

Learning the 4Cs through Literacy Based STEM

Estimated Grade Band - Grades 2-3 | Time Frame: **1-2 40 Minute Class Periods for Communication, Collaboration, Critical Thinking, 3+ Class Periods for Creation**

Quick Links:

- [COMMUNICATION - Click Clack Moo](#)
- [COLLABORATION - Iggy Peck Architect](#)
- [CRITICAL THINKING - Rosie Revere Engineer](#)
- [CREATION - Galimoto](#)

Stage 1 - Desired Results

Big Idea(s)
<ol style="list-style-type: none">1. An effective communicator adds to the ideas of others and what is being discussed, actively listens to the ideas of everyone in the group, and builds upon those ideas by sharing his or her own thoughts when appropriate.2. Trying new ideas beyond one's own comfort zone is part of developing a growth mindset, as well as identifying the flaws within a plan or design and improving upon them.3. Recognizing when a friend needs assistance is part of building a stronger team, even when it means compromising your own ideas. Being on a team means sharing responsibility and taking collective ownership of the project.4. Taking risks, being inventive, and trying new/original ideas can often lead to a better project.

PA Core Standards / Next Generation Science Standards				
T & E Education	Science Education	Mathematics Education	Computer Science	CEW
	3.2.4.D GRADE 4 - Recognize and use the technological design process to solve problems. <ul style="list-style-type: none">• Recognize and explain basic problems.• Identify possible solutions and their course of action.• Try a solution.• Describe the solution, identify its impacts and modify if necessary.• Show the steps taken and the results.			*The corresponding 5th Grade CEW Standards can also apply. 13.2.3.A - GRADE 3 -Identify appropriate speaking and listening techniques used in Conversation. 13.3.3.B - GRADE 3 -Identify how to cooperate at both home and school.

Essential Questions
<ol style="list-style-type: none">1. What can I do to be a more effective communicator when working in a group, and am I actively listening to my teammates?2. How can I try new ideas to make a plan or design better?3. How can I help a friend achieve his or her goal?4. How have I taken a risk or developed an original idea to be inventive?

Students Will Know	Students Will Be Doing
--------------------	------------------------

<ol style="list-style-type: none"> 1. Communication is more than speaking; it's also listening. It is important to listen to the ideas of teammates and build upon them in addition to sharing one's own thoughts and ideas. 2. Critical thinking is a skill that involves trying new ideas that may be beyond one's own comfort zone. It also means improving upon design flaws and capitalizing on strengths within a plan. 3. Collaboration involves recognizing when a peer is in need of assistance and offering help when necessary. It also involves shared ownership and responsibility within a given project. Students should recognize that a lack of ownership leads to lower quality outcomes. 4. Creativity is a skillset that is strengthened by risk taking, trying new ideas and being inventive. Students should recognize the importance of trying original ideas and how innovation can be used to elicit a desired outcome. 	<ol style="list-style-type: none"> 1. Listen actively and build upon the ideas of others 2. Improve design flaws and build on strong ideas 3. Recognize when a friend needs assistance, offer help, and take ownership 4. Implement new ideas to reach the intended goal
<p>VOCABULARY STUDENT/STAFF WILL KNOW AND USE</p> <p>Critical Thinking - using what you know and new information to find a new way to solve a problem</p> <p>Communication - a way to share ideas and ask questions</p> <p>Collaboration - working with someone or a team to produce something</p> <p>Creativity - using the imagination or original ideas to produce something</p> <p>Effective - successful in producing desired results</p>	

Stage 2 - Evidence of Understanding

Assessments (Formative and Summative):	Performance Task(s)
<ul style="list-style-type: none"> • Teacher Observation of STEM behaviors (4CS, EDP) • Class Discussion of 4Cs • Student Online Discussion Board Post • Optional: Student digital portfolios with self-reflection (i.e. Seesaw, Screencastify/Google Drive) 	<ul style="list-style-type: none"> • Student Collaborative Creations (Bridge, Tower, Galimoto)

Stage 3 - Lesson Learning Targets

Learning Activities:
<ul style="list-style-type: none"> • COMMUNICATION Learning Target: Today we will learn what communication is and how we effectively communicate with each other. • COLLABORATION Learning Target: Today we will learn what collaboration is and how to effectively collaborate with our peers. • CRITICAL THINKING Learning Target: Today we will learn what critical thinking is and how we can use critical thinking in our everyday life. • CREATIVITY Learning Target: Today we will use creativity to design a galimoto using recycled materials.

RESOURCES / LINKS

Activities	Assessments
<p style="text-align: center;">COMMUNICATION - Click Clack Moo</p> <p>Learning Target: Today we will learn what communication is and how we effectively communicate with each other.</p> <p>Performance of Understanding:</p> <ul style="list-style-type: none"> I will show my learning by sharing with a partner or the class by demonstrating appropriate communication with my peers. I will show my learning by using communication in the classroom. <p>Success Criteria:</p> <ul style="list-style-type: none"> I will know that I can do this when I can demonstrate how to effectively communicate with my peers. I will know that I can do this when I can explain what communication is and how to communicate. <p>Materials:</p> <ul style="list-style-type: none"> Click Clack Moo gClassroom on Chromebooks/Student Device <p>Procedures:</p> <ol style="list-style-type: none"> Review definition of communication -- looks like/sounds like -- how do we communicate? Why is it important to be an effective communicator? **Emphasize both the speaking and listening components of communication. Read Click Clack Moo. Class Discussion: How did the characters use effective communication? Use the question feature in gClassroom to present the question: How do you use communication in your life? How do you know you are an effective communicator? Have the students type their answers in gClassroom. Then students will respond to their peers using ACCOUNTABLE TALK. Discuss as a class - accountable talk, how to respond to peers online, how to post properly online, how to communicate effectively etc. -- digital citizenship tie-in. <p style="text-align: center;">COLLABORATION - Iggy Peck Architect</p> <p>Learning Target: I can or Today we will..... (What are students learning?)</p> <ul style="list-style-type: none"> Today we will review what collaboration is and how we collaborate with our peers. Today we will learn how to effectively collaborate with one another. <p>Performance of Understanding:</p> <ul style="list-style-type: none"> I will show my learning by explaining what effective collaboration looks like and sounds like with my teacher and peers. I will show my learning by demonstrating effective collaboration with my peers and teacher in a situation. <p>Success:</p> <ul style="list-style-type: none"> I will know that I can do this when I can define effective collaboration. I will know that I can do this when I demonstrate appropriate collaboration with my peers. <p>Materials:</p> <ul style="list-style-type: none"> Iggy Peck Architect Straws Twist ties or pipe cleaners cut to length Tape (only to attach to chairs) Optional: Student Tablets/Devices <p>Procedures:</p> <ol style="list-style-type: none"> Review effective communication.. Introduce collaboration to the class. What does effective collaboration look like/sound like? Read the Iggy Peck Architect to the class. - Discuss how the theme collaboration evolves in the story. Give students time to plan out their bridge. Students will design a bridge that is AT LEAST 12 inches long out of only straws and twist ties. There bridge will be built between two chairs. Optional: Students will share out their learning to peers or to a larger audience using dojo/seesaw etc. Wrap-up Conversation: Discuss success & failure. Discuss how students used the 4Cs previously taught in today's challenge. <p style="text-align: center;">CRITICAL THINKING - Rosie Revere Engineer</p> <p>Learning Target: I can or Today we will..... (What are students learning?)</p>	<ul style="list-style-type: none"> 4Cs Behaviors Continuum Rubric

- Today we will learn what critical thinking is and how we can use critical thinking in our everyday life.

Performance of Understanding: I will show my learning by.... (What are students doing?)

- I will show my learning by explaining what critical thinking is.
- I will show my learning by using critical thinking in the classroom to solve the problem.

Success: I will know that I can do this when I can... (What is a successful product, process?)

- I will know that I can do this when I can independently define critical thinking.
- I will know that I can do this when I can demonstrate to my teacher/peer how I use critical thinking.

Materials:

- Rosie Revere Engineer
- Pipe cleaners (15 per group)
- Optional: Student Tablets/Devices

Procedures:

1. Review communication and collaboration. Introduce critical thinking. What does critical thinking look like / sound like.
2. Read Rosie Revere Engineer. Discuss how the character engineered their design. Discuss how the theme of critical thinking and growth mindset show in the story.
3. Explain to the students they will be completing a pipe cleaner tower challenge and they will have 10 minutes. Follow the scenarios below while students build:
 - a. Your Engineering Team has been asked to use 15 pipe-cleaners to build the tallest, freestanding tower. You have 10 minutes!
 - b. 3 Minutes in to the Challenge: "Your team had an unexpected budget cut, and one of your resources has been depleted. Each team member must now put one arm behind his/her back!"
 - c. 6 Minutes in to the Challenge: "Your engineering company realized that the loss in resources were detrimental to the product. The manager has decided to expand your operations globally to bring in more business. Your team now operates in China allowing you to use both arms again. But now you are unable to speak the same language. Continue the task without any speaking!"
 - d. 9 Minutes in to the challenge: "Business is booming, and your company has hired translators. Complete the task with all your resources! One minute left!"
4. Students can share and reflect on their towers with peers, families and beyond via Seesaw/Dojo Portfolios.
5. Discuss: What was challenging? What worked well? What would you change for next time? How did your group think critically? Discuss how students used the 4Cs previously taught in today's challenge.

CREATIVITY - Galimoto - Allow 3+ Class Periods

Learning Target:

- Today we will use creativity to design a galimoto using recycled materials.

Performance of Understanding: I will show my learning by.... (What are students doing?)

- I will show my learning by creatively coming up with a plan to build given limited materials.
- I will show my learning by explaining my thought process when creating my project.

Success: I will know that I can do this when I can... (What is a successful product, process?)

- I will know that I can do this when I can independently come up with an idea the galimoto.
- I will know I can do this when I am able to verbally share my idea and how I came up with it to the class.

Materials:

- Book: Galimoto
- Upcycled materials
- Chart Paper/Writing Supplies for Brainstorming
- Optional: Student Tablets/Devices

Procedures:

Day 1

1. Review communication, collaboration, and critical thinking. Introduce creativity. What does creativity look like / sound like.
2. Read the story Galimoto, after reading the story, discuss how the character used recycled materials to create Galimmotos.
3. Explain to the students that they will be using upcycled materials to create a group galimoto.
4. Have the students begin planning their galimoto using chart paper or gDrawings (or other online blueprinting tool).
5. Students can share their finished blueprint to their digital portfolio (Seesaw/Dojo etc.)

Day 2

1. Review the 4CS (CREATIVITY) and Galimoto expectations.

<div>2. Students begin building/creating their Galimotos in a group using recyclable materials.</div> <div>Day 3+</div> <div>3. Give students time to finish building their galimotos.</div> <div>4. Students should then test, seek feedback and revise their galimotos as necessary.</div> <div>5. Students will share their finished galimotos to the class and share with a larger audience on seesaw/dojo etc.</div> <div>6. Wrap-up Discussion: What worked well? How did you work with your group? What do you need to work on? How did you use creativity? Discuss success/failure. Discuss how students used the 4Cs in today's challenge.</div>	
---	--

Curriculum Curators & Authors: Sara Bowers, Michael Creed, Matthew Derr, Dana Rosenberger, Susan Wojciechowski



