N1 flu virus and the vaccine being offered at the school. They have heard a lot of information on the news, read about it in newspapers, and have seen headlines on the Internet. Jacob mentions a blog that he saw on the Internet that described how dangerous the vaccine is and that doctors had commented on the blog that they would not allow their own children to have the vaccine. Students want to know how the H1N1 virus would attack their body systems, and they want to know what is true about the disease as well as the vaccine. How do they know whom to believe? How can they help prevent the spread of the disease? What can they do about the decision to have the vaccine? They decide to do research to find answers to their questions.

As an initial activity, students brainstorm what they have heard about H1N1, using a graphic organizer to record everything they have heard, know or think they know about H1N1. Included in the brainstorming are questions they have, such as "How is the disease spread? What are the symptoms of the disease?", "Has anyone in Vermont died from H1N1?", "How can I avoid getting it?", and "Should I get the vaccine?" Using the graphic organizer, they arrange, revise, and prioritize by topic and focus question. (3a, 6a, 6b)

Students are given a day or two to think about these focus questions and decide which question they would like to research. Students work in teams of four to work on one of the focus questions that include:

> Is the vaccine safe and should I get it?
> What can I do to prevent acquiring or spreading the disease?
> What are the differences between H1N1 and other types of seasonal flu?
> Where did H1N1 come from?
> Where have H1N1 cases been verified and how/when is it predicted to spread to our area?

After choosing the focus question, but before doing research, students discuss in teams what they think would be good sources of information. They create a list of indicators

that would define a website, online video, or *podcast* as authentic, reliable, and valid. Students discuss the fact that any information they find should be current and from sources that are reliable. Jacob finds the blog he read and the students discuss whether the information should be accepted as valid. They examine the site, finding no reference to the author's credentials. The blog is also suspect based on its URL. Discussion about the date of the information is very important to the students because they want the most relevant, current information. The students design a checklist of their indicators for a good source of information, which they plan to refer to as they do their research. (3a, 3b, 3c)

Working in their teams, students use a full class *wiki*, so that information is shared among all teams, to brainstorm ideas of where to obtain their information. They discuss who might be an authority on the disease (the school nurse, local doctors, people at the state health department, the CDC), list this first-person contact information, and match that contact with a particular student who will be responsible for arranging interviews or classroom visits. They also share links to newspaper articles and news clips. (3a, 3b)

The majority of the research is done online, using written work, videos, and *podcasts,* as well as "live" interviews with physicians or other authorities, using video conferencing such as *Skype* or the *Learning Network of Vermont Video Conferencing System (LNV).* (6a, 6b) Teams discuss and decide upon search terms for their topics and look at a variety of search engines and directories together to decide which ones are most appropriate for this type of research. (3a, 3b, 3c) While researching, each student has at least one other person on their team who double-checks their sources for validity and accurate citation. To facilitate this activity, as students choose websites for use in their research, they record them in a social bookmarking tool such as *Delicious,* noting all the information that validates the site using the checklist created earlier. Using *Delicious*, students also share websites that may be of use to their team members. (3c)

As research progresses, some teams create, edit and finalize a script for a *podcast* or *vodcast,* using a *wiki*. The students then use *Audacity* to record their *podcasts* or a *Flip* camera to record *vodcasts*, and upload them to *Podomatic*. Other teams create a draft of text and prepare the layout for a *Glog*, then create their work in *Glogster*. (3c, 3d)

Using *Microsoft Publisher*, each team also creates an informational printed poster, duplicates it, and distributes copies to the schools around their community, as well as at other community-accessed buildings such as libraries, post offices, town offices, pharmacies, and doctors' offices.

One student from each team works on the *Delicious* account to organize it, edit it, manage *tags,* and open it to the public. Other students work on the *wiki* main page to edit it, organize it, and create links to the *Delicious* account as well as all of the teams' final products. A group of students work with the school webmasters to make sure each school in their district has a link to their site from both the school's home page and from the district nurses' web page. The students also offer the informational link to other appropriate venues such as the Vermont Department of Health.

Finally, each team is also responsible for reporting their findings to a live audience. (3d) Some teams choose to visit elementary schools to teach younger children tips on how to try to stay healthy, some teams visit parent group organizations such as the PTO to educate parents about their findings, other teams make presentations to the school board about offering the vaccine during school hours, and others visit nearby middle schools to

share their information. After the project is completed, all students feel comfortable that they know the facts, can take positive steps to avoid contracting the flu, and can have an intelligent discussion with their parents about whether they wish to receive the vaccine.

Student Standards – The following NETS-S are noted in the scenario:

3. Research and Information Fluency – A, B, C, D
6. Technology Operations and Concepts – A, B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C
2. Design &bDevelop Digital-Age Learning Experiences/Assessments – A, B, C
3. Model Digital-Age Work and Learning – B, C, D
4. Promote and Model Digital Citizenship and Responsibility – A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

HE4: Accessing Information
Students will demonstrate the ability to access valid information and/or resources about health issues, services and products.

- Identify resources that provide valid health information and services for individuals, families, and communities.

HE7: Decision Making
Students demonstrate the ability to make decisions that lead to better health.

- Analyze how individuals, families, and community values influence health-related decisions.

Informational Writing: Reports
W8: 8 In reports, students organize information/concepts by…

- Using an organizational text structure appropriate to focus/controlling idea
- Drawing a conclusion by synthesizing information from the report
- Obtaining information from multiple locations or sources when appropriate
- Listing and citing sources, using accepted format, if appropriate

W8: 9 In reports, students effectively convey a perspective on a subject by…

- Stating and maintaining a focus/controlling idea/thesis (purpose)
- Writing with a sense of audience, if appropriate
- Establishing an authoritative stance, when appropriate

W8: 10 In reports, students demonstrate use of a range of elaboration strategies

- Including facts and details relevant to focus/controlling idea, and excluding extraneous information
- Including sufficient details or facts for appropriate depth: naming, describing, explaining, comparing, use of visual images

NETS-S – 3

Research and Information Fluency

Grade Cluster

9-12

Can We Get There from Here?

Grade Cluster - 9 – 12

NETS-S – 3 - Research and Information Fluency

Quick Look:

In this Social Studies/Science/Math project, students explore the topic of transportation with the goal of answering the question, "How can we design a sustainable transportation system for our town?" Students collaboratively conduct research, develop a series of alternative scenarios, and ultimately conduct a community forum to share their work.

Scenario:

Joanne joins Alexandra and Paul at a VPIRG (Vermont Public Interest Research Group) presentation on global warming. She finds one statistic particularly surprising**:** Vermont's transportation sector accounts for approximately 45 percent of Vermont's greenhouse gas emissions. Alexandra and Paul agree that this is a serious issue, so the three students decide to propose that their Public Policy class study transportation in Vermont as the class's next research project.

At class the next day, the other class members are shocked as well. Most have just started driving and they hate to think that they are major contributors to global warming. So, they decide to explore the question "How can we design a sustainable transportation system for our town?"

Because the Public Policy class only meets in person twice a month, the students discuss how they can use *Google Docs* and *Skype* to plan and carry out their work. They choose *Google Docs* rather than a *wiki* so that they can all edit the documents simultaneously while they discuss their work with *Skype*. They decide to divide into working groups of four students each so that the conference calls with *Skype* will be manageable. (3C, 6A, 6B)

The students next use *Inspiration* (*concept mapping software*) to brainstorm the topics they will need to research. Their list includes collecting data on energy used for personal automobiles, mass transit, farming, and the transportation of goods. Each group selects two or three major topics and together they brainstorm how they will conduct their research. (3A, 3C, 6A, 6B)

As the final activity of the class session, the students discuss possible research strategies. Of course they'll use the Internet, but they also realize that they should contact organizations such as Vermont's Agency of Transportation and Department of public service, non-profits like Efficiency Vermont and VPIRG, local town energy committees, and national organizations such as the Natural Resources Defense Council and the Rocky Mountain Institute. They agree to use a *Google Doc* shared with everyone in the class to record all their proposed contacts at least three days in advance, including a list of the questions they intend to ask. That way other students can add to the question list and

they can minimize repeatedly contacting the same people. They also agree to record all the answers to their questions in the *Google Doc* so that all students have access. (3A, 3B, 3C, 6A, 6B)

The students also decide to create an online survey to collect data from fellow students and community members about where they live, how far they travel to school/work, how they commute, the gas mileage of their vehicle(s), etc. Each group develops a short list of questions for the survey and representatives from each group meet online with *Skype* and *Google Docs* to craft their survey with *Google Forms*/*Spreadsheets*. (3A, 3B, 3C, 6A, 6B)

As the students conduct their research, they enter what they discover in a shared *Google Spreadsheet*. Everyone is careful to fully document their sources. (3B, 6A, 6B)

After the student groups have completed their research, they meet again as a whole class to share what they've learned. They discuss the quality of their sources and decide to delete a couple of questionable pieces of data and to do some follow up research to confirm a few others. They organize their information by topic in *Google Spreadsheets* and identify a few gaps in their research, which they commit to filling. (3B, 3C, 3D, 6A, 6B)

One group volunteers to summarize the results of the survey. They use *Google Spreadsheets* to compute a variety statistics, such as the number of miles travelled per person per year, the average gas mileage for all the cars in town, the average number of passengers in each car, etc. (3B, 3D, 6A, 6B)

Several of the members of the class learned how to use *Google Spreadsheets* to build *simulations* in another course. They guide their classmates in the development of a set of spreadsheets that uses their data to model the current state of transportation energy consumption and greenhouse gas production in the town. (3B, 3C, 3D, 6A, 6B, 6D)

Once the current state model is complete, the students create a series of "What if" scenarios to explore how changes in transportation modes or habits could impact transportation energy consumption. For example, what if everyone who could carpool to work or school did? Or what if everyone had hybrid or electric cars? (3B, 3D, 6A, 6B)

They realize that they are missing a few key numbers, but quickly gather them with follow-up phone calls to some of their sources. Using their model, they identify a set of proposals that will lead to a truly sustainable transportation system. (3B, 3D, 6A, 6B)

Next the students develop a web site that summarizes their research and presents the pros and cons of their proposals. They carefully document and provide links to their sources so that interested readers can explore further. (3B, 3D, 6A, 6B)

The students wrap up the project with a community forum on transportation, at which they present the results of their research and their proposals. At the end of the meeting, the students have participants select the top four proposals they would like the town selectboard to consider implementing, as a first step to developing a sustainable transportation system. (3D, 6A, 6B)

Student Standards: The following NETS-S are noted in this scenario:

3. Research and Information Fluency – A, B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards: Teachers who teach this unit address the following:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C
2. Design and Develop Digital-Age Learning Experiences and Assessments A, B
3. Model Digital-Age Work and Learning – C, D
4. Promote and Model Digital Citizenship and Responsibility – A, C
5. Engage in Professional Growth and Leadership **–** N/A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

MHS: 1 Accurately solves problems involving conceptual understanding and magnitude of real numbers, or simple vectors.

MHS: 15 Measures and uses units of measures appropriately and consistently when solving problems across the content strands. Makes conversions within or across systems and makes decisions concerning an appropriate degree of accuracy in problem situations involving measurement.

S9-12:8 Students demonstrate their ability to APPLY RESULTS by…

- Using technology to communicate results effectively and appropriately to others.
- Predicting/recommending how scientific conclusions can be applied to civic, economic or social issues.

H&SS9-12:1 Students initiate an inquiry by…

- Asking focusing, probing, and significant research questions that will lead to independent research and incorporate concepts of personal, community, or global relevance.

H&SS9-12:4 Students conduct research by…

- Referring to and following a detailed plan for a complex inquiry.
- Locating relevant materials such as print, electronic, and human resources.
- Applying criteria from the plan to analyze the quality and quantity of and corroborate information gathered.
- Describing evidence and recording observations using notecards, videotape, tape recorders, journals, or databases.
- Revising the research plan and locating additional materials and/or information, as needed.

Also: RHS: 12; **WHS:** 1, 8, 9, 10; **MHS:** 4, 21, 30; **S9-12:** 5, 7; **H&SS9-12:** 2, 3 5, 6, 7, 12, 14

Drugs: What's the Deal?

Grade Cluster - 9-12

NETS-S - 3 - Research and Information Fluency

Quick Look:

Local media collaborate with high school students to create public service announcements encouraging the accurate research about variety of drugs, both legal and illegal. They include at least one reference to an accurate, dependable, reliable site.

Scenario:

While doing some investigative reporting on illicit drug use in the community, the local TV reporter discovers that there is a large amount of community ignorance about drug use, including issues around legal and illegal drugs. Through a connection with a local high school teacher, the reporter asks if a class of students would be interested in undertaking a project that would further investigate the issues involved and help educate the public. It is apparent that many citizens don't have the confidence to use the Internet to obtain the most recent information about the impact of using a variety of drugs, either legal or illegal.

Excited by the idea of working with reporters, students start off by organizing themselves. Using a *graphic organizer* and projector, the teacher leads the class in a brainstorming activity, listing all of the drugs students can name. The teacher reminds students that over-the-counter drugs like aspirin belong on the list as well. In small groups, students then attempt to categorize the drugs; some want to group them by legal vs. illegal (antihistamine vs. crack), some by the drug's effects (curing pain vs. getting high). The teacher then brings up a web site that defines the drugs by seven established categories (depressants, stimulants, etc.) In small groups, students then arrange their brainstorming accordingly. Doing this activity encourages students to bring order to the bewildering variety of drugs; they comment that there is such a vast array of drugs that no one person could possibly know all of the information available about them all.

Exclamations from the students erupt when the teacher slyly suggests that consumers have all of the information they need to make responsible decisions in consuming drugs, because there are so many ads about drugs on TV. “Oh sure, we all need Cialis!” “Right, no one sleeps at night so we’d better all get Ambien CR.” “Never mind the ads, my sister thinks smoking pot will help her study.” The teacher challenges students to inform the public about ways to get accurate information.

Working in pairs, students select one drug they would like to study for the next few classes. Once the selections are complete, the teacher explains the final project. Each team will produce a public service announcement that shows the consequences of using a particular drug (legal or illegal) and how consumers can find accurate information about

that drug. She then shows some examples of PSAs, both those created by former students and current TV hits. Students may create either an audio file for radio, or a video for TV. Specialists from the local radio and TV stations volunteer to work with students in the next class to identify key components of a good public service announcement.

The next phase is student research. The teacher demonstrates to the whole group what happens if one Googles marijuana: 21,800,000 results! Try it with aspirin: 14,100,000! Google is too good at its job of finding web sites for anyone to use even a fraction of the material. The teacher clicks on one of the links to marijuana that is obviously biased and based on opinion, easily demonstrating the need for a better search engine. The students are directed to a page on the class wiki that lists some other search engines to try: ask.com, answers.com, and Noodletools. Each student runs a query for his or her drug name. In teams of three, students discuss the benefits of each of the search tools.

The whole group reconvenes and the teacher leads a discussion on effective Internet searching with a focus on finding reliable sources. Students are reminded of domain names, extensions, and country codes. They are directed to the *webquest*, http://webquest.sdsu.edu/searching/fournets.htm, which gives examples of effective searching applied to Advanced Google searches, but can be applied to most searching.

Students now research their own topic. (3a) They are required to find sites with extensions of .com, .gov, .edu, and a +host.cdc.gov. in order to consider the differences in content for each site. They need to find information about the category of drug and the benefits or detriments of using the drug. Any students who have difficulty reading some of the articles are invited to listen to the text, using "ReadPlease" or other digital text readers. As they locate sites and analyze the text, they bookmark the site on a shared *web-based social bookmarking site* such as *Portaportal* or *Delicious*. Commenting on the credibility of the site, they answer the questions, "Who is the author? What is the date of publication? Are there any affiliations with drug companies or blogs?" *EasyWhoIs* and *WayBackMachine* may help students find some of these answers (EasyWhoIs identifies the organizations that made the website and WayBackMachine documents changes in the website over time). Other students who read the same article contribute to the analysis. (3b,c) They create a "Top Ten" list of reliable resources and another list of those "Voted Off the Island." Only sites on the Top Ten list are eligible for citation in the PSAs.

Armed with accurate data, students create a brief public service announcement about their drug, proclaiming both its benefits and/or cautioning its use. They include reference to one of the trusted and accurate sites they used, and emphasize the need to the public for finding current, accurate data. As students make a point about the importance of finding reliable information, they also include a few tips to get good results (3d). The final PSAs are shown on local TV and radio stations. Some will be uploaded to YouTube. Volunteers will locate PSA competitions and various students will submit theirs for consideration.

Student Standards – The following NETS-S are noted in the Scenario:

3. Research and Information Fluency – A. B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A,B,D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A
3. Model Digital-Age Work and Learning – A,D
4. Promote and Model Digital Citizenship and Responsibility- A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

HE2: Core Concepts Students will show an understanding of health promotion and disease prevention concepts.

- Describe the signs and symptoms of alcohol and other drug use, including the progression from non-use through addiction.
- Evaluate the short and long-term effects of alcohol, tobacco, and other drugs on health.
- Analyze the impact of personal health behaviors on body systems (e.g., alcohol and drug affects on brain function; alcohol, tobacco and other drug use during pregnancy).

HE4: Accessing Information Students will demonstrate the ability to access valid information and/or resources about health issues, services and products.

- Demonstrate the ability to access appropriate sources of support and treatment available in the school, community, and state for health issues related to alcohol, tobacco, and other drugs

H&SS 9-12:4 Students conduct research by…

- Locating relevant materials such as print, electronic, and human resources.
- Describing evidence and recording observations using notecards, videotape, tape recorders, journals, or databases.
- Revising the research plan and locating additional materials and/or information, as needed.
- Citing sources

The Vietnam Conflict

Grade Cluster - 9-12

NETS – 3 - Research and Information Fluency

Quick Look:

High school students research the Vietnam Conflict through news footage, essays, photographs, art, music, books and firsthand accounts, and develop a multimedia embedded presentation, video, poster or webpage. They study relevant data about the war and visually represent this information. Students correspond with a class in Vietnam using *ePals*, to learn about the impact of the war on modern Vietnam. They also take advantage of the large number of Americans of Vietnamese ancestry who can recollect this time period and the history, culture and language of Vietnam.

Scenario:

In their U.S. history class, students have a lively discussion about the Vietnam conflict and develop focus questions (3a):

- What political events and policies led to the involvement of the U.S. in the Vietnam conflict?
- Was the reasoning for entering the war sound, considering our attitude towards communism?
- What effects did the war have on the social fabric of the United States and Vietnam?
- How did this conflict compare to other U.S. conflicts in regard to casualties, time, economic, and political costs?
- How is the war affecting political decisions in the U.S. today?

Students have several options for their reading assignment about the Vietnam War, all available on their *eBook readers*. After selecting a book, they read and/or listen to the text, highlight important information, look up terms and phrases with a click, and add notes digitally (3c). They form book groups which meet face-to-face and on the web. They create a page using *Google* discussion groups where they can read and post messages online, and contribute documents and other resources. Students discuss information and build collaborative resources using this site.

Still using their *eBook reader*, students connect to the web and go to NoodleBib http://www.noodletools.com/, to develop the outline and bibliography for their research. They continue their research at dozens of sites including http://thewall-usa.com/, http://www.pbs.org/wgbh/amex/vietnam/, and

http://www.time.com/time/archive/collections/0,21428,c_vietnam_war,00.shtml and add information to NoodleBib (3b).

Concurrently, the teacher points students in the direction of online resources containing information about the significant wars and numerous other conflicts in which the United States has participated from 1775 to the present, such as: http://www.history.navy.mil/faqs/faq56-1.htm, http://siadapp.dmdc.osd.mil/personnel/CASUALTY/castop.htm, http://www.fas.org/sgp/crs/natsec/RL32492.pdf , http://www.teacheroz.com/index.htm and many others. Students compare two or three of these military conflicts on the basis of economic, political, and human cost. They make discoveries about the real price of war on the U.S. and their overseas participants. They place similar data in a spreadsheet and graph it to produce visual comparisons (3d). The graphs become supporting documents for their research assignment and are incorporated into their final product. Students select from the following data types:

- Number of human casualties, and battle deaths
- Military casualties by gender
- Civilian casualties by country
- Military dollars spent on the war
- Per capita military spending during the war
- Number of years that the conflict lasts
- Unemployment during the time period
- GDP during the wartime period
- Number of American presidents during the conflict
- Effect of war on political party power
- Major world powers militarily involved in the conflict

Several speakers join the class over the course of two weeks both directly and indirectly, including through the *Vermont Learning Network* (VLN), a Veteran Vietnam nurse, a Vietnam Military Veteran, a Vietnamese American who experienced the war, and a conscientious objector from the 1960s. Students gain valuable insight during a Q&A and add this new information to their notes and *Google discussion group*.

In order to understand more about the current culture of Vietnam, the students correspond with a high school classroom in Vietnam using *ePals*. They learn about Vietnamese language, history, family life, social structure, physical geography, natural resources, climate, religion and culture while the Vietnamese students have an opportunity to practice English. The richness of this cultural context brings life to events that happened forty years ago and helps students consider the lasting effects of war. American students share their final products with their Vietnamese counterparts.

The student groups select a final multimedia format for their research. Students choose from a variety of product possibilities including interactive posters using *Glogster*, Y*ouTube* video production, online presentations such as *Prezi* , *Slideshare* or *Google presentation*, enhanced *podcasts*, or a *Knol* or *blog* with original art, photos, music, video, links, and other supporting resources (3c). They publish their work so that it is accessible from anywhere in the world.

Vietnamese *Epal* students, classmates and parents are provided with guidelines on constructive feedback for the project and have an opportunity to look at the work, ask questions and provide recommendations to the groups (2a). The students finalize their work based upon the feedback.

Final products

- Interactive poster using *Glogster*
- *YouTube* video production
- Online presentation using *Prezi, Slideshare* or *Google* presentation
- Enhanced *podcast*
- *Knol* or *blog*

Student Standards – The following NETS-S are noted in the Scenario:

2. Communication and Collaboration (A)
3. Research and Information Fluency (C,D)

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity (A,D)
2. Design and Develop Digital-Age Learning Experiences and Assessments (A)

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS9-12:5 - Students develop reasonable explanations that support the research statement by…

- Organizing and display information in a manner appropriate to the research statement through tables graphs, maps, dioramas, charts, narratives, posters timelines, models, simulations, and/or dramatizations.

H&SS9-12:10 - Students show understanding of past, present, and future time by…

- Creating an historical narrative.
- Making predictions, decisions, or taking a public stand on a defensible position based on an understanding of the past and present.
- Explaining transitions between eras that occurred over time as well as those that occurred as a result of a pivotal event, and evaluating the effects of these transitions (e.g.,What factors led to various democratic revolutions? What have been the long-term effects of these revolutions?).
- Identifying why certain events are considered pivotal and how they cause us to reorder time (e.g., Muhammad's call to prophecy, the collapse of the Soviet Union).

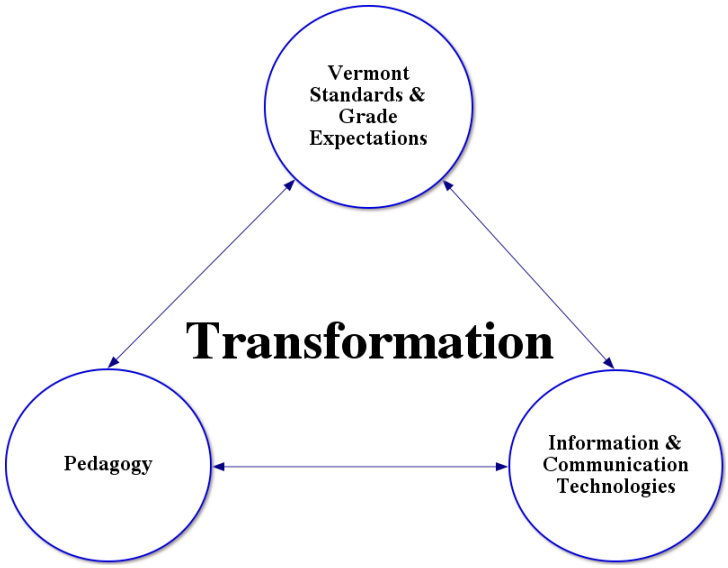
National Technology Standards for Students

Standard 4

Critical Thinking, Problem Solving, and Decision Making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:

a. identify and define authentic problems and significant questions for investigation.
b. plan and manage activities to develop a solution or complete a project.
c. collect and analyze data to identify solutions and/or make informed decisions.
d. use multiple processes and diverse perspectives to explore alternative solutions.



NETS-S – 4

Critical Thinking, Problem Solving, and Decision Making

Grade Cluster

K-2

Give Me Shelter.... Please?

Grade Cluster - K-2

NETS-S - 4 - Critical Thinking, Problem Solving & Decision Making

Quick Look:

After an early summertime recess, students return to Ms. V.'s classroom complaining that it's much too hot on the playground. They decide they need some shade and proceed to figure out how they might get it.

Scenario:

One warm summer day, the line at Ms. V.'s classroom water fountain quickly increases as wilted children return from their morning recess. "It's way too hot outside. There's no place to get out of the sun," many are heard to complain. As the children join the meeting time circle, a discussion begins about the problem on the playground. The class decides that the playground is in need of some sort of shade from the sun. "I wonder if other classes feel the same as we do?" children ask.

The class decides to bring digital video cameras to the playground the next day to interview other students about the playground situation (4a). The group decides to only ask two questions: "Does all the sun on the playground bother you?" and "If so, what does our playground need to help solve this problem?" In preparation for the student interviews, Ms. V. emails fellow teachers from all grades in the school and arranges for representatives from their classes to speak with the younger children. On Interview Day, Ms. V.'s students organize themselves into teams of two students, one person asking questions and the other recording the video (6a). They proceed to the playground to gather their data.

When interviews have been completed, Ms. V.'s students return to the classroom to watch their playground videos using an *interactive whiteboard*. Ms. V. enlists two students to act as scribes for the class. Using their *netbooks* and a simple *Google spreadsheet* created by Ms. V., the students record either the problems students have with the sun or possible solutions (4c, d, 6b). Ms. V. pauses the videos for students in the class to add suggestions to the lists as needed. After viewing all the videos, the two recording students project their spreadsheets and report the following class findings (6a):

Problems - sunburn, sweating, thirsty, hard to work after hot recess, wet clothes, can't focus when hot, sleepy

Solutions - tents, roof over playground, trees, no outdoor recess, fans, no school when hot
The class decides to further explore planting trees around the playground as a solution. They learn more about trees at Dr. Arbor Talks Trees and from books checked out of their library. Using their *netbooks*, the students conduct *safe searches* to find out which trees might provide good shade and grow well in the Northeast (4c). Ms. V.

invites experts from local tree nurseries to speak with her class and give their suggestions for tree types, as well.

The class narrows the choices to the top three trees. The parent email system is used to find out if anyone knows the location of any of the recommended trees so that the students might see the trees up close and take digital images of them (6a). Students form teams for each of the three types of trees and use a *visual organizer* to illustrate reasons supporting why their type of tree should be planted around the school's playground (4b, 6b). They create posters at *BigHugeLabs*, using their digital images (4b, 6d). Both the *visual organizers* and posters are published on the class web site. A display board outlining the students' problem and solution is also assembled, using a few of the student creations that have been printed in color.

The class requests that the topic of shade trees for the playground be placed on the agenda for the next school PTO meeting. Representatives from the three class teams attend the meeting, showing video interview clips of the playground problem that Ms. V. has spliced together with *Windows Movie Maker*. The students make a case for shade trees by presenting their teams' *visual organizers* and posters. They request PTO support in the purchase of trees for the school playground. There is unanimous support from PTO members at the meeting with the decision to plant two of each of the recommended trees, since a local tree nursery has offered a discounted rate for the tree purchase. The next day, Ms. V.'s class celebrates the news about the results from PTO meeting. Her students are interviewed and photographed by the local newspaper when the trees are planted a couple of weeks later. The children now know that even the youngest of learners can make a big difference in the world.

Resources:

Dr. Arbor Talks Trees - http://urbanext.illinois.edu/trees3/01.html

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Student Standards – The following NETS-S are noted in the Scenario:

4. Critical Thinking, Problem Solving & Decision Making – A. B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C, D
5. Engage in Professional Growth and Leadership – A, B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage

you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Science Inquiry
SPK-K:1 Students demonstrate their understanding of SCIENTIFIC QUESTIONING by…

- Developing a question by completing the prompt, "I wonder.. .?"
- Demonstrating a "questioning mind" through extended, intentional (purposeful) interactions with materials or people; Experimenting with possibilities.

Writing Grade Expectations: Grade 2
Standard 5.13: Responding to Text

Writing in Response to Literary or Informational Text

W2: 6 In response to literary or informational text, students make and support analytical judgments about text by…

- Using references to text to support a given focus.
-

Standard 1.19: Research

Informational Writing: Reports

W2: 8 In reports, students organize information by…

- Using a given organizational structure (e.g., template, frame, graphic organizer).

History and Social Sciences GEs: **Grades 1 – 2**
Inquiry
H&SS1-2:4 Students conduct research by…

- Asking questions and observing during the investigation process.
- Recording observations with words, numbers, symbols, and/or pictures (e.g., drawing or labeling a diagram, creating a title for a drawing or diagram, recording data provided by the teacher in a table).

H&SS1-2:5 Students develop reasonable explanations that support the research statement by…

- Organizing and displaying information (e.g., table, chart, graph).
- Classifying information and justifying groupings based on observations, prior knowledge, or experience.

H&SS1-2:7 Students communicate their findings by…

- Speaking, using pictures, (including captions) or creating a simple report or "painted essay" containing a focus statement, details, and conclusions.

Government and Society
H&SS1-2:16 Students examine how different societies address issues of human interdependence by…

- Explaining that people have rights and needs (e.g. fairness, safety).
- Defining their own rights and needs – and the rights and needs of others – in the classroom, school, and playground (e.g., "I" statements, learning to be assertive, taking care of yourself).

Garbage to Gardens

Grade Cluster - K-2

NETS-S - 4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

Students develop a plan to dispose of the cafeteria and classroom waste.

Scenario:

The bell rings for students to clean up their lunch trays and get ready for recess. This is the first year the school has separated the food waste from all other trash. Charlie loves to hold his chocolate milk container from a distance and watch the remains of his milk splash into the barrel. "Yuck!" shouts his buddy standing next to him. "That's disgusting!"

The two boys carry on with a conversation about where this massive bin of slop goes when lunchtime is over. The students have recently learned that there is a local pig farmer down the road who feeds the waste to his pigs. The class is planning a trip to visit the pigs later in the year.

The next day Charlie's first grade class cleans up after snack time. Charlie realizes that there is only one trashcan for all waste, and the food is not separated from the other waste like in the cafeteria. He shares this problem with his teacher who decides that this may be a perfect introduction to the upcoming science unit on recycling.

After hearing Charlie's concerns, Mrs. F. gathers the children for a class meeting. Students all agree that if the cafeteria food is composted, so should the classroom food scraps. Students are curious to find out what other classrooms do with their scraps after snack time. Mrs. F. encourages her class to talk with fellow students out at recess that day to hear what they have to say. Using video cameras, groups of students travel about the playground posing questions regarding the disposal of other classrooms' snack time scraps.

After recess, students report out what they learned from the other first graders by sharing the projected video clips. As expected, none of the other classrooms compost either. In response to this new information, the class develops a brief questionnaire for teachers using a word processor, such as *Microsoft Word*, *Google Docs* or *Zoho*, in order to find out how food waste is disposed of in each classroom. The questionnaire asks, "Do you separate food waste from garbage in your classroom? If you separate the food waste, what do you do with the scraps?" A database is created using *InspireData*, and its link is sent out to the teachers in the school. Their responses are collected and used to form a graph. The students analyze and discuss the data.

The results show that only two of the fourteen classrooms in the school compost (4a,c). The other twelve classrooms toss their food into the garbage with the rest of the trash.

Students then invite a representative from the local composting center to come into the classroom to share how the center actually works. They learn that they can bring their food scraps to the center and purchase compost, too. A field trip is scheduled to visit the center later that month. Next, students collect plastic containers for each classroom. They decorate and distribute the containers to classrooms. Students also share with other classrooms and teachers the importance of composting and how everyone can help in school. The scraps from the containers are collected biweekly and added to a larger bin outside the school.

Students decide that they can promote the idea of composting to help with the environment. They are excited to share what they have learned from the employees at the composting center. They create and display posters using *KidPix*, or another paint program (6b), throughout the school highlighting the idea that compost adds nutrients, organic matter and helpful micro-organisms to lawns, gardens, and potted plants (4b). They decide to raise money for the school by designing and painting clay pots, to be accompanied by seed selections, to sell later to families and community members. Order forms are created using *Google spreadsheet* and shared with parents. These forms specify the types of seeds parents can purchase. The seed choices are voted on by the students using a *clicker-response system* (6a). The students tally the orders daily to determine how many pots to paint, how many seeds to purchase, and how much compost to order.

On the day of the trip to the composting center, the class drops off the collected food scraps, takes a tour of the site, and purchases a variety of seeds and compost for their project, as well as a number of vegetable seeds to plant for the classroom. They return to school and immediately plant the seeds in their beautiful pots using the compost. Most of the seeds are designated for orders placed by the parents, while a variety of vegetable seeds have been planted separately for the class. They are excited to notice the daily changes in the quickly sprouting plants. Students document changes in the plants as they grow using digital photographs (6a). The students will later upload the images into Shutterfly and create a published photo book to share with parents and other classrooms. When the plants are ready to harvest, students prepare a class salad using the organic vegetables set aside for the class. Parents pick up their orders and celebrate with students in a class salad party made from the delicious classroom-grown organic vegetables.

Student Standards – The following NETS-S are noted in the Scenario:

4. Critical Thinking, Problem Solving & Decision Making – A, B, C
6. Technology Operations and Concepts – A, B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C
5. Engage in Professional Growth and Leadership – B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS1-2:1 Students initiate an inquiry by...

- Asking questions based on what they have seen, what they have read, what they have listened to, and/or what they have researched as a class.

H&SS1-2:3 Students design research by...

- Identifying resources for finding answers to their questions.
- Explaining what their jobs will be during an inquiry investigation.
- Planning how to organize information so it can be shared.

H&SS1-2:5 Students develop reasonable explanations that support the research statement by...

- Organizing and displaying information (e.g., table, chart, graph.)
- Classifying information and justifying groupings based on observations, prior knowledge, or experience.

Smart Snacks and Furious Fitness

Grade Cluster - K-2

NETS-S - 4 - Critical Thinking, Problem Solving and Decision Making

Quick Look:

Students gather data from their peers about their eating habits, fitness and snacking. Students want to offer their peers suggestions for better snacking and how to stay healthy. This information will be shared with the principal, food service staff, teachers, and peers. Students will participate in a walking challenge to measure the distance they can walk around the playground.

Scenario:

Mrs. Jones' students want healthier choices for snacks and lunches. This leads them to a conversation about fitness and healthy eating. After a discussion with their teacher, they decide to research what other schools have for snack options. Students send out a *Tweet* on *Twitter* asking others to share information about snacks offered at school and/or what they bring to school for snack and what activities they participate in to stay fit.(4a) Students start by brainstorming what they think are healthy snacks and what being "fit" means. They want to know they can make better choices about what they eat and share this information with their peers. They use the interactive whiteboard to record their lists and a graphic organizer to record the data. (4b)

Students use several *kid-friendly search engines*, such as *KidsClick,* and Superkids, and search terms as "healthy", "snacks", "nutrition", and "fitness." Students send out a request on Twitter for other classrooms to respond with their favorite healthy snack idea and favorite type of physical activity. (4b) The students use the President's 10 Tips to Healthy Eating and Physical Activity list found on the The President's Council on Physical Fitness and Sports webpage to develop questions to be put on a Google form. They post this form on the school webpage and ask classes to fill in the Google form, so they can compile information to share with their principal, food service and peers. They also send out a link on Twitter to try and get schools to share information from all over the world. (4c) (6a)

Mrs. Jones uses her *interactive whiteboard* to present the information students have collected and they use it to organize their groups for the second part of their project on healthy snacks and fitness. Since they have already collected information about eating habits, fitness, and snacking, the next step is to divide students into small groups to come up with suggestions for improving their fitness and eating habits and how to share that information with their peers and others who have participated in providing information for this project. Using a *video camera*, one group of students works with their physical education teacher to videotape students doing exercises properly. (6d) This group has to gather information about proper techniques for specific activities from the teacher, as

well as fitness sites on the Internet. These videos are edited and then made available through the school's learning center and Physical Education department for viewing. Meanwhile, a different group develops a list of healthy food choices they would like to see offered in the cafeteria, and presents this to the food services manager using *Google Presentation*. A third group collects healthy snack recipes and produces a recipe book to be handed out and shared with other classrooms. They will use *Google Documents* to type up their recipes and others in their group use Paint to do illustrations to include in the recipe book. (6b) The recipe books are published and sold online at a book publishing site such as *Lulu* to raise money for a local food shelf. Students will research where their local food shelf is and have someone from the organization come and share information about their services. Interviews with the food shelf representative will be conducted and posted on the *class blog.*

The final group will work with the physical education teacher to measure out a walking track around the playground. Students keep track of how many times they walk around the playground using button counters . The information is recorded by the group to see how many miles they can walk in a months' time. Students collect this data by grade level and record it in a *Google spreadsheet*, so that they can then show which grade has walked the farthest distance. The graph is displayed beside a map that shows how far they have walked from their school to a predetermined location. Google maps are also used to map the distance they have walked. (6a) Student set a goal for the distance that the entire student body wants to try to reach and keeps track of number of miles walked on the playground. For example, they may decide to walk the distance it is around the state of Vermont and try to walk this distance. (4b, 6b) Students will post on *Twitter* requests for other classes to participate in their own challenge, to see how far they can walk during a specified amount of time.

This project helps students make better decisions about their snack choices and also gives them different ways to stay fit. When students meet their first goal, they decide to continue with the project, recording other distances, and challenging other classrooms in their school to participate as well.

Student Standards – The following NETS-S are noted in the Scenario:

4. Critical Thinking, Problem Solving, and Decision Making – A, B, C
6. Technology Operations and Concepts – A, B

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments- A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, C
5. Engage in Professional Growth and Leadership

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of

disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Physical Education

GE 9: Students show awareness of personal responsibility for individual wellness by…

- Identifying an activity and a benefit associated with each of the four health-related fitness components.

GE 10: Students promote individual success and self-confidence by…

- Identifying several activities that are personally enjoyable.
- Attempting movement, skills, and activities.

Nutrition and Physical Activity (NPA)

HE5: Interpersonal Communication

- Students will demonstrate use of skillful communication to contribute to better health for themselves, their families, and the community.

HE7: Decision Making

- Students demonstrate the ability to make decisions that lead to better health.

M2: 24 Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using "more," "less," or "equal."

NETS-S – 4

Critical Thinking, Problem Solving, and Decision Making

Grade Cluster

3-5

Where Does All That Paper Go?

Grade Cluster - 3-5

NETS-S- 4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

Students look at the issue of paper consumption in their classroom and in their school. After collecting and analyzing the data they realize that the issue of paper usage is a school wide problem and they start a paper-recycling program in the school.

Scenario:

"We need more paper for the printer and there isn't any more paper." said one of the students. "We filled the printer paper tray three days ago and put the extra paper beneath the printer." replied the teacher.
“Well, there isn't any paper. What are we going to do” answered the student.
"Good question! One I would like the answer to myself", replied the teacher.

At morning meeting the topic of paper usage is discussed. Working in small groups, students brainstorm a list of ways paper is used, recording their ideas in their netbooks. Using the electronic white board, groups report out and quickly realize that it is a bigger problem than just the amount of printer paper they are using. The students concluded that they used many types of paper in school (drawing, math, writing, printer, constructions, etc.). Using a *Google spreadsheet* the students conducted an inventory of all the paper they had in their room and how much of it they had left in their storage closet. After analyzing the results the conclusion was made that they would not have enough paper to last the year. (4a, 4c)

Next, students sorted and weighed the paper (construction, printer, drawing, white lined, & math) in the recycling bins. They entered the type and weight of each pile into a *Google spreadsheet*. Using the *Internet* they researched the cost of the different kinds of paper they used and added this information to the *spreadsheet*. They used the data to create charts for a report on the cost of the paper they had used this year.

From the data collected the students hypothesized that not all the paper needed to be recycled and most could be reused. The students defined the criteria to use when deciding which paper was reusable or recyclable. Again, the paper was weighed and entered in the *spreadsheet* as either usable or not usable. Over the next two weeks students sorted and recorded the paper in their recycling bins. Using the *spreadsheet*, students analyzed the data and realized that they were wasting a lot of paper that could be reused and that they needed to develop a plan for recycling paper.

The students create a *wiki* where all their information is located and accessible for the parents and community to view. (4b)

Students work in small groups to research solutions to their paper problem. One group uses the *Internet* to find information about the local recycling center and arrange for a class fieldtrip. Students document the fieldtrip using *digital and video cameras* and create a digital presentation for the class wiki on what they had learned about recycling paper. (4c, 6a)

After reviewing effective *Internet* search techniques, students use the *Internet* to research facts about paper, why it should be recycled, and how it can be reused to make other products.

They use *Google presentation* to create an informational report on paper recycling and create a list of websites that highlight different ways paper can be reused in the classroom. This is shared on the class *wiki.* (4d)

Students design an *online survey* to create a paper waste audit for the school that focuses on classroom paper usage. Students *email* the faculty to let them know about the paper audit. The data is analyzed and the conclusion is made that there is a great deal of paper wasted in school. This group meets with the school business manager to find out how much money is spent on paper each year. They analyzed the data over the last five years and conclude that purchasing paper is a large money item in the school budget and that the school's consumption of paper increases each year. The students conclude that this is not just a classroom issue, but also a school wide issue that needs to be addressed. (4a) Students meet with the principal and head custodian to discuss their plan to implement a school-wide paper-recycling program.

Students use the *Internet* to find information about school recycling programs. They begin the project by creating a *shared spreadsheet* that is used to track the amount of paper that is recycled by each classroom. Using a publishing program, they create a booklet of suggested ways a class can reuse their paper. In order to save paper, they publish their booklet using "*issuu*" and link it to their *wiki.* They contact the local recycling company and request two blue, recycling bins (one for reusable and one for recyclable paper) for each classroom in the school. Students use a Google shared calendar to develop a schedule of paper pick up times from the other classrooms and share the calendar with all the teachers in school. They create another *shared calendar* that lists the students who will be responsible for collecting the paper each week. Students record the amount of paper collected from each classroom in a *shared spreadsheet*. (4b, 4d)

Students use the paper from their recycling bins to make new products (ex. note paper, math scratch paper and re-cut construction paper), which are displayed in the front lobby for people to see how the paper can be reused. . Students use the video camera to produce short, public service announcements on paper recycling topics. These are located on the class wiki. (6a, 6b)

Students meet with the principal to review their plan and arrange a date for a school wide assembly. Through a *digital presentation* the class shares the results of their work and their plan for implementing a school wide paper-recycling program. (6b)

Students create charts to hang on the school walls where they can record the amount of paper that is recycled each week. The information is shared with the parents, school board and community via *email*, the school and local newspaper, and links to the class *wiki*. (4b,)

At the end of the school year the students meet again with the business manager and principal to share the data they collected. This information is shared with the school and community. Plans are made to start the project the following September with everyone in school educated and trained on the why's and how's of cutting down the paper usage in school. The goal is to have paper recycling become part of the school culture. (4c, 4d)

Student Standards – The following NETS-S are noted in the Scenario:

4. Critical Thinking, Problem Solving, and Decision Making- A, B, C, D
6. Technology Operations and Concepts- A, B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B
2. Design and Develop Digital-Age Learning Experiences and Assessments- A
3. Model Digital-Age Work and Learning- A, C
4. Promote and Model Digital Citizenship and Responsibility- C
5. Engage in Professional Growth and Leadership- A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Standard 7.9: Data, Statistics, and Probability Concepts

M4: 23 Interprets a given representation (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.

Visual Arts, Grades 3, 4, 5

A3-4:11 Students demonstrate PERFORM/COMMUNICATE skills in visual arts by…

- Participating in group art activities.
- Experimenting with media and materials to convey feelings or ideas

Theater Skill Development

A3-4:8 Students PERFORM/ COMMUNICATE through theater by…

- Presenting a classroom or public announcement.

H&SS 3-4:14 Civics, Government and Society =Students act as citizens by…

- Demonstrating positive interaction with group members
- Identifying problems, planning and implementing solutions in the classroom, school or community.

Outdoor Learning Spaces

Grade Cluster - 3-5

NETS-S-4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

As part of a school board initiative to redesign the land around the school, a multiage classroom develops a plan for interactive outdoor learning spaces. The students develop four learning spaces called “Froggy Bottom”, “Today’s Weather”, “Shhh! Quiet”, and “Plants Plants!”.

Scenario:

The students are very excited because their idea to develop an outdoor learning space is approved by the principal. The students post an "Idea Search" on their blog and ask for suggestions to revitalize the school’s nature trail by developing outdoor learning spaces along the trail. The students use the *blog* to communicate their project and use the suggestions and comments as they develop the learning spaces. (4a, b)

To support their project, the class invites experts from the Vermont Departments of Fish and Wildlife, Environmental Conservation, Forests & Parks, and Agriculture to visit the school, work with the class, and identify areas to develop. In addition, the class arranges to collaborate with these groups through *email* or a *videoconference* as the project progresses. Students join several *virtual tours* to see what others have done when given the opportunity to make an "outdoor learning space". One virtual tour that they join is Welcome to Bayville, Maryland’s "BayQuest", a *virtual tour* of Chesapeake Bay. (4a, b, c, d)(6a, b, c)

After a few visits to the old nature trail area and because of suggestions from their *blog*, the students identify four sections that seem to have natural boundaries along the path. With their *netbooks* and *digital cameras* in hand, each group sets out to create a visual presentation of a section before they begin to redevelop their learning space. The groups collaborate and make a video and a slide show of the trail before it is renewed. They post it on the project *blog* where they report the progress of the project. (4a, c)(6b)

The class divides into four groups and each group selects a section of the path as their area to redevelop. They give each area a name, “Froggy Bottom”, “Today’s Weather”, “Shhh! Quiet”, and “Plants Plants!”. The groups create a graphic to represent their section using Photoshop and use it to make a durable sign for each area. The students visit the trail throughout the year and identify seasonal activities for their learning space. As wireless is available throughout the trail, students use their *netbooks* as they work along the trail. They spend many days developing interactive activities, where students use *science probes*, outdoor infrared cameras, and weather gauges to record and track data, and make observations. The data is stored in “*the Cloud*” where students can communicate, collaborate and create by sharing the information. (4a, b, c) (6a, b)

The "Froggy Bottom" learning space includes an activity where students use probes to measure water ph, temperature, and hardness. The students add their collected data to the collaborative *Goggle Form,* FroggyBottomWater. The "Plants Plants!" learning space has students measure, collect the diameters of the trees, and track the growth of the trees over time using a shared *Goggle Spreadsheet.* "Today's Weather" learning space contains an outdoor weather station that collects and reports data about the local weather and is accessible via the *Internet*. "Shhh! Quiet" is a space for listening, reading, writing, drawing, and thinking. (4b, c)

All areas have plant and wildlife identification activities available and students add information about the plants and wildlife they identify to an on-line database. The database creates a real time graph of the data. The spaces also include areas for large and small group work. (4a, c) (6b)

Posts are made to the project blog throughout the project. They collaborate on a *PBwiki* to create an interactive guide to the Trail that describes the activities and provides electronic information for the learning space. They create a page on their class *web page* that monitors and interacts with the learning spaces. They develop a pamphlet using *MS Publisher* to introduce the new Learning Spaces to the community. People are encouraged to continue to add to the *wiki* even after the project is officially closed. (4b) (6a, b)

Students use *Goggle Docs* to collect and organize the data for the project and *Picasa* to upload all graphics. The graphics they produce and the information they collect are now available for all students to use or add their own graphics under the *Creative Commons license.* (4b)

The students organize a work weekend where parents and community members volunteer to clear the path and spruce up the learning spaces. The project opens to the public with a ribbon cutting ceremony and everyone walks through the new Learning Spaces and is introduced to the interactive projects that are now available for all students. (4a) (6d)

Resources:

Welcome to Bayville
http://bayville.thinkport.org/default_flash.aspx
Vermont Department of Forest, Parks, and Recreation
http://www.vtfpr.org/
Vermont Department of Fish and Wildlife
http://www.vtfishandwildlife.com/

Student Standards – The following NETS-S are noted in the Scenario:

4. Critical Thinking, Problem Solving, and Decision Making – A. B, C, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A,B,C,D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A,B,C,D
3. Model Digital-Age Work and Learning – A,B,C,D
4. Promote and Model Digital Citizenship and Responsibility – A,B,C
5. Engage in Professional Growth and Leadership – A,B,C,D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Life Science,
S3-4:30 Students demonstrate their understanding of Structure and Function-Survival Requirements by

- Explaining how the physical structure/characteristic of an organism allows it to survive and defend itself.

S3-4:35 Students demonstrate their understanding of Food Webs in an Ecosystem by…

- Recognizing that, in a simple food chain, all animals' food begins with plants
- Researching and designing a habitat and explaining how it meets the needs of the organisms that live there.

Standard 1.8: Informational Writing: Reports
W4: 10 In reports, students demonstrate use of a range of elaboration strategies by…

- Including sufficient details or facts for appropriate depth of information: naming, describing, explaining, comparing, or use of visual images

Standard 7.9: Data, Statistics, and Probability Concepts
M4: 23 Interprets a given representation (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.
Standard 1.5: Writing Dimensions
Writing Process
W4: 1 Students use prewriting, drafting, revising, editing, and critiquing to produce final drafts of written products.
H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members (e.g., working with a group of people to complete a task).
- Identifying problems, planning and implementing solutions in the classroom, school or community.

An Edible Schoolyard

Grade Cluster - 3-5

NETS-S- 4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

The students transform a piece of unused school property into a garden. Students work with local community members throughout the process. They find a garden-partner classroom in Global Gardens, where they document the growing process together on their *wiki*, comparing and contrasting how different climates grow different plants.

Scenario:

In the early spring, the students have started a unit on native plants, when two students notice a small, unused plot of ground off to the side of their play area. Native weeds and yard clutter have taken the plot over. The students noted that, while it seems to be a great spot for weeds, perhaps there could be better use for this piece of land. Back in the classroom, they bring up this question with their teacher. Together, using their class *wiki*, they brainstorm different uses for this piece of land. (4a, 6b) Ideas float around the room. Should they turn it into a sandbox for the younger students, attract wildlife with feeders, or clean it up to make more room for their playground? After a long discussion, students vote using a *student-response system* and decide the best use of this land would be to create a class garden. (4b

After *emailing* the principal, students get the okay to transform the land into a garden. Each student uses a *Mobi*, a collaboration tablet that communicates with an *interactive whiteboard*, to generate a list, saved in a *wiki*, of the plants and vegetables they would like to grow in the garden. (4b, 6a) The children then *email* the local university's horticultural research center and set up a *Skype* call with a master gardener. (6a, 6b) Recording their call, the students ask questions about the kinds of local vegetables and plants that would be good for their garden. They also ask what other things they should consider when planning their garden, like soil type, physical space, sunlight needs and water sources. The information is recorded in the *wiki*. (4b, 6b) When the *Skype* call ends, the students realize that they must revisit their *wiki* to look at which of the plants and vegetables would be most productive, based on what they had just learned. The question then arises, "How come some plants cannot grow in our garden?" Excited the students are interested in local plants, the teacher then decides to join **Journey North's Global Garden** and set up a *wiki*, partnering with a classroom in Arizona, who is also planting a garden. The two classrooms can communicate with each other as their gardens grow, track weather and temperature, and watch what happens to their gardens in the different climates.

Since they have now learned that there are many different factors that will affect the productivity of their garden plot, the class invites the local master gardener to come to school and work with them on determining soil type and condition. Students learn how

to use a *soil electromagnetic (EM) sensor* to determine soil quality, (4c, 6a, 6d) and they use a *digital tape measure* to find the area of the plot. They record their findings in their *netbooks,* in the class *wiki*. (4c, 6a, 6d)

Back in the classroom, using the data collected on their plot of land, students use the *student response-system* to collectively decide which vegetables and plants they would like to plant. Students then use *Google Sketch* up create a virtual garden of the plants they plan on growing (6b) and set up another *Skype* call with the master gardener to share their *Sketch-Up*, asking for input. They learn which plants should be started in the classroom and which ones they can plant directly into the ground from seed. All this information is saved in the *wiki*. (4b) The master gardener gives the students local seeds to start the process and the students set up a green house in their classroom to germinate the seeds.

While the seeds are sprouting in the classroom, the students realize they need to prepare the soil. They use the data in their *wiki* to determine what they need in order to create the optimum growing environment. They soon learn that they will need composted manure, which is very expensive. Students *email* a local organic farmer, and they are delighted to learn that he is willing to donate composted manure for this project. Based on their calculations of the area of the land, students determine how much composted manure should be delivered and send that information to the farmer. (4c)

The delivery is soon made and the soil is prepared for planting. Soon the seeds germinate and the class plants the garden. On the *wiki*, students create a *spreadsheet* to track the growing process. Additionally, two students collect daily information on weather, temperature, and growth of the plants. (4c) Students are able to view the same information as it is gathered from their partner school in Arizona. Using Google Calendar students organize a schedule for watering the garden. Students take digital pictures of the plants as they grow and create a short *Photo Story* to document the process. (4c, 6b)

As the plants start to grow tall and strong in each classroom's garden, the students look at the differences in their collected data. They see how environment affects the type of plants that can be grown, and how the weather also plays an important role in the growing process. They share their findings with the school by inviting them to participate in a Harvest Soup Party. They make a short "How to Create a Garden From An Empty Plot" video, using all their collected data and pictures. (4c, 6b) Their partner classroom *Skypes* in on their celebration, giving the school a "taste" of what they also grew in their Arizona garden.

Each day on the playground, the students smile at the garden they grew from a little piece of forgotten land. They now have learned how a little effort and care can result in wonderful things. The garden is replanted the following year.

Student Standards- The following NETS-S are noted in the Scenario:

4. Critical Thinking, Problem Solving, and Decision Making- A, B, C, D
6. Technology Operations and Concepts- A, B, C, D

Teacher Standards- Teachers who teach this unit addresses the following NETS-T

1. Facilitate and Inspire Student Learning and Creativity- A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments- A, B, C, D
3. Model Digital-Age Work and Learning-A, B, C
4. Promote and Model Digital Citizenship and Responsibility- B, C, D
5. Engage in Professional Growth and Leadership- A, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS3-4:7 Inquiry - Student communicate their findings by...

- Giving an oral, written, or visual presentation that summarizes their findings

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

S3-4:35 Life Science - Students demonstrate their understanding of Food Webs in an Ecosystem by…

- Researching and designing a habitat and explaining how it meets the needs of the organisms that live there.

Standard 7.9: Data, Statistics, and Probability Concepts
M4: 23 Interprets a given representation (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.

NETS-S – 4

Critical Thinking, Problem Solving, and Decision Making

Grade Cluster

6-8

Let's Get Serious About Fitness

Grade Cluster – 6-8

NETS-S - 4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

Students use data to make a strong case for altering the health-related choices available at their school. An improved understanding of data collection techniques and analysis prepares these students to make healthier choices.

Scenario:

Mr. Harley's 8th grade health classes often point out the inconsistencies between his lessons that focus on making healthy choices and the lack of healthy options available to them in the place where they spend much of their time – school. He acknowledges that they have a valid point and this year he has put them in change of doing something about it. They are using data to prepare a presentation for an upcoming school board meeting, during which they will use that data to make a compelling argument that changes should be made within their school to make it a healthier place for students.

Twice a year, for the past five years, Mr. Harley's students have taken the *Fitnessgram* physical fitness assessments. This series of fitness tests measures each student's aerobic capacity, muscular strength, endurance, and flexibility. These test results are compared to a national average and students are issued reports of their placement with a "healthy fitness zone." These individual reports include recommendations for personal improvement in areas of fitness where a student might be deficit.

Mr. Harley makes an anonymous version of the school's fitness data available to his students. They use this data to establish a benchmark of their schools' overall fitness level. Students upload the data to a series of *Google spreadsheets* and use formulas to determine the range, median and mode of the fitness assessment results for boys and girls in their school for the last five years and use the Google chart feature to display this information relative to the national averages. They discuss the significance of this information, what it means for the overall health of the class and the possible reasons for the differences they can see between the fitness levels of the boys and girls and the change in their fitness levels from year to year. Students use this information to complete a *Google form* that asks them to assign a "grade" for their school's health and defend that grade by providing evidence from the data they analyzed. Their grades are averaged to establish a reference point for comparing their school's overall fitness level to other schools. A Google *Word Cloud* visually displays the popularity of the various reasons they have listed in their evidence. (4c, 6a, 6c, 6d)

Working in teams, students use the drawing tools in a *Google document* to create a *mind map* of the variables that might contribute to any school's overall fitness level. (4a, 6b, 6c, 6d) The responses fall into two main categories, variables that are unique to individual students and take place outside of school (membership in health clubs, access to

community pools and bike paths, opportunities for participation in community-sponsored athletic events, a high level of interest in fitness within a student's family, genetics, living in a fitness-oriented community, etc.) and factors within the school that may affect them all (amount and intensity of exercise during an average school week during PE classes and recess, opportunity for participation in intramural sports, quality of food available at school, quantity and quality of health education, etc.). Mr. Harley discusses the impact free access to a community pool or skating rink might have on the health of students, to illustrate the need to control for outside variables. (4b)

After an examination of several surveys and the kind of results they produce, students create a twenty-question survey designed to collect information about the factors that they believe would contribute to the health of middle school students both in and out of school. The survey is tested on a small group of students and their feedback is used to refine the survey. (4a, 4b) *Google Form* is used so the surveys can be easily distributed and the results will be immediately available in spreadsheet form. (6b) Under Mr. Harley's guidance, the students use class lists to produce a stratified random sample with equal representation of boys, girls, and grade levels. (4b, 4c) The survey is linked to the school's Web site and selected students complete the survey during their study hall. (6a, 6c, 6d)

Through the American Association for Physical Activity and Recreation *listserv* (http://www.aahperd.org/membership/connect.cfm), Mr. Harley has enlisted 24 middle schools from around the US to participate in their study. Each of these schools has also been collecting data about student fitness levels with the *Fitnessgram* program for a number of years and have agreed to share that data and respond to questions sent to them by the students. The Fitnessgram data has allowed the students to categorize the schools within their study along a continuum from “very fit” to “unfit.” Analyzing the survey results helps them learn why some schools are “fitter” than others. (4c) This information will be used to determine what might be done to increase the fitness of students in their school and convince the school board to make these changes. (4a, 4c, 4d)

The students send an instruction sheet to all the participating schools that explains how to create a stratified random sample along with the link to their *Google From*. (4b) After receiving an acceptable number of returns, students analyze the data using the same approach that they used to analyze their own school. (4c) A clear picture emerges about the differences between the more and less fit schools. Students use graphs from their data and illustrative graphics to create a *Google presentation*. The Google presentation allows students to all work on the same presentation simultaneously and to continue their efforts outside of school. The sideshow is shared online with all the contributing schools who use the *chat* feature built into the Google presentation to gather feedback that they use to further refine their presentation. (4b, 4d, 6a, 6b, 6c, 6d)

A representative group of the Mr. Harley’s students use their slideshow to present their findings and recommendations to their school board. Their recommendations focus on three areas where the data they collected demonstrates that "fitter" schools are significantly different that "less-fit" schools: the intensity of exercise during physical education classes, the opportunity for structured fitness activities instead of traditional unstructured recess periods, and a consistent effort to have healthy food alternatives at snack time, during celebrations, and during other occasions when students traditionally

only had less healthy choices. The slideshow is also embedded in the school's home page for students and community members to see. The project concludes with an online self-assessment by the students, using a rubric created as a *Google Docs* form, in which students make suggestions on how the project could have been improved and what the students may do as a follow-up health project the following year. (4a, 4b, 4d, 6a, 6b, 6c, 6d)

Student Standards – The following NETS-S are noted in the scenario:
4. Critical Thinking, Problem Solving, and Decision Making - A, B, C, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards – Teachers who teach this unit address the following NETS-T:
1. Facilitate and Inspire Student Learning and Creativity – A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B
3. Model Digital-Age Work and Learning – A, B, C, D
5. Engage in Professional Growth and Leadership – A, B, D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

HE1: Self Management - Students will understand how to reduce their health risks through the practice of healthy behaviors.

- Select a variety of foods that can be eaten for healthy snacks.
- Create a list of foods that should be limited.
- Identify a variety of physical activities that are personally enjoyable.

HE2: Core Concepts - Students will show an understanding of health promotion and disease prevention concepts.

- Identify habits that are healthy and reduce the risk of disease (e.g., healthy food choices, regular physical activity, drinking water, adequate sleep and rest).
- Explain the importance of eating a variety of nutrient-rich foods.
- Identify a variety of nutritious food choices.
- Identify a variety of ways to be physically active and raise heart rate.

HE3: Analyzing Influences - Students will show understanding of how culture, media, peers, family, and other factors influence healthy behaviors.

- Explain how culture, media, peers, family and other factors influence eating behaviors and physical activity.

HE5: Interpersonal Communication - Students will demonstrate use of skillful communication to contribute to better health for themselves, their families, and the community.

- Demonstrate appropriate communication skills when asking adults/caretakers to offer healthy foods and time for physical activity.

Saving Our Streams

Grade Cluster - 6-8

NETS-S - 4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

Students work collaboratively in teams to develop solutions and recommendations for stream bank preservation through erosion prevention on a river in their community. They collect data, research solutions, and raise funds to employ their solutions.

Scenario:

As a group of students hike along the Browns River at Moore Park (a local park in the community), they notice serious stream bank erosion similar to other examples they had learned about in science class. The next day, the students share their observations in class and other students add to the conversation, sharing similar examples they've noticed along other sections of the Browns River. The conversation quickly generates interest and enthusiasm for taking action to improve the riverbank's conditions and protect the river. Realizing that this is a big project to tackle, the class acknowledges that this will be a multi-year project and they need some help. So, together as a class, they create a concept map on their *SMART board* using *Mindomo* to brainstorm what kinds of data they will collect, how they will collect the data, and who they can contact as resources to help with the project (4a, 4b, 6a).

The next day, students set up a wiki to plan additional investigations of the different areas along Browns River in order to collect specific data (4b, 6a). Using *Google Earth* and *Google Maps*, they identify different locations along the river that they could easily access (such as other parks, pubic land, or private land owned by students' families) and arrange themselves in groups to study each location (4a, 4b). Students also use the *wiki* to brainstorm a list of tools that they can use including digital cameras, *Flip cameras*, *GPS units*, and *Smart phones* to collect quantitative and qualitative data along the river (4b). With the help of their teacher, students e-mail the diverse group of local and state field experts they identified earlier, including members of the Conservation Commission, Vermont Department of Forests, Parks, and Recreation, and Vermont Natural Resources Council, to guide and assist them in their studies. In addition, they also *Skype* with various professors at UVM (botany, geology, biology, etc.) who give them access to databases of information previously collected which the students can analyze, and also pair them up with college students who volunteer to assist with their project (4b). The middle school students invite their UVM partners to collaborate with them on their *wiki*.

Throughout the next two weeks, students and volunteers visit their designated areas along the Browns River to document the problem. They take pictures, videos, GPS coordinates, and anecdotal notes (4c, 6a, 6c). They use *Google Earth* and their GPS coordinates to placemark the locations they studied along the river. Students add pictures, videos, and notes to their placemarks and assemble them into a *Google Earth* tour (4c, 6a, 6b, 6c, 6d). They use PhotoShop to overlay photos in two layers, in order to

compare older aerial photos with current photos to identify differences in erosion (to compare older aerial photos to current photos, and identify the actual linear feet of erosion in the same areas (4c, 6a, 6c).

Together with UVM student volunteers and field experts, students analyze the data they collected and determine that the Browns River stream banks are changing and showing great evidence of erosion (4c). Upon consultation and collaboration with their expert contacts, they use the Internet to research plant species and different erosion control strategies that could help preserve the banks of the Browns River (4c, 4d).

Student groups use *Google Docs* to collaboratively compile a report of their findings and recommendations for stream bank restoration and preservation to accompany their *Google Earth* tour of the Browns River (4b, 6a, 6b). The reports and the *Google Earth* tour are published to a web site and shared with the Underhill community, Conservation Commission, Vermont Department of Forests, Parks, and Recreation, and Vermont Natural Resources Council in order to let others know about the river's condition (6a, 6b). Students present their findings and recommendations at a town meeting to urge the community to support the continuation of their project by raising funds to implement their restoration strategies.

Over the following months, students raise money to support their project and begin restoration efforts. They plan to extend the project over future years by passing on their information and resources to younger classes for continued data collection.

Resources

Vermont Department of Forests, Parks, and Recreation http://www.vtfpr.org/
University of Vermont (botany, ecology, geology, biology, etc. departments)
Vermont Natural Resources Council http://www.vnrc.org
Underhill Conservation
http://www.underhillvt.gov/index.asp?Type=B_BASIC&SEC=%7B417CF2DB-A72B-4146-BEA3-588A82DA6FFF%7D

Student Standards – The following NETS-S are noted in the Scenario:

1. Critical Thinking, Problem Solving, and Decision Making —A, B, C, D
6. Technology Operations and Concepts—A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity—A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments—A, B, C
3. Model Digital-Age Work and Learning—A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility—B
5. Engage in Professional Growth and Leadership—A, B

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

S7-8:3 Students demonstrate their understanding of experimental design by…

- Writing a plan related to the question and prediction that includes:
  a. A diagram labeled using scientific terminology that supports procedures and illustrates the setup.
  b. A procedure that lists significant steps that identify manipulated (independent) and responding (dependent) variables.
  c. A control for comparing data when appropriate.
  d. Identification of tools and procedures for collecting data and reducing error.

S7-8:4 Students demonstrate their ability to conduct experiments by…

- Using technology to collect, quantify, organize, and store observations
- Recording multiple perspectives to scale

S7-8:5 Students demonstrate their ability to represent data by…

- Using technology to enhance a representation.

S7-8:7 Students demonstrate their ability to explain data by…

- Sharing conclusion/summary with appropriate audience beyond the research group.

S7-8:8 Students demonstrate their ability to apply results by…

- Explaining relevance of findings to the local environment
- Devising recommendations for further investigation and making decisions based on evidence for experimental results.

S7-8:9 Students demonstrate their understanding of Processes and Change within Natural Resources by…

- Investigating natural resources in the community and monitoring/managing them for responsible use.

Researching the impact of different human activities on the earth's land, waterways and atmosphere, and describing possible effects on the living organisms in those environments.

Cell Phones + Driving = Accidents?

Grade Cluster - 6 - 8

NETS-S- 4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

Vermont students collaborate with students from schools in other states to analyze data regarding cell phone use while driving. Accident data is collected and compared from states that have enacted laws that prohibits or restricts cell phone use while driving to those states that have no such laws. Students also collect data to determine if laws do, in fact, lower the incidence of cell phone use while driving. Students analyze their findings and prepare videos to share with driver education classes, their communities, and their respective state legislatures.

Scenario:

Hannah's sister, Megan, a high school senior, had a car accident while driving and talking on her cell phone. Three other local high school students were in the car with Megan. One received injuries requiring hospitalization for nearly a week, while the others had only minor injuries, but will not be recovered in time to participate in the fall sports season. When Hannah came into school the day after the accident, a discussion among her seventh and eighth grade friends caused them to share experiences and information about other accidents related to cell phone use, including one incident where several high school cheerleaders were all killed while the teenage driver was texting. These middle school students want to know the facts. Does cell phone use really create more accidents? Vermont has no law that restricts any kind of cell phone use while driving. Would a state law that prohibits or restricts cell phone use while driving prevent these accidents from happening?

Their math and English teachers quell the discussions during class time, but the teachers talk over lunch about the enthusiasm their students are showing about this topic. They decide that this might be a perfect project for integrating the two subjects. The English teacher sees the possibility for a persuasive essay, while the math teacher envisions his statistics unit taking on a life of its own as students investigate this issue. The social studies teacher walks in during the discussion and asks if he, too, could use this project to teach the students about individual rights and government, and he wonders if the students might be able to prepare persuasive arguments to take on their visit to the state house. They agree to work with the students to develop this project, and select a small group of students to meet with them during a study period to plan the work for the larger group.

The small group of students working on the planning phase includes two students who have moved to Vermont from states that have already enacted laws regarding cell phone use. Those students use their *Facebook* accounts to elicit help from friends in their previous schools to collaborate on the research project. The social studies teacher's home

state has no cell phone and driving laws, so he contacts a teacher with whom he used to work to find out if she would be willing to join the project. Two days later, the planning group and teachers have elicited a total of four middle school classes to collaborate on their project, two from states with laws prohibiting or restricting cell phone use while driving, and two from states with no law prohibiting any cell phone use by drivers. Each of the schools outside of Vermont selects planning leaders to meet with the Vermont planning group.

Guided by the Vermont student planning group, all the planning groups meet via the *Learning Network of Vermont Video Conferencing System (LNV)* to formulate research questions and to plan how they will conduct the research. (4a, 4b, 6b) The students introduce themselves and then the Vermont students lead a discussion on the project. One student takes notes on a *Google Doc* that he shares with the students from all four schools. (6b) The students brainstorm ideas about data collection and develop several questions they wish to pursue. They decide to collect data about accidents from the state police in their areas, from the National Highway Safety Administration, and from the National Center for Statistics and Analysis. They also discuss surveys that could be developed to collect data from teenagers in each community. They want to compare the number of students who use cell phones while driving in spite of the law, with the number of those who use cell phones while driving in states without laws. The students from the states with laws in place decide they should also collect accident data from both before and after the law was enacted. The "before" data will be compared to the data from the states without laws, as well as compared to data after the laws were enacted. (4a, 4b, 4c) The planning groups bring this information back to their classes for discussion, and the students add, delete, or modify questions in the *Google Doc.*

Groups of eight students are formed, with two students from each school, to gather specific types of information. (4c) For example, one group designs a survey for teenage drivers. They use *Google Docs* to prepare the questions and *Google Forms* to collect the data. Another group looks up online data from the National Highway Safety Administration, arranges for an interview with a representative from that organization via *Skype*, and prepares to present the findings to students in all four classes. Other groups take on the task of preparing questions and gathering data from their respective states about the number of accidents related to cell phone use before and after laws were in place. Each group creates a *Google Doc* to draft questions for a community survey and meets via *LNV* to discuss these questions. When the survey questions are finalized, the students prepare a *Google Form* to enter data that is later shared among all four classes. (4a, 4b, 6a, 6b) The four classes agree on a deadline for data collection and distribute their surveys to random samples of community members.

After all the data is collected, the groups at each school use *Excel* to analyze it and prepare comments to share with everyone. (4c, 6a, 6b) All the students meet again using the *LNV* to share their group findings. Students from each state gather the entire sets of data to further analyze it to prepare their presentations at home. The Vermont students are each required to prepare a persuasive essay that uses data to support either having no cell phone laws, enacting a cell phone law with restrictions (e.g., hands-free cell phone use only or teen drivers prohibited from using cell phones), or enacting a law that prohibits all use of cell phones while driving a vehicle. (4d) The essays are used to prepare group presentations that include:

- *Flash video clips* directed at teens, to be played when the school home page opens
- presentations to be shared with the driver education classes at their local high schools and at a local driver education center
- presentations to state legislators that compare accident data from states with and without the law
- "infomercials" to be played over local radio and television stations to encourage drivers to obey the law or to avoid using cell phones while driving

As a result of the student presentations, the Vermont State Legislature begins a discussion about drafting a cell phone law that targets all drivers, not just teens. Students anxiously await the final decision and carefully watch the legislative process. This topic becomes an ongoing discussion during current events in their social studies class.

Student Standards – The following NETS-S are noted in the scenario:

4. Critical Thinking, Problem Solving, and Decision Making – A, B, C, D
6. Technology Operations and Concepts – A, B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B
3. Model Digital-Age Work and Learning – C, D
4. Promote and Model Digital Citizenship and Responsibility – B

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

W7:15 & W8: 15 In persuasive writing, students define a significant problem, issue, topic, or concern by…

- Establishing necessary context, taking audience into account, as needed
- Stating and maintaining a clear position on the problem or issue (purpose)

W7:16 & W8: 16 In persuasive writing, students present and coherently support judgments or solution(s) by…

- Arranging supporting evidence persuasively
- Providing and elaborating on with convincing and appropriate facts and details
- Addressing the reader's potential concerns or counterarguments
- Drawing a conclusion by synthesizing the persuasive argument

M7:28 & M8: 28 In response to a teacher- or student-generated question, makes a hypothesis, collects appropriate data, organizes the data, appropriately

displays/represents numerical and/or categorical data, analyzes the data to draw conclusions about the questions or hypothesis being tested, and when appropriate to make predictions, asks new questions, or makes connection to real-world situations.

H&SS7-8:14 Students act as citizens by…

- Demonstrating positive interaction with group members
- Identifying problems, proposing solutions, and considering the effects of a course of action in the local community, state, nation, or world.
- Explaining and defending their own point of view on issues that affect themselves and society, using information gained from reputable sources.
- Explaining and critically evaluating views that are not one's own.
- Establishing rules and/or policies for a group, school, or community, and defending them.

NETS-S – 3

Critical Thinking, Problem Solving, and Decision Making

Grade Cluster

9-12

Internet for All!

Grade Cluster - 9 – 12

NETS-S – 4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

Students in the interdisciplinary 21st Century Issues course realize that not everyone in town has Internet access. They research options for providing and funding Internet access and use a variety of collaborative technology tools to develop and implement a proposal to provide "Internet for All."

Scenario:

Maia, Sharvari, and Rachel are discussing their upcoming field hockey tournament as part of their nightly *video chat*. They wonder how they'll get their math project completed given that they'll be out of town for four days. Maia says they'll be fine because they can bring their wireless laptops with them and can collaborate with their classmates back home anywhere there is cell coverage. Sharvari agrees, but she wonders aloud how the team members who don't have laptops will get their work done. Rachel asks how kids with no or limited Internet access at home manage to get their homework done at all. After a few minutes discussion, they all realize that ensuring that all students in town have high-speed Internet access at home would be a great problem for the next project in their multi-disciplinary science and social studies 21st Century Issues course. (4A, 6A, 6B)

In class the next day the three girls propose their idea to their peers. The students conduct a quick, anonymous poll using the *SMART Response "clickers"* to see if this really is a problem that affects their classmates. The students are shocked to learn that 17 of the 42 students in the class (over 40%) don't have Internet access at home and that those students all say that it significantly impacts their ability to take part in the ever more common collaborative projects teachers assign. The students feel that they've found a pretty compelling topic for their next class project! (4A, 4C, 6A, 6B)

The class begins the project by collaboratively brainstorming the different facets of the problem and the project using *a visual organizer* on their *SMART Board*. They quickly decide to expand their focus from providing Internet access for students to providing Internet access for all the members of their town. They develop a list of tasks they'll need to accomplish in order to achieve their goal of providing "Internet for All." They copy the task list to the class *wiki* and students agree to sign up on the *wiki* as teams of four or five to work on each of the tasks. (4B, 6A, 6B)

Team One is responsible for overseeing the overall project. They use the *ManyMoon* (http://www.manymoon.com) online project management system to develop and manage the project plan for all the groups. They've never used project management software before, but they build on their knowledge of spreadsheets and online collaborative tools to quickly learn this new software. (4B, 6A, 6B, 6D)

Team Two develops an anonymous survey to collect data about Internet access in town. They ask a variety of questions designed to get a firm understanding of the magnitude of the problem such as: "What neighborhood do you live in? Do you have Internet access: if not, why not? If so, what type of connection do you have and how much do you pay per month? How many computers do you have at home? How many are connected to the Internet?" They post their survey online using *Google Forms*, and they also create a paper copy which they distribute widely to ensure that they collect data from as many townspeople as possible. (4C, 6A, 6B)

Teams Three, Four, and Five divide up responsibility for researching options for providing Internet access, such as satellite, cable, DSL, using wireless to access school and business networks after hours, etc. They determine such things as pricing, availability in the various neighborhoods, and available tech support. They also explore different devices that might be used for Internet access such as *Netbooks*, laptops, and *iPhones*. They collect their data in a series of shared *Google Docs*. (4C, 4D, 6A, 6B)

Team Six uses *Google Earth* to map out data that the other groups collect. They create layers that display data such as which Internet service providers cover which neighborhoods, where there are businesses that could provide wireless access after hours, and how many people in each neighborhood lack Internet access. (4C, 6A, 6B)

Teams Seven and Eight are responsible for developing a funding plan. They invite their teammates who are researching options to input their cost data into a shared *Google Spreadsheet*. They work with town and state government officials to identify possible funding sources. They also explore possible corporate sponsorships from Fairpoint, Comcast, and other Internet service providers. (4B, 4C, 4D, 6A, 6B)

Teams Nine and Ten collect and organize the data from all the other groups. They use *Google Docs* to develop a multi-option proposal that would provide Internet access for all townspeople. They invite the other students to critique the proposal online. (4C, 6A, 6B)

In a whole-class session, the students meet to finalize the proposal and to discuss next steps.

Teams who have completed their work interview townspeople and develop a set of PSA's (Public Service Announcements) to promote their proposal. They use *digital voice recorders* and *Audacity* to create compelling audio PSA's for radio and *podcasts* and high-end video cameras and sound recording equipment to create heart-rending *digital video stories* for TV and the Internet. The PSA's all list a web site the students have created and a post office box where community members can pledge donations to help fund the project. (6A, 6B)

Teams Seven and Eight, with the assistance of members from other teams, expand their funding spreadsheet to create a concrete plan for sustainably funding Internet access for the low- and moderate-income families who cannot currently afford it. Pairs of students meet with potential funders and use several of the PSA's to solicit their support. After all the pairs have updated the funding spreadsheet, they are ecstatic to realize that they have more than enough funding to make their plan a reality! (4B, 4C, 6A, 6B)

With funding in place, one team creates both online and paper forms that townspeople use to sign up for the Internet service that is best for them. Other teams work with local Internet service providers and computer/smart phone retailers to develop a plan to meet the needs of the respondents. The project planning and mapping teams use the *ManyMoon* project planning site and *Google Maps* to plan and track the installations and hardware purchases. Other students develop an "Internet for All" *Ning* with online training and support materials. They also set up a discussion forum on the *Ning* where townspeople can post questions and answers. Finally, another group of students develops a series of training workshops for novice Internet users, both in-person and online (using the *Scopia Desktop* webinar software). (4B, 6A, 6B)

Overall, the project is a huge success! Within a year, everyone in town who wants Internet access has it. And the *Ning* that was originally set up as a training and support tool has morphed into a major community resource on a wide variety of topics.

Maia, Sharvari, and Rachel head off to another field hockey tournament. This time, however, they know they don't have to worry about collaborating with their classmates back home. They know their town has Internet for all!

Student Standards: The following NETS-S are noted in this scenario:

4. Critical Thinking, Problem Solving, and Decision Making – A, B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards: Teachers who teach this unit address the following:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – C, D
4. Promote and Model Digital Citizenship and Responsibility – A, C
5. Engage in Professional Growth and Leadership – N/A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Writing:

WHS: 9 In reports, students effectively convey a perspective on a subject by…

- Stating and maintaining a focus/controlling idea/thesis.
- Writing with a sense of audience, if appropriate.
- Establishing an authoritative stance, when appropriate.

Math:

MHS: 1 Accurately solves problems involving conceptual understanding and magnitude of real numbers, or simple vectors.

History and Social Sciences:

H&SS9-12:1 Students initiate an inquiry by…

- Asking focusing, probing, and significant research questions that will lead to independent research and incorporate concepts of personal, community, or global relevance.

H&SS9-12:11 Students interpret geography and solve geographic problems by…

- Identifying, utilizing, and evaluating appropriate maps for specific purposes.

Also: RHS: 12**; WHS:** 1, 8, 10; **MHS:** 30; **S9-12:** 7, 8; **H&SS9-12:** 2, 3, 4, 5, 6, 7, 14

Reap What You Know

Grade Cluster - 9-12

NETS-S - 4 - Critical Thinking, Problem Solving, and Decision Making

Quick Look:

As part of their high school's ongoing effort to provide fresh, local produce to the local food shelf, chemistry students conduct ongoing research to increase the yield of their blueberry patch.

Scenario:

For several years the high school community has contributed labor to the local community garden. In the fall, at a local farmer's market, Nora learns that the soil in her area is supposed to be good for blueberries. Ms. Camara, her chemistry teacher, agrees to spend class time studying why that might be true. In class, she explains that she is part of a group of science teachers studying soil chemistry at VTC. The class quickly decides that they'd like to try adding blueberry bushes to their garden, working in collaboration with other area high school students and VTC students/teachers.

A quick Internet search indicates that blueberry plants are long-lived and have unique needs. The class decides to conduct long-term studies to provide maximum produce per bush and leave future classes with hypotheses and tests to encourage meaningful scientific inquiry.

The class is excited. "Real research! Next year's class will have to do what we tell them to do!" they exclaim. Ms. Camara adds, "This will be an inquiry cycle in real time. We'll take data and apply it to our hypotheses. We can take a measure of our own work."

An initial discussion suggests that they will need to test soil with their digital probes and control the pH. (4a) They imagine they'll need to study not only how ionic compounds dissolve in different types of soils but also soil temperature and dissolved oxygen. Students will need to complete background research on soil types and how pH varies from soil type to soil type. A Soil Management Plan will be developed to plan what to apply to the soil, when to apply it, and in what amounts. Other disciplines can be brought into the mix. Biology connections: "Maybe we can test the tissue of the plant?" Ecology connections: "Bees, too! We'll need to figure out how pollination works. Maybe we should get our own hives!"

Students brainstorm a list of questions to research:

- What varieties of bushes are best?
- What are the soil requirements?
- What diseases do they typically get?
- What is the proper soil nutrient management plan for blueberries?

- What pests need to be avoided?
- Can blueberries be raised organically and still get the yield we want?
- How long will each bush live?
- When do they ripen?
- How does exposure to sunlight affect each plant?

After small groups research each question, local gardeners are invited to a panel discussion about growing blueberries. Students pepper them with questions and suppositions based on the research. Several gardeners donate bushes to the school's garden and volunteer to help students raise them.

A *Google Wave* is established and the high school students invite VTC students to join their research. Ms. Camara has established the connections with both VTC and regional high school teachers from her course work there. The high school students believe that VTC will have more access to high tech information and may be able to add insights that the local students lack. Ms. Camara knows that many of these students had not considered college as an option after high school, so hopes this involvement will influence their thinking.

Each group of students collects soil samples for testing. Based on Internet research and the panel presentation, they think that, ideally, the pH should be between 4.6 and 4.8. Students will use instant read field pH soil *probes* for initial, in the field, determinations. These tests will be verified using soil pH methods designed for Vernier Probeware and Vernier LabQuests. PH will be measured using the Vernier pH probe; temperatures will be collected using the Vernier temperature probe; dissolved oxygen measured using the Vernier DO probe. (4c) On the Wave, they discuss ways to modify the soil to reach ideal conditions. All members post helpful resources. Collaboratively (teams composed of high school students from each participating high school and a VTC college student and professors) create predictions about which testable conditions will result in the highest quantity of berries. Collaborative teams will join the high school students in the garden plot in early spring to plant. It is agreed that half of the plants will be a control group and the other half will be tested. (4b) Each growing group will have equal numbers of several varieties of blueberries to test. Next year's class will access all of this data on the Wave, and Vernier Probe software will assist students in keeping the data organized and stored for long periods of time. Future classes will re-test the soil and re-evaluate the hypotheses. They'll consider new soil amendments, adjust the soil management plan and carefully measure the results from these revisions. (4d)

Knowing that they will want to share their final results with future students as well as gardeners across the region, they decide to document each step. (4b)(6a) Some students create sketches of their ideal plant, posting them on the Wave as if they were entries in a garden catalogue. Others contact the school digital photography teacher to determine how to set up a time-lapse photography project. Another group uses the school's *Flip* video every time they test or modify the soil. Some groups meet face to face at the gardens of some successful blueberry farms, where they ask permission to test those soils with the use of digital probes as well. Digital photos are taken throughout the process and tagged by key words that might be used in future publications. (6b)

A final, parting gift is for each group of students to create a digital presentation for students in next year's class, describing their hypotheses, conclusions and recommendations.

Student Standards – The following NETS-S are noted in the Scenario:

4. Critical Thinking, Problem Solving, Decision Making – A. B, C, D
6. Technology Operations and Concepts – A, B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A,
3. Model Digital-Age Work and Learning – A, C
4. Promote and Model Digital Citizenship and Responsibility – B, C
5. Engage in Professional Growth and Leadership – B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

S9-12:9 Students demonstrate their understanding of the Properties of Matter by…

- Distinguishing one substance from another through examination of physical properties (such as density**,** melting point, **conductivity**), chemical properties (such as **pH, reactivity**—with O_2 or acid or water), and nuclear properties (such as changes in **atomic mass, isotopes** and **half-life**).

S9-12:15 Students demonstrate their understanding of Chemical Change by…

- Writing simple **balanced chemical equations** to represent chemical reactions and illustrate the conservation of matter (atoms).
- Qualitatively predicting **reactants** and **products** in a prescribed investigation (e.g. **oxidation, reduction, acid/base reactions**).

(Extension)

- Using chemical equations and
- Information about molar masses to predict quantitatively the masses of **reactants** and **products** in chemical reactions

2.2 Problem Solving Process: Students use reasoning strategies, knowledge, and common sense to solve complex problems related to all fields of knowledge. This is evident when students:

2.2.aa. Seek information from reliable sources, including knowledge, observation, and trying things out;

2.2.aaa. Critically evaluate the validity and significance of sources and interpretations
2.2.bb. Evaluate approaches for effectiveness and make adjustments;
2.2.cc. Consider, test, and justify more than one solution;
2.2.dd. Find meaning in patterns and connections (underlying concepts); and
2.2.ee. Select and apply appropriate methods, tools and strategies.

3.10 Teamwork: Students perform effectively on teams that set and achieve goals, conduct investigations, solve problems, and create solutions (e.g., by using consensus-building and cooperation to work toward group decisions).

Green Tape

Grade Cluster - 9-12

NETS – 4 - Critical Thinking and Problem-Solving

Quick Look:

High school students investigate the economic and environmental implications of green energy as a local company suggests the development of a wind farm in their county. This has created uproar in their community as residents take sides, either for or against the wind farm. The school is located directly below the proposed site and students wonder what impact it could have on their school community.

Scenario:

Students look at the issues surrounding energy and the concepts of supply and demand, factors of production, trade off and incentive. They examine how technology can help decision-makers identify the best locations for energy development.

As part of an economics unit, students consider the pros and cons of fossil fuel versus green energy. They look at some convincing evidence that suggests that we need to power our world with something less harmful than our current practices. Students watch time lapse photography of the ice caps on the Ted Talk http://www.ted.com/talks/lang/eng/james_balog_time_lapse_proof_of_extreme_ice_loss.html and consider the optimum extraction of fossil fuels (consume at the current rate, slow the rate down, eliminate consumption), the impact of carbon emissions and the greenhouse effect, and the benefits of utilizing green technology even when the price is equal to that of fossil fuel. (4a)

Students examine:

- The trade-offs of replacing traditional energy resources such as oil and natural gas with green energy
- Market forces such as supply and demand and the impact on energy prices
- Environmental considerations for energy development

Students work with *Google Earth*, to examine interactive resources developed by the National Resource Defense Council (NRDC) that assist environmentalists, renewable energy developers, utility companies, and others meet the challenges of going green http://www.nrdc.org/land/default.asp.

Students use this mapping project to consider where and how to develop renewable energy resources in our local region, while minimizing damage to the region's land, wildlife and cultural resources.

NRDC has used *Google Earth* to map the most well-known lands and other natural resources in the American West that are protected by local, state and federal regulations, as a way to initially identify areas that are best kept off limits to energy development. Using this as a model, students use *Google Earth* to develop colored layers to plot places in Vermont that are protected by local, state and federal regulations (wilderness areas, refuges, areas of critical environmental concern, state parks, etc.). They also examine other factors, such as population density, elevation, wind patterns, and important bird migration routes and habitats.

Students watch a film about wind and solar energy development and have a discussion about the environmental considerations of energy development in their classroom. They review facts and policy found on websites such as the Vermont Agency of Natural Resources State Land Wind Power Policy Development website http://www.vermontwindpolicy.org/ , as well as newspaper and web articles about green energy in Vermont. They share what they learned about energy development with their classmates through a class discussion and a Q&A using a teacher-developed wiki at http:// pbworks.com (4a).

In class they begin a teacher-led lesson on supply and demand to consider the impact of oil production cuts on oil prices and the growing attractiveness of alternative energy in Vermont. The teacher has them review some articles about supply and demand for energy resources including http://www.mindtools.com/pages/article/newSTR_69.htm . Students plot data to develop a graph for oil supply and demand based upon changes in oil production and changes in prices. When oil prices increase, demand shifts and people consider using alternative energy. Using Excel spreadsheet software, they plot their own supply and demand curves for different types of energy and present them to their classmates using a xy scatter chart. They discuss the trade-offs of replacing traditional energy resources such as oil with green energy, consider the optimum extraction of fossil fuels (consume at the current rate, slow the rate down, eliminate consumption), and the benefits of utilizing green technology even when the price is equal to that of fossil fuel (4c).

In order to visualize a wind farm at the proposed site, students examine a British project (http://www.juicygeography.co.uk/gewind2.htm) that uses a combination of *Google SketchUp* and *Google Earth* to allow stakeholders to envision how a wind farm might look in various geographic locations. Students form groups and one group places a 3-D rendering of wind turbines in the proposed location near the school (6c). Other groups design wind farms around the state by placing 3-D renderings of wind turbines in locations that appeared the most promising (based upon the *Google Earth* work conducted earlier which maps areas in Vermont protected by local, state and federal regulations, population density, elevation, wind patterns, and important bird migration routes and habitats).

Student groups present their work as two-minute videos during a panel discussion with the Vermont Agency of Natural Resources http://www.anr.state.vt.us/, the local zoning board, and the company pursuing wind energy development in the county. The short video presentations combines maps and photos with video clips of themselves on camera arguing for or against wind power in Vermont as an alternative energy source (4b,4d).

Final products are presented in the following public forums:

- Supply and demand curves on the school's website
- Google Earth maps of Vermont to the Vermont Agency of Natural Resources
- Panel discussion with video exhibits

Student Standards – The following NETS-S are noted in the Scenario:

4. Critical Thinking, Problem Solving, and Decision Making (A,B,C,D)
6. Technology Operations and Concepts (C)

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity (A,D)
2. Design and Develop Digital-Age Learning Experiences and Assessments (A)

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS9-12:18 -Students show an understanding of the interaction/interdependence between humans, the environment, and the economy by…

- Explaining patterns and networks of economic interdependence that exist nationally and globally (e.g., currency, stock market, world trade).
- Examining how producers in the U.S. and/or world have used natural, human, and capital resources to produce goods and services and comparing and contrasting the findings (e.g., compare the use of the labor supply in different countries).
- Drawing conclusions about how choices within various economic systems affect the environment in the state, nation, and/or world (e.g., mixed, command, and market economies).

H&SS9-12:20 - Students make economic decisions as a consumer, producer, saver, investor, and citizen by…

- Examining the causes and long term effects of people's needs and/or wants exceeding their available resources, and proposing possible solutions (e.g., distribution and use of fresh water).

H&SS9-12:11 - Students interpret geography and solve geographic problems by…

- Observing, comparing, and analyzing patterns of national, and global land use over time (e.g., agriculture, forestry, industry) to understand why particular locations are used for certain human activities; speculating as to which areas might be used in the future and the impact of that usage.
- Identifying, utilizing, and evaluating appropriate maps for specific purposes (e.g., choosing resource allocation maps in order to investigate oil distribution).
- Using a variety of grid systems to locate places on maps and globes (e.g., UTM or Public Land Survey Systems).

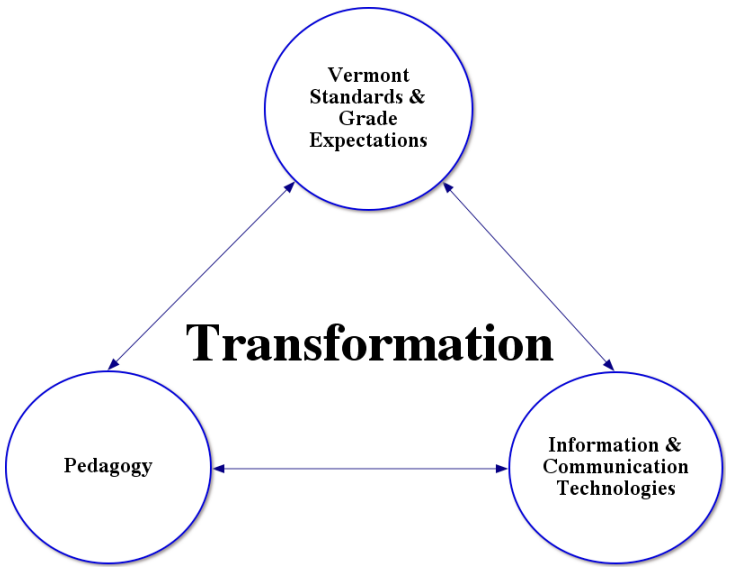
National Technology Standards for Students

Standard 5

Digital Citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:

a. advocate and practice safe, legal, and responsible use of information and technology.
b. exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
c. demonstrate personal responsibility for lifelong learning.
d. exhibit leadership for digital citizenship.



NETS-S – 5

Digital Citizenship

Grade Cluster

K-2

City Citing

Grade Cluster - K-2

NETS-S – 5 - Digital Citizenship

Quick Look:

As a part of their study of the United States, students explore four Northeast cities and create a brochure, demonstrating their learning. Along the way, the students, and their teacher, learn about copyright and fair use of digital materials.

Scenario:

On the first day back to school from a vacation break, students in Mr. B.'s class are buzzing with news of where they had traveled. "I can't believe I was really INSIDE the Statue of Liberty," Joey exclaims.

"That's so cool! My aunt and uncle live in Boston and we all went on a tour of Fenway Park! That's where the Red Sox play baseball," Emma replies.

The excitement continues as the students gather in the morning meeting circle and take turns sharing their vacation adventures. "I wish I knew more about Washington, D.C.! Terry makes it sound so interesting," Chloe says. She tells the group that she stayed in Vermont for vacation, but would like to learn more about where others traveled. The class agrees that it would be a fun project to learn about some big cities, since they are so different from places in Vermont. Mr. B. uses the *interactive whiteboard* to bring up a map of the United States, using Google's *safe search* for images. The group decides to study four major cities in the Northeast part of the country - Boston, New York City, Washington D.C. and Philadelphia. They decide on four teams, each made up of three students, who would be responsible for learning about one of the cities, and then sharing their learning with their fellow classmates. Mr. B. uses Google Earth to project a quick tour of each of the four cities, making sure that the street view is selected so that the students can see the actual buildings. Students take turns selecting images to view in each of the cities (6a). Now they are even more excited to learn about their chosen location.

The students get busy, opening their netbooks and using a *safe search* to research facts about their city (6a, b). A couple of students begin to copy and paste information from their web sites into a word processing document (6b). Mr. B. doesn't want to dampen the current excitement of learning, but knows that he must prepare a lesson on copyright for the next day.

That evening, Mr. B. visits the web to refresh his memory on legal and ethical use of digital materials. He finds some helpful personal resources. (See below.)

The next day, the students are again anxious to continue their learning about the Northeast cities. They gather in their morning meeting circle and talk about their

research from the previous day. Two students share that they had copied and pasted facts directly from web sites and were all finished the project. Mr. B begins a discussion of plagiarism. He uses the *interactive whiteboard* to show the class two videos:

What is Plagiarism? (http://www.youtube.com/watch?v=4P05vgxDoPU)
User Rights, Section 107 Music Video (http://www.youtube.com/watch?v=8tWhKeb-fUQ)

A discussion ensues, and all students become aware that copying material is a form of stealing and is just not ok. The group decides to rewrite their information, using just the most important words from the original piece in their own writing. They place the completed paraphrased information in a template for a three-column brochure that Mr. B has prepared using Google Docs or *Microsoft Word* (5b, 6d). The teams decide that each member will be responsible for learning about two places in their chosen city. Mr. B shows the class a few resources that help the children properly cite the source of their information (5a). (See below.) Mr. B has added links to these resources on the class web site for easy access.

The students use Creative Commons to find copyright free images for their brochures (5a). After more research, the teams work together to merge their findings together into one brochure for each of the four cities (5b, 5c, 6d). During art class, the children create murals of their city's skyline, carefully adding the specific places they had researched. The students are excited to share their city projects with family, friends and schoolmates, so Mr. B. arranges for a sharing time. Each group will demonstrate their learning by projecting and explaining their brochures and artwork (6a).

The city interest continues so Mr. B uses ePals to locate schools in each of the researched cities. He arranges for times to Skype with students in these cities. The children in all the locations are happy to share information about their respective hometowns. They promise to continue to connect with each other on other projects throughout the school year.

When sharing day rolls around, the class proudly presents their city research projects to schoolmates, family and friends. An important piece of the sharing time is a discussion of what the class has learned about respecting the rights of ownership for material that is on the Internet (5d). This is a lesson that will stay with each child for quite a long time.

The city murals are displayed in the hall, with color copies of the completed brochures nearby for all to enjoy.

Mr. B's Personal Resources for Digital Citizenship

1) Finally ~ The End of Copyright Confusion Has Arrived (http://copyrightconfusion.wikispaces.com/)
2) Fair Use for Media Literacy Education (http://www.youtube.com/watch?v=lIU0JNCc3tM)
3) Code of Best Practices in Fair Use for Media Literacy Education (http://www.centerforsocialmedia.org/resources/publications/code_for_media_literacy_education/)

4) Fair Use for Media Literacy Education: Video Case Study, P.S. 124, Media Literacy, Copyright, and Fair Use (http://www.youtube.com/watch?v=VoCnzVZ1phY)

Class Resources for Citing Sources

1) http://www.hobbyhorsebooks.com/biblio.html
2) http://nausetschools.org/research/works2.htm
3) http://www.openc.k12.or.us/citeintro/citeintro.php?Grd=Elem
4) http://elementary.oslis.org/resources/cm/mlacitationse

Student Standards – The following NETS-S are noted in the Scenario:

5. Digital Citizenship – A. B, C, D
6. Technology Operations and Concepts – A, B, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, C, D
5. Engage in Professional Growth and Leadership – A, B

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Visual Arts Skill Development
A1-2:1 Students demonstrate PERFORM/COMMUNICATE skills in visual arts by…

- Participating in group art activities (e.g., mural, group drawing).

Writing Grade Expectations: Grade 2
Standard 5.13: Responding to Text

Writing in Response to Literary or Informational Text
W2: 6 In response to literary or informational text, students make and support analytical judgments about text by…

- Using references to text to support a given focus.

Standard 1.19: Research

Informational Writing: Reports

W2: 8 In reports, students organize information by…

- Using a given organizational structure (e.g., template, frame, graphic organizer).

W2: 10 In reports, students demonstrate use of a range of elaboration strategies by…

- Including details/information relevant to topic and/or given focus.

History and Social Sciences GEs: **Grades 1 – 2**
Inquiry
H&SS1-2:7 Students communicate their findings by…

- Speaking, using pictures, (including captions) or creating a simple report or "painted essay" containing a focus statement, details, and conclusions.

H&SS1-2:14 Government & Society
Students act as citizens by…

- Describing what it means to be a responsible member of a group.
- Demonstrating positive interaction with group members (e.g., working with a partner to complete a task).
- Participating in setting and following the rules of the group, school, community.

Signs of Appreciation

Grade Cluster - K-2

NETS-S – 5 - Digital Citizenship

Quick Look:

Second grade students show kindergarten students basic computer use and thank U.S. soldiers.

Scenario:

All students in a small k-2 elementary school have been studying painter, Claude Monet during art class for the last month. Today Mrs. T., the art teacher, will use the projection system to share a sample presentation of Monet's portfolio to Mrs. F.'s second grade class. As the slideshow runs, student see paintings they've tried to replicate during class, as well as several new paintings not yet studied. Students' paintings have been created in class using basic watercolors and poster paper. These beautiful works of art cover the walls of this small K-2 elementary school.

Once the slideshow is over, Mrs. T. announces to the class that she will show the students how to create an original work of art using a different medium- *KidPix,* the school's networked paint program. Excitement runs through the room as students gear up for their new project. Mrs. T. shows them how to use the paintbrush tool to create delicate strokes with a textured feel to them. Students marvel at the assortment of colors in the program's paint palette and can't wait to try this on their own. Mrs. F. joins the group and rolls the school's portable laptop station into the art room so they second graders can have a try at the software. Both teachers are amazed at how quickly the students learn to use the tools and start to create their own watercolor renditions of Monet (6a, d). Out of the corner of her eye, Mrs. F. notices several of the children gathered around a little girl in the class who is crying. Mrs. F. knows that this child's father has just been deployed to Iraq and won't return for several months. As she approaches the group, children share in unison that Savannah is missing her dad. It makes Mrs. F. proud to know that her students can show such empathy towards their classmate. Students use kind words with the little girl and suggest that perhaps the Savannah could send her dad a card while he is away.

As more students gather around, a terrific discussion is led by the students about the fact that Savannah's dad is helping our country and how thankful we all should be. One student suggests that we send cards to more than just Savannah's dad to say thank you. "Yeah, and we can use the painting we're making on the front of the cards!" exclaims a student. Mrs. F. then begins to see a real purpose to the beautiful works of art her students have created with *KidPix*. Using the greeting card feature of the program, Mrs. F. teaches her class how to use the image they've created as the cover of a greeting card. Inside the card, students write a personal "thank-you" message to a soldier. Once all messages are proofread and published, the cards are mailed to a military base in Iraq.

Students decide they want to take pictures of the thank-you cards and upload them to *Flickr.* They then share the idea with other elementary schools across the country to encourage them to do the same (5b, 5d.)

Mrs. F. then suggests to one of her kindergarten colleagues that perhaps her second grade students could share their paintings and greeting cards with the kindergarten students, knowing that they are also familiar with the works of Monet. Upon completion of the project, Mrs. F. gathers her second-grade students and their kindergarten buddies in to her room for a sharing time. Each second grader shares a laptop with a kindergarten pal. After sharing their painting and card with their buddy, the second grade partner teaches their buddy how to use the tools in the program to create a painting of their own (5b, 6b).

There are "oohs", and "ahs" as the kindergarten students discover all sorts of sounds and animations with the program. As part of this peer lesson, Mrs. F. has prepared her students to teach the kindergarten students some of the basics of responsible computer use (5c, 5d.) These points include: turning the computer on and off, logging on, and how to access the program from the desktop. This way the kindergarten students can use the program on their own, if they choose to do so. At the end of the forty-minute block, the kindergartners walk away with ideas galore on how to use the program, while their second grade buddies feel a sense of accomplishment and empowerment from their role as teachers. Mrs. F. encourages the kindergarten students to create cards of their own to mail off to the soldiers as well.

Student Standards – The following NETS-S are noted in the Scenario:

1. Digital Citizenship – B, C, D
6. Technology Operations and Concepts – A, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – B, C
5. Engage in Professional Growth and Leadership – B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

A1-2:11 Students demonstrate perform/communicate skills in visual arts by...

- Using media and materials to convey feeling, idea, or thought

HE1-2:1 Students will understand how to reduce their health risks through the practice of healthy behaviors by….

- Applying effective ways to cope with emotions (e.g., anger, fear, overwhelmed, too excited, anxious)

Seasons - Always Changing

Grade Cluster - K-2

NETS-S- 5 - Digital Citizenship

Quick Look:

Students realize that the seasons are not the same all over the world. They work in groups to study a country and its seasons, and learn the relationship between weather and seasons. They will produce a Travel Fair to share their information with friends and family.

Scenario:

A student in Mrs. T's second grade class, Gregory, proudly announces to his class that he is going to New Zealand over the holiday break and it is going to be summer there. "How can it could be summer in December in New Zealand? Where IS New Zealand???" the rest of the class asks. Mrs. T. goes over to the computer and brings up Google Earth. She puts New Zealand into the search and the students watch as they virtually fly to New Zealand. "This is where you are now and this is where Gregory is traveling," Mrs. T. shares, "Do you think the seasons are the same everywhere?" Students start asking more questions about the seasons, so Mrs. T. decides this is a good lead into her unit on the seasons and weather. She will have the students research the different seasons found in different parts of the world and compile a brochure about them.

She asks her students, "What are the four seasons here in Vermont?" The *interactive whiteboard* is divided into four sections, and as the students identify each season, she writes it in one of the sections. She then has students come up and draw something that represents each of the seasons. After students finish their drawing, she asks them to think about each season and identify something that reminds them of that season. Students excitedly share their thoughts and she writes these words and phrases in the corresponding sections as well. Soon they are discussing the weather, animals, and plants related to each of the seasons found in Vermont. She reminds the class about their initial question. "Do you think the seasons are the same all over the world?" A tweet is sent out on Twitter asking teachers from around the world to send information about the seasons found in their geographic location of the world.(6b) They also send out a tweet asking for the current weather and they record this with location, temperature, and type of weather (snow, rain, sunny, cloudy, etc.). Since this is the first time that the class has asked for information from other schools, and Mrs. T. discusses with the children the importance of being respectful and safe when using these online tools. (5a, 5b)

Students soon decide that they want to explore two distinct parts to this project. The first part focuses on learning more about weather, and then recording the local weather and collaborating with another school to learn more about their weather. The second part involves researching a different country and the seasons found there, and then learning

more about the specific characteristics of those seasons. Students wonder if weather and seasons connect in some way.

As part of their long-term project, students observe and record the local weather outside their school each week. Students take the temperature outdoors and measure the amount of precipitation with a rain or snow gauge. Whenever possible, students use a windsock or anemometer to measure the amount of wind that whistles by. Students record this information into a collaborative form that is shared with other schools. Students decide that they want to participate in the seasonal recording project that involves numerous schools around the world. Schools submit their weather information from their area of the world and then the data is available for all the participants to use. (5b)

As the seasons change, students look at the data and make inferences about the weather. "How does the weather change throughout the year? What patterns do you see?" They collaborate with another school in the world to compare the seasons in their country. They look for a school to work with, using an online collaborative website. Students develop a list of questions to ask their cooperating school. Both schools commit to sharing, long-term information about their respective weather changes. Knowing that a picture is worth a thousand words, the schools share photos illustrating their weather and seasons taken at different times of the year, to compare. Mrs. T. uses this opportunity to remind her children about the importance of the appropriate use of technology by not sharing personal information with others on the computers. (5a)

Mrs. T. decides now is a good time to have students start studying multiple other countries and the seasons of those countries. Students work in groups of three and choose from a list of countries that represent a variety of regions of the world. They find out when the seasons occur in that country and the characteristics of each season. Students use kid-friendly websites to research their country. This is one of the first times that students have used the Internet to do research so Mrs. T. uses this opportunity to discuss how to do safe searches, and what to do if they have something show up on their monitor that is inappropriate. The reading level is at a higher level than they can read so *ReadPlease* is available for students to listen to the information on the website. (6b) (5a) Mrs. T. also collects travel guides and brochures from a local travel agency, as another way for students to gather information about their country. Using their sources, students find average temperatures for each season, types of precipitation that characterize the seasons, as well as fun activities or festivals that occur during each season. Students collect this information in a simplified word-processing program such as Abiword. Using a simple brochure template made by the teacher, students input their travel information. (6b) Students then present the information that they have obtained at a Travel Fair. Students also work as a class to present this information in a Voice Thread document that can be viewed by their families.

Parents and community members are invited in to see what the students have learned about weather and seasons around the world at the Travel Fair. Students proudly have their brochures available for parents to see, to show them the experts that they have become!

Student Standards – The following NETS-S are noted in the Scenario:

5. Digital Citizenship – A,B
6. Technology Operations and Concepts – A, B

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, C
2. Design and Develop Digital-Age Learning Experiences and Assessments- A, B, C
3. Model Digital-Age Work and Learning – A, B, C
4. Promote and Model Digital Citizenship and Responsibility – B, C,
5. Engage in Professional Growth and Leadership

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

S 1-2: 2 - Students demonstrate their understanding of PREDICTING AND HYPOTHESIZING by…

- Predicting a logical outcome to a situation, using prior knowledge, experience and/or evidence.
- Explaining reasons for that prediction.

S 1-2:6 -Students demonstrate their ability to ANALYZE DATA by…

- Sorting and classifying objects based upon observations, prior knowledge, or experience and justifying groupings.
- Identifying and describing the pattern in diagrams and charts (e.g., model, bar graph, pictograph, diagram or chart).

S1-2:7 -Students demonstrate their ability to EXPLAIN DATA by…

- Developing a reasonable explanation based upon observations (e.g., I found out.).

S1-2:48-Students demonstrate their understanding of Processes and Change over Time within Earth Systems by…

- Observing and recording weather data through the seasons and identifying and drawing conclusions based on the patterns in the data collected.

Standard 1.8: Reports
Standard 1.19: Research

Informational Writing: Reports

• Using a given organizational structure (e.g., template, frame, graphic organizer

NETS-S – 5

Digital Citizenship

Grade Cluster

3-5

Global Dreams and Goals

Grade Cluster - 3-5

NETS-S- 5 - Digital Citizenship

Quick Look:

Students work with a local dentist who is part of the "Dentist Without Borders" project to begin a relationship with students in Peru. As part of a yearlong citizenship unit, students share their dreams and goals for the future with the students in Peru. Students collaborate on projects to develop an understanding and awareness of each other's cultures.

Scenario:

Citizenship is a goal that the students in Mrs. T's class have been working on this year. The students complete several projects that involve working with the local senior citizens group, mentoring younger students in school who need a big brother/sister relationship, collecting food for the local food shelf, and raising money to buy school supplies for a local family who had lost their home in a fire. Throughout the year, the students discuss projects that have taken place in their local area, their state, and around the world that illustrate what it means to be a good citizen.

Johnny has just returned to class from his dentist appointment and he is excited to share with the class the discussion he had with his dentist about his dentist's involvement with a program called "Dentists without Borders." Johnny wants to know if this was something the class can find out more about, as it would fit into their goal of being global citizens. Everyone agrees that this sound like a great idea. Johnny offers to take responsibility for contacting his dentist via email and setting up a time for the dentist to visit the classroom and talk about the Dentists without Borders program. (5c)

The day arrives for the visit from the dentist. He tells the class how he has been going to Peru for the past four years and has gotten to know the teachers in the community where he volunteers his dental expertise. He explains how the teachers expressed the need for their students to develop a relationship with American students, so they can expand their understanding of our culture. He talks about the lives of the children he works with and shows a slide show of their community. He says that the students in one of the towns where he works have *Internet* access and some computers.

The students discuss with him their idea of wanting to know if the children in Peru have the same kinds of dreams and goals for themselves as they do. They want to know more about the children who live in another country and who have a different culture than theirs. The dentist thinks their questions are great and agrees to initiate the contact between Mrs. T. and a teacher in Peru, in order to begin the steps of developing a project between the two classes. He is willing to continue working with the class as a mentor for their projects. He tells the students that he is returning to Peru in the spring and will transport any items that the class wants to share with children in Peru.

The class spends several work sessions deciding on the kind of projects they can design to foster an understanding of how the life styles in the two cultures may be different but how children's dreams and goals for the future are similar. The two classes will share their answers to these questions through personal *email* communications between the two teachers and by sharing the results of the projects they created. (5d)

The project begins with the two teachers using *Google Wave* to communicate. Together they, review the structure, time frame and details of the project. A *wiki* is created as the area where both classes will share their information. The *wiki* is made available to the parents in both schools so they can stay informed about the project. (5a) An online *Google Forms* about student interests is created and students from both schools take the survey. After the survey is completed, both teachers review the information so that they may pair their students by similar interests. (5a, 6b)

The project is divided into two components.

The first part of the project begins by each student writing a personal *email* letter (interests, family, pets, etc.) to his or her new friend, telling the other about herself/himself. Students discuss the cultural differences between themselves and their *ePals* and what an appropriate *email* letter would contain for information. *Email* etiquette rules are revisited before the class begins writing the emails. (5a) The email letters are written in English as the South American students study English as a second language.

Next, the students discuss the appropriate use of the *digital camera.* (5a) Students take several pictures of themselves, both at home and in school. The pictures paint a story about the interests of the student. (6b) Students respond to the questions from their *e-pals* and attach their picture files to their responding *emails*. Students are responsible for responding to their *emails* as they arrive in their mailboxes, as this is part of their being independent and responsible learners. (5c) Students use *Glogster* to create posters about themselves and links to their favorite activities, places, food, etc. Students are always aware of the quality of the information they include in their posters. (5a, 5b, 6b)

Students discuss the information they receive from their new friends. Using the Venn Diagram format in a *graphic organizer*, each student records the similarities and difference of each other. Their pictures and their *ePal* pictures are inserted into the Venn Diagram as a visual. These are displayed on the class *wiki*. (6b)

The second part of the project involves both teachers reading or using the CD version of the book Dream: A Tale of Wonder, Wisdom & Wishes by Susan V. Bosak to their classes (a poetic story about life's hopes and dreams). The class in Peru is sent the CD version of the book so the students can listen to the book as an English-speaking narrator reads it. Book discussions center on the dreams and goals that each individual has for himself/herself. Students share their dreams and goals with their *ePals* throughout their continued email correspondence. (5c)

During the project, several *Skype* sessions are scheduled where students get a chance to talk with and see each other. (5a) Through the communications, the students learn about their peers in Peru and realize that even though they live in different countries, eat

different foods and have different life styles, in the end they all have dreams and goals that are similar. (5d)

Using a *paint program* the students create Dream Flags of their most important goals or dreams for their future. The images they use in their flag symbolize their goal or dream. The students from Peru send their Dream Flag files to the class, where they are printed in color on *transfer fabric sheets,* which are used as the quilt squares. (6b) Once the flags are completed, the students sew the fabric sheets together to make a quilt. The dentist takes the quilt with him when he returns to Peru to be displayed in the Peruvian classroom. The flag files are uploaded to the *wiki* and a group picture of the students holding their flags is shared on the *wiki*. The students write poetry pieces based on the images and words in their flags. They narrate and record their poems and share them on the class *wiki*. The flag pictures and narrated poetry pieces from both classes are put together in a *PhotoStory* and shared on the class *wiki*. The flags and the poetry pieces are organized and uploaded to *issuu* to create an online book. (5a, 5b, 5c)

The students keep their parents informed of their work via the class *wiki* and write news articles for the local paper about the project. The work is available to the students in Peru to share with their families.

The class shares their new learning about the Peruvian students and their goals for their lives, through *digital presentations* given to the other classes in school. (6b) At the same time they organize a fund raiser so they can buy school supplies to send to Peru with the dentist. He will distribute the supplies to the students he meets in the remote villages when he returns to Peru in the spring, along with the other volunteers in the Dentists Without Borders program.

Student Standards – The following NETS-S are noted in the Scenario:

5. Digital Citizenship – A, B C D
6. Technology Operations and Concepts. Students- B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, D
2. Design and Develop Digital-Age Learning Experiences and Assessments -A, B
3. Model Digital-Age Work and Learning - A, B
4. Promote and Model Digital Citizenship and Responsibility- A, B, C, D
5. Engage in Professional Growth and Leadership - A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Visual Arts

A3-4:11 Students demonstrate PERFORM/COMMUNICATE skills in visual arts by…

- Participating in group art activities.
- Experimenting with media and materials to convey feelings or ideas.

A3-4:18 Students show understanding of how the arts shape and reflect various cultures and times by…

- Creating or performing art based on a culture.
- Identifying how the arts have a relationship to family and/or community events and celebrations.

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

H&SS3-4:16 Students examine how different societies address issues of human interdependence by…

- Identifying and describing ways regional, ethnic, and national cultures influence individuals' daily lives
- Defining their own rights and needs – and the rights and needs of others – in the classroom, school, and community.
- Giving examples of ways that she or he is similar to and different from others.
- Identifying behaviors that foster cooperation among individuals.

Standard 1.6: Writing Conventions

W4: 3 In independent writing, students demonstrate command of conventional English spelling.

- by applying spelling knowledge in proofreading and editing of writing.

New Kid on the Block

Grade Cluster - 3-5

NETS-S – 5 - Digital Citizenship

Quick Look:

The class prepares for a student from China to enter their class. They are studying world cultures and select China as their focus. The students interact with the students in the Chinese classroom to learn about each other's school community, culture, and language. The students prepare for the new student using a *virtual world* called *ZON*, a multi-player online role-playing game for learning about the Chinese culture and speaking Mandarin Chinese.

Scenario:

The guidance counselor meets with the teacher and the class to talk about the new student from China that is joining their class in one month. The students learn that the new student's name is Yong Cheng and he is learning to speak English. The students are interested in learning more about China and his school. The counselor asks them if they can prepare to welcome the new student to the class and leaves a packet of information about Yong Cheng that can be shared with the students in the class. The student information packet contains basic information about the student including current address, family members, and his current school's name.

From the information, the teacher contacts the new student's current teacher via *email* and together they plan to have their students communicate and learn about each others' school culture and language. The Chinese students are learning English and the teachers arrange to have both classes use *email* to learn about each other's school. To prepare for the arrival of Yong, the Chinese teacher suggests having the English-speaking students use *ZON*, a multi-player online role-playing game to learn Mandarin Chinese, learn about China, and learn some basic Chinese words before he arrives. The two teachers arrange for the two classes to meet via *Skype*. They will meet twice before Yong Cheng leaves China. Since there is a twelve hour time difference between the two countries, the teachers identify 7:00 a.m. -8:00 a.m. and 7:00 p.m.-8:00p.m. as an optimal time to schedule the two meetings. (5a, b, c, d)(6a, b)

The classroom teacher introduces *ZON* to the students and describes an *avatar*, the three-dimensional representation of the computer user, used in computer games. The teacher also talks about the importance of students being respectful when they are working in the *virtual world*. The students have many questions, so they discuss how to be polite when they speak to another *avatar*, how to introduce themselves, and remind each other to make sure to use correct spelling and grammar. Students work together in small groups to solve the *ZON* challenges. Each student selects an *avatar* and begins the first of four challenges in *ZON*. They meet with the avatars of the Chinese students that also help them travel through *ZON*. The students are very interested in *ZON* and continue working at home. (5a, b, c)(6a, c, d)

Because of this role-playing game, the students are very excited about helping with the new student's transition and his acquisition of the English language. Using the *electronic whiteboard* and a *document camera,* the teacher and the students identify activities that support Yong's transition. Using a publishing program, they decide to create signs in English and Chinese to identify locations around the building and areas in the classroom. The teacher asks the class to remember that this work will be displayed in public and the students must follow the rules for using copyrighted material. The students work together and identify areas to put the signs. From their research, they find they can write the signs in three styles, English, Chinese characters, and Pinyan, a way to write Chinese words using the English alphabet. The students identify copyright free pictures from **Pics4Learning** they can use on the posters. Students make many posters and display them throughout the school and their classroom. (5a, b)

They then discuss what they can do to help Yong learn the English language. The students find many English-to-Chinese translators and select *Google Translate* to communicate with Yong and help him learn the language. Additionally, the teacher contacts the ELL (English Language Learner) teacher and together they arrange to have some volunteer students work with the new student when he arrives, using *RosettaStone*, a language learning software program. (5b, d) (6a, b, d)

As part of their Global Studies project, the teacher arranges for a Chinese-speaking member of the community to visit the class to help them learn a few words in Chinese and to talk about life in China. The students research music, pictures and videos that portray China and share their information with each other. The class cannot wait to start their *email* communication with the Chinese class to learn about each other's school. Both classes communicate using *email* to identify the similarities and differences between their classes. The teachers talk with their students about "netiquette" (network etiquette), and review the common-courtesy online rules of *email* and cyberspace. The teacher reminds the students to be aware that, due to cultural differences, there may be differences in network etiquette. (5a, b, d) (6a, b)

Each class prepares *multimedia* presentations, movies, and slide shows about their school and community and exchanges this information with each other. The students use *digital cameras*, scanners and microphones to record the sound and graphics and use *Audacity*, MS Office Picture Manager, and *Windows Movie Maker* to edit their work. From the information, the students gather using *email* and their conversations in *ZON*, each class prepares a two-minute video about the other class. For the culminating activity, the two teachers arrange for the two classes to meet via *Skype* to share and discuss their videos. (5b, d)(6a, b, d)

Finally, the day arrives for Yong Cheng to join their class! However, much to Yong Chen's relief, the students are truly prepared to welcome the New Kid on the Block.

Resources:

ZON virtual world
http://enterzon.com/
RosettaStone Chinese
http://www.rosettastone.com/learn-chinese

Google Translate
http://translate.google.com/
Pics4Learning
http://www.pics4learning.com/

Student Standards – The following NETS-S are noted in the Scenario:

5. Digital Citizenship – A. B, C, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A,B,C,D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A,B,C
3. Model Digital-Age Work and Learning – A,B,C,D
4. Promote and Model Digital Citizenship and Responsibility – A,B,C,D
5. Engage in Professional Growth and Leadership – A,B,C,D
6.

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

History & Social Science

H&SS3-4: Inquiry- Students conduct research by…

- Referring to and following a plan for an inquiry.
- Locating relevant materials such as print, electronic, and human resources.
- Describing evidence and recording observations using videotape, tape recorders, journals, or databases.
- Citing sources

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

H&SS3-4:16 Students examine how different societies address issues of human interdependence by…

- Identifying and describing ways regional, ethnic, and national cultures influence individuals' daily lives

A3-4:10 Visual Arts- Students show skill development when creating art by…

- Using various art tools and materials for specific purposes.

Speak-Up to Space

Grade Cluster - 3-5

NETS-S- 5 - Digital Citizenship

Quick Look:

Students learn that, as citizens of their world, they have an opportunity to collaborate with a class in Japan to participate in a NASA classroom experience, and to communicate with astronauts in space from their classroom. They share their experience with their fellow schoolmates and local community.

Scenario:

"Ms. Ammon, did you know that a Japanese and American astronaut will be meeting up on the space station in a couple of weeks? My *ePal* Natsumi just told me this when we were *Skyping* last night at home." (5b) Proud that her students have really taken off on their communication with their Japanese ePals, the teacher decides to involve her students in *ARISS, the Amateur Radio on the International Space Station* program. The class *Skypes* to their *ePal* class in Japan to see if they would also like to be involved with the project. This collaboration will give the project a slight twist that will set them apart from all the other applicants; namely, they would create a united Japanese American classroom to communicate from Earth to space. (5d, 6a, 6b)

Excited by the project, students set-up a *VoiceThread* so they can converse with their *ePals* in Japan and brainstorm discussion topics for their live transmission with the astronauts. (6a, 6b) After generating a couple of ideas, the two classes decide they would like to learn more about growing sprouts in space. The two classes discuss the kinds of sprouts that are grown in their respective locations, and wonder if being in space would make this growing process different. They submit their idea on the *NASA wiki.* (5b, 6b) They soon hear back that the idea is accepted and that the NASA scientists want to know which sprouts the students want grown for this experiment, given the variety of seeds already available on the space station. The two classes look back at the data they have collected in their collective *Google spreadsheet* and decide on sprouts that are fast growing and have high nutritional value. They *email* their suggestions to the NASA scientists.

Feeling proud about their impending conversation with actual NASA astronauts, the students in Ms. Ammon's class decide that it would be wonderful if other classes could also be involved. A "Space Talk" *blog* is set up, and through *email* the students set up mini-lessons on blogging with other classrooms, so that those students can have a place to ask potential questions. (5a, 5d, 6b) The questions are gathered and using a *student response system* the class votes on their favorite questions.

The class then decides they should also let the public know about their upcoming space conversation and decide to contact the local media. Using Internet resources, students locate the names and email addresses of the local media. Using the *interactive white*

board, the class collectively writes an official email to the school and local newspapers, radio stations, and the town's official homepage. Students are reminded never to give out private information in cyberspace without the permission of their parents or teachers. (5a) They use the teacher's name and email address to represent the class, so the students do not have to submit their own personally identifiable information.

The local radio station is now very interested in their project, and so radio station representatives come to the class to teach them about shortwave radio mechanics, broadcasting policies, content regulation, and acceptable use practices. These guidelines are recorded and added to the class space blog. (5a) The radio station personnel then helps students set up a 2-meter satellite ground station in their classroom. Students are also allowed to borrow a *shortwave receiver* so they might hear Amateur Radio transmissions. (6d)

When the day arrives for transmission, the classes has set up both a live *podcast*, in order to broadcast their conversation to the public, as well as a *Skype* call with their Japanese ePals, so the two classes will be able to communicate. (5b, 5d, 6a, 6b) The astronauts make contact with both classes. The classes see their sprouts growing in space and the astronauts answer the many questions that had been generated prior to the transmission. The students then create a *podcast* of their "space conversation". It is shared on the *NASA wiki* and added to their space *blog*. (5b, 6a, 6b) Now when the students look to the sky, it does not feel so far away.

Student Standards- The following NETS-S are noted in the Scenario:

5. Digital Citizenship- A, B, C, D
6. Technology Operations and Concepts- A, B, C, D

Teacher Standards- Teachers who teach this unit addresses the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments- A, B
3. Model Digital-Age Work and Learning- A, B, C
4. Promote and Model Digital Citizenship and Responsibility- A, B, C
5. Engage in Professional Growth and Leadership- A, D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS 3-4:14 Civics, Government and Society - Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, planning and implementing solutions in the classroom, school or community.

H&SS3-4:11 Students interpret geography and solve geographic problems by...

- Locating countries and major cities in North America.
- Locating major global physical divisions, such as continents, oceans, cardinal directions, poles, equator, tropics, Arctic and Antarctic Circles, tropical, mid-latitude and polar regions.
- Identifying and using basic elements of the map (e.g., cardinal directions and key).

H&SS3-4:3 Students design research by

- Identifying resources for finding answers to their questions
- Planning how to organize information so it can be shared.

S3-4:1 Science Inquiry - Students demonstrate their understanding of SCIENTIFIC QUESTIONING by…

- Identifying at least one variable that affects a system and using that variable to generate an experimental question that includes a cause and effect relationship

NETS-S – 5

Digital Citizenship

Grade Cluster
6-8

Being 11

Grade Cluster – 6-8

NETS-S - 5 - Digital Citizenship

Quick Look:

Sixth grade students build a foundation for understanding their place in the world by researching the most important historical and cultural events of the past eleven years, the years in which they have been alive. They work in collaborative groups to create a multimedia presentation that will tie these national and world events together in their own lives.

Scenario:

The gym darkens and the crowd quiets as the three screens on stage come to life with a fast-paced flurry of images. With the music of the past decade providing the background, students' voices narrate an exploration of the most important events of the years they have been alive. The sixth graders in attendance watch the crowd for reactions to this very familiar presentation that they have spent the last six weeks creating.

Six weeks earlier...
Mr. Bizzarro, the sixth-grade history teacher and Mr. Brown, the 6th-grade language arts teacher, decide to try something new. They depart from their traditional cross-discipline assignment, research reports about the Age of Exploration, and decide to focus instead on a very brief historical time period, the last eleven years.

Students from their four classes are each assigned one of the past eleven years upon which to concentrate. Eight students are assigned to each year, two from each of the four classes. Students must decide on a communication system that will allow them to work collaboratively since they are not in the same class and are not working on the project at the same time. After they have been told the general guidelines for the project, students meet face-to-face with their teammates and debate the pros and cons of the communication tools available to them; a Moodle threaded discussion forum, Google documents, *EtherPad* or a *PBWorks* Wiki. (6a, 6b) After they have made their decision, their first task is to use that tool to explain why it was their choice and establish a set of ground rules for the safe and ethical use of that communication tool. (5a) The teachers read these ground rules and make suggestions for improving these rules if they have failed to address a potential problem area. The teachers closely monitor communication between group members and any inappropriate activity is used as a learning opportunity for the entire class. (5a, 5c)

From the outset, students are told that the projects will be presented to the entire school and community during a school-wide assembly and open house, scheduled to take place in six weeks. This clear deadline prompts discussion about the necessity to set milestones for completing each step of the process and methods for staying on schedule. A Google Site's project *Wiki* is created and the "to-do" list, benchmark dates, and "time tracker"

features are activated and explored. A sub-group is assigned the task of managing the site and reminding team members of approaching deadlines. During a sixth grade class meeting, each team uses a *student response system "clicker"* to record their group's preferences about the length of the presentation, the topics to include, methods for ensuring the proper citation of content, etc. After a considerable amount of voting, discussion and re-voting, the project guidelines are decided. (5a, 5b, 5d, 6a, 6c, 6d)

The class watches Alan Levine's sideshow, during which he demonstrates how he used 50 different online tools to tell the same story about his dog http://slides.diigo.com/list/cogdog/dominoe . Students go to Mr. Levine's web site and look more closely at the presentation tools they feel would be the best choice for their part of the Being Eleven project. Together, they make a selection. (6b) Students are told that they will be teaching themselves how to use this presentation tool and are given time to practice the tool and help each other master its features. (6d) During the project, students create and distribute *Jing screencasts* to show each other how to accomplish tasks when they have difficulties. (5b, 5c, 6c, 6d)

Students use a variety of online resources to locate the important events of "their year." They select two or three of the most popular songs from that year to serve as background music. The school librarian explains the meaning of "*fair use"* to the students, the importance of only using enough of the music as is necessary for their purposes, and clearly establishing the fact that they are repurposing the music from its original purpose (to entertain) to this new purpose, to establish the mood for a particular period in time. (5a) In order to be in compliance with copyright regulations, students are careful to clearly cite their sources of historical information and only use images from *Flickr* that have *Creative Commons licenses*, images they have created themselves, or images from public domain or government sites. (5a, 5b) In some cases, students wishing to use copyrighted images will send a district-created form to the owners, requesting permission to use the image. (5a, 5b)

Students assemble their presentations after a combination of individual, online and face-to-face work. Representatives do the compilation of the separate years into the final project from each group. (6a, 6b, 6c, 6d) Several practice sessions ensure that all of the components of the project work well together. Invitations are posted on the school web site, as well as on fliers and posters distributed around the community. Students troubleshoot a few inevitable last-minutes technical difficulties on their own and the overall presentation proceeds without a hitch. (6c) Much to the relief and gratification of the students, it is well received by the community. After the presentation, students request that it be shown again at their eighth grade graduation, perhaps with two years of additional "history" added. (5b, 5c)

An assessment of student work is done in the form of a "The Making of Being Eleven" video. Students work in front and behind the video camera to record and edit a documentary that records the high and low points of the production, tips and tricks about such a production for other teachers and students to learn from, and suggestions for future projects.(5b, 5d, 6a, 6b, 6c, 6d) The Being Eleven production and the "The Making of Being Eleven" video are available on the school Web site and are submitted to the "Life Round Here" *digital storytelling* contest. http://liferoundhere.pbworks.com/.

Student Standards – The following NETS-S are noted in the scenario:

5. Digital Citizenship - A, B, C, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards – Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C, D
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, C, D

Content Grade Expectations

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W6: 5 - In response to literary or informational text, students show understanding of plot/ideas/concepts by…

- Selecting appropriate information to set context/background
- Summarizing key ideas
- Connecting what has been read (plot/ideas/concepts) to prior knowledge or other texts

W6: 6: In response to literary or informational text, students make and support analytical judgments about text by…

- Stating and maintaining a focus (purpose), a firm judgment, or a point of view when responding to a given question,
- Using specific details and references to text or relevant citations to support focus or judgment
- Making inferences about the relationship(s) among content, events, characters, setting, or common themes.

W6: 7: In response to literary or informational text, students engage readers by…

- Organizing ideas using transition words/phrases and writing a conclusion that provides closure,
- Addressing the reader's possible questions - EXAMPLE: Clarifying the context when using a citation,
- Using effective voice and tone (word choice sentences with embedded phrases and clauses).

W6: 8: In reports, students organize information/concepts by…

- Using an organizational text structure appropriate to focus/controlling idea
  EXAMPLES: description, chronology, proposition/support, compare/contrast

- Selecting appropriate information to set context, which may include a lead/hook
  EXAMPLES: startling statistic, anecdote/scenario, general to specific, quotation
- Using transition words or phrases appropriate to organizational text structure
- Writing a conclusion that provides closure
- Obtaining information from multiple locations or sources when appropriate
  EXAMPLES: Locations—library, Internet, electronic media sources—almanacs, magazine/news articles, books, encyclopedia, interviews, surveys, video/TV, sidebars, charts
- Listing sources at end of a report, if appropriate

W6: 10: In reports, students demonstrate use of a range of elaboration strategies by…

- Including facts and details relevant to focus/controlling idea, and excluding extraneous information
- Including sufficient details or facts for appropriate depth: naming, describing, explaining, comparing, use of visual images
- Addressing readers' concerns (e.g., providing context)

H&SS5-6:4 Students conduct research by…

- Referring to and following a plan for an inquiry.
- Locating relevant materials such as print, electronic, and human resources.
- Applying criteria from the research plan to analyze the quality (e.g., credibility of a web site) and quantity (e.g., minimum number of sources) of information gathered.
- Describing evidence and recording observations using notecards, videotape, tape recorders, journals, or databases. (e.g., recording relevant details of a historical or geographical landmark).
- Citing sources.

H&SS5-6:10 Students show understanding of past, present, and future time by…

- Identifying an important event in the United States and/or world, and describing multiple causes and effects of that event.

Motion Movies

Grade Cluster- 6-8

NETS-S- 5 - Digital Citizenship

Quick Look:

Students design and conduct an investigation using the scientific method that demonstrates the relationship between variables dealing with force and motion, such as acceleration, momentum, speed, and mass. Experiments are recorded and made into videos to be shared with younger students and posted to *YouTube*.

Scenario:

After a massive snowstorm, students enter Mrs. Smith's science class all excited about their weekend adventures sledding. Riley shares about all the fun he had sledding down the hill in his back yard on a toboggan with several other friends. He shared that he and his friends picked up some aggressive speed as more friends boarded the toboggan. Amber chimes in about her day sledding on a snow tube down the hill at her neighbor's house. She mentioned that she and her friends gave each other pushes to get them going down the hill as fast as possible. Stanley adds his experiences sledding on a saucer down a hill in his neighborhood. He described several instances where he bumped into his friends who were also sledding, and changed his direction.

Mrs. Smith joins the class discussion and comments on how the students' weekend experiences are actually tied to their studies on force and motion. She challenges the class to think about how their weekend adventures relate to the force and motion concepts they have been studying for homework. Amber suggests that they can discuss their ideas in a forum in their science course in *Moodle*. Mrs. Smith sets adds a forum to the *Moodle* and students add their ideas and questions outside of class.

The next day, the class continues with a brief discussion on the main conversation points from the *Moodle* forum. The students are all excited and somewhat confused by how the force and motion concepts apply. So, Mrs. Smith challenges the class to apply their experiences in order to create videos for younger students that demonstrate their knowledge and understanding of essential force and motion concepts. In class, students form collaborative groups of 3-4 students to design investigations to test the relationship between variables dealing with force and motion, such as acceleration, momentum, speed, and mass. Students choose an activity of their choice to illustrate the concepts such as sledding, snowboarding, skiing, and bicycling.

Outside of class, students use a *wiki* developed by Mrs. Smith to select a force and motion concept to investigate. Some of the concepts include:

- how the acceleration of an object is proportional to the force on the object and inversely proportional to the mass of the object
- how a change in mass or velocity affects an object's momentum

- how a change in the direction of an object changes the forces acting on that object
- how an object's acceleration and mass determines the force it can apply to another object

Then, each group uses the *wiki* to collaboratively plan an investigation by forming a question, planning research, creating a hypothesis, generating a list of materials, and developing a procedure (5b, 6a, 6b).

During the next two days in class, students work in their groups to further design their experiments. Once experiments are ready, students begin their investigations. They use *Flip video cameras* to record an explanation of their use of scientific process and their actual investigation (6b, 6c, 6d). Students use *Pasco Passport Sensors* (digital data probes) such as accelerometers, force sensors, and motion sensors to collect data (6a, 6b, 6c, 6d). Data is recorded using a spreadsheet in *Google Docs* so all group members can have easy access. At home, students meet online to collaboratively analyze their data--they all have the *Google Docs* spreadsheet open so they can collaboratively edit it and they communicate using *Skype*. (5b, 6a, 6b, 6c, 6d).

Over the next week of school, each group downloads its video footage and uses video editing software such as *Windows Movie Maker* to create a one to three minute video of their investigation (6a, 6b, 6c, 6d). They cover all the steps of the scientific process, their investigation, analysis of the results, and a conclusion. Next the students add special effects, transitions, images, and music to enhance their videos, which prompts a discussion. Riley's group asks Pete's group where they are getting their images and music. Pete said he has been downloading mp3s and images that he finds from the web. Stanley overhears the conversation and questions if it is okay to do that because he is on the school's news team and recalls learning about copyright issues that impact what you can and cannot use in projects (5a, 5c).

Mrs. Smith hears the conversation among the students and opens up a class discussion. The students share what they know about copyright based on past class experiences. Stanley, Joanne, Steve, and others in the class share resources that they have learned about in the school news team and from the school's library media specialist. The class determines that it's especially important for them to follow copyright guidelines for this project because they intend to share their final projects and post them on *YouTube*.

Mrs. Smith agrees to share what she knows and starts a new page on the class *wiki* where she and the students add links to resources that outline fair use of images and music for student projects (5a, 5b, 5c, 5d). They also add links to a variety of web sites they find that have images and music that is royalty-free and/or published with creative commons licenses that explicitly grant students the right to use them. David and Lisa also add links to sites that provide guidelines for citing resources used in student projects (5a, 5d).

Upon completion, the students share their resources with the school's library media specialist. She contributes more resources and creates a link from the school's web page (5a, 5d). One student from each group is invited to the staff meeting later that week to present their fair use and copyright resources to all the teachers to share with their classes (5a, 5d).

Over the next three days, the students continue editing their projects and add music and images using the resources and guidelines the class created (5a, 5b, 5c). They document all of their sources and resources (5a). Upon completion of videos, students upload their projects to *YouTube* to share with the class and a greater audience. The next day in class, students use the *SMART Response System* (student response system) to vote on which videos are the best for each concept**.** They use the results of this voting to determine which videos should be presented to fourth and fifth grade classes in the district who are studying the same science concepts.

Mrs. Smith coordinates with other teachers in the district to arrange sharing of the videos. Throughout the next two weeks, students share their videos with different fourth and fifth grade classes using the *LNV* (5b). The fourth and fifth grade students ask Mrs. Smith's students questions about the science concepts and also offer feedback on the videos. The videos are added to the district's science resources for sharing with future classes.

Student Standards – The following NETS-S are noted in the Scenario:

1. Digital Citizenship—A, B, C, D
6. Technology Operations and Concepts—A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity—A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments—A, B, C, D
3. Model Digital-Age Work and Learning—A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility—A, B, C
5. Engage in Professional Growth and Leadership—B, C

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

S7-8:1 Students demonstrate their understanding of scientific questioning by…

- Developing questions that reflect prior knowledge.

S7-8:2 Students demonstrate their understanding of predicting and hypothesizing by…

- Proposing a hypothesis based upon a scientific concept or principle, observation, or experience that identifies the relationship among variables.

S7-8:4 Students demonstrate their ability to conduct experiments by…

- Accurately quantifying observations using appropriate measurement tools.
- Using technology to collect, quantify, organize, and store observations (e.g., use of probe).
- Recording multiple perspectives to scale

S7-8:7 Students demonstrate their ability to explain data by…

- Using scientific concepts, models, and terminology to report results, discuss relationships, and propose new explanations.
- Sharing conclusion/summary with appropriate audience beyond the research group.

S7-8:19 Students demonstrate their understanding of Motion by…

- Designing investigations that illustrate the effect of a change in mass or velocity on an object's momentum.
- Describing and explaining how the acceleration of an object is proportional to the force on the object and inversely proportional to the mass of the object.

S7-8:21 Students demonstrate their understanding of Force by…

- Diagramming or describing, after observing a moving object, the forces acting on the object before and after it is put into motion

How Do We Help the Victims of War?

Grade Cluster - 6 - 8

NETS-S- 5 - Digital Citizenship

Quick Look:

Vermont middle school students work on an interdisciplinary unit to help Afghan children by sending them school supplies. They communicate with Vermont National Guard members who are stationed in Afghanistan to assess the needs in nearby Afghan towns. The students elicit support and donations from local community members, businesses**,** and organizations to gather supplies and send them to National Guard members who distribute them.

Scenario:

Several members of the Explorer Team, a multi-age grade 6 - 8 team, have parents or other family members who belong to the Vermont National Guard and have been, or are being, deployed to Afghanistan. The war and conditions for the military are continual topics of discussion in social studies. The teacher decides this is a perfect lead-in to a study of other cultures and religions, a major focus for the year. Students soon realize that there are "normal" people who are affected by the war, that not all the people in Afghanistan are terrorists**,** and that villages have been totally destroyed by the war. They want to know what they can do to help the victims of the war, especially other school-aged children. They decide they would like to communicate with children in Afghanistan but wonder if that is even possible.

Justin's dad, who is an officer with the Vermont National Guard, has just returned from Afghanistan. Justin asks him to come in to talk to the class. Before his visit, the students use *a visual organizer* and the classroom *SMART Board* to brainstorm interview questions about ways of life in Afghanistan, including topics such as education, religion, fine arts, traditional dress, and modes of communication. (6b) The teacher suggests that students study these concepts in relation to American culture, as well as comparing the way of life for people in the cities of Afghanistan to those of the people in the small villages.

During the interview with Justin's father, students ask about communication via the Internet. Students are surprised to learn that any form of electronic communication could be intercepted by terrorists, that the terrorists use the Internet as a way to share information using key words in e-mail, and that the terrorists are believed to use *steganography*, a form of embedding information in messages. Some of the students decide to begin a side project to study these digital tools on their own. (5a, 5b, 5c) After the interview, all students realize that poverty reigns in the country and want to know what they can do to help.

The group studying education finds out that the schools in Afghanistan lack resources. They find several *blogs* and websites, many for charitable organizations, which appear to have raised funds and materials to send to schools and children in Afghanistan. They become excited about contributing to these individuals and/or organizations. However, when they use a website reliability checklist the class created earlier in the year, they determine that all of these sites are either out of date or insecure. (5a) The team members soon agree that the best way to contribute would be to start their own fundraising effort, to collect their own school supplies, and to ship them directly to Vermont National Guard members for distribution in Afghanistan. They elicit the help of the entire class in this project. (5d)

The students decide to develop *wikis* to share what they learn with the general public (5b, 5d). As the small teams of students continue their studies of culture, they collect pictures from the Internet to use on their wikis. The teacher soon realizes that many of the younger students are just copying and pasting picture from wherever they find them, without crediting sources. A class discussion ensues about copyright and proper use of pictures and other media. The teacher works with the students to teach them how to use websites such as *Creative Commons* to find pictures that are either copyright-free or have usage rights that allow posting with proper citation. The older students work with the younger students to teach them about crediting sources. (5d) Next, the students set up a private *Flickr* account, and invite their friends and family members who have been stationed in Afghanistan to share their pictures. Having just learned about citation of resources, they also ask the people posting to note any citations they want used with each picture. (5a, 5d)

Many students want to know if they can get pictures from troops currently stationed in Afghanistan. Justin's father suggests they contact an officer in the Vermont National Guard who can answer this question. The officer, unable to visit the class, agrees to do a *Skype* interview. When the children mention putting pictures on the Internet, the officer cautions them about how this might endanger the lives of the troops. An ensuing discussion about the public nature of the Internet leads a small group of students to do a side project to share with others about safety on the Internet**.** They describe the officer's concern about the possible endangerment of soldiers should they use pictures from troops currently stationed in Afghanistan. (5c, 5d) The students work with the officer to find a safe way to get pictures from their family members currently stationed in Afghanistan and agree to only post pictures that will not reveal any identifying information or landmarks. (5a) Students also take on the task of educating their family members about how the use of the Internet for communication could endanger Vermont troops and what measures to use to ensure their safety. (5d)

The students develop a front page for their *wiki* that describes their project to collect and distribute school supplies to schools and children in Afghanistan, including links to each group *wiki* that compares and contrasts culture in Afghanistan to American culture. The topics become very emotional as students realize the extent of poverty and how there is widespread discrimination against females**.** Some students decide that *podcasts* or *digital stories* would be more effective than just pictures and text. (6b) When the *wikis* are complete, including *podcasts*, *digital stories*, and pictures, students contact each of their school and town webmasters requesting links to their *wiki* space. Next they contact their local newspapers and television stations. Reporters come to the school to interview them

and the project soon becomes a community-wide effort led by the students on the Explorer Team.

When it appears that donations might come in from a larger audience, a community member knowledgeable about digital security helps the group of students interested in security and *steganography* expand their knowledge by working with them to develop a safe method of collecting funds via the Internet. (5b, 5c) Other groups of students emerge to help with collection and shipping of supplies. Math classes study the most efficient way of shipping the materials. Tech-ed students explore the creation of lightweight, sturdy shipping containers. A school**-**wide picnic is held on a Saturday to collect supplies**,** to prepare them for shipping**,** and to recognize the leaders of the project.

The supplies are shipped off to Afghanistan and distributed by our troops. Videos of happy Afghan children are sent home to the Explorer Team, ample reward for a project well done.

Student Standards – The following NETS-S are noted in the scenario:

5. Digital Citizenship – A, B, C, D
6. Technology Operations and Concepts – B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – B, D
4. Promote and Model Digital Citizenship and Responsibility – A, C, D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

H&SS5-6:13 Students analyze how and why cultures continue and change over time by…

- Identifying expressions of culture in the U.S., and the world through analysis of various modes of expression such as poems, songs, dances, stories, paintings, and photographs
- Identifying how location influences cultural traits

H&SS5-6:13 Students act as citizens by…

- Describing and defining the rights, principles, and responsibilities of citizenship in the U.S.
- Giving examples of ways people act as members of a global community

- Demonstrating positive interaction with group members
- Identifying problems and proposing solutions in the local community, state, nation, or world.
- Explaining their own point of view on issues that affect themselves and society; being able to explain an opposing point of view
- Describing how an American's identity stems from beliefs in and allegiance to shared political values and principles, and how these are similar and different to other peoples.
- Establishing rules and/or policies for a group, school, and/or community, and defending them.

NETS-S – 5

Digital Citizenship

Grade Cluster

9-12

The End of the Landmine

Grade Cluster - 9 – 12

NETS-S Standard -5 - Digital Citizenship

Quick Look:

A group of students research landmines and write persuasive essays to convince others they should be outlawed. They also create a *wiki* to share what they've learned with the general public.

Scenario:

Paolo, Tommy, Rena, and Sarah watch the new documentary film about landmines at the local independent movie theater. They are devastated by what they learn and vow to do whatever they can to end the senseless killing that results from landmines. Their English class is about to begin a persuasive writing project. They decide to enlist the help of some of their peers and focus their project on landmines.

In class the next day, the students relate the highlights of the movie to their peers. They invite some of their classmates to join them, and three others join their team. Not only will they write persuasive essays, they also decide to build a *wiki* that they can use to increase public awareness of this issue. (5B, 5D, 6A, 6B)

The students realize that there will be a fair amount of research involved, and they agree to share their information so they don't duplicate efforts. They decide to use *Delicious* to share bookmarks for web resources they discover. They create an "sbhs_landmines" *tag* that they all agree to use to tag the resources they find. Then they each create a *subscription for that tag* so that they can easily view all the resources with the "sbhs_landmines" *tag* on one page. (5B, 6A, 6B)

Sarah suggests that they establish a *group* on *Facebook* where they can discuss what they learn. She discovers that some students in her team and in the other teams have never used the *group discussion* feature of *Facebook*, so Sarah says she'll do a quick overview for the class on the *SMART Board*. As Sarah logs in, she notices that she has a request to *friend* Robert Washington. She mentions that this is someone she doesn't know, but she loves meeting new people, so she's about to confirm the request when Tommy, Rena, and others stop her. They warn her that she shouldn't friend just anyone. (5A, 5B, 5D, 6A, 6B)

Rena suggests that they do a little research about Robert. They quickly discover that **all** his *Facebook* friends are young women, which seems a little odd. They *Google* him and discover that he is on the Michigan sex offender registry and that he currently lives in Burlington. "Now what do I do?" Sarah wonders aloud. Paolo suggests that they report Robert to *Facebook*. The class uses *Facebook* Help and quickly discovers that *Facebook* has a special e-mail account set up for such reports, abuse@facebook.com. After Sarah

sends her message, the class discusses how important it is to use the privacy features of *Facebook* so that personal information is displayed only to their trusted friends, and not to "everyone." They also agree that it's a good idea not to include address and phone number information in their profiles. (5A, 5B, 5D, 6A, 6B)

With that teachable moment handled, they get back to work. Sarah shows her classmates how the *Facebook discussion forum* works, and the students in her team agree to use the forum to share key things they learn with each other. (5B, 5C, 5D, 6A, 6B)

The students research landmines, *tagging* resources in *Delicious* as they find them. They also decide to get firsthand information about living with landmines from students who live in war-torn countries like Iraq, Bosnia, and Afghanistan. They use *epals.com* to find a few students in each country, with whom they communicate via e-mail and the *LNV (Learning Network of Vermont).* The Vermont students record the video conferences and ask the other students if they can use portions of the recordings on their *wiki*. (5A, 5B, 5C, 6A, 6B)

The students discover that Senator Leahy has been very active in working to outlaw landmines and set up a *videoconference* with him, also using the *LNV*. They record this videoconference, too, and ask for permission to use portions of it on their *wiki*. (5A, 5B, 5D, 6A, 6B)

After they've conducted a week's worth of research, the students use *Inspiration* in class to brainstorm topics for their landmine *wiki*. Two of the team members volunteer to use the results of the brainstorm to build the structure of the *wiki*. They all agree that they should use *alternative text* for pictures and other *accessibility features* to ensure that their *wiki* is accessible to as many people as possible, even those with disabilities. They decide to use the *WAVE website* (http://wave.webaim.org) to evaluate the *accessibility* of their wiki. (5A, 5B, 5D, 6A, 6B)

When the *wiki* structure is ready, all the students add information, pictures, videos, and links as they find them. They use what they've learned about copyright, *fair use, Creative Commons*, etc. to ensure that they can legally use the pictures and videos. They carefully document the sources of everything. (5A, 5B, 5D, 6A, 6B)

When their research is complete, the students use the information on their *wiki* to write their persuasive essays arguing that landmines should be outlawed. The students use the *comment and track changes features in Word* to peer review each other's essays. When the essays are revised and deemed complete, the students post them on the *wiki* and invite comments from parents, other students, and their peers in Iraq, Bosnia, and Afghanistan. They arrange to submit their essays to the local newspaper that agrees to publish one per week and to include a link to the class *wiki*. And they send copies of their essays to Senator Leahy and the United States delegation to the United Nations. (5B, 5C, 6A, 6B)

However, before the first essay is published in the newspaper and the *wiki* link goes public, the class agrees that they need to review the wiki. They proof it for readability, grammar and spelling, content accuracy, organization, citations, and accessibility. Once all the proofreaders sign off, they change the privacy settings on the *wiki* to make it public and start sharing the *wiki* address publicly. (5A, 5B, 5D, 6A, 6B)

Paolo, Tommy, Rena, and Sarah are pleased with the results of this project, but they realize there is much more to be done in the fight against landmines. They make a pact to continue to learn about and work on this issue until the U.S. ratifies the international treaty to ban landmines. (5C)

Student Standards: The following NETS-S are noted in this scenario:

5. Digital Citizenship – A, B, C, D
6. Technology Operations and Concepts – A, B

Teacher Standards: Teachers who teach this unit address the following:

1. Facilitate and Inspire Student Learning and Creativity – A, B, C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C
3. Model Digital-Age Work and Learning – C, D
4. Promote and Model Digital Citizenship and Responsibility – A, C, D
5. Engage in Professional Growth and Leadership **–** N/A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

Writing:

WHS: 15 In persuasive writing, students define a significant problem, issue, topic, or concern by…

- Establishing necessary context, taking audience into account, as needed.
- Stating and maintaining a clear position on the problem or issue.
- Taking an authoritative stance.

WHS: 16 In persuasive writing, students present and coherently support judgments or solution(s) by…

- Providing a hook
- Arranging supporting evidence persuasively with effective use of transitional words and phrases
- Providing convincing and relevant arguments and/or reasons
- Using a range of strategies to elaborate and persuade.
- Addressing the reader's potential concerns or counterarguments
- Writing an effective conclusion

History and Social Sciences:

H&SS9-12:4 Students conduct research by…

- Referring to and following a detailed plan for a complex inquiry.
- Locating relevant materials such as print, electronic, and human resources.

- Applying criteria from the plan to analyze the quality and quantity of and corroborate information gathered.
- Describing evidence and recording observations using notecards, videotape, tape recorders, journals, or databases.
- Revising the research plan and locating additional materials and/or information, as needed.
- Citing sources.

H&SS9-12:14 Students act as citizens by…

- Demonstrating positive interaction with group members.
- Identifying problems, proposing solutions, considering the effects of and implementing a course of action in the local community, state, nation, or world.
- Explaining and defending their own point of view on issues that affect themselves and society, using information gained from reputable sources.

Also: RHS: 12; **WHS:** 1, 8, 9, 10; **H&SS9-12:** 1, 2, 3, 5, 6, 7

Pathways

Grade Cluster - 9-12

NETS-S- 5 - Digital Citizenship

Quick Look:

Formerly disengaged students in a public high school work independently in a supportive, collaborative environment in a program called "Pathways: Another Way to Graduate."

Scenario:

A typical day in a non-typical school setting:
It is 8 a.m. in the Pathways Workspace. A group of twelve students, from grades eight through twelve, lounge in a circle with large pillows and comfy chairs. Their advisor, Paul, joins them. He inquires of Steve how the presentation went the night before.

"Awesome," replies Steve a junior. "The Conservation Commission really liked the photos! Some of them had never heard of *Creative Commons* where I've got them licensed, so they are psyched to be able to use the photos for their own work." (5a, 5b, 5d)

An eighth grader named Alex asks, "Did you end up using *Prezi*?" (6a)

"Nope, I used *Photostory*," Steve replied, "But thanks again for showing me Prezi last week. I decided that if last night went well, I'd post the movie on YouTube. That's my plan for today...one more edit, then get it up there as a wmv. Will you guys check it out this afternoon and rate it? I'll create a *Facebook group*...will you all forward an invite? It will be cool to show it off next month at the next Conservation meeting with comments and ratings. It might even get some of the older folks to join Facebook!" (5b)(6b)

"Who's going to help Steve with the edits?" inquires Paul.

"I can do that," volunteers Ashley, a sophomore. "I've been doing a lot of wordsmithing on my play this week, so I'm in the edit mode." (6c)

Paul reminds the group that each project needs to focus on at least one of the Pathways major learning goals of thinking like a scientist, being a great communicator, thinking like a mathematician, thinking like a social scientist, and of course, doing the best job possible along the way. Secondarily, each project needs to include the integration of technology and the integration of future thinking.

Paul then asks the group to give Steve feedback about the film he created and specific feedback as to whether it met Steve's goal of thinking like a scientist? Students pull out their "Science Assessment Guide" rubric. They discuss the possibility that he has met other standards, as well. The group has followed Steve's project since its start in March, so knows the background…

Background: Steve found his mentor Casey, a grad student at UVM, with the help of a Pathways resource wiki. On the wiki comment section, she wondered why he wanted to

work with her. "I've just always liked frogs, salamanders, snakes and stuff like that. I'd much rather be out in the woods than anywhere else." It took a few weeks of research and conversation to really narrow the focus of the project: "What is the impact of Valley Road on our population of amphibians?" Casey invited Steve to join a group of community members at an evening "salamander crossing" on a rainy night in early April. Volunteers helped frogs and salamanders go from their upland homes to spring breeding grounds. They set up a data base of species to keep track of the total number of road kills and successful road crossings by species. Steve took hundreds of photos, applying some of the lessons learned in his digital photography class. (6c) Casey and Steve then set up a research study monitoring vernal pools, setting up a spreadsheet on Google docs that they can both access. Casey reminds him of the importance of being an unobtrusive observer, never modifying the land nor handling animals or eggs unnecessarily. One special night he witnesses a salamander-mating dance. Every day following, for two months, Steve would catalogue and photograph the multitude of eggs as they develop, then enter observations on the Google spreadsheet via his cell phone. Upon return to class, Steve would label each photo with accurate scientific nomenclature and store it in Flickr, assigning it a Creative Commons license for "no derivative works." He was excited to allow others to legally use his photos, but he didn't want anyone to "Photoshop" them, which might diminish their scientific legitimacy. As the months progress, Steve witnesses the emergence movements of adults from the vernal pools. At the end of this study period, Steve uploads the spreadsheet data to the Vermont Reptile and Amphibian Atlas Project. (http://community.middlebury.edu/~herpatlas/). He is delighted at the thought of returning to the grounds next spring to witness the cycle again. (5c, 5d)

Throughout the spring, Steve attends Pathways morning meetings daily. Students routinely challenge each other's ideas and offer suggestions for more in-depth work.

After the Pathways morning meeting, students move into their Pathways independence time. During this time, Project Foundry (http://www.projectfoundry.org/) is the tool used by students to document their learning. Using entries at that site, the rest of the group now discusses whether Steve has met the requirements for "thinking like a scientist." In so doing, they are helping him to prepare for the "big game" where he publicly presents his final project to a RoundTable, a group of citizens, mentors, advisors and specialists in his field. Once that RoundTable group approves his work, he earns credit toward graduation and posts the work in his *electronic portfolio.*

At 10 a.m., Steve sits down to his Virtual High School class on herpetology. Steve uses the laptop provided by Pathways in his own work carrel to read resources and learn more about this material. He can easily go on-line to reference additional materials. At 11 a.m., he sends an email to Casey and check the "frog blog" he developed. (6d)

During lunchtime, Steve is likely to be guiding some of the younger members of Pathways in their uses of Project Foundry or other on-line tools. Today he is showing Ashey his favorite websites on playwrights, saved on *Delicious.com.* Together they check out the resources recommended by other users who had saved the same sites. She then shares the edits she suggests for his movie.

Between 1:00 and 3:00 p.m., Steve heads off to his job at the local grocery store. Since his contract has him scheduled for a 2-hour stint this afternoon at the vernal pools with Casey, he can use the hours from 1:00 - 3:00 as he needs. Time management is a big issue for some Pathways members, but the postings on Project Foundry really help Steve keep tabs on his own learning. After work, he enjoys his fieldwork with Casey from 4-6 p.m.

Steve's long term plans include more on-line classes in science and a math class at his local high school, His requirement to read three books a semester will probably happen using his *Kindle*. He is considering starting a business in photography for his next project in Pathways. The thing that keeps him engaged in school, though, is the work in the field and the anticipation of returning to his field study next spring. (5b, 5c)

Student Standards – The following NETS-S are noted in the Scenario:

5. Digital Citizenship – A. B, C, D
6. Technology Operations and Concepts – A, B, C, D

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity - A, B,C, D
2. Design and Develop Digital-Age Learning Experiences and Assessments – A, B, C, D
3. Model Digital-Age Work and Learning – A, B, C, D
4. Promote and Model Digital Citizenship and Responsibility – A, B, C, D
5. Engage in Professional Growth and Leadership – A,B, D

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

S9-12:36 Students demonstrate their understanding of Equilibrium in an Ecosystem by…

- Designing an investigation to compare a natural system with one altered by human activities (e.g., acid rain, eutrophication through agricultural runoff, fertilizer, pollution, solid waste, clear cutting, toxic emissions or conservation and habitat reclamation).

S9-12:5 Students demonstrate their ability to REPRESENT DATA by…

- Representing data quantitatively to the
- appropriate level of precision through the use of mathematical calculations.
- Developing the skill of drawing a **"bestfit" curve** from data.
- Recording accurate data, free of bias.

- Explaining importance of avoiding plagiarism/fabrication of other recorded research data.

S9-12:8 Students demonstrate their ability to APPLY RESULTS by…

- Using technology to communicate
- results effectively and appropriately to others (e.g., power point, web site, posters, etc.).
- Predicting/recommending how scientific conclusions can be applied to civic, economic or social issues.
- Proposing and evaluating new questions, predictions, procedures and technology for further investigations.

3.10 Teamwork: Students perform effectively on teams that set and achieve goals, conduct investigations, solve problems, and create solutions (e.g., by using consensus-building and cooperation to work toward group decisions).

Visual Art Stories

Grade Cluster - 9-12

NETS - 5 - Digital Citizenship

Quick Look:

Intermediate art students study, research and write about the history of drawing and painting, and the basic elements and principles of art and design. They learn about Western Art from the Renaissance to 20th Century Modernists, and create works of art using pencil, charcoal, dry paste, watercolor and oil paints. They examine the connection between the artists' beliefs, values and art and consider how they can convey their own beliefs, values, culture and experiences through a visual medium.

Scenario

As part of class, students visit the Marsh-Billings-Rockefeller National Historical Site, an important part of our cultural heritage located in Woodstock, Vermont. They examine works by some of America's finest landscape painters including the Hudson River School. The students reflect on how the landscape paintings of these artists expressed personal emotions and memories. These were people who sought out isolated and wild parts of America to produce art that spoke to the soul, eye and consciousness. They consider the impact of landscape art on the Conservation Movement in the United States and the subsequent establishment of local, state and national parks and wilderness areas. Students endeavor through their own artwork to convey the need for Vermont conservation of farmland and wild areas for today and well as in the future. This genre of art corresponds with techniques they are developing and exploring during the hands on sessions of the class: pencil, charcoal, dry paste, watercolor and oil.

Intermediate art students are exposed to great works of Landscape art through a number of online resource including http://www.artstor.org/ (subscription based), and museum collections such as http://www.metmuseum.org/, http://www.mfa.org/, which contain a wide selection of digital images. The teacher and library media specialist lead a discussion about the legal and ethical issues of posting intellectual property online so the students can learn about their rights and responsibilities as creators and consumers of art. (5a).

The teacher connects with an art museum through the *LNV*, where a professional education coordinator takes them on a tour of American landscape paintings. Through the program, students are part of an in-depth discussion about the Hudson River School's landscape paintings, and use this opportunity to select a piece of visual art which they are drawn to from this American art movement (5b). Using books and online resources such as http://www.albanyinstitute.org, students closely examine one painting or drawing and develop the language required to write about, describe and express their experience as they explore the work. Students research the history of the drawing or painting, along with as much information as they can gather about the artist. As they study the art, they

develop a list of all of the visual content they observe. They use descriptive language to write about the facts: color, light versus dark, use of space, texture, shapes and lines. They then interpret the purpose, themes and mood of the drawing or painting. The teacher provides a list of concepts for students to explore as they write about this form of landscape painting, as well as descriptive words that relate to this art movement.

Using SMART notebook software, the students create a visual display of the various paintings and drawings and project these displays on their interactive whiteboard. Students read their written notes and descriptions aloud while their classmates attempt to match the descriptions to the art. Students use the *SMART board* software to zoom in on small details, spotlight important content, draw lines, circles, write notes and make connections directly on the art.

Students develop a multimedia presentation about their artwork and the artist including historical facts and details, choosing from a variety of tools: *Voicethread*, enhanced *podcasts*, comic strip creator, *slideshare*, scrapblog, video or *Google doc* (5c, 6b). To illustrate their learning, they create an original piece of landscape art that demonstrates the techniques and concepts depicted by their research artist: pencil, charcoal, watercolor or oil. Using a camera, they create digital copies of their work. The teacher uses this opportunity to discuss with students their own rights as an artist and how copyright applies to digital media (5a). Students license their work with *Creative Commons–* a place where students can license their work and document their copyright conditions.

A group of students collaborate online and build a Vermont Virtual Museum in *Teen Second Life* funded through a grant from a local art council. They post digital photos of their work in the gallery and then open the gallery up for viewing by other teens (5d). The focus of the exhibit is Vermont Conservation, a compelling series demonstrating the need for preservation and conservation of Vermont farmland and wild areas. The students' virtual landscapes find a home online in the Teen Second Life Gallery. The original art is placed on display throughout the community as a visual statement of what students value as Vermonters.

Student Standards – The following NETS-S are noted in the Scenario:

5. Digital Citizenship – A,B,C,D
6. Technology Operations and Concepts – B

Teacher Standards –Teachers who teach this unit address the following NETS-T:

1. Facilitate and Inspire Student Learning and Creativity- A,B
2. Design and Develop Digital-Age Learning Experiences and Assessments - A

Content Grade Expectations

The scenario writer has identified the following content grade expectations that s/he felt might be assessed in this scenario. In most of these scenarios, there may well be opportunities to assess other or additional content grade expectations across a variety of disciplines. If you are interested in developing a unit or lessons based on the following

scenario, and you don't see any grade expectations in your content area, we encourage you to capture the ideas presented in the scenario and make it your own by adding components that address the grade expectations you are most interested in assessing.

APHS: 10- Students show skill development when CREATING art by…

- Selecting appropriate drawing techniques for visual representations.
- Controlling media techniques and processes with skill, confidence, and sensitivity so that their intentions are carried out in their works of art.

APHS: 12 - Students show understanding of visual arts CONCEPTS and VOCABULARY by…

- Articulating and utilizing formal and expressive qualities of a variety of media, techniques and complex processes with appropriate vocabulary.
- Describing and demonstrating how art and artists reflect and shape their time and culture.

APHS: 13 - Students describe art using discipline specific vocabulary, for example:

- Visual Arts: by using the elements and principles of art, along with previously learned vocabulary

APHS: 14 - Students analyze, interpret, and respond to art by…

- Explaining qualities (elements, principles of design, expression) and how they evoke emotion and meaning.
- Relating varied interpretations of works of art using some or all of the following (e.g., observation, personal experience, background knowledge, cultural context, artist's intent, and/or artist's process).

Glossary and Index of Terms, Tools & Sites

Accessibility: A measure of the ability for anyone, including those with disabilities such as visual or hearing impairment, to access and use a web page.
Pages 210, 220

Accessibility Features: Web page design features that help make web pages accessible to all. E.g., alternative text that is attached to each picture that can be read aloud by special software for the visually impaired or captions for live audio.
Page 210

Alternative Text: Text that is attached to a picture that can be read aloud by "screen reader" software for the visually impaired. This text explains what the visually impaired person is not seeing.
Page 210

ARISS: Amateur Radio on the International Space Station
http://www.arrl.org/ARISS/
Page 192

Audacity (http://audacity.sourceforge.net/) is a free digital audio editor and recording application. Audacity is cross-platform and is available for Windows, Mac OS X, Linux, and BSD. http://en.wikipedia.org/wiki/Audacity
Pages 21, 33, 71, 82, 83, 117, 163, 190

Avatar is the three-dimensional representation of the computer user, used in computer games. http://en.wikipedia.org/wiki/Avatar_(computer)
Page 189

BigHugeLabs provides an assortment of tools for creating magazine covers, posters, puzzles and much more. This web site doesn't require registration and copies of creations can be downloaded for free. http://bighugelabs.com/
Page 162

Blog - is an online "weblog" or journal website. Content is typically displayed in reverse chronological order. A blog offers features including comments, RSS feeds, and links.
Pages 17, 21, 23, 24, 27, 41, 55, 56, 59, 60, 61, 63, 66, 74, 85, 96, 97, 101, 103, 107, 113, 114, 116, 117, 124, 127, 128, 138, 144, 245, 192, 193, 205, 214, 218

Boolean logic is really just a set of rules for the manipulation of given inputs. It consists of a set of "logic gates", each of which is a different set of rules. The three main logic gates are **AND**, **OR**, and **NOT**. AND and OR require two inputs, whereas NOT only requires one. http://library.thinkquest.org/19488/boolean.html
Pages 110, 113

Bubbl.us is a simple and free web application that lets you create a visual representation online. http://bubbl.us/ (see also Visual Organizer)
Pages 36, 85

Chat - Online chat can refer to any kind of communication over the Internet, but is primarily meant to refer to direct one-on-one chat or text-based group chat (formally also known as synchronous conferencing), using tools such as instant messengers, Internet Relay Chat, talkers and possibly MUDs. http://en.wikipedia.org/wiki/Online_chat
Pages 85, 111, 152, 163

Chat room: a site on the Internet where a number of users can Chat (see above) in real time.
Pages 21, 63

Class Response System - see Student Response System
Pages 23, 192, 197, 202

The **Cloud** - Computers attached to the Internet that connect those machines together to create massive, shared pools of storage and compute power that would be much larger than what any one institution could afford to build.
Pages 63, 144

Comment and Track Changes Features in Microsoft Word: Microsoft Word has tools that enable users to add textual and audio comments to the text of a document. It also has a tool named "Track Changes" that enables multiple users who are editing the same document to see what changes other users have made.
Page 210

The **Common Craft Company** focuses on building a library of educational videos on a variety of topics that are easy to understand for people without a technical background. The videos use stop-action animation with whiteboards and paper cutouts to illustrate the topic. http://en.wikipedia.org/wiki/Common_Craft
Page 34

Concept Mapping Software: Software that enables the user to diagram or map the relationships between concepts, facts, ideas, etc. Also called "graphic organizers" or "visual organizers." Such software can be helpful in collaborative brainstorming or in diagramming a plan for a presentation, paper, project, etc. Examples include Inspiration, Mindomo, and cmap.
Pages 43, 120

Creative Commons (CC) is a non-profit organization devoted to expanding the range of creative works available for others to build upon legally and to share. The organization has released several copyright-licenses known as “Creative Commons” licenses. These licenses allow creators to communicate which rights they reserve and which rights they waive for the benefit of recipients or other creators.
http://en.wikipedia.org/wiki/Creative_Commons
Pages 34, 71, 91, 103, 111, 145, 176, 197, 201, 205, 210, 213, 214, 218

Data Collection Probes are digital sensors that can be connected to a computer or another digital data collection device (e.g., an iPhone). These probes can measure such physical and chemical properties as dissolved Oxygen, pH, current, temperature, light, etc. Data collected with these probes can then easily be organized and analyzed. Vernier is one of several manufacturers of data collection probes. Pasco is another.
Page 80

Delicious (http://delicious.com/) Delicious is a social bookmarking service that allows users to tag, save, manage, and share addresses (URLs) for web pages from a centralized source. With emphasis on the power of the community, Delicious greatly improves how people discover, remember, and share on the Internet.
Pages 110, 117, 124, 135, 209, 210, 214

A **Digital audio editor** is a computer application for audio editing, i.e. manipulating digital audio. http://en.wikipedia.org/wiki/Digital_audio_editor

Digital Camera - A **digital camera** (or **digicam** for short) is a camera that takes video or still photographs, or both, digitally by recording images via an electronic image sensor. Many compact digital still cameras can record sound and moving video as well as still photographs. http://en.wikipedia.org/wiki/Digital_camera
Pages 11, 16, 21, 24, 26, 51, 53, 60, 66, 71, 75, 97, 106, 107, 144, 154, 186, 190

Digital Footprint- evidence left behind after visiting web sites or using a computer
Page 83

Digital Presentation is an electronic way of presenting information.
Pages 142, 168, 187

Digital Tape Measure has a digital readout for more precise accuracy.
Page 148

Digital Story: A story told using multi-media tools. Digital stories typically include text, voice, music, and pictures or video.
Pages 16, 27, 33, 80, 197

Digital Story Telling is an emerging term, one that arises from a grassroots movement that uses new digital tools to help ordinary people tell their own 'true stories' in a compelling and emotionally engaging form. These stories usually take the form of a relatively short story (less than 8 minutes) and can involve interactivity.
http://en.wikipedia.org/wiki/Digital_storytelling
Page 197

Digital Voice Recorder/Dictation Machine is a sound recording device most commonly used to record speech for later playback or to be typed into print.
http://en.wikipedia.org/wiki/Digital_voice_recorder
Pages 13, 31, 33, 34, 36, 40, 41, 51, 75, 107, 113, 163

Discovery Education Streaming is an online video-on-demand teaching service that is correlated to state K-12 curriculum standards and features up to 7,700 full length videos

and 77,000 video clips, as well images, audio files, lesson plans, a quiz builder, assignment builder, writing prompts, and online self-paced professional development. http://corporate.discovery.com/brands/education/discovery-education-streaming/
Page 34

Document cameras, also known as visual presenters, digital visualizers, ("visualisers" in the United Kingdom) digital overheads, and docucams, are real-time image capture devices for displaying an object to a large audience. They are, in essence, high-resolution web cams, mounted on arms so as to facilitate their placement over a page. This allows a teacher, lecturer or presenter to write on a sheet of paper or to display a two or three-dimensional object while the audience watches.
http://en.wikipedia.org/wiki/Document_camera
Pages 34, 93, 106, 190

Drawing and Painting Applications provide tools for creativity and self-expression. (Example: Microsoft Paint)
Examples that must be purchased include: KidPix and HyperStudio. There are several Web 2.0 drawing and painting tools available, such as http://artpad.art.com, http://bomomo.com/, http://www.onlinesketchpad.com/, http://www.sumopaint.com/home/.
Pages 11, 16, 151, 217

Easy Who Is: web site that shows the organizations that create web pages
http://www.easywhois.com/
Pages 113, 124

Ebook reader-device used to display ebooks
Page 126

Eco-School "is a program for environmental management and certification, designed to implement sustainable development education in schools by encouraging children and youth to take an active role in how their school can be run for the benefit of the environment." http://www.eco-schools.org

Edublogs is a blog hosting website that provides free (or almost free) educational blogs with a user-friendly interface and various options for customization. http://edublogs.org
Page 113

ed.Voicethread - see Voicethread
Page 71

An **electronic portfolio**, also known as an **e-portfolio** or **digital portfolio**, is a collection of electronic evidence assembled and managed by a user, usually on the Internet. Such electronic evidence may include text, images, multimedia, and hyperlinks. E-portfolios are both demonstrations of the user's abilities and platforms for self-expression, and, if they are online, they can be maintained dynamically over time. Some e-portfolio applications permit varying degrees of audience access, so the same portfolio might be used for multiple purposes. http://en.wikipedia.org/wiki/Electronic_portfolio
Page 214

email - **Electronic mail**, often abbreviated as **email**, **e.mail** or **e-mail**, is a method of exchanging digital messages.

Pages 21, 26, 60, 64, 73, 82, 84, 90, 96, 100, 113, 131, 132, 142, 143, 144, 147, 148, 185, 186, 189, 190, 192, 193, 214

ePals is a website that allows teachers and students to connect globally and collaborate safely. http://www.epals.com/

Pages 41, 53, 73, 82, 83, 91, 106, 126, 127, 176 186, 192, 193, 210

EtherPad is a web-based collaborative real-time editor, allowing up to eight people to edit a text document at the same time, and see all of the participants' edits in real-time, each in their own color. Participants can permanently save revisions at any time, and it provides a separate chat box in the sidebar. http://en.wikipedia.org/wiki/Etherpad

Pages 71, 111, 196

Excel (Microsoft Office Excel) is a spreadsheet application created and distributed by Microsoft. http://en.wikipedia.org/wiki/Microsoft_Excel

Pages 30, 33, 80, 158, 171

Facebook is a global social networking website that is operated and privately owned by Facebook, Inc. Users can add friends and send them messages, and update their personal profiles to notify friends about themselves. Additionally, users can join networks organized by city, workplace, school, and region. http://en.wikipedia.org/wiki/Facebook

Pages 37, 47, 79, 86, 157, 209, 210, 213, 224

Facebook Discussion Forum: A facebook feature that enables multiple people to have a discussion online. One person posts a statement or question; others comment or reply.

Page 210

Fair Use "...is a doctrine in United States copyright law that allows limited use of copyrighted material without requiring permission from the rights holders, such as for commentary, criticism, news reporting, research, teaching, or scholarship. It provides for the legal, non-licensed citation or incorporation of copyrighted material in another author's work under a four-factor balancing test"
(Source: http://en.wikipedia.org/wiki/Fair_use)

Pages 113, 175, 176, 177, 197, 210, 210

FITNESSGRAM was developed in 1982 by The Cooper Institute in Dallas, Texas. The objective was to increase parental awareness of children's fitness levels by developing an easy way for physical education teachers to report the results of physical fitness assessments. Student's are assessed in three general areas of health-related fitness. Scores are evaluated against objective criterion standards that indicate a level of fitness necessary for health. http://www.cooperinstitute.org/ourkidshealth/fitnessgram/index.cfm

Pages 151, 152

Flash Video is a container file format used to deliver video over the Internet using Adobe Flash Player, The format has quickly established itself as the format of choice for embedded video on the web. http://en.wikipedia.org/wiki/Flash_video

Page 159

Flickr is an image and video hosting website, web services suite, and online community platform. In addition to being a popular website for users to share personal photographs, the service is widely used by bloggers as a photo repository. http://en.wikipedia.org/wiki/Flickr

Pages 34, 71, 73, 180, 197, 205, 214

Flip

is the name brand of a popular, easy to use video recording device which allows video to be loaded directly to a computer with a pop out USB connector.

Pages 31, 34, 36, 117, 154, 167, 201

FreeTranslation.com: A web site (one of several) that translates text typed in one language to another language.

Page 79

Friend: (n) A Facebook term used to refer to a person you trust who you allow to access private content on your Facebook page. (v) To friend someone is to designate them to be one of your Facebook friends, and thus gain access to your private content.

Pages 37, 209

Geni.com is a genealogy-related social networking website launched in beta mode on January 16, 2007 by Web 2.0 company Geni, Inc. http://en.wikipedia.org/wiki/Geni.com

Page 36

GIMP (The GNU Image Manipulation Program) is a free software raster graphics editor. Primarily, GIMP is used as a tool for photo manipulations,[3] such as resizing, editing, and cropping photos, combining multiple images, and converting between different image formats. GIMP can also be used to create basic animated images in the GIF format. http://en.wikipedia.org/wiki/GIMP

Page 56

Global SchoolNet's "mission is to support 21st century learning and improve academic performance through content driven collaboration. We engage teachers and students in meaningful project learning exchanges with people worldwide to develop literacy and communication skills, foster teamwork and collaboration, encourage workforce preparedness and create multi-cultural understanding. We prepare youth for full participation as productive and effective citizens in an increasing global economy."http://globalschoolnet.org/

Pages 51,106

Glog may refer to: a graphics blog or graphical blog; online rich media poster http://en.wikipedia.org/wiki/Glog

Pages 21, 73, 74, 91, 117

Glogster is a tool that can be used to create interactive, multimedia posters with images, text, and music. http://www.glogster.com/

Pages 21, 73, 74, 91, 117, 127, 128, 186

Google: (n) Probably the most popular "search engine" on the World Wide Web--a web site that is designed to search for information on the Internet. (v) To Google someone is to use Google to search for information about that person on the web.
Pages 124, 126, 209

Google Docs is a free, Web-based word processor, spreadsheet, presentation, and form application offered by Google. It allows users to create and edit documents online while collaborating in real-time with other users. http://en.wikipedia.org/wiki/Google_docs
Pages 21, 23, 26, 36, 61, 63, 101, 103, 107, 120, 121, 134, 153, 155, 158, 163, 176, 201, 214

Google Document is the word processor (similar to Microsoft Word) in Google Docs.
Pages 63, 67, 138, 151, 196

Google Earth is a virtual globe, map, and geographic information program that was originally called Earth Viewer and was created by Keyhole, Inc, a company acquired by Google in 2004. It maps the Earth by the superimposition of images obtained from satellite imagery, aerial photography, and GIS on a 3D globe.
http://en.wikipedia.org/wiki/Google_Earth
Pages 11, 12, 33, 53, 60, 61, 67, 70, 71, 80, 91, 154, 155, 163, 170, 171, 172, 175, 181

Google Form is a flexible data entry and survey development interface with built-in reporting using Google Spreadsheets (see also Google Docs)
Pages 26, 30, 43, 60, 63, 96, 121, 137, 151, 152, 158, 163, 186

Google Maps is a web mapping service application and technology provided by Google free (for non-commercial use), that powers many map-based services, including the Google Maps website ... According to one of its creators (Lars Rasmussen), Google Maps is "a way of organizing the world's information geographically"
http://en.wikipedia.org/wiki/Google_maps
Pages 53, 56, 138, 154, 164, 226

Google Presentation is the presentation tool (similar to Microsoft PowerPoint) in Google Documents
Pages 55, 59, 60, 127, 128, 138, 142, 152

Google Sites is an online application that makes creating a team website as easy as editing a document. With Google Sites, you can quickly gather a variety of information in one place -- including videos, calendars, presentations, attachments, and text -- and easily share it for viewing or editing with a small group, an entire organization, or the world. http://www.google.com/support/sites/bin/answer.py?hl=en&answer=90447
Page 196

Google Sketch Up is used to create, modify and share 3D models. This is a free piece of software that you download. http://sketchup.google.com/
Pages 60, 148, 171

InspireData is billed as a visual database. Students use InspireData® to investigate, analyze, and represent data and information in dynamic graphs and charts.
http://www.inspiration.com/inspiredata
Pages 27, 134

An **interactive whiteboard**, or IWB, is a large interactive display that connects to a computer and projector. A projector projects the computer's desktop onto the board's surface, where users control the computer using a pen, finger or other device. The board is typically mounted to a wall or on a floor stand.
http://en.wikipedia.org/wiki/Interactive_whiteboard (see also SMART Board)
Pages 11, 13, 14, 17, 26, 46, 51, 90, 94, 106, 131, 137, 147, 175, 176, 181, 218

Internet - The **Internet** is a global system of interconnected computer networks that use the standard Internet Protocol Suite (TCP/IP) to serve billions of users worldwide.
http://en.wikipedia.org/wiki/Internet
Pages 16, 26, 30, 40, 43, 44, 46, 59, 72, 73, 79, 83, 85, 92, 96, 100, 101, 103, 106, 116, 120, 123, 124, 138, 141, 142, 145, 155, 162, 163, 164, 166, 167, 176, 182, 185, 192, 199, 204, 205, 206

iPhone is an Internet and multimedia enabled smartphone designed and marketed by Apple Inc. Because its minimal hardware interface lacks a physical keyboard the multitouch screen renders a virtual keyboard when necessary. The iPhone functions as a camera phone (also including text messaging and visual voicemail), a portable media player (equivalent to a video iPod), and an Internet client (with email, web browsing, and Wi-Fi connectivity). Current models also have GPS functionality.
http://en.wikipedia.org/wiki/IPhone
Pages 75, 76, 80, 163

issuu is an online area where you can publish your work in different formats.
http://issuu.com/
Pages 21, 60, 61, 66, 142, 187

iTunes is a digital media organization and sharing application by Apple.
Pages 31, 44, 83

iTunes U "...is a part of the iTunes Store (Apple Inc) featuring free lectures, language lessons, audio books, and more, that you can enjoy on your iPod, iPhone, Mac or PC. (Source: http://www.apple.com/education/guidedtours/itunesu.html)
Page 44

Jing is a screencasting software launched in 2007 as Jing Project by the TechSmith Corporation. The software takes a picture or video of the user's computer screen and uploads it to the Web, FTP, computer or clipboard. A URL is automatically created and can be shared with others to view or access the uploaded file.
http://en.wikipedia.org/wiki/Jing_(software)
Pages 33, 106, 107, 197

KidPix is a bitmap drawing program aimed at children. http://en.wikipedia.org/wiki/KidPix

Pages 14, 135, 179

Kindle is a software and hardware platform for reading electronic books (e-books), developed by Amazon.com
Pages 20, 106, 215

A **KMZ file** is a special kind of document used to store information about Google Earth placemarks. Users can create a series of placemarks, including text, pictures, and links, and save them to a KMZ file. They can then share the KMZ file with others, who can open it and see the placemarks and all of the associated information.
Pages 71, 80

Knol- a Google project that allows users to publish and write articles on the web.
Pages 127, 128

LISTSERV was the first electronic mailing list software application, consisting of a set of email addresses for a group in which the sender can send one email and it will reach a variety of people http://en.wikipedia.org/wiki/LISTSERV
Page 152

LNV (Learning Network of Vermont) - The Learning Network of Vermont (LNV) is a video conferencing system that uses the Internet to connect Vermont schools to each other and the world. LNV members can participate in videoconferences with other LNV members as well as other sites anywhere on the Internet.
Pages 37, 46, 47, 117, 158, 202, 210, 217

Lulu- Lulu.com lets you publish and sell print-on-demand books and e-books, online music and images, custom calendars and books.
Pages 17, 138

ManyMoon is a collaborative, online project planning system. Users can create and manage tasks, projects, timesheets, and more. ManyMoon offers both free and commercial versions.
Pages 162, 164

Microsoft Excel is a spreadsheet tool developed by Microsoft. It can be used to perform a vast array of calculations, to create graphs, and to analyze data with a variety of powerful tools.
Pages 30, 80

Microsoft Paint is a simple graphics painting program that has been included with all versions of Microsoft Windows. http://en.wikipedia.org/wiki/Microsoft_Paint
Page 14

Microsoft Publisher, officially **Microsoft Office Publisher**, is a desktop publishing application from Microsoft. It is an entry-level application, differing from Microsoft Word in that the emphasis is placed on page layout and design rather than text composition and proofing. http://en.wikipedia.org/wiki/Microsoft_publisher
Page 117

Microsoft Word is a word processor designed by Microsoft. http://en.wikipedia.org/wiki/Microsoft_word

Pages 134, 176

A **mind map** is a diagram used to represent words, ideas, tasks, or other items linked to and arranged around a central key word or idea. Mind maps are used to generate, visualize, structure, and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing. (See Visual Organizer) http://en.wikipedia.org/wiki/Mind_map

Page 151

Mindomo is online, collaborative mind mapping software where users can create, view, and share mind maps in their browser. Mindomo is offering the basic services for free, while charging for advanced features. Unregistered users can view the mind maps, while registered users are permitted to create and share mind maps. The free version limits the number of private maps to seven and disables some special features like spell checking. http://en.wikipedia.org/wiki/Mindomo

(See Visual Organizer)

Pages 36, 43, 73, 79, 80, 113, 154

Mobi is an interactive wireless table that communicates with an interactive whiteboard.

Page 147

Moodle is a free, open source course management system that offers features such as wikis, podcasts, journals, forums, and web pages to organize and share content.

Pages 30, 196, 200

MP3 a patented digital audio encoding format. It is a common audio format for consumer audio storage, as well as a de facto standard of digital audio compression for the transfer and playback of music on digital audio players. http://en.wikipedia.org/wiki/MP3

Pages 53, 107, 201

Multimedia projects are those using more than traditional print. They might include audio, visual, video, interactive web sites, and/or text.

Pages 20, 23, 24, 40, 46, 47, 66, 70, 73, 100, 114, 116, 126, 127, 190, 196, 218

My Punch Bowl is a place where you can design and send out electronic invitations. http://www.mypunchbowl.com/

A **Netbook** (sometimes also called mini notebook or ultraportable) is a rapidly evolving category of small, light, and inexpensive laptop computers suited for general computing and accessing web-based applications. http://en.wikipedia.org/wiki/Netbook

Pages 51, 100, 103, 106, 107, 131, 141, 144, 148, 163, 175

Ning is a social networking tool. It competes with large social sites like MySpace and Facebook by appealing to people who want to create their own social networks around specific interests with their own visual design, choice of features, and member data. The unique feature of Ning is that anyone can create their own social network for a particular

topic or need, catering to specific membership bases.
http://en.wikipedia.org/wiki/Ning_%28website%29
Pages 37, 70, 71, 79, 85, 86, 164

Pasco Pasport Sensors offers more than 70 sensors to measure virtually anything. The PASPORT sensor line is all-digital, each sensor a computing device of its own complete with digital chip on board. With PASPORT, students can collect data with or without computers, even wirelessly.
http://www.pasco.com/products/probeware/pasport/Index.cfm
Pages 51, 201

PBWorks is a service that hosts wikis for any user. PBWorks offers both free and commercial options, and has both a user-friendly interface as well as powerful editing tools. Many Vermont teachers use PBWorks as their wiki site.
Pages 30, 79, 171, 196, 197

Photo Story is a free application that allows users to create a show and tell presentation from their digital photos. [1] The software uses the Ken Burns Effect on digital photos and allows adding narration, effects, transitions and background music to create a Windows Media Video movie file with pan and zoom effects. Once a photo story has been made it can be played on Windows Media Player or burned to a DVD or CD.
http://en.wikipedia.org/wiki/Photo_Story
Pages 14, 16, 21, 27, 33, 66, 148

Picasa is a software application for organizing and editing digital photos.
http://en.wikipedia.org/wiki/Picasa
Pages 76, 101, 145

Picnik is an online photo editor.
Page 107

A **podcast** is a series of digital media files, either audio or video, that is released episodically and downloaded through web syndication. The mode of delivery is what differentiates podcasts from other ways of accessing media files over the Internet, such as simple download or streamed webcasts: special client software applications known as podcatchers (like iTunes, Zune, Juice, and Winamp) are used to automatically identify and download new files in the series when they are released by accessing a centrally-maintained web feed that lists all files associated with the series. New files can thus be downloaded automatically by the podcatcher and stored locally on the user's computer or other device for offline use, giving simpler access to episodic content
http://en.wikipedia.org/wiki/Podcasts
Pages 31, 33, 36, 37, 73, 74, 83, 97, 117, 127, 128, 163, 193, 205, 218

Podomatic is a web-based tool for creating, finding and sharing podcasts.
Page 117

Portaportal: free web based book marking site http://www.portaportal.com/
Page 124

Prezi-a zooming presentation editor
Pages 127, 128, 213

Probes--See Data Collection Probes
Pages 80, 144, 145, 166, 167, 201

Project-Based Learning is "... an instructional approach built upon authentic learning activities that engage student interest and motivation. These activities are designed to answer a question or solve a problem and generally reflect the types of learning and work people do in the everyday world outside the classroom.
http://pbl-online.org/About/whatisPBL.htm
Pages 43, 103

RSS Feeds (Really Simple Syndication) is a summary of frequently updated content on the web (such as from a blog or a news source) that people can subscribe to in order to receive automatic updates (feeds).
Pages 30, 79, 113

Rubistar - Rubistar offers a variety of features to assist teachers who may not have time to create rubrics from scratch. It also serves as a tool to introduce the concept to beginning teachers who may have little experience in the development and use of rubrics. The site houses a collection of generic rubrics displayed in a format that can be customized. http://www.learnnc.org/lp/external/2062
Page 34

Safe search web sites provide a large database of filtered kid safe sites. Some examples include http://www.askkids.com/, http://kids.yahoo.com/, http://www.onekey.com/, http://cybersleuth-kids.com/ and http://www.kidzsearch.com/. Google also provides a safe search option (http://www.google.com/preferences).
Pages 90, 96, 131, 175, 182

Scopia Desktop—A "webinar"/video conferencing service that enables multiple people at different locations to take part in an online meeting. Each user of the Learning Network of Vermont (LNV) has a free account and can set up meetings with anyone on the Internet. The leader can share his/her desktop with the participants, participants can see and hear each other using web cameras, and the "meetings" can be recorded and played back at a future time.
Page 164

ScrapBlog a digital scrapbook
Pages 107, 218

S**creencast** is a digital recording of computer screen output, also known as a video screen capture, often containing audio narration (http://en.wikipedia.org/wiki/Screencast)
Pages 33, 197

Shortwave Receiver is a device that receives radio broadcasts on a portion of the radio spectrum in the frequency range of 3-30 MHz. http://en.wikipedia.org/wiki/Shortwave
Page 193

S**imulation** is a computer program that attempts to simulate or model the working of real world systems and processes. For example, meteorologists use computer simulations to model complex weather systems so they can predict future weather. Computer simulations allow users to explore how changes in certain conditions or variables impact the processes the simulation is modeling. For example, a simulation of a river might allow users to change the amount of pollution being dumped into the river to explore the impact on fish in the river. Example: Stella

Pages 43, 44, 121, 128

Skype is a free software application that allows users to make voice calls (i.e., "telephone calls") over the Internet. The software also supports video-conferencing between users with web cameras, online chats, and conference calls.

Pages 21, 37, 43, 44, 46, 51, 54, 56, 60, 70, 73, 76, 79, 86, 91, 100, 117, 120, 121, 147, 148, 154, 158, 176, 186, 189, 190, 192, 193, 201, 205

Slideshare-presentation sharing website

Pages 127, 128, 218

SMART Board is an interactive whiteboard developed by SMART Technologies. http://en.wikipedia.org/wiki/Smart_board

Pages 33, 75, 154, 162, 204, 209, 218

SMART Response Clickers are handheld wireless devices that enable students to answer factual or opinion questions based on true/false, yes/no or multiple choice type questions. The SMART Response system automatically collects those answers and displays a summary of all responses on a computer screen, a projection screen, and/or a SMART Board.

Pages 162, 202

Social bookmarking is a method for Internet users to store, organize, search, and manage bookmarks of web pages on the Internet with the help of metadata, typically in the form of tags that collectively and/or collaboratively become a folksonomy. Folksonomy is also called social tagging, "the process by which many users add metadata in the form of keywords to shared content".
http://en.wikipedia.org/wiki/Social_bookmarking

Pages 117, 124

Social Network Services focus on building online communities of people who share interests and/or activities, or who are interested in exploring the interests and activities of others. A social network service essentially consists of a representation of each user (often a profile), his/her social links, and a variety of additional services. Most social network services are web based and provide a variety of ways for users to interact, such as e-mail and instant messaging services.
http://en.wikipedia.org/wiki/Social_network_service

Pages 37, 70, 85

Soil Electromagnetic Sensor is a digital senor that can detect the physical and chemical properties of soil.

Page 148

Smart phone - a mobile phone offering advanced capabilities, often with PC-like functionality. For some, a smartphone is a phone that runs complete operating system software providing a standardized interface and platform for application developers. For others, a smartphone is simply a phone with advanced features like e-mail, Internet, e-book reader capabilities, and/or a built-in full keyboard ... In other words, it is a miniature computer that has phone capability. http://en.wikipedia.org/wiki/Smart_phone

Pages 154, 164

Steganography is the art and science of writing hidden messages in such a way that no one, apart from the sender and intended recipient, suspects the existence of the message, a form of security through obscurity. http://en.wikipedia.org/wiki/Steganography

Pages 204, 206

Storyboards are graphic organizers such as a series of illustrations or images displayed in sequence for the purpose of pre-visualizing a motion picture, animation, motion graphic or interactive media sequence, including website interactivity. http://en.wikipedia.org/wiki/Story_board

Page 41

Streaming Video is when video sent in compressed form over the Internet and displayed by the viewer in real time.

Page 106

Student Response Systems (SRS) is a technological way to assess students, more commonly known as Audience Response Systems. The instructor is able to ask objective and subjective questions to each student. The questions come from a computer, and are displayed for each student to view. Each student can answer their test questions at their own pace and respond with a remote control device ("clicker"). A radio or infrared transmitter picks up the student's response and sends it to the computer, which stores the responses and can provide detailed reports. This system allows instructors to obtain immediate feedback from each student. The system keeps a log of every class session, so student records are always available. http://en.wikipedia.org/wiki/Student_Response_Systems

Pages 23, 192, 197, 202

Subscription for a Delicious Tag--Delicious users can "subscribe" to a tag. This causes Delicious to collect all items that have that same tag and to display them in one location. Users can subscribe to a tag used by a single, specified Delicious user or by all Delicious users.

Survey Monkey is a tool for creating online surveys.

Page 30

Tag (n or v)/Tagging - In online computer systems terminology, a **tag** is a keyword or term assigned to a piece of information (such as an internet bookmark, digital image, or computer file). This kind of metadata helps describe an item and allows it to be found again by browsing or searching for the tag. Tags are generally chosen informally and personally by the item's creator or by its viewer, depending on the system. Tagging was popularized by websites associated with Web 2.0 and is an important feature of many Web 2.0 services. It is now also part of some desktop software. For example, Delicious

users can tag web pages with keywords such as energy or solar energy. When a user searches for the energy tag, s/he would be presented with all the web pages that have been tagged with that keyword. (http://en.wikipedia.org/wiki/Tag_%28metadata%29)
Pages 66, 76, 210

TeacherTube is an "...online community for sharing instructional videos. We seek to fill a need for a more educationally-focused, safe venue for teachers, schools, and home learners. It is a site to provide anytime, anywhere professional development with teachers teaching teachers. As well, it is a site where teachers can post videos designed for students to view in order to learn a concept or skill."
http://www.teachertube.com/staticPage.php?pg=about)
Page 43

Teen Second Life-a virtual world for teens
Page 218

Text to Speech: tools that "read" aloud the words on a computer screen. Example: http://www.readplease.com/
Pages 97, 124, 182

Tiny.cc: Tiny.cc turns a ridiculously long URL into a tiny URL...
shohttp://vttgefollowup.pbworks.com/Glossary#view=editrt

Transfer Fabric Sheets- Special sheets of fabric that can be put into your printer and be printed on.
Page 187

Twitter- social networking site that allows users to send short messages called "tweets".
Pages 46, 47, 59, 61, 85, 86, 101, 137, 138, 181

Vernier Data Collection Probes--See Data Collection Probes
Pages 80, 167,

Video Chat--See videoconferencing
Page 162

Videoconferencing is a way of communicating with video, audio, and text through a computer or TV system.
Pages 37, 43, 56, 73, 113, 117, 158

A **virtual world** is a genre of online community that often takes the form of a computer-based simulated environment, through which users can interact with one another and use and create objects. http://en.wikipedia.org/wiki/Virtual_world
Pages 189, 190

Virtual Tour is a computer presentation of a real place where geometrical properties of space are conveyed to a human so that he or she feels as if he or she is actually there.
Pages 97, 144

Visual Organizer, also known as Graphic Organizer, Concept Mapping Software, or Mind Mapping Software**--** that enables the user to diagram or map the relationships between concepts, facts, ideas, etc. Such software can be helpful in collaborative brainstorming or in diagramming a plan for a presentation, paper, project, etc.
Pages 76, 90, 91, 132, 162, 204

The **Visual Ranking Tool** brings focus to the thinking behind making ordered lists. Students identify and refine criteria as they assign order or ranking to a list. They must explain their reasoning and can compare their work with each other in a visual diagram. This tool supports activities where students need to organize ideas, debate differences, and reach consensus. http://educate.intel.com/en/thinkingtools/Visualranking/

Vodcast- a video podcast (see Podcast)
Pages 37, 117

Voice over Internet Protocol (VoIP) is a general term for a family of transmission technologies for delivery of voice communications over IP networks such as the Internet or other packet-switched networks.
(http://en.wikipedia.org/wiki/Voice_over_Internet_Protocol)

VoiceThread - A VoiceThread is a collaborative, multimedia slide show that holds images, documents, and videos and allows people to navigate pages and leave comments in 5 ways - using voice (with a microphone or telephone), text, audio file, or video (via a webcam). http://voicethread.com/about/
Pages 12, 34, 40, 71, 76, 94, 192, 218

WAVE Web Site—"WAVE is a free web accessibility evaluation tool provided by WebAIM. It is used to aid humans in the web accessibility evaluation process. Rather than providing a complex technical report, WAVE shows the original web page with embedded icons and indicators that reveal the accessibility of that page." (Source: http://wave.webaim.org/)
Page 167

Way Back Machine: a tool that maps the history of a web site. Even when a site is modified, or things are deleted, tools like Way Back Machine can show what was originally on there. http://www.archive.org/
Page 124

A **WebQuest**, as implied by the name, is an inquiry-based, on-line learning activity. During this activity students work groups, dividing assignments among each other, so that everyone participates in a group-assigned role. The objective of the activity is to promote "transformative" learning outcomes, accomplished through the reading, analysis, and synthesis of Web-based material. http://webquest.org/search/index.php
Pages 16, 67, 124

Widget - is a tool that can be embedded on a blog or a webpage to run an application or hold information (for example, video, text, links, images, etc.)
Pages 56, 113
Wiki - A **wiki** is a type of collaborative software program that typically allows web

pages to be created and collaboratively edited using a common web browser. Web sites running such programs are themselves referred to as wikis. (http://en.wikipedia.org/wiki/Wiki_software) Examples: http://www.pbworks.com, www.wetpaint.com, www.wikispaces.com

Pages 20, 30, 37, 40, 41, 47, 63, 64, 66, 67, 70, 73, 76, 79, 80, 96, 97, 106, 107, 111, 117, 120, 124, 141, 142, 143, 145, 147, 148, 154, 162, 171, 176, 186, 187, 192, 193, 196, 200, 201, 205, 209, 210, 213

Wikipedia (pronounced WI-ki-PEE-dee-ə) is a free, web-based, collaborative, multilingual encyclopedia project supported by the non-profit Wikimedia Foundation. Its name is a portmanteau of the words wiki (a technology for creating collaborative websites, from the Hawaiian word wiki, meaning "quick") and encyclopedia. Wikipedia's 14 million articles (3.1 million in English) have been written collaboratively by volunteers around the world and almost all of its articles can be edited by anyone with access to the site. (http://en.wikipedia.org/wiki/Wikipedia)

Pages 63, 64, 111

Windows Movie Maker is a basic video creating/editing software included in Microsoft Windows. It contains features such as effects, transitions, titles/credits, audio track, timeline narration, and Auto Movie. Windows Movie Maker is also a basic audio track editing program. It can apply basic effects to audio tracks such as fade in or fade out. http://en.wikipedia.org/wiki/Windows_Movie_Maker

Pages 132, 190, 201

Word Cloud - A **tag cloud** or **word cloud** (or **weighted list** in visual design) is a visual depiction of user-generated tags, or simply the word content of a site, used typically to describe the content of web sites. Tags are usually single words and are typically listed alphabetically, and the importance of a tag is shown with font size or color. Thus both finding a tag by alphabet and by popularity is possible. The tags are usually hyperlinks that lead to a collection of items that are associated with a tag. http://en.wikipedia.org/wiki/Tag_cloud

Page 151

Wordle is a devise for generating “word clouds” from text that you provide. http://www.wordle.net/

Page 21

YouTube is a video sharing web site on which users can upload and share videos.

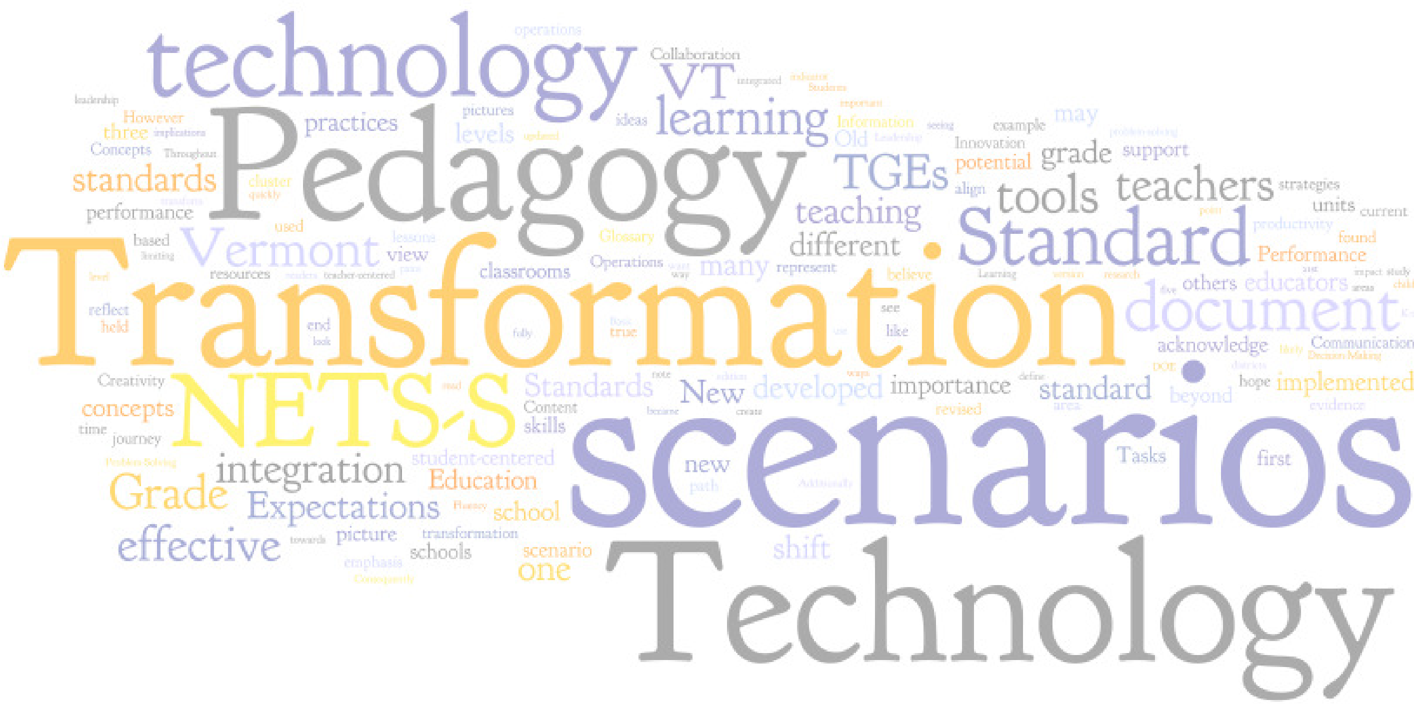
Pges 31, 47, 79, 80, 82, 86, 110, 124, 127, 128, 176, 177, 200, 201, 202, 213

Zoho is a Web- based online office suite containing word processing, spreadsheets, presentations, databases, note-taking, wikis, CRM, project management, invoicing and other applications developed by ZOHO Corporation. http://en.wikipedia.org/wiki/Zoho

Page 134

ZON is a multi-player online role-playing game for learning about the Chinese culture and speaking Mandarin Chinese.

Pages 189, 190



technology
Pedagogy
Transformation
Standard
document
NETS-S
scenarios
Technology
VT
learning
TGEs
tools
teachers
teaching
Vermont
standards
practices
different
Grade
integration
Expectations
effective
Education
Standards
New
developed
importance
standard
implemented
acknowledge
educators
Performance
many
grade
support
potential
levels
concepts
school
scenario
one
shift
new
first
Tasks
student-centered
picture
schools
transformation
performance
Collaboration
Communication
Creativity
Information
Innovation
Operations
classrooms