Technology Enrichment - Grade 2

Unit Title: Grade 2 -- Unit 1 -- iPad Navigation and Digital Citizenship

Stage 1: Desired Results

Standards & Indicators:

NJSLS for Mathematics

- MP 1 Make sense of problems and persevere in solving them.
- MP 2 Reason abstractly and quantitatively.
- MP 6 Attend to precision.
- 2.OA.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 2.OA.2 With accuracy and efficiency, add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
- 2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
- 2.NBT.1.Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.	Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.
8.1.2.CS.2	Explain the functions of common software and hardware components of computing systems.	A computing system is composed of software and hardware.
8.1.2.CS.3	Describe basic hardware and software problems using accurate terminology.	Describing a problem is the first step toward finding a solution when computing systems do not work as expected.
8.1.2.NI.1	Model and describe how individuals use computers to connect to other individuals, places, information, and ideas through a network.	Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide.
8.1.2.NI.2	Describe how the Internet enables individuals to connect with others worldwide.	
8.1.2.NI.3	Create a password that secures access to a device. Explain why it is important to create unique passwords that are not shared with others.	Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and information from unauthorized access.
8.1.2.NI.4	Explain why access to devices needs to be secured.	
8.1.2.IC.1	Compare how individuals live and work before and after the implementation of new computing technology.	Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools).

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8.2.2.ITH.1	Identify products that are designed to meet human wants or needs.	Human needs and desires determine which new tools are developed.
8.2.2.ITH.2	Explain the purpose of a product and its value.	
8.2.2.ITH.3	Identify how technology impacts or improves life.	Technology has changed the way people live and work. Various tools can improve daily tasks and quality of life.
8.2.2.ITH.4	Identify how various tools reduce work and improve daily tasks.	
8.2.2.ITH.5	Design a solution to a problem affecting the community in a collaborative team and explain the intended impact of the solution.	
8.2.2.EC.1	Identify and compare technology used in different schools, communities, regions, and parts of the world.	The availability of technology for essential tasks varies in different parts of the world.

Career Readiness, Life Literacies and Key Skills		
Standard	**Performance Expectations**	**Core Ideas**
9.2.2.CAP.1	Make a list of different types of jobs and describe the skills associated with each job.	Different types of jobs require different knowledge and skills.
9.4.2.DC.2	Explain the importance of respecting digital content of others.	Digital artifacts can be owned by individuals or organizations.
9.4.2.DC.3	Explain how to be safe online and follow safe practices when using the internet	Individuals should practice safe behaviors when using the Internet.
9.4.2.DC.4	Compare information that should be kept private to information that might be made public.	
9.4.2.DC.5	Explain what a digital footprint is and how it is created.	An individual's digital footprint reflects the various actions an individual makes online, both positive and negative.
9.4.2.DC.6	Identify respectful and responsible ways to communicate in digital environments.	Digital communities allow for social interactions that can result in positive or negative outcomes.

Central Idea / Enduring Understanding:

Students will…

- Use computer terminology in daily practice.
- Navigate and use a touch-screen device properly and effectively.
- Use basic troubleshooting techniques, such as refresh, closing out and restarting, using backspace, etc.
- Distinguish safe and unsafe behaviors when using a device.
- Compare and contrast how they can connect to different people and places, in person and on the Internet.
- Learn how to show respect online.
- Understand the importance of tone in both face-to-face and online communications
- Learn how to write clear and respectful emails.
- Learn the functions of passwords, identify strategies for creating and protecting secure passwords, and create their own secure passwords using the lesson guidelines.

Essential/Guiding Question:

- How do you navigate and use a touch-screen device properly and effectively, what are some basic troubleshooting techniques, and how do you practice safe behaviors when using a device?
- How can you connect to different people and places, in person and on the Internet?
- How do you show respect online?
- How is tone important in both face-to-face and online communications and how do you write clear and respectful emails?
- What are passwords and what are strategies for creating and protecting secure passwords?
- How do you use keywords to complete Internet searches?
- How can you use hyperlinks to find important information and get good search results?

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• Understand how to complete Internet searches using keywords. • Use hyperlinks to find important information and develop web browsing skills.	
Content: • iPad • Computer terminology • Internet • Communication • Internet safety • Digital citizenship • Email • Usernames • Passwords • Keyword • Search bar • Hyperlink	**Skills (Objectives):** • Navigate and use a touch-screen device properly and effectively, use basic troubleshooting techniques, and practice safe and unsafe behaviors when using a device. • Explain how they can connect to different people and places, in person and on the Internet. • Explain how to show respect online. • Recognize the importance of tone in both face-to-face and online communications and explain how to write clear and respectful emails. • Understand the functions of passwords, identify strategies for creating and protecting secure passwords, and create their own secure passwords using the lesson guidelines. • Complete Internet searches using keywords. • Use hyperlinks to find important information and develop web browsing skills.

Interdisciplinary Connection(s):

NJSLS for Language Arts Literacy

- RI.CR.2.1. - Ask and answer such questions as who, what, where, when, why, and how in an informational text to demonstrate understanding of key details in a text.
- L.VL.2.2- Determining or clarify the meaning of unknown and multiple- meaning words and phrases based on grade 2 reading and content, choosing flexibly from an array of strategies
- L.RF.2.4.A. - Read grade-level text with purpose and understanding.
- L.RF.2.4.B. - Read grade-level text orally with accuracy, appropriate rate, and expression.
- W.WP.2.4. - With guidance and support from adults and peers, develop and strengthen writing as needed by planning, revising and editing.
- W.WP.2.4.C- With feedback and digital or print tools such as a primary dictionary, find and correct errors.
- W.SE.2.7- Engage in both collaborative and independent writing tasks regularly, including extended and shorter time frames.
- SL.PE.2.1. - Participate in collaborative conversations with diverse partners about Grade 2 topics and texts with peers and adults in small and larger groups.
- SL.II.2.2. - Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- SL.ES.2.3. - Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- S.PI.2.4. - Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.
- SL.AS.2.6. - Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
- L.WF.2.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

NJSLS for Science

- K-2-ETS1-1 - Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

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- K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

NJSLS for Social Studies

- 6.1.5.EconNM.4: Explain how creativity and innovation resulted in scientific achievement and inventions in many cultures during different historical periods.
- 6.1.5.EconGE.1: Explain how the development of communication systems has led to increased collaboration and the spread of ideas throughout the United States and the world.
- 6.1.5.CivicsHR.4: Identify actions that are unfair or discriminatory, such as bullying, and propose solutions to address such actions.

Stage 2: Assessment Evidence

Performance Task(s):

- Student classwork/projects
- Student demonstration
- Class/partner/group discussion
- Self-assessments
- Peer-assessments
- Turn and Talk
- Various class activities and games
- Self-reflection
- Exit tickets/questions
- My Online Community Assessment [PDF]
- Show Respect Online Assessment [PDF]
- Writing Good Emails assessment [PDF]
- Powerful Passwords Assessment [PDF]

Other Evidence:

- Teacher observation
- Student/Teacher conference
- Unit Assessments [Web][PDF]

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Lesson 1: iPad navigation and using them properly
Students will review the parts of an iPad, the home screen, how to open and close programs on an iPad, and how to use a touch-screen properly and effectively. They will review how to use hyperlinks, the characteristics of a hyperlink, the “back button” to navigate, use the scroll bar, and locate important information on a website. They will review keys on a keyboard, including “power keys” that help them with special functions. Students will learn basic troubleshooting techniques, such as using the refresh button, closing out and clicking back onto the application, backspace key, etc. They will review what it means to have safe and unsafe behaviors when using a device.

Lesson 2 - My online community
Students explore the concept that people can connect with one another through the Internet. They understand how the ability for people to communicate online can unite a community. Students discuss the nature of the Internet, and understand that while it is not a “real” physical place, it is made up of real people. They use a graphic representation to explain the different in-person

Resources:

Lesson 1:Ipad navigation and using them properly

- Parts of an iPad online worksheet
- Safari App (Ipad)
- Chrome app (Chromebook)

Lesson 2 - My online community

- TweetSheetsforClassroomTwitter-1.pdf

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connections they have with their family, friends, and community.	
Lesson 3 - Show respect online Students explore the similarities and differences between in-person and online communications, and then learn how to write clear and respectful communication. Students begin by discussing how to be clear and respectful when they talk with people, either face to face or on the telephone. They explore the concept of tone, then compare and contrast what it is like to communicate face to face versus online. Students learn some rules that can help them express themselves clearly and respectfully when they write messages. They then apply what they have learned by editing an email message.	Lesson 3 - Show respect online ● Notes App (Ipad) ● Show Some Respect
Lesson 4 - Writing good emails Students explore the components of a well-written email. Students learn that such emails have a 5-part structure that is similar to that of traditional letters. Students then analyze the parts of an email, making note of the subtle differences. Lastly, students try to identify and correct seven errors in an email, keeping in mind five proofreading guidelines.	Lesson 4 - Writing good emails ● Sending Email: a K-2 Digital Citizenship Le…
Lesson 5 - Powerful passwords Students explore why people use passwords, learn the benefits of using passwords, and discover strategies for creating and keeping strong, secure passwords. Students learn password tips, test their existing passwords with an interactive game, and create new passwords using guidelines for powerful passwords.	Lesson 5 - Powerful passwords ● Password Creator Guidelines How to make a strong password How to Create a Strong Password https://www.security.org/how-secure-is-my-password/
Lesson 6: Using the search bar Students will learn what “keywords” are and how to use them in a search bar to find websites. They will also determine which websites that appear in the search results are relevant and useful.	Lesson 6: Using the search bar ● Effectively use keywords in search Search Keywords Tutorial Using Keywords
Lesson 7: Using hyperlinks and developing searching skills Students will learn how use hyperlinks to find important information and develop web browsing skills. Learning to use QR codes to access information.	Lesson 7: Using hyperlinks and developing searching skills ● Google QR creator within Chrome Search Engine ● QR code linked to pbskids.org ● https://pbskids.org/ (students access both ways) ● What is a hyperlink? ○ What is a hyperlink example?
Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to struggling and/or Special Needs Section for differentiation.	

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High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Adaptation of materials and requirements Elevated text or question complexity Independent student options Projects completed individually or with partners Self-selection of research Open-ended activities Expert mentorship	Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	**Materials** Provide pictures Provide text in alternative formats, such as large print, audio formats, or digital text Use peer readers Permit highlighting of text List discussion questions prior to reading text Vocabulary lists and/or study guides Provide lecture notes/outline Provide model or example **Environment** Reduce visual or auditory distractions Preferential seating Post a visual schedule Emphasize multi-sensory learning **Directions** Use oral, recorded, and/or printed directions with pictures Highlight key words in directions Give brief and concrete directions Have student verbalize steps	**Materials** Decreased text or question complexity Provide page numbers or highlighted texts Shorten assignments to focus on key concepts **Grading** Provide partial grade based on individual progress or effort Use recognition tests (true-false, multiple choice, or matching) instead of short answer Provide a vocabulary list with definitions Modified rubrics

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		Repeat, clarify, or reword directions **Time** Alert students before transitions Provide additional time for tasks Extra response time	

Unit Title: Grade 2 -- Unit 2 -- Applications

Stage 1: Desired Results

Standards & Indicators:

NJSLS for Mathematics

- MP 1 Make sense of problems and persevere in solving them.
- MP 2 Reason abstractly and quantitatively.
- MP 6 Attend to precision.
- 2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 2.OA..2 With accuracy and efficiency, add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
- 2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
- 2.NBT.1. - Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.	Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.
8.1.2.CS.2	Explain the functions of common software and hardware components of computing systems.	A computing system is composed of software and hardware.
8.1.2.CS.3	Describe basic hardware and software problems using accurate terminology.	Describing a problem is the first step toward finding a solution when computing systems do not work as expected.
8.1.2.NI.4	Explain why access to devices need to be secured.	Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and

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		information from unauthorized access.
8.1.2.IC.1	Compare how individuals live and work before and after the implementation of new computing technology.	Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools).
8.1.2.DA.1	Collect and present data, including climate change data, in various visual formats.	Individuals collect, use, and display data about individuals and the world around them.
8.1.2.DA.2	Store, copy, search, retrieve, modify, and delete data using a computing device.	Computers store data that can be retrieved later. Data can be copied, stored in multiple locations, and retrieved.

Career Readiness, Life Literacies and Key Skills		
Standard	**Performance Expectations**	**Core Ideas**
9.4.2.CI.2	Demonstrate originality and inventiveness in work.	Brainstorming can create new, innovative ideas.
9.4.2.IML.1	Identify a simple search term to find information in a search engine or digital resource.	Digital tools and media resources provide access to vast stores of information that can be searched.
9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool.	Digital tools have a purpose.
9.4.2.TL.2	Create a document using a word processing application.	
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools.	

Central Idea / Enduring Understanding:

Students will…

- Learn how to take a test on a device.
- Learn how to navigate Google Classroom.
- Learn how to create and submit a Google Doc through Google Classroom.
- Learn basic tools in a toolbar.
- Understand what a slide presentation program is and know when it would be appropriate to use it.
- Learn how to create a new slide presentation.
- Learn how to add additional slides and change the slide layout.
- Learn how to change the theme of a Slides presentation.
- Learn how to present their slide presentations.

Essential/Guiding Question:

- How do you take a test on a device?
- How do you use Google Classroom?
- How do you create and submit a Google Doc using Google Classroom?
- What are and how do you use the basic tools in the toolbar?
- How do you create a new Slides presentation?
- What are the tools used to create a slide presentation and how do you use them?
- How do you present a slide presentation?

Content:

- Internet
- Google Classroom
- Google Docs
- Toolbar
- Google Slides

Skills (Objectives):

- Use test taking strategies to complete practice tests on an iPad.
- Use Google Classroom effectively and appropriately.
- Create and submit a Google Doc through Google Classroom.
- Explain and use basic tools in a toolbar.
- Create a new Slides presentation.

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	• Add a new slide and change the slide layout to their Slides presentation. • Change the theme of a Slides presentation. • Present their slide presentation.

Interdisciplinary Connection(s):

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- RI.CR.2.1. - Ask and answer such questions as who, what, where, when, why, and how in an informational text to demonstrate understanding of key details in a text.
- L.VL.2.2- Determining or clarify the meaning of unknown and multiple- meaning words and phrases based on grade 2 reading and content, choosing flexibly from an array of strategies
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- W.WP.2.4. - With guidance and support from adults and peers, develop and strengthen writing as needed by planning, revising and editing.
- W.WP.2.4.C- With feedback and digital or print tools such as a primary dictionary, find and correct errors.
- W.SE.2.7- Engage in both collaborative and independent writing tasks regularly, including extended and shorter time frames.
- SL.PE.2.1. - Participate in collaborative conversations with diverse partners about Grade 2 topics and texts with peers and adults in small and larger groups.

NJSLS for Science

- K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

NJSLS for Social Studies

- 6.1.5.EconNM.4: Explain how creativity and innovation resulted in scientific achievement and inventions in many cultures during different historical periods.
- 6.1.5.EconGE.1: Explain how the development of communication systems has led to increased collaboration and the spread of ideas throughout the United States and the world.
- 6.1.5.CivicsHR.4: Identify actions that are unfair or discriminatory, such as bullying, and propose solutions to address such actions.

Stage 2: Assessment Evidence

Performance Task(s):	Other Evidence:
• Student classwork/projects • Student demonstration • Class/partner/group discussion • Self-assessments • Peer-assessments • Turn and Talk • Various class activities and games • Self-reflection • Exit tickets/questions • Student presentations	• Teacher observation • Student/Teacher conference

Stage 3: Learning Plan

Learning Opportunities/Strategies:	Resources:
Lesson 1: Test taking strategies	Lesson 1: Test taking strategies

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Students will learn the strategies needed to take a test using an iPad. They will learn how to login to a practice test and how to navigate through questions and testing windows. Students will also learn test taking strategies. They will learn to look for radio buttons ("circle answer choices"), multiple answer boxes ("square answer choices"), short answer text box, etc. to determine how to answer the question.	• MAP testing video • MAP testing app • MAP practice test
Lesson 2: Using Google Classroom Students will learn how to navigate Google Classroom. They will learn how to use it to communicate with the teacher and classmates.	Lesson 2: Using Google Classroom • Google Classroom app • Google Docs app
Lesson 3: Creating and submitting a Doc through Google Classroom Students will review how to create a new document and type their name, words, and sentences into a word processor. They will look for the cursor, or the "blinking line," that shows where the words appear. They will type sentences using proper spacing, make capital letters, and period at the end of a sentence. Students will review how to use the "power keys" in a doc, which include the return key, shift key, caps lock, and backspace. They will submit assignments through Google Classroom.	Lesson 3: Creating and submitting a Doc through Google Classroom • Google Classroom app • Google Docs app
Lesson 4: Using the toolbar Students will learn how to use the commonly used tools in a toolbar in Google Docs, such as changing the size, style, and color.	Lesson 4: Using the toolbar • Google Docs app
Lesson 5: Create a Slides presentation Students will learn what a slide presentation is and when it would be practical and useful. They will learn how to create a new slide presentation and add text into text boxes.	Lesson 5: Create a Slides presentation • Google Slides app
Lesson 6: Adding a new slide and changing the layout Students will learn how to add a new slide and change the slide layout.	Lesson 6: Adding a new slide and changing the layout • Google Slides app
Lesson 7: Changing the Slides presentation theme Students will learn how to change the theme of a slide presentation.	Lesson 7: Changing the Slides presentation theme • Google Slides app
Lesson 8: Presenting a Slides presentation Students will learn how to show their slide presentation in full screen. They will share their completed projects with the class. Students will have an opportunity to make commendations and recommendations. Critiques will help students improve future slide presentations.	Lesson 8: Presenting a Slides presentation • Google Slides app
Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to struggling and/or Special Needs Section for differentiation.	

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High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Adaptation of materials and requirements Elevated text or question complexity Independent student options Projects completed individually or with partners Self-selection of research Open-ended activities Expert mentorship	Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	**Materials** Provide pictures Provide text in alternative formats, such as large print, audio formats, or digital text Use peer readers Permit highlighting of text List discussion questions prior to reading text Vocabulary lists and/or study guides Provide lecture notes/outline Provide model or example **Environment** Reduce visual or auditory distractions Preferential seating Post a visual schedule Emphasize multi-sensory learning **Directions** Use oral, recorded, and/or printed directions with pictures Highlight key words in directions Give brief and concrete directions Have student verbalize steps	**Materials** Decreased text or question complexity Provide page numbers or highlighted texts Shorten assignments to focus on key concepts **Grading** Provide partial grade based on individual progress or effort Use recognition tests (true-false, multiple choice, or matching) instead of short answer Provide a vocabulary list with definitions Modified rubrics

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		Repeat, clarify, or reword directions **Time** Alert students before transitions Provide additional time for tasks Extra response time	

Unit Title: Grade 2 -- Unit 3 -- Coding

Stage 1: Desired Results

Standards & Indicators:

NJSLS for Mathematics

- MP 1 Make sense of problems and persevere in solving them.
- MP 2 Reason abstractly and quantitatively.
- MP 6 Attend to precision.
- 2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 2.OA.2 With accuracy and efficiency, add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
- 2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
- 2.NBT.1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.
- 2.G.1. - Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- 2.G.2. - Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
- 2.G.3. - Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. For example, students partition a rectangle (i.e. the whole) into three equal shares, identify each of the shares as a ‘third’ and describe the rectangle as three ‘thirds’.

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.	Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.
8.1.2.CS.2	Explain the functions of common software and hardware components of computing systems.	A computing system is composed of software and hardware.
8.1.2.CS.3	Describe basic hardware and software	Describing a problem is the first step

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	problems using accurate terminology.	toward finding a solution when computing systems do not work as expected.
8.1.2.NI.4	Explain why access to devices need to be secured.	Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and information from unauthorized access.
8.1.2.IC.1	Compare how individuals live and work before and after the implementation of new computing technology.	Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools).
8.1.2.DA.3	Identify and describe patterns in data visualizations.	Data can be used to make predictions about the world.
8.1.2.DA.4	Make predictions based on data using charts or graphs.	
8.1.2.AP.1	Model daily processes by creating and following algorithms to complete tasks.	Individuals develop and follow directions as part of daily life. A sequence of steps can be expressed as an algorithm that a computer can process.
8.1.2.AP.2	Model the way programs store and manipulate data by using numbers or other symbols to represent information.	Real world information can be stored and manipulated in programs as data (e.g., numbers, words, colors, images).
8.1.2.AP.3	Create programs with sequences and simple loops to accomplish tasks.	Computers follow precise sequences of steps that automate tasks.
8.1.2.AP.4	Break down a task into a sequence of steps.	Complex tasks can be broken down into simpler instructions, some of which can be broken down even further.
8.1.2.AP.5	Describe a program's sequence of events, goals, and expected outcomes.	People work together to develop programs for a purpose, such as expressing ideas or addressing problems. The development of a program involves identifying a sequence of events, goals, and expected outcomes, and addressing errors (when necessary).
8.1.2.AP.6	Debug errors in an algorithm or program that includes sequences and simple loops.	
Career Readiness, Life Literacies and Key Skills		
Standard	**Performance Expectations**	**Core Ideas**
9.2.2.CAP.1	Make a list of different types of jobs and describe the skills associated with each job.	Different types of jobs require different knowledge and skills.
9.4.2.CI.1	Demonstrate openness to new ideas and perspectives.	Brainstorming can create new, innovative ideas.

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9.4.2.CI.2	Demonstrate originality and inventiveness in work.	
9.4.2.CT.2	Identify possible approaches and resources to execute a plan.	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	
9.4.2.TL.1	Identify the basic features of a digital tool and explain the purpose of the tool.	Digital tools have a purpose.
9.4.2.TL.4	Navigate a virtual space to build context and describe the visual content.	
9.4.2.TL.7	Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts.	Collaboration can simplify the work an individual has to do and sometimes produce a better product.

Central Idea / Enduring Understanding:

Students will…

- Review the basics of computer programming, such as move forward, turn, and “light” (action) that are used to program lightbot robot in the Lightbot app.
- Understand how to use the basic computer programming commands to create procedures that will control the movement of their lightbot robot in the Lightbot app.
- Understand how to use loops to control the movement of their lightbot robot in the Lightbot app.
- Use strategies in critical thinking, problem solving, and troubleshooting to complete coding puzzles in the Lightbot app.
- Understand how to use loops and actions to control the movement of their character in the Scratch Jr app.
- Understand special action commands, such as “Looks Blocks,” “Sound Blocks,” and “Control Blocks,” to control the movement and actions of their character in the Scratch Jr app.
- Understand how to program multiple characters to use advanced action commands in the Scratch Jr app.
- Understand how to use strategies in creativity, critical thinking, problem solving, and troubleshooting to determine their own way to make their character(s) do advanced movements on the screen.
- Build a robot using special block pieces and control movement using the Robo Wunderkind Live app.
- Program the movements of their robot using code.
- Learn what sensors are, how they work, and how they help a robot.

Essential/Guiding Question:

- What are procedures in computer programming and how do you use them?
- What are loops in computer programming and how do you use them?
- How do you use loops and actions to control the movement of a character in the Scratch Jr app?
- What are special action commands, such as “Looks Blocks,” “Sound Blocks,” and “Control Blocks,” and how are they used to control the movement and actions of their character in the Scratch Jr app?
- How do you build a robot using the Robo Wunderkind block pieces and how do you control its movement?
- How do you use code to control the movement of a Robo Wunderkind robot?
- What are sensors, how do they work, and how do they help a robot?

Technology Enrichment - Grade 2

Content:
- Computer programmer
- Computer program
- Code
- Command
- Algorithm
- Sequence
- Debug

Skills (Objectives):
- Use procedures to control the movement of their Lightbot robot in the Lightbot app.
- Use loops to control the movement of their Lightbot robot in the Lightbot app.
- Use loops and actions to control the movement of their character in the Scratch Jr app.
- Use special action commands, such as “Looks Blocks,” “Sound Blocks,” and “Control Blocks,” to control the movement and actions of their character in the Scratch Jr app.
- Build a robot using Robo Wunderkind kit block pieces and control its movement using the Robo Wunderkind Live app.
- Program the movements of their Robo Wunderkind robot using code.
- Explain what sensors are, how they work, and how they help a robot.

Interdisciplinary Connection(s):

NJSLS for Language Arts Literacy
- SL.PE.2.1. - Participate in collaborative conversations with diverse partners about Grade 2 topics and texts with peers and adults in small and larger groups.
- SL.II.2.2. - Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- SL.ES.2.3. - Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- S.PI.2.4. - Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.
- SL.AS.2.6. - Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
- L.WF.2.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

NJSLS for Science
- K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

NJSLS for Social Studies
- 6.1.5.EconNM.4: Explain how creativity and innovation resulted in scientific achievement and inventions in many cultures during different historical periods.
- 6.1.5.EconGE.1: Explain how the development of communication systems has led to increased collaboration and the spread of ideas throughout the United States and the world.
- 6.1.5.CivicsHR.4: Identify actions that are unfair or discriminatory, such as bullying, and propose solutions to address such actions.

Stage 2: Assessment Evidence

Performance Task(s):
- Student classwork/projects
- Student demonstration
- Class/partner/group discussion

Other Evidence:
- Teacher observation
- Student/Teacher conference

Technology Enrichment - Grade 2

• Self-assessments • Peer-assessments • Turn and Talk • Various class activities and games • Self-reflection • Exit tickets/questions	
Stage 3: Learning Plan	
Learning Opportunities/Strategies: Lesson 1: Using procedures to code Lightbot Students will review the basics of computer programming, such as move forward, turn, and "light" (action), to control the movement of their Lightbot robot in the app. In this lesson, they will learn more advanced commands. They will learn how to use the basic commands to create procedures that will control the movement of their robot. Students will use strategies in critical thinking, problem solving, and troubleshooting to complete coding puzzles.	**Resources:** Lesson 1: Using procedures to code Lightbot • Lightbot app
Lesson 2: Using loops to code Lightbot Students will learn the more advanced commands in computer programming through the Lightbot app. They will learn how to use loops to control the movement of their Lightbot robot. Students will use strategies in critical thinking, problem solving, and troubleshooting to complete coding puzzles.	Lesson 2: Using loops to code Lightbot • Lightbot app
Lesson 3: Using loops and actions to code a Scratch Jr character Students will review the basics of computer programming, such as move forward and turn, to control the movement of their character in the Scratch Jr app. They will learn how to use loops and actions to control the freestyle movement of their character. Students will use strategies in creativity, critical thinking, problem solving, and troubleshooting to determine their own way to make their character move on the screen.	Lesson 3: Using loops and actions to code a Scratch Jr character • Scratch Jr app
Lesson 4: Using advanced action commands to code a Scratch Jr character Students will learn the more advanced commands of computer programming through the Scratch Jr app. They will learn special action commands, such as "Looks Blocks," "Sound Blocks," and "Control Blocks," to control the movement and actions of their character. They can program multiple characters to use advanced action commands. Students will use strategies in creativity, critical thinking, problem solving, and troubleshooting to determine their own way to make their character(s) do advanced movements on the screen.	Lesson 4: Using advanced action commands to code a Scratch Jr character • Scratch Jr app

Technology Enrichment - Grade 2

Lesson 5: Building and controlling a Robo Wunderkind robot Students will build a robot using the kit block pieces and control movement using the Robo Wunderkind Live app. Students will brainstorm and collaborate on ways to put the pieces together and control how it will move.	Lesson 5: Building and controlling a Robo Wunderkind robot ● Robo Wunderkind Kit ● Robo Wunderkind Live app
Lesson 6: Building and coding a Robo Wunderkind robot Students will build a robot using the kit block pieces and Lego pieces. They will use the Robo Wunderkind Code app to program the movements of their robot. Students will brainstorm and collaborate on different ways to put the pieces together and which code commands they will use to control how it will move.	Lesson 6: Building and coding a Robo Wunderkind robot ● Robo Wunderkind Kit ● Robo Wunderkind Code app
Lesson 7: Using sensors on a Robo Wunderkind robot Students will learn what sensors are, how they work, and how they help a robot. They will build a robot with sensors. They will use the Robo Wunderkind Code app to code the robot with sensors. Students will collaborate on ways to put the pieces together and which code commands they will need to use with the sensors.	Lesson 7: Using sensors on a Robo Wunderkind robot ● Robo Wunderkind Kit ● Robo Wunderkind Code app

Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to struggling and/or Special Needs Section for differentiation.

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Adaptation of materials and requirements Elevated text or question complexity Independent student options Projects completed individually or with partners Self-selection of research Open-ended activities Expert mentorship	Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	**Materials** Provide pictures Provide text in alternative formats, such as large print, audio formats, or digital text Use peer readers Permit highlighting of text List discussion questions prior to reading text Vocabulary lists and/or study guides Provide lecture notes/outline Provide model or example **Environment**	**Materials** Decreased text or question complexity Provide page numbers or highlighted texts Shorten assignments to focus on key concepts **Grading** Provide partial grade based on individual progress or effort Use recognition tests (true-false, multiple choice, or matching) instead of short answer Provide a vocabulary list with definitions Modified rubrics

		Reduce visual or auditory distractions Preferential seating Post a visual schedule Emphasize multi-sensory learning **Directions** Use oral, recorded, and/or printed directions with pictures Highlight key words in directions Give brief and concrete directions Have student verbalize steps Repeat, clarify, or reword directions **Time** Alert students before transitions Provide additional time for tasks Extra response time	

Unit Title: Grade 2 -- Unit 4 -- STEAM

Stage 1: Desired Results

Standards & Indicators:

NJSLS for Mathematics

- MP 1 Make sense of problems and persevere in solving them.
- MP 2 Reason abstractly and quantitatively.
- MP 6 Attend to precision.
- 2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 2.OA.B.2 With accuracy and efficiency, add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

Technology Enrichment - Grade 2

- 2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
- 2.NBT.1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.
- 2.G.1. - Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- 2.G.2. - Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
- 2.G.3. - Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. For example, students partition a rectangle (i.e. the whole) into three equal shares, identify each of the shares as a 'third' and describe the rectangle as three 'thirds'.

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.1.2.CS.1	Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.	Individuals use computing devices to perform a variety of tasks accurately and quickly. Computing devices interpret and follow the instructions they are given literally.
8.1.2.CS.2	Explain the functions of common software and hardware components of computing systems.	A computing system is composed of software and hardware.
8.1.2.CS.3	Describe basic hardware and software problems using accurate terminology.	Describing a problem is the first step toward finding a solution when computing systems do not work as expected.
8.1.2.NI.4	Explain why access to devices need to be secured.	Connecting devices to a network or the Internet provides great benefits, but care must be taken to use authentication measures, such as strong passwords, to protect devices and information from unauthorized access.
8.1.2.IC.1	Compare how individuals live and work before and after the implementation of new computing technology.	Computing technology has positively and negatively changed the way individuals live and work (e.g., entertainment, communication, productivity tools).
8.2.2.ED.1	Communicate the function of a product or device.	Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.	
8.2.2.ED.3	Select and use appropriate tools and materials to build a product using the design process.	
8.2.2.ED.4	Identify constraints and their role in the engineering design process.	Limitations (constraints) must be considered when engineering designs.
8.2.2.NT.1	Model and explain how a product works after taking it apart, identifying the relationship of each	Innovation and the improvement of existing technology involves creative

Technology Enrichment - Grade 2

	part, and putting it back together.	thinking.
8.2.2.NT.2	Brainstorm how to build a product, improve a designed product, fix a product that has stopped working, or solve a simple problem.	
Career Readiness, Life Literacies and Key Skills		
Standard	**Performance Expectations**	**Core Ideas**
9.2.2.CAP.1	Make a list of different types of jobs and describe the skills associated with each job.	Different types of jobs require different knowledge and skills.
9.4.2.CI.1	Demonstrate openness to new ideas and perspectives.	Brainstorming can create new, innovative ideas.
9.4.2.CI.2	Demonstrate originality and inventiveness in work.	
9.4.2.CT.2	Identify possible approaches and resources to execute a plan.	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools.	Digital tools have a purpose.
9.4.2.TL.7	Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts.	Collaboration can simplify the work an individual has to do and sometimes produce a better product.

Central Idea / Enduring Understanding:

Students will…

- Understand what stop motion animation is.
- Understand how to make a stop motion animation
- Understand how to use stop motion animation to tell a story.
- Understand different types of stop motion animation.
- Understand how to use different materials to make different types of stop motion animation.
- Create different types of circuits with multiple functionality.
- Create their own circuits using the components provided in the snap circuit kit.
- Learn the concepts of energy, design, and engineering that are used in vehicles.
- Design and create a car, boat, and plane using craft materials.

Essential/Guiding Question:

- What is stop motion animation and how do you create a stop motion animation?
- How can you use stop motion to tell a story?
- What are the different types of stop motion animations?
- How do you create a circuit with multiple functionality?
- How do you create your own circuit?
- What are the concepts of energy, design, and engineering that are used in vehicles (cars, boats, or planes) and how do you use those principles to design and create a vehicle (car, boat, or plane) using craft supplies?

Content:

- Stop motion animation
- Electricity
- Circuits
- Energy
- Design
- Engineering
- Vehicles

Skills (Objectives):

- Create a stop motion animation.
- Tell a story using stop motion animation.
- Create different types of stop motion animation by using different materials.
- Create different types of circuits with multiple functionality.
- Create their own circuits using the components provided in the snap circuit kit.
- Explain the concepts of energy, design, and engineering that are used in vehicles and design

Technology Enrichment - Grade 2

	and build a car, boat, and plane using craft materials.

Interdisciplinary Connection(s):

NJSLS for Language Arts Literacy

- SL.PE.2.1. - Participate in collaborative conversations with diverse partners about Grade 2 topics and texts with peers and adults in small and larger groups.
- SL.II.2.2. - Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- SL.ES.2.3. - Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- S.PI.2.4. - Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences.
- SL.AS.2.6. - Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.
- L.WF.2.1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

NJSLS for Science

- K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
- K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

NJSLS for Social Studies

- 6.1.5.EconNM.4: Explain how creativity and innovation resulted in scientific achievement and inventions in many cultures during different historical periods.
- 6.1.5.EconGE.1: Explain how the development of communication systems has led to increased collaboration and the spread of ideas throughout the United States and the world.
- 6.1.5.CivicsHR.4: Identify actions that are unfair or discriminatory, such as bullying, and propose solutions to address such actions.

Stage 2: Assessment Evidence

Performance Task(s):	Other Evidence:
• Student classwork/projects • Student demonstration • Class/partner/group discussion • Self-assessments • Peer-assessments • Turn and Talk • Various class activities and games • Self-reflection • Exit tickets/questions	• Teacher observation • Student/Teacher conference

Stage 3: Learning Plan

Learning Opportunities/Strategies:	Resources:
Lesson 1: Create a stop motion animation Students will learn: what is a stop motion animation, why it is used, and how to make a stop motion animation. They	Lesson 1: Create a stop motion animation • Stop Motion Studio app

Technology Enrichment - Grade 2

will view and discuss example stop motions movies. Students will use creativity, communication, and collaboration to create their own stop motion animations using a few objects.	
Lesson 2: Storytelling through stop motion Students will continue to expand on their understanding of stop motion. They will learn about different ways it can be used to tell different types of stories. Students will use creativity, communication, and collaboration to create their own stop motion animations using a variety of objects.	Lesson 2: Storytelling through stop motion ● Stop Motion Studio app
Lesson 3: Making different types of stop motion Students will continue to expand on their understanding of stop motion. They will learn about how they can use different materials, such as a whiteboard and small objects, to make different types of stop motion. Students will use creativity, communication, and collaboration to create their own stop motion animations using a variety of materials.	Lesson 3: Making different types of stop motion ● Stop Motion Studio app
Lesson 4: Create multi-functioning circuits Students will review the fundamentals of electronic circuits and understand how they are used in technology devices. They will use the snap circuit kit to create different types of circuits with multiple functionality, such as shining a light bulb and spinning a motor. They will use strategies in critical thinking, problem solving, creativity, communication, and collaboration to complete circuit challenges.	Lesson 4: Create multi-functioning circuits ● Snap Circuit Kit
Lesson 5: Create your own circuits Students will be able to apply what they learned about circuits to manipulate and create their own circuits using the components provided in the snap circuit kit.	Lesson 5: Create your own circuits ● Snap Circuit Kit
Lesson 6: Create a car Students will be introduced to concepts of energy, design, and engineering that are used in cars. They will use these concepts to design and create a car. They will use problem solving and critical thinking skills to build, re-design, and test their car.	Lesson 7: Create a car ● Design and Play STEAM Kit
Lesson 7: Create a boat Students will be introduced to concepts of energy, design, and engineering that are used in boats. They will use these concepts to design and create a boat. They will use problem solving and critical thinking skills to build, re-design, and test their boat.	Lesson 7: Create a boat ● Design and Play STEAM Kit
Lesson 8: Create a plane Students will be introduced to concepts of energy, design, and engineering that are used in planes. They will use	Lesson 8: Create a plane ● Design and Play STEAM Kit

Technology Enrichment - Grade 2

these concepts to design and create a plane. They will use problem solving and critical thinking skills to build, re-design, and test their plane.	

Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to struggling and/or Special Needs Section for differentiation.

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Adaptation of materials and requirements Elevated text or question complexity Independent student options Projects completed individually or with partners Self-selection of research Open-ended activities Expert mentorship	Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	**Materials** Provide pictures Provide text in alternative formats, such as large print, audio formats, or digital text Use peer readers Permit highlighting of text List discussion questions prior to reading text Vocabulary lists and/or study guides Provide lecture notes/outline Provide model or example **Environment** Reduce visual or auditory distractions Preferential seating Post a visual schedule Emphasize multi-sensory learning **Directions** Use oral, recorded, and/or printed directions with pictures Highlight key words in directions Give brief and concrete directions	**Materials** Decreased text or question complexity Provide page numbers or highlighted texts Shorten assignments to focus on key concepts **Grading** Provide partial grade based on individual progress or effort Use recognition tests (true-false, multiple choice, or matching) instead of short answer Provide a vocabulary list with definitions Modified rubrics

		Have student verbalize steps Repeat, clarify, or reword directions **Time** Alert students before transitions Provide additional time for tasks Extra response time	

Technology Enrichment

Pacing Guide

Grade 2

Units	Unit TOTAL*	Cumulative TOTAL**
Unit 1 – iPad Navigation and Digital Citizenship	**7 days**	**7 days**
Unit 2 – Applications	**8 days**	**15 days**
Unit 3 – Coding	**7 days**	**22 days**
Unit 4 – STEM	**8 days**	**30 days**
		30 days

* Unit Total is inclusive of introduction, instruction, assessment for that particular topic.

** Cumulative Total is a running total, inclusive of prior and current topics.