

Purple=Vienna Blue=Carmen Yellow=Ellie Red=Everyone individual
 Green=Caiti

Systems	Standards/Proficiency Criteria	Failure and UC	Transfer - Personal Takeaways	Project
-This year we have been studying SYSTEMS - both the past, the present and the future. -We started by studying ancient Egypt, then moved to the soccer team that was trapped in the Thailand caves and moved into the future by looking at plans for sending humans to the moon and Mars. -This work is important because it dives into the power of a system... MUST: ~Talk about what a system is and what it is important? -Explain RESEARCH - both primary and secondary sources, (credible, reliable,	-You might just think we are playing, but... -This isn't just legos and robotic kits... -The learning we did is beyond what you actually see here... <u>TEACHERS will help you pull out standards' phrases.....</u> -Proficiency criteria: Pull out 2 or 3 from your sheet. • This means... • For example ...	-but this process isn't easy...it takes time -this isn't always "fun", we spend a lot of time learning, unlearning, and relearning... -there were several times throughout this work where we had to toss out our old ideas and start over... -new information forced us to pivot, replace, shift, MUST: -Talk about failure...why is it important? What does it GIVE us? What happens if we don't fail? Why is it so valuable? -Universal Constructs (+ or -)... talk truth...what was your team really good at OR	-As a human, my biggest life takeaway is.... *(each person shares) Vienna Caiti Ellie Carmen	(Your group will use the 'SharkTank hook/speech you shared with Steven.) -Now, we'd like to show you our solution Or... -HERE is our solution. We are excited to show you our idea

experts) -Which experts helped you grow in your thinking(PICK ONE that really helped your team and explain who they are, what they did and how they helped you)		where did you struggle OR what did you realize you needed to do in order to move forward as a team?		
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System

-This year we have been studying SYSTEMS - both the past, the present and the future.

-We started by studying ancient Egypt, then moved to the soccer team that was trapped in the Thailand caves and moved into the future by looking at plans for sending humans to the moon and Mars.

-This work is important because it dives into the power of a system...

We've been studying systems of the past, present and future. We studied ancient Egypt in the past. We also researched All 13, a nonfiction book that tells the story of the Thai soccer team that got trapped in a cave which is the present system, and the future work contributing to NASA. This current and past work is working to get people to the moon and back. This system needs all layers to grow, including personal experience and expertise. Here's what we believe is most important about systems. Systems are complex. They are also complicated because not only do they throw barriers that can disrupt your current mindset. Systems also have multiple complex layers that are important for human centered systems to work together and solve the conflict. This is true because each layer of the system has different strengths. Their strengths are like ebbs and flows. Think of it like humans. Sometimes their strengths and expertise are required and other times they just need to listen. Without the layers that work together with their different strengths, the balance in ideas within the system will crash. This is because in a system all strengths are essential in order to develop new ideas that will influence present and future systems. Systems also have to rely on each other because adding onto others' ideas, can give you a better understanding of a systems thinking process. With NASA, we have been collaborating to intentionally improve and add value to our ideas so we can influence how we grow and how we develop our thinking because we believe that a system cannot not be independent.

To better illustrate, let us give you an example of some resources and experts that have helped guide us through our journey.

Stephanie Yeldell (Education Integration Lead, Space Technology Mission Directorate, NASA Headquarters)

- Helped us realize that it's not about growing food it's about how it tastes and how we can enhance that flavor
- Informed us about how food affects your brain and mental health

Steven Smith (Education Specialist for NASA's Educator Professional Development Collaborative at the Johnson Space Center)

- Brought up the idea of liquifying spices (Sort of like pesto) and using oil to develop a liquid spice substance
- Gave us informational feedback we could all process through NASA

Both of these individuals are an example of using a primary resource in the form of an EXPERT: We feel that being given the opportunity to talk to REAL experts gave us an honest opinion and a personal viewpoint from people that actually have EXPERTISE which then gave US a better viewpoint on our own work. We also believe it's important to have the opportunity to talk to experts because they have real experience and they live in that environment every single day. (BC)

Standards & Proficiency Criteria

-You might just think we are playing, but...

-This isn't just legos and robotic kits...

-The learning we did is beyond what you actually see here...

You might just think we are playing but, the work that we are doing is more than that. We are not only searching credible and reliable websites that EVERYBODY has access to, but we are willing to be VULNERABLE and OPEN to suggestions from experts with years of experience.

As kids, doing this work we feel that we are given the opportunity to be the drivers and have ownership in our own learning. We also believe that this work will drive us and benefit us in the future as adults. This isn't just showing a test score or doing a worksheet, instead it's an opportunity to grow and do real-world work. This work shows that we are capable of being a productive collaborator and that we can actually solve problems not within a worksheet. Our NASA work has helped us grow into individuals, with our own lens, and the ability to be responsible and accountable for our own work. It has also shown us that sometimes there are no clear answers to complex problems.

The learning we did is beyond what you actually see here.. For example, we synthesized information within one source or the text. This means that we created new ideas with smaller solutions, and incorporated other thinking. For example, our group gathered as much information about our topic that we could find. We created charts, mentioning the benefits of spices and what they can do for you beneficially in the future. After doing all that research we took that information and developed our big idea.

We also analyzed interrelationships among concepts, issues, problems, with our work when we noticed flaws in our prototype. For example, we noticed that we did not have a solution of how to mix both the oil and the water. We decided to reconfigure our build and come to a solution. We added a rotating bowl to mix the oil, water, and spices. In order to do this, our team had to talk with each other. We realized that we couldn't just have one idea. We had to listen to each other's thoughts and then analyzed what to do with those ideas. There was not just one idea - like on a worksheet. We were practicing using multiple pathways. And we discovered that our product was going to fail and we had to learn from that. We couldn't let that make us depressed. We had to move on and persevere. It was ok to say 'this idea doesn't work'.

This work taught us that it takes failure to learn and life comes with trial and error.

(BC)

Failure and UCs

- but this process isn't easy...it takes time
- this isn't always "fun", we spend a lot of time learning, unlearning, and relearning...
- there were several times throughout this work where we had to toss out our old ideas and start over...
- new information forced us to pivot, replace, shift,

Adding value as a critical thinker is something we struggled with as a group. For example, coming to a compromise. It was hard for all of us to express what we really felt because we didn't want to hurt others' feelings. We didn't realize this would make it challenging to compromise. As a group, we all agree that sometimes we have gotten distracted. This resulted in one person having to explain ideas when others didn't know what was going on. Also, when talking, not all voices were heard, so it can be hard to hear what others are adding to the topic. For example, explaining ideas on your own is hard without having others to support you and your ideas. Finally, we learned that when your voice isn't heard, it's complicated to come up with a compromise because when you don't hear all viewpoints, you cannot add value to others' ideas and come up with a solution. So, we figured out a way to solve this dilemma. We started by asking questions to anyone that didn't get a chance to speak up, such as, "do you have anything to add?" Or, "does anyone disagree?" This ensured that all voices could get the chance to state their ideas.

Effective communication was also something we had to make a priority. Especially because our band schedule is during the day. This means some of our group members have to go to their band lesson, or whole band. Which means they miss 30 minutes of quality work time. And this messes up with all the voices to be heard, limiting us to only having 3 voices rather than 4. Most of the time it was one person filling in for the band member when they got back. We need to ask questions because if we have concerns we need to tell our group so we can make changes. Sometimes people would leave without telling their other group members or telling them where they are going but then making a trip to other places before coming back. If someone doesn't agree we want them to speak up. Both sides of the disagreement can work together to make a compromise.

We believe that being a critical thinker, adding value, and being an effective communicator are important to our team. Adding value matters to us because it improves team members' ideas. This is because adding value grows and changes new ideas and sends a message to team members that "your idea matters". Being an effective communicator matters because it ensures that all voices are heard and computed to other ideas.

Throughout our journey, we learned that failure was **POWERFUL** and **IMPORTANT** to shift our ideas, and taking **FEEDBACK** and turning it into a process of unlearning, relearning, and learning in general, making feedback **BENEFICIAL** to our work. This led us into intentionally improving, which we used and was a major key in our construction through our iterations.

(BC)

Transfer and Personal Takeaways

-As a human, my biggest life takeaway is....

- 1: I believe school should be a place where kids get to choose their own **PATHWAYS**. Kids should be known as **INDIVIDUALS** so they can know in a **AUTHENTIC REAL WORLD ENVIRONMENT** how to be a **DRIVER** of their own **LEARNING**
2. I believe students should be able to be pushed to be **UNCOMFORTABLE**. Students need to learn how to **APPROVE FAILURE** and know that you have to **MOVE ON** from your failures.
3. I believe school should be a place where kids get the **OPPORTUNITY** to be a **CRITICAL THINKER**. To be a critical thinker you have to **SEEK PROBLEMS** and be ready to take **AGENCY** to be a **GLOBAL COLLABORATOR** and **LEARNER**.

CAITI:

1. I believe students should be able to take **RESPONSIBILITY** and actually **LEARN REAL WORLD PROBLEMS, PROVING** your **CAPABILITY** to **LEARN** to solve **COMPLEX** problems.
2. I believe school should be an **ENVIRONMENT** where students should be **UNCOMFORTABLE, CRAVING** new **KNOWLEDGE** and a **DRIVER** in their own **WORK**.

CARMEN: I believe this work has made us more willing to do work we are uncomfortable with. It has made us more comfortable going through **RISK**, and being able to stretch our horizons of learning while thinking **BEYOND THE BARRIERS** of "basic **KNOWLEDGE**". Along with more **CREATIVE** thinking and developing new possibilities. I have been more open and I have been thinking more about new ideas that have never been seen. This work has helped us grow and learn in so many ways. For example, our spice liquifier. It has never been created.

ELLIE: As a student I believe this work has made our group grow and improve. We have more **TRUST** for each other and keep each other **ACCOUNTABLE** for our work. Our group has had to process through many **TRIALS AND ERRORS**. We all **ADDED VALUE** to the group. As a group we definitely needed to work on being **EFFECTIVE COMMUNICATORS**. In the future, I will **ADD VALUE** to my groups that I am in and have **EFFECTIVE CONVERSATIONS** so that I am a good student to work with.

(BC)

Project

Original -Our original idea was to create an environment to grow good tasting and healthy plants. We were thinking of growing dwarf trees, strawberries, and carrots. But we realized: What about the environment for these plants to grow in? Well we thought of building an insulated greenhouse, and painting it black. We

thought about black because it absorbs heat better than any other color. Think about when you wear black pants? They get really hot because they absorb heat. We also had a fully functional water system. This water system sprays water through sprinklers and the system is timed. For example grocery stores, there are water systems for set times for different plants... but for plants on the moon.

New/Reworked - Fast forward to today. We found that we were focussed on too many ideas, and we realized that we were fixated on too many concepts. It wasn't only that, we realized our idea wasn't how we **GROW** tasty foods. Instead how we **ENHANCE** then realized we needed to narrow down our idea into something specific. Our idea was, upgrading the flavor of vegetables with spices, so it would astronauts. With this, we

Our solution is a spice liquifier, for in transit missions. This is a box with a bottle of oil, and a bottle of water. We also have a spice cabinet where we store our spices that we chose to be liquified. Inside the box, there is a spinning platform with a bottle on top. This is where you put the water, oil, and spices in. These ingredients are connected to tubes that pump to our rotating bowl. Finally, you are ready to pull the plug in the water and oil, add in your spice, and let the spinning platform do its magic. This spinning platform spins in circles to your desired speed, mixing up all the ingredients. Once this is done, you have your favorite spice but liquified to take on transit missions that you can apply to bland and boring foods. **(BC)**