

RCSD Secondary Curriculum Department

Middle / High Instructional Technologists

Catherine Beasley Middle / High School Social Studies

Sheri Blankenship Director of Secondary Curriculum, Instruction, and Professional Development

Middle / High School English Language Arts &

Jana Comer Middle / High School English Language Arts Curriculum Specialist

Executive Director of Academics

Montgomery Hinton College and Career Ready Preparation

Administrative Assistant

Dr. Rhonda Kilgo & Jasmine Rosemon Middle / High School Mathematics Curriculum Specialists

> Cassondra Vanderford Director of Career Technical Education and Acceleration

Dr. LaVonda White Insturctional Data Specialist

Lorie Yates Middle / High School Science Curriculum Specialist

Guest Contributers

Matthew Rice, Richland High School Maegan Speights, Northwest Rankin Middle School Kimberly Watson, Pelahatchie High School



PROJECT BASED

EARNING

C O N N E C T

7 | BOOK REVIEW

Ross Cooper and Erin Murphy map out the implementation of changing the classroom culture in Project Based Learning: Real Questions. Real Answers. How to Unpack PBL and Inquiry. These two authors share all things project based that fully engaged this reader. by Margo West

8 BUILDING AN ECO BOTTLE

The goal of this project was to get students to learn about biotic and abiotic factors of an environment, the components of a healthy ecosystem, and how cycles of matter work, all while creating something that they could take home and potentially keep for many many years. The scope of this project within the PBL frame is on the lighter side. by Matthew Rice



11 GETTING STARTED WITH PROJECT BASED LEARNING IN THE MATH CLASSROOM

As a math teacher, I was very overwhelmed when I was first introduced to the concept of project based learning. My thoughts were: "I don't have time for that!" and "I'm not covering all the standards as-is; I surely won't if I try to incorporate a big project for every unit!". Fortunately, PBL doesn't have to be all or nothing. by Maegan Speights

14 LET'S TALK ABOUT C.A.K.K.E

I hope inviting you into my learning environment and sharing my experience feeds your curiosity of project based learning (PBL) and makes you hungry to practice PBL yourself, leaving this space with a better understanding of the steps to implementing PBL in your classroom and igniting your learners' curiosity and self - esteem. by Kimberly Watson



8 | SQUIRMY SCIENCE

Squirmy Science is a project based assignment that Florence Middle and Brandon Middle have been using for several years as part of their 6th grade ecology unit. Through this project, students learn about the engineering design process, make observations of mealworms, and conduct research on what factors contribute to healthy habitats and ecosystems. by Lorie Yates



21 CULTIVATING CLASSROOM ENGAGEMENT WITH THE 4 C'S By utilizing the 4 C's, we can help our

students take ownership of their learning, creating a learner-led environment and enhancing student engagement. by Erin Barrios & Stephanie Cotnam

The Project Based Learning Issue



IU WAICH:

Since the establishment of K-12 schools, a primary focus of educators has always been to provide students with the knowledge and skills necessary to succeed in a world beyond the classroom. That primary focus has not changed; however, the picture of what success looks like in the real world and how we prepare students for it has definitely evolved.

Consider the list provided at the bottom of the next page which is a list of the top 10 skills CEOs are currently looking for when hiring. A comparison from 2015 to 2020 indicates how rapidly and intensely what our students need to be successful continues to change and adapt with our modern world.

As educators, then, we must work to provide students with the learning opportunities and experiences that will allow them to develop skills, both soft and conceptual, that will contribute to their engagement in school and their overall success. While the old adage that you "can take the horse to the water but can't make it drink" may be true, it is also possible to look at things from a new perspective and "add salt to the hay to make them thirsty" as Prince Ea says in his <u>Student vs. Teacher video</u>.

Project-Based Learning (PBL) is one type of salt that when sprinkled into the traditional instruction model, can make students thirsty for more knowledge. It propels students to develop as critical thinkers and problem solvers. Engaging in PBL requires students to take ownership of their own learning through real-world, meaningful projects and ultimately helps them to learn to think on a deeper level.

In this issue, you will learn more about what project-based learning could look like in various classrooms. We hope you will see some things that spark your interest. Happy Reading!

What is Project Based Learning?

Resources for Putting Your Project Based Learning Ideas into Practice.

Hear More About how it Worked in a Classroom.

TOP 10 Skills

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- . Critical Thinkin
- 3. Creativity
- 4. People Manage
- 5. Coordination v
- 6. Emotional Inte
- 7. Judgement an
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Getting Started with Project Based Learning in Your Classroom.

How You can Start Your Project Based Learning Journey!!

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IN 2015

- 1. Complex Problem Solving
- 2. Coordinating with Other
- 3. People Management
- 4. Critical Thinking
- 5. Negotiatior
- 6. Quality Control
- 7. Service Orientation
- 8. Judgement and Decision Making
- 9. Active Listening
- 10. Creativity

REDUCE GRADING TIME PROVIDE BETTER FEEDBACK

Check out the next issue for information about **STANDARDS – BASED GRADING**

*** * BOOK REVIEW * ***

Project Based Learning by Ross Cooper & Erin Murphy

Ross Cooper and Erin Murphy map out the implementation of changing the classroom culture in Project Based Learning: Real Questions. Real Answers. How to Unpack PBL and Inquiry. These two authors share all things project based.

Key take-aways:

The authors begin with "The Why" which is, of course, where we should start within our own classrooms.

Start with the end in mind. It should be second nature to any educator at this point, but sometimes we need to be reminded. In order for a unit to truly be project based, you have to know exactly what you want the students to master before you begin planning.

Reflect, reflect, reflect. Students and educators should reflect at every step. Skipping this crucial step can mean the difference in great work and exemplary work on both sides of the gradebook. "When you implement a solid structure, connect feedback to learning goals, and continually look to enhance your craft, you're bettering yourself as an educator while at the same time creating a learning environment that will allow your students to thrive - even in your absence" (p. 103).

Project Based Learning is a classroom culture not a strategy. Dumping a project at the end of a unit to fill time or do something fun is a strategy. Creating a unit around student choice is a culture. Be prepared to throw out any of your laminated lesson plan units you want to "adapt" to performance based learning.

Direct Instruction doesn't just magically disappear. It does, however, have to be planned and implemented strategically based on the students' needs. PBL provides students with ample opportunities to struggle productively with the understanding that they still need to be taught some skills before being thrown to the wolves.

The "shaded" pages or "How to avoid PBL pitfalls" - These are The Stuff. As I pored through the book with markers and post-its in hand, I found that the "shaded" pages were excellent, quick reference points packed with The Stuff I needed to get started. I found this book useful as a way of tiptoeing into the PBL starting point. The authors provided an excellent overview of the ins and outs of this classroom culture. In order to fully implement projects into my classroom, however, I feel like I need further resources.



by Margo West

English & Math Teacher

Florence Middle School





WHY BUILD AN ECO BOTTLE? The goal of this project was to get students to learn about biotic and abiotic factors of an environment, the components of a healthy ecosystem, and how cycles of matter work, all while creating something that they can take home and potentially keep for many many years. The scope of this project within the PBL frame is on the lighter side. There was a lot of guidance from myself, while still trying to give students as many opportunities to design and plan as I could.

I was inspired to do this project because I built my own eco bottle back in college, and it has survived, relatively untouched, for almost 10 years. I wanted my students to have a similar experience, all while learning important components of Environmental Science.

ESSENTIAL QUESTION How can we successfully simulate Earth's natural cycles within a jar that can sit on a kitchen counter or windowsill?

STANDARDS COVERED These standards were covered either directly or indirectly throughout this PBL unit. Some of the standards were directly associated with project activities, while others were taught in a more traditional way and then used to implement the project as background knowledge.

ENV.1.1 Identify, investigate, and evaluate the interactions of the abiotic and biotic factors that determine the types of organisms that live in major biomes

ENV.1.2 Evaluate evidence in nonfiction text to explain how biological or physical changes within biomes affect populations and communities and how changing conditions may result in altered ecosystems.

ENV.1.5 Develop and use models to diagram the flow of nitrogen, carbon, and phosphorus through the environment.

ENV.1.6 Use mathematics, graphics, and information text to determine how population density-dependent and density-independent limiting factors affect populations and diversity within ecosystems. Use technology to illustrate and compare a variety of population-growth curves.

ENV.1.7 Analyse and interpret quantitative data to construct explanations of how the carrying capacity of an ecosystem may change as the availability of resources changes.

LESSON SEQUENCE This project was introduced in the beginning of the year before we had covered any major topics within our class. We used the Eco Bottle project as a backdrop for many of the topics we covered throughout the 9 weeks and continued to reference it as we discussed new topics.

As we covered relevant information, we discussed how these topics would be implemented within the Eco Bottles.





INTRODUCING THE PROJECT On this day, we introduced the project. We started off by discussing how the Earth is able to sustain and produce life. This was set up as a Bell Ringer activity, where the students brainstormed the necessary components and resources that the Earth has that allow for all of the life that we have on Earth. Students' ideas tended to migrate towards resources like water, sunlight, and nutrients.

After this Bell Ringer, we completed a lesson on Abiotic and Biotic factors. This included identifying them within an ecosystem, finding them outside during a Nature Walk activity, and identifying how and why they are both necessary for a healthy, balanced ecosystem.

The project itself was then introduced. How can we build a system to simulate the Earth and how it can sustain itself, but small enough that you can keep it in your home? This led to a long discussion, ending up with the introduction of the Eco Bottles.

See attachment here: <u>Activity 1: Eco Bottle Brainstorming</u> for more information on this activity.

See a picture of an inspiration jar on page 4.

ECO BOTTLE PLANNING As we continued to learn new topics over the next few weeks, we discussed how each topic would be relevant for the Eco Bottles. Content included Abiotic and Biotic Factors, Cycles of Matter, Population Density, Community Interactions, and Carrying Capacity.

On this day of working specifically on the project, we used our previous knowledge to try and identify the purposes of each item that was gathered based on our Eco Bottle Brainstorming activity. Students wrote about the suspected purpose of each item, based on their previous knowledge after discussing each of the topics of the class. See attachment here: <u>Activity 2: Eco Bottle Planning</u> for more information on this activity.

ECO BOTTLE CYCLES OF MATTER ACTIVITY On this day of the project, we drew connections between the cycles of matter on Earth, and how the cycles of matter will still have to happen within the jars for there to be long-term success.

First we looked at the world's oldest living jar, with the following attached activity: <u>Activity 3: Exploring the Cycles of</u> <u>Matter Within Your Eco Jar</u>

BUILDING THE ECO BOTTLES After reviewing the supplies that my students brainstormed about, and examining the Eco Bottle Planning activities, supplies were purchased and collected. After all supplies had been purchased and collected, we were ready to begin our project.

We began to build our Eco Bottles by having a discussion of what we needed to start with first, second and so on. Students enjoyed this process as there was a group discussion where ideas were shared and reviewed, until a consensus was reached. 3 classes participated in this project, and each class produced their bottles slightly differently. This was a great opportunity to see the students implement their own artistic interpretations for their bottles, as this was something they would get to look at for a long time.

In general, the order of items placed within the jar, from bottom to top was as follows: Hydroballs, mesh screen, charcoal, soil, invertebrates, plants, moss, leaf litter and debris, water.

Jars were then sealed and placed on a windowsill, receiving indirect sunlight. Over the next week we checked on our Eco Bottles daily to monitor water condensation, plant health, and more.



Getting Started with **Project Based** Learning in the Math Classroom

As a math teacher, I was very overwhelmed when I was first introduced to the concept of project based learning. My thoughts were: "I don't have time for that!" and "I'm not covering all the standards as-is; I surely won't if I try to incorporate a big project for every unit!". Fortunately, Cooper and Murphy insist in their book Project Based Learning that PBL doesn't have to be all or nothing. You can incorporate certain elements of project based learning into what you are already doing in your classroom! They suggested looking at your standards and seeing if any lend themselves to realworld problem solving. My first unit that I cover with my 7th grade students is rational number operations, and I'm always looking for a way to jazz it up since math students notoriously loathe fractions and this unit is full of them. I asked myself what came to mind as a real-world application with fraction operations, and I immediately thought of cooking. I remembered a project that a college professor that I worked with conducted with her Elementary Education students where they adjusted a recipe (brookies, brownies, and Oreo balls!) to feed a certain number of people. I decided to try something similar with my students. I wanted to create a project where they would take a recipe and adjust it to feed the number of students in their class section. They would need to find the new amounts of each ingredient needed, determine how many packages of each ingredient would need to be purchased and what the cost of ingredients would be, and find the leftover amounts of each ingredient. I thought as a fun

Before we even got into our learning material for the unit, I followed Cooper and Murphy's suggestions for setting an appropriate class culture for project based learning. To build some teamwork skills, we completed the Marshmallow Towers Challenge as a class during the first week of school (here's a link for an explanation of this activity if you want to try it in your classroom!). I also set up a class Instagram account and had the students and their parents fill out permission slips for posting their pictures. I explained that I would be using the account to share updates of what we're doing in class, and I will also use it to post pictures of progress on their projects. I think taking the time to set this tone was important in getting students comfortable with working together and made them more excited when I introduced the project. Here's a peek at my instagram account from the day we completed the Marshmallow Towers Challenge! <u>speights_math</u> When it came to planning the project, the timeline, and how students would be assessed, I found the Real PBL Freebies resources to be incredibly helpful. I used the Project Planning Template to decide on my learning targets, key takeaways, assessments, and direct-instruction lessons. I used Cooper and Murphy's directions of rewording my NS standards into student-friendly language for the learning targets. You'll notice that I still plan on giving in-class quizzes and

incentive, I could have the students vote on a winning recipe in each class and I would make that recipe and bring it to class for them to enjoy. by Maegan Speights

Math Teacher

Northwest Rankin Middle School



a unit test during this unit - still gotta have grades in the gradebook! As my baby step towards incorporating PBL in my classroom, I'm making the project fit into my unit that I've already used in years past in my classroom. As I delve more into PBL, I'll work towards the goal of having the unit centered around the project rather than the project centered around the unit. Below is what my project planner looked like once I had it completed. give feedback on how they can improve on each standard within their project. I'll readjust their feedback as they make improvements and use the tool to determine each group's overall mastery of the standards. Here's a picture of my completed progress assessment tool, as well as one group's tool that I filled out after the completed the first checkpoint.

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I also used the Real PBL freebie called the <u>Progress</u> <u>Assessment Tool Template</u> to list how mastery of each learning target will be determined within the project. I created a Progress Assessment Tool for each of my student groups to share with them. On each of the project "checkpoint" days, I'll meet with each group and share on the document how well they're showing mastery of each standard and

PROGRESS ASSESSMENT TOOL				
Project Tible: Feed the Peoplel 7th Grade Math Unit 1 Project				
Learning Targets	Success Oritoria	Feedback		
i can convert a fraction to a decimal.	In section 2, you should convert at least one fraction to a decimal in your-operations. This must explain why you chose to convert that fraction to a decimal and why you chose not to convert a different fraction.			
Fcen add rational numbers.	In section 3, you must connectly find the total cent of your impredience.			
Fcen subtract rational numbers.	In section 4, you must connectly find the amount influenced such ingredient other fixeding the class.			
l can rewrite a subtraction problem as an addition problem.	In section 4, you must correctly rewrite at least one of your subtraction problems as an addition problem.			
I can multiply satismal numbers.	In centre 2, you must convertig use multiplication land deviated to find the amount of each improved the must uniplied recipie that will be resolved to lead the class. This must explain how you used multiplication in this process.			
Fcan divide solicial numbers.	In section 2, you must correctly use delixion (and multiplication) to find the answeri of each logradient from your original recipe that will be readed to lead the class. This must explain how you used delixion in this remote			

Learning Targets	Success Criteria	Feetback
I can convert a fraction to a decimal.	In section 2, you should convert at least one traction to a decimal in your operations.	Recipe does not have a fraction in the impredents - could you change one of your surplexes into a fraction and then applyin
	Now must explain why you chose to convert that haction to a decimal and why you chose not to convert a different fraction.	how it would convert to a decimal or whole number?
I can seld rational numbers.	In section 3, you must connectly field the total cost of your ingredients.	
i can subtract rational numbers.	In section 4, you must correctly find the anount leftower of each improtient after feeding the class.	
i can rewrite a subtraction problem as an addition problem.	In section 4, you must correctly rewrite at least one of your subtraction problems as an addition problem.	
i can multiple rational numbers.	In section 2, you must correctly use multiplication/and division? to find the ansard of such lagradient fram your original recipe that will be needed to find the class. This must explain how you used multiplication to this process.	"shewed that you are multiplying each impredient by 2-but why are you doing that? Now many people time, your anipled recipe fixed?
I can divide rational numbers.	In section 2, you must correctly use division	

Since I work with 7th graders, I figured they would need a lot of guidance and structure for their first project based learning experience. In order to help them keep their work organized, I created a Project Organizer for each group. This is just a Google Doc that is separated into the project's four different sections - the original recipe, new amounts needed, cost of ingredients, and leftover amounts. Under each section heading there are directions for that section and space for the groups to enter their work. I thought this would help to ensure that group members were able to stay on the same page and not lose any valuable work. I hoped that it might also prevent me from having to constantly repeat directions if they had them right in front of them while working :) Below is a picture of the Project Organizer that each group is given access to.

ention I - Original Recipe

Here you will push its type in uption a process of the property make that you' power has chosen. This maps should here 12 or long experiments

lection 2 - New Amounts Norded

Here you will find the new extension mention for each experiment during the fact live manifer of people or your write same. For each signations, you need to draw your each or explain how one politice around.

"This must convert of least one heater or a multival in the second exposit why you shows to acrive that fraction and dation account asymptotic terms."

TYPE represents must make how you used multiplicate with dynamic

Section 0 - Cast of Ingredients

You will look on Kitoper of Wei-Mari's website and link the ond of each of your ingestions. Remember you't need to be termine how many packages of each ingestions you will need (you might need more than one separating on how shull it to a package).

Explain here you determined how many packages you washi here his each impression

At the and of this section, find the little unit of the impediators.

Section 4 - Lefterer Amounts

In this leader, you will list incernsh of each repretent you will have leftown after making the mode to farm the class consider from much you had to buy and bear much you will meet to use planch repretents (

"You real search at least the Subjection problem as an another problem on the

I also created an introduction page that was passed out to students that covered the title of the project, overview of the directions, and dates for each project checkpoint. Creating these four documents took about two hours. Definitely a lot of planning and preparation, but I'm hoping it will be worth it if it gives my students even a glimmer of excitement about fractions!

We have currently covered adding, subtracting, and multiplying, and dividing rational numbers in our unit. Students have been introduced to the project and have been given access to their Project Organizers and Progress Assessment Tools via links to those Google docs in Canvas. They have all completed Section 1 by finding an original recipe that they want to adjust to feed the number of people in their class and Section 2 where they have adjusted the amount of ingredients needed. They're all excited about working with their groups and possibly having their recipe chosen to feed the class! I'm looking forward to seeing their progress and hope they form an appreciation for the real-world applications of fractions in cooking. For updates, follow us on Instagram @ <u>speights_math</u>!





Project Based Learning for Our Learners

by Kimberly Watson

World

Language

Teacher

Pelahatchie

High School

Let's talk about c.a.k.k.e. No, we are not going to discuss, queque, the sweet goodness that makes a birthday a birthday. Nor, by the the final word of this reading will you have the expertise to create the overly sweet deliciousness known as torta chilena or the popular milk soaked tres leches that pairs nicely with a good cup of cafecito on a Saturday afternoon. iQué rico! Let's talk about the steps to creating a kinetic-knowledgeable environment (c.a.k.k.e) with project based learning for our students. Being present in this space means we share something meaningful. You are committed to learning for your learners. While I cannot share torta chilena and cafecito with you, I hope inviting you into my learning environment and sharing my experience feeds your curiosity of project based learning (PBL) and makes you hungry to practice PBL yourself. After reading, I hope you leave this space with a better understanding of the steps to implementing PBL in your classroom and igniting your learners curiosity and self esteem.

The hispanic culture references might have given it away. I am a secondary world language educator of Spanish. Wait! Don't see this as merely an article for world language educators. World language learning environments are unique. They are like the sponge cake of the tres leches that draws upon authenticity, creativity and cross-curriculum collaboration to give it life. Take a moment and recall your most recent world language learning experience. Now, if we were having a conversation with cafecito and torta chilena, how would you describe that learning experience to me? Would you describe the instructional method as memorization or proficiency? Did the activities and tasks encourage learning and experimenting with the target language (TL) beyond the walls of your classroom? Did you practice repetitive grammar drills or embedded context output? What was your role?

Since my first year in the classroom ten years ago, authenticity remains a priority in world language curriculums. The American Council for Teachers of Foreign Language (ACTFL) leaves little doubt on their stance on the use of authentic resources or authentic learner created artifacts that connect to real-world, problem solving experiences. World language learners should be able to identify the targets they can do successfully as they work towards proficiency in their target language. Second language acquisition varies from person to person, after all. August marked the beginning of the third year in building our world language program at Pelahatchie High School. Two years have been invested, and slowly learners are understanding the value of proficiency over perfection. They are becoming aware that communication in the TL is an active problem-solving, situation that transcends the confines of a textbook with grammar drills.

Prior to introducing my Spanish II students to their PBL project, Nuestra carta para un/a estudiante nuevo/a (Our Letter to a New Student) we discussed projects and the PBL teaching method. This open-discussion gave me the opportunity to hear their voices and perspectives on tasks, activities and

projects. Many felt projects were extra responsibility and lacked their ownership. Yes. Our learners want to feel ownership. Generation Z does not conform to the status quo of conservative tradition, yet it continues to be widely used within our education system. Taking their perspective of projects into consideration, we began to discuss PBL and shifting the engrained idea of projects from a teacher centered environment to a learner led goal with teacher support and facilitation. Ironically, while Generation Z learners want ownership, our ever present traditional rote practices have conditioned them to conform to specific boxes in order to get 'x' grade that defines mastery. Usually, mastery is defined as a mark of "A." I find myself hitting the ever-present wall of fear as I work to move my learners to communicative based learning. They are fearful of being wrong, getting messy, or not having all the words to express their English based thoughts. Have you negotiated a compromise with a sixteen year old on being okay with sounding like a five year old in their TL?

As if preparing to make torta chilena, I began to carefully envision what I would consider a proficient marker for learners. Selecting specific Can-Do statements that would demonstrate mastery of a learning target. (i.e. "I can introduce myself." "I can introduce someone else." "I can assist someone in gathering information.") Educators know their classroom and their learners. It is important to work backwards from your learning goal. Do not look at the flawless torta chilena on the internet and expect yours to come out the exact same. Think about the hopes of contestants on Netflix's *Nailed It*!' For my learners, it was important to discuss PBL and the goal of the teaching method. This allowed them to buy into the process, trust me, and feel confident in



understanding the instructional method shift that was about to take place. I was asking them to embark on preparing a recipe in their second language as the chef and I as their sous chef. Trust is a crucial part in cultivating a safe space to explore a second language. The majority of their educational career can be described as being told something is either correct or incorrect.

Committing to the PBL process and focusing on teaching grammar in context became my instructional goals. To assist in creating a minimal stress environment we revisited a comprehensible input reader from their Spanish I course. As their initial introduction to PBL, I felt it crucial for them to feel confident in having a strong understanding of specific learning targets. Using Taruka, a character from Jennifer Degenhardt's La Chica Nueva (The New Girl) as the inspiration, learners were able to recall the main problem and conflict. Taruka's family moves to Connecticut from Bolivia for job opportunities for the parents. Unfortunately, there are cultural and language differences. Posted in the front of my classroom are ACTFL's World - Readiness Standards for Language Learning. Learners are constantly reminded of these as we move through our thematic units.

Reminding learners of our standards, they began to address the problem within the reader. Once they presented and discussed the conflict within the story, I facilitated a discussion of our real-world experience at Pelahatchie High School. This is an important step in the PBL process, as it identifies the problem scenario learners will work to find a solution. At the close of the brainstorming round-table, they identified our problem. Would a Spanish speaking student feel connected and/or seen at Petlahatchie High School, with the majority of the community being monolingual English speakers? Following their problem identification, learners sought to find solutions. They identified two immediate stakeholders - the Pelahatchie High School Leadership Team and the new Spanish speaking student. With the two stakeholders identified, learners were divided into peer groups and began organizing their task. Those working with the Leadership Team worked to provide a digital resource to communicate with the family. The second group focused on creating resources to build a connection with the new learner and introduce them to the campus and school community.

ASSESSMENT SAYS I WANT TO HELP YOU; GRADING SAYS I WANT TO JUDGE YOU.

Providing students with feedback (not grades) is possibly the most important resource you can offer them, and conferences are the major arteries for delivering this feedback.

COOPER @ MURPHY #REALPBL

With both the problem and the solutions identified, learners began to research within their respective focus areas. Those working on the resource for the Leadership Team researched the roles of our school's administration and what basic expressions they might need to communicate. Learners working on the school community resource for the new learner, researched what a new student should know about Pelahatchie High School. At the close of the research stage, learners began to create their resources. Due to the structure and class size, each class had the responsibility of creating a resource. Students working with the Leadership Team elected to compile their basic expressions in a digital format using a notebook template for Google Slides. The second group worked to provide a video product that would provide human connection with learner voice overs of key information.

At the time of this article, learners are entering the final stage of their product development. Reflecting on the past weeks, I have seen leadership development from all learners and through the periodic feedback check-ins, it is apparent that all learners have grown in their proficiency of specific communication targets and their confidence in their L2. To date, on an alternating A/B schedule, we have spent 2 weeks on learning target introduction and structured communicative L2 practice and 6 weeks on the PBL project itself.

To see a video illustrating the steps I took to implement this project, click <u>HERE</u>.

To hear a student's feedback on the project based learning experience, click <u>HERE.</u>







"The purpose of the mealworm project was to see if we could successfully make a suitable ecosystem for our mealworms. My team and I had to study every aspect of the mealworms' behavior and their environment to imitate all the components of a healthy habitat."

That is what Laila, a 6th grader at Brandon Middle School, wrote in the introduction of her Squirmy Science project report.

Squirmy Science is a project based assignment that Florence Middle and Brandon Middle have been using for several years as part of their 6th grade ecology unit.Through this project, students learn about the engineering design process, make observations of mealworms, and conduct research on what factors contribute to healthy habitats and ecosystems. The ultimate goal of the project is for students to use the skills they've learned and the knowledge they obtain to design a suitable habitat for mealworms. Students are provided a "budget" and are asked to design a prototype of their mealworm ecosystem. Once the design is approved, students "purchase" materials within the budget and design an actual ecosystem for mealworms. Students make regular observations of the condition of the mealworms and any changes in the ecosystem. Students record their observations in a data sheet. After 7 days of observations, students then draw conclusions about the effectiveness of their design. In the final report, students describe their design, argue its effectiveness, and connect their understanding of ecosystems to the results of their ecosystem design.

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Middle School / High School Curriculum New

Why do an assignment like this, rather than a traditional lesson?

Because Project Based Learning engages students in learning that is deep and long-lasting, and inspires for them a love of learning and personal connection to their academic experience (*PBL Works - Why Project Based Learning?*).

Whether you implement a full project, or just components of a project, designing project based learning experiences for your students will pay dividends in learning content and skills. PBL assignments provide students a chance at meaningful collaboration. They become divergent thinkers that see multiple perspectives. They learn how to manage a project and reflect on their own progress. They develop an innovative mindsetwAnd, they learn content and skills that will last a lifetime.

To see the original Squirmy Science project in action, check out the video: *LDC Real Works: Squirmy Science Module*

Check out John Spencer's Blog: <u>10 Things That</u> Happen When Students Engage In Project Based Learning - John Spencer

For a collection of fantastic articles on Project Based Learning, go to: <u>Edutopia's Project Based Learning</u> <u>Collection</u>

REFLECTING ON PROJECT BASED LEARNING

"It made learning the science information fun." ~Silas

"We saw how important it was to plan" - Chassidy.

"I learned more about ecosystems this way." - Anna

"My team and I worked good together; and shared ideas" - Riley

We worked together, when we started to struggle, we helped each other " - Chassidy

"We realized we needed to make a sketch of pur design first so we could talk about possible problems.* -Ella

"We tested our design before submitting the final product* - Tristan

"We learned from mistakes we made in our design. If we had time to change it, there would be things we would do better. - Gabriel

"It was nice to do something different. To do a project that made us think hard and it was fun at the same time." -Sarahi

"Are we really using "REAL mealworms"? This happens to be my favorite question asked about our Squirmy Science project. Squirmy Science has taught our sixth graders to truly become great observers, while learning how observations create inferences and take learning to a deeper level. It is a joy to watch each student's face as they "squirm" in their seats over the thought of holding mealworms and creating habitats for the larvae. While project based learning can be fun, exciting, and full of creativity, students learn science concepts which will affect their everyday lives." -Mrs. Byrd (Brandon Middle)

CULTIVATING CLASSROOM ENGAGEMENT WITH THE 4 C'S

Do you remember that college class where creativity. By utilizing the 4 C's, we can help our students take ownership of their learning, which you just sat and the professor went on and would create a learner-led environment and enhance student engagement. Let's take a quick look at the 4 C's. What would this look like in your classroom? First, do not feel that every lesson has to have each of the 4 C's in. The goal would be to include at least one "C" in a portion of the lesson. Sometimes lessons will lend themselves to include more than one. This is great! Do not let yourself become overwhelmed. Try one and learn it well! Just like tech tools, sometimes repeat practice of a tool or idea is a good thing. This repetition builds the ability of your students to be more successful. Constantly Reflecting on this experience, I see now that switching between tools can lead to frustrathe teacher probably had a deadline and needed tion. Next, take a little time to reflect. Did you to get through things. Also, let's be honest it's notice anything different by incorporating college. The lecture is a part of life. However, I one of the 4 C's? Include your students in this wonder if sometimes our students face this all reflection. It's not a bad thing to ask students too often in middle/high school. Yes, we must what worked and what didn't work for them as prepare them for that next step. They need to learners. Use this evaluation to help you plan understand taking notes and being self-startor change for the next time you incorporate ers, but we also have to build in that capacity. this "C" in your lesson.

So as teachers, we need to ask ourselves are we creating engagement that meets all of our learners? Are we giving our students a chance to do more than sit and get? Have we empowered our students to own their learning?

Thinking of these questions brings to my mind the 4 C's of 21st Century Skills, which are collaboration, critical thinking, communication, and

on and on about a topic while you tried to furiously take down notes? I remember sitting in a lecture hall with over 200 students my Sophomore year trying to learn about the impact of Global warming on the environment. After an hour and a half, I left to head to my next course on learning strategies and management for the classroom teacher and realized I hadn't spoken. I never asked a question. I never shared an idea. For the entire class period, I just sat there. Having taken numerous learning style tests over the years, I know that I learn best with visual, hands-on experiences. Hearing it helps, but I needed a little more.

Middle School / High School Curriculum Newsletter

Since we are your instructional technologist, I cannot end this article without giving you a few examples of how technology does support the 4 C's, but remember if the tech doesn't fit the lesson....leave it out! The center of the lesson is always the learning goal. Technology can support the learning goal and help enhance the 4 C's in your classroom!

by **Erin Barrios** & Stephanie Cotnam

Instructional **Technologists**

Rankin County School District

WHAT ARE 21 ST CENTURY SKILLS? THESE 4 C's:

С CREATIVITY

Trying new approaches to get things done equals innovation & invention

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Communication is how our students articulate and share their thoughts and opinions. Students can do this in multiple ways, whether verbal or written, the idea is to help build fluency in the sharing of their ideas.

Collaboration

together towards a common goal. We can see this in the classroom when we have our students work in groups,

Critical Thinking

Critical thinking is the ability to analyze, interpret, evaluate, and solve problems. This is a step beyond memorization. This gives kids the skills to apply to thinking on their own outside of the classroom.

Creativity

Creativity is the idea of creating authentic products that either remix or a new twist on an old idea. It's a great way for students to demonstrate their knowledge and to accomplish a learning goal in a new way.

COLLABORATION	CREATIVITY	COMMUNICATION	CRITICAL THINKING
Create a Jamboard to foster and create debate, discussion, and team- work in the classroom.	Use tools like Canva to create interactive mul- timedia presentations that blend slides, videos, and more.	Create discussion boards in Canvas to allow the classroom discussion to go beyond the four walls.	Create a Flipgrid chan- nel for book discussion and debate. Allow stu- dents to research a topic and create a screen- cast sharing what they learned.

This chart shows a few ways that technology can be used to support the 4 C's in your classroom. The tech tools listed can be used in multiple ways, and are not restricted to one particular "C". They often overlap. For example, a Jamboard can be used for creation, communication, and collaboration depending on the learning goalIf you would

SOURCES

Juarez, A., & Goyette, K. (2020). The complete edtech coach: An Organic Approach to supporting Digital Learning. Dave Burgess Consulting, Incorporated.

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P21. (2016). P21.org. Retrieved 28 September 2021, from http://www.p21.org/ index.php

Source for Screenshot: https://sccoe.instruc-This chart shows a few ways that technology can be used to support the 4 C's

in your classroom. The tech tools listed can be used in multiple ways, and are not restricted to one particular "C". They often overlap. For example, a Jamboard can be used for creation, communication, and collaboration depending on the learning goalIf you would like more information

- Have students restart computers before a test. A Just like our bodies, computers need to be restart gives the device a fresh start and generally makes things work better!
- Use your computer at home? Restart it when arriving at school.
- Filling out a work order? Try not to choose general. Be as specific as possible when selecting the issue. This will get you assistance faster!

like more information about the 4 C's, please reach out to your instructional technologist! Also, we understand that sometimes technology does not work as we need it to! Sometimes this can be frustrating, but don't pull your hair out! Try these troubleshooting tips!

about the 4 C's, please reach out to your instructional technologist!

Also, we understand that sometimes technology does not work as we need it to! Sometimes this can be frustrating, but don't pull your hair out! Try these troubleshooting tips!

TECH TIPS

- turned off and get some "rest". If you aren't going to be using your computer in the next hour or so, shut it down! If you are finished with it for the day, shut it down!
- While troubleshooting can resolve the majority of issues, sometimes it does not. If those troubleshooting steps do not resolve the issue, please put a ticket in on incident IQ (https:// rankin.incidentiq.com/).

Brandon Florence McLaurin Northwest Pelahatchie Pisgah Puckett Richland

TRADITION OF EXCELLENCE