COLLABORATION STATION

Carly & Adam

Makerspace Consumables

Having an area devoted to Makerspace consumables will add to your students' creativity. While materials are listed to use for each challenge, additional materials can be used. Below are just some suggested consumables for your Makerspace.

craft sticks
corrugated cardboard boxes
plastic caps/lids
thin cardboard (think cereal boxes)
toilet paper tubes
paper towel tubes
newspaper
corks
yarn/string
plastic cups
cotton balls
Q-tips
index cards
toothpicks

fabric
felt
rubber bands
paper clips
construction paper
cardstock
empty plastic containers
tissue paper
pipe cleaners
straws
plastic beads
brads
ribbon
tin foil

Share this list with parents and see what donations they may have around the house.

Non-Consumable Building Materials

Whether you are just getting started with a new STEM lab or you've been facilitating hands-on learning for a while, there are many different materials that students will enjoy using in your space.

Non-consumables are things that you will be able to reuse. It will be worth it to invest in some of these items so you always have them on hand in your classroom.

Keva Planks
3DuxDesign
Brackitz
Brain Flakes
Bloxels
Snap Circuits
Strawbees
Magna-Tiles
K'NEX
Bendy Builders
Tangrams
CLIXO
Dominoes
Hashtag Blocks
Pattern Blocks
Base 10 Blocks
Linking Cubes
Magformers
Straws and Connectors
Blockaroo
Building Blocks Bars
Lincoln Logs
Marble Run
LEGO

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Next Generation Science Standards (NGSS)

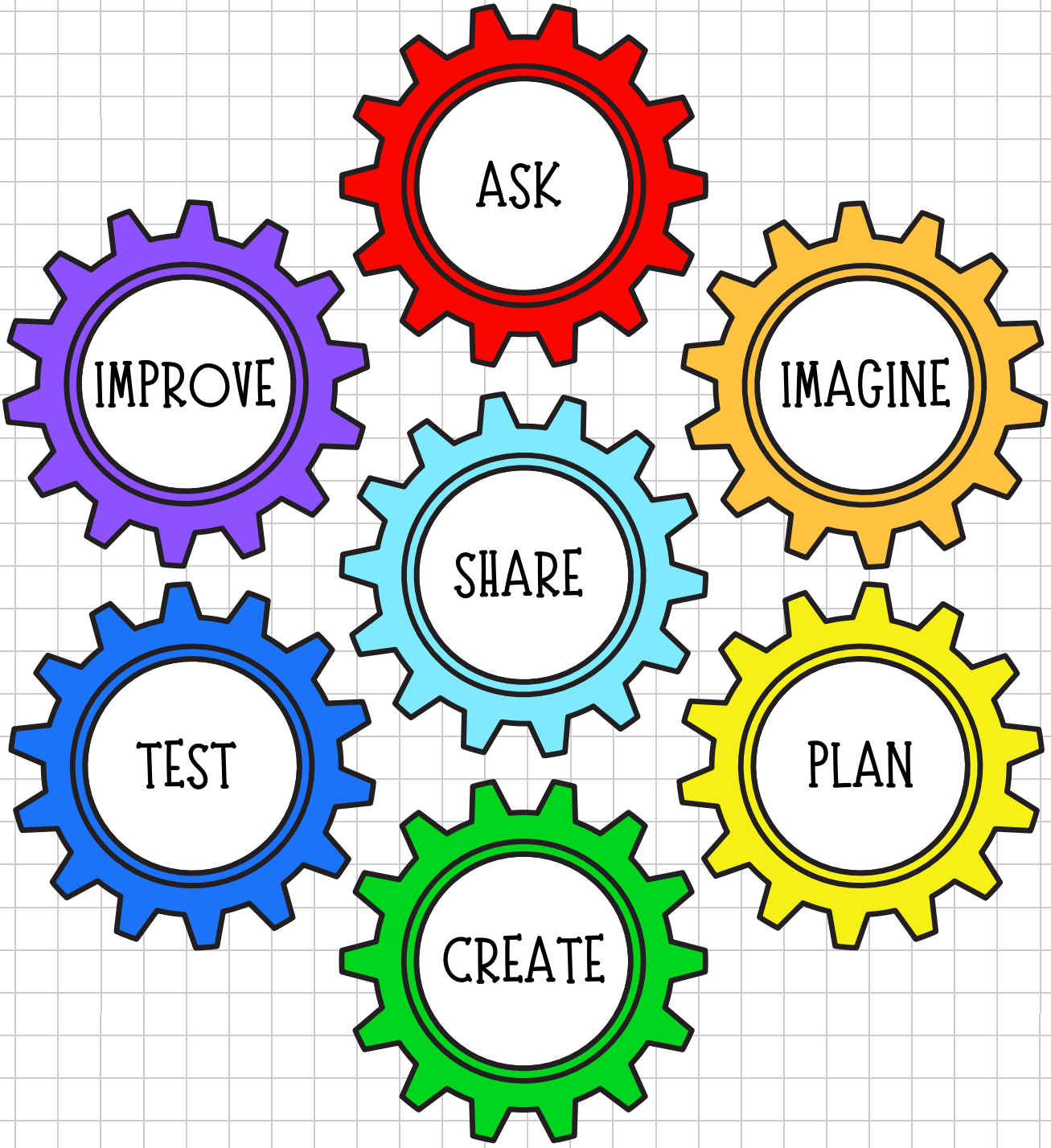
K-2-ETS1-2
Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

3-5-ETS1-3
Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Texas Essential Knowledge & Skills (TEKS)

SCIENCE K-5 1.G
Develop and use models to represent phenomena, objects, and process or design a prototype for a solution to a problem.

THE ENGINEERING DESIGN PROCESS



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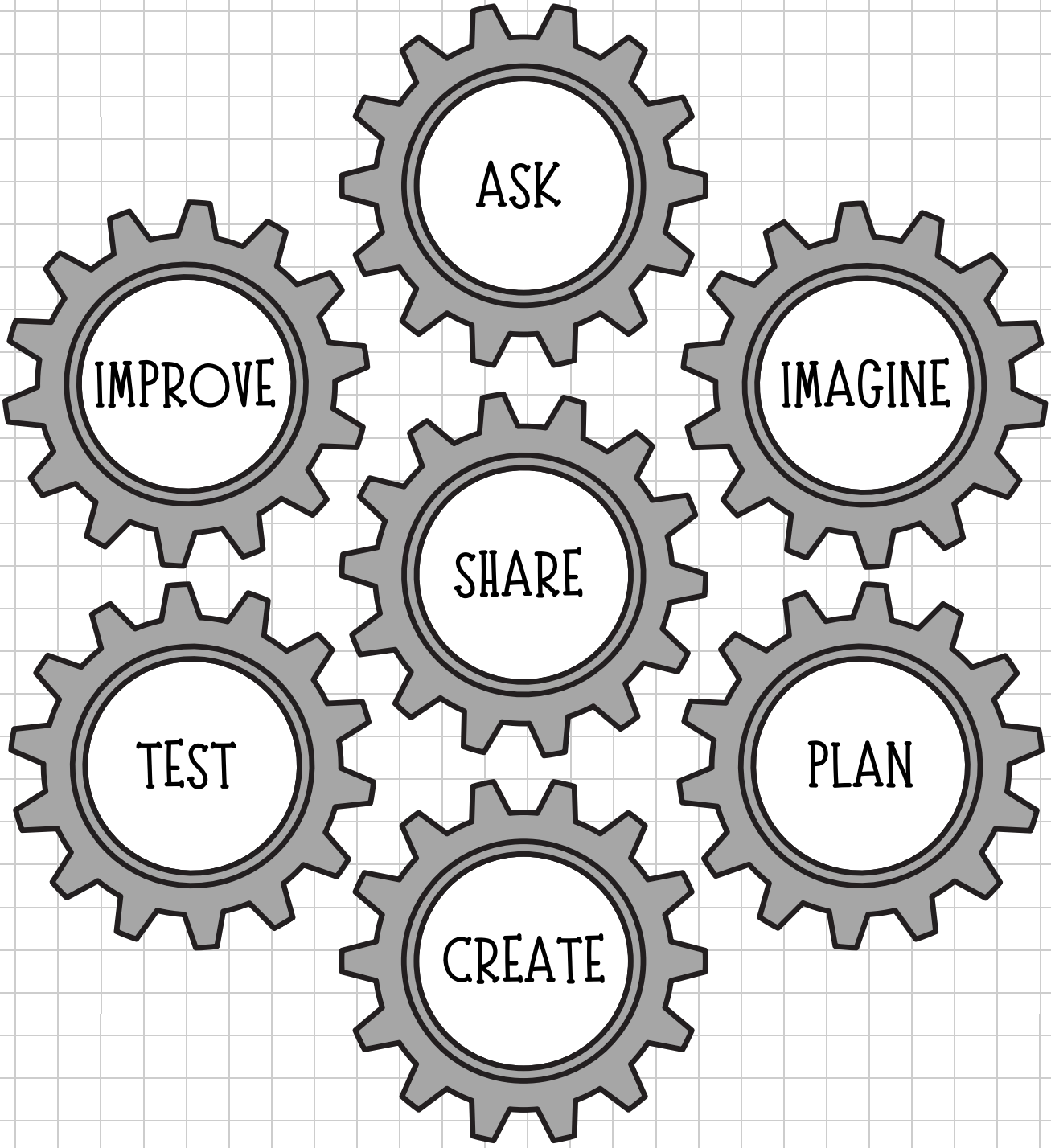
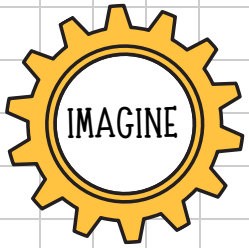
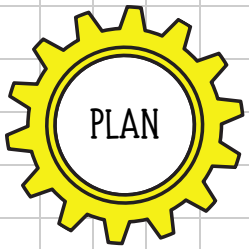


THE ENGINEERING DESIGN PROCESS

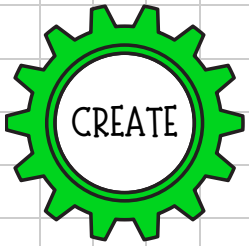
What is the problem you are trying to solve? What are the constraints?



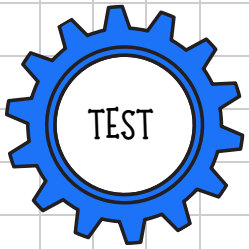
What are possible solutions to the problem? Is this problem similar to another problem that you already solved?



Which of your ideas is the most realistic given the amount of time and materials you have? How can you combine the designs of your group members to create the best solution? What materials will you use for each part of your design?

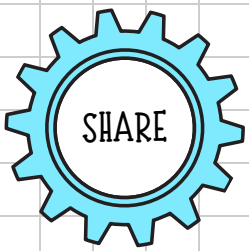


Who in your group will complete which task? What is going to be the most challenging part of your design to build? What can you do to make it go more smoothly?



Does your design meet all of the requirements? How will you test your design? What do you notice during the testing phase?

What specifically about your design needs to be improved? Why? What changes will you make to your design? Who in your group will make which changes?



What surprised you about the challenge? What was frustrating about the challenge? If you were to do this challenge again what would you do differently?

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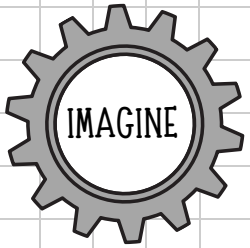

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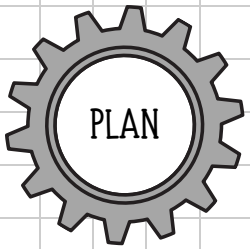

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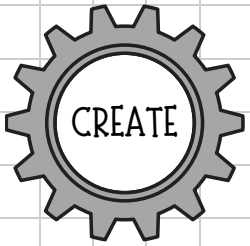

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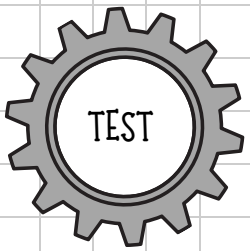

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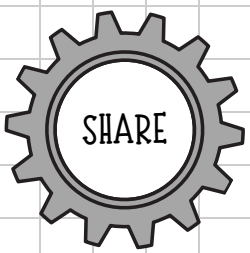


What surprised you about the challenge? What was frustrating about the challenge? If you were to do this challenge again what would you do differently?

Teacher Instructions

Suggested Materials:

- large piece of butcher paper or poster board
- paper plates
- color sticks, crayons, or markers (one per student, each of a different color)
- tape
- Collaboration Station by Shannon Olsen (optional)

Instructions

- This challenge is a great activity to complete after reading ***Collaboration Station*** by Shannon Olsen. The activity can stand alone, but it is best if students are familiar with the book.
- Review the vocabulary cards with students.
- Have students read the challenge instructions or read them together as a class.
- Students must think outside of the box to come up with different things a paper plate can be used for.

Teacher Instructions

Activity Setup:

1. Preparation:
   - Place a large piece of butcher paper or poster board in the center of each group.
2. Distribute Crayons:
   - Give each student one crayon of a different color.
3. Place the Paper Plate:
   - Put the paper plate in the middle of the butcher paper.

Collaborative Brainstorming:

1. Drawing and Writing:
   - Instruct students to use their crayon to draw and write all over the butcher paper, around the paper plate, to illustrate their ideas of what the plate could be.
   - Encourage them to be creative and think outside the box. They can draw pictures, write words, or both. Because each student has a different color, explain there should be equal ideas from each.

Teacher Instructions

- Have students share their ideas and as a team come up with one collaborative plan for the plate. Have each member draw the team idea on their planning page.

2. Discuss Collaboration:
   - Throughout the activity, facilitate a discussion about how combining everyone's ideas can lead to even better and more imaginative solutions.
   - Emphasize the importance of listening to each other, respecting ideas, and building on each other's thoughts.

Collaborative Reflection:

- After the activity, gather students to discuss what they came up with together.
- Talk about the variety of ideas represented on the butcher paper and how each student's contribution made the overall creation richer and more diverse.

Teacher Instructions

How to Set Students Up for Success During a STEM Challenge

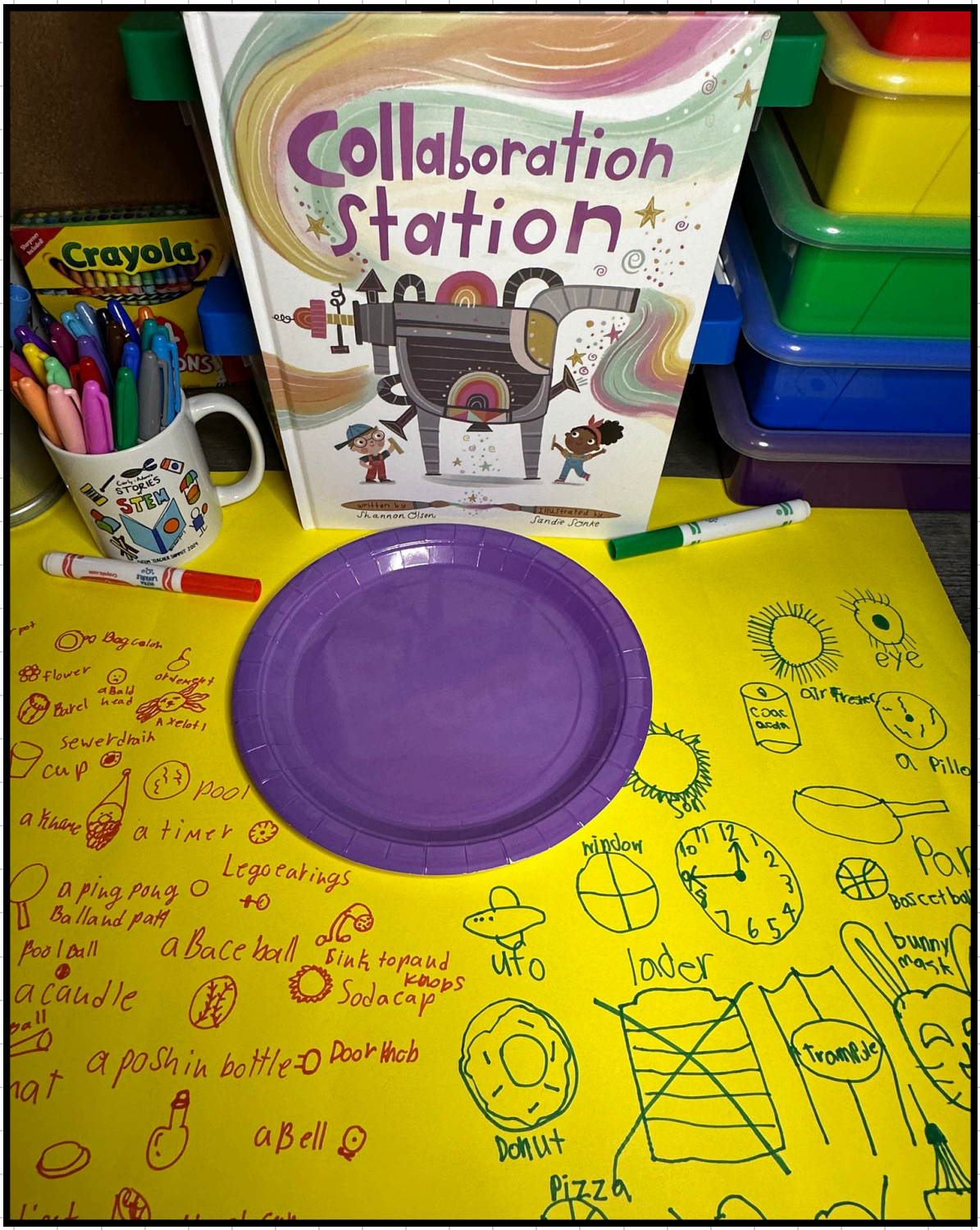
When it comes to STEM challenges success doesn't always look like a completed build. Success may be learning what doesn't work. We want students to have a productive struggle when they are building. Learning what doesn't work can be just as valuable as learning what does.

Try these steps with your students when setting up your STEM challenges.

1. **Ask Questions Before** - Think ahead about student misconceptions and prepare to guide them.
2. **Plan Ahead** - Have planned materials organized and available.
3. **Provide a Purpose** - Ensure that students understand the purpose of the challenge.
4. **Allow Time for Redesign and Sharing** - Consider time constraints.

Challenge Sample 1

Do not share this with your students. See where their own creativity takes them!



Challenge Sample 2

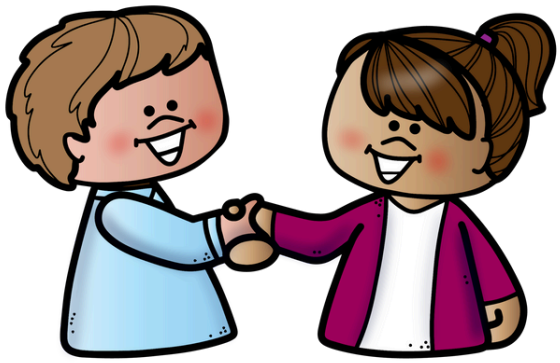
Do not share this with your students. See where their own creativity takes them!

Vocabulary

Directions: Use the vocabulary cards to pre-teach the vocabulary words before completing the activities.

collaboration

working together to get something done



compromise

finding a way to agree where everyone gives a little

teammates

friends who work with you on a project or game

goal

something you want to achieve or do

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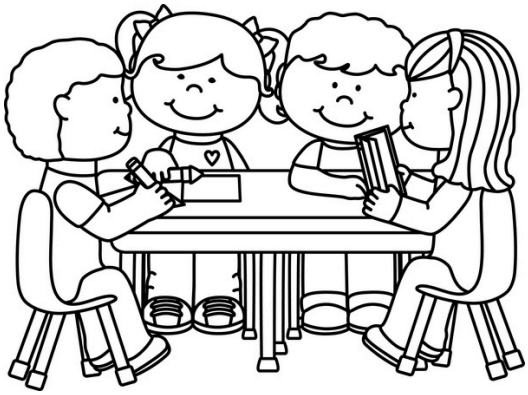

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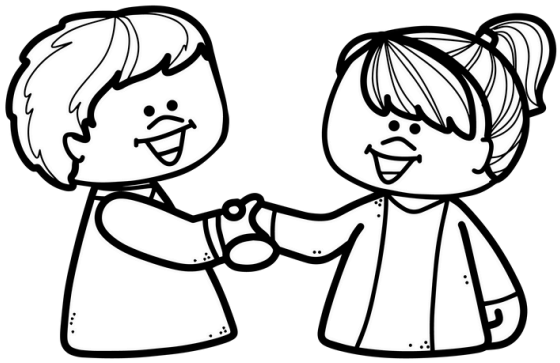

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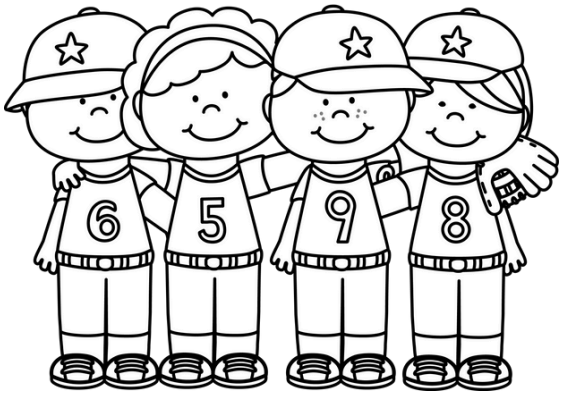

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TOGETHER, WE CAN DO AMAZING THINGS!

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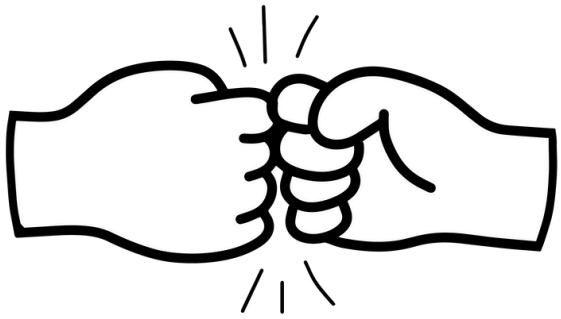
Name:_____



Dear Students,

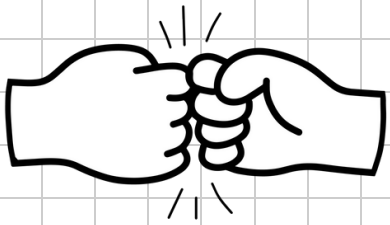
In the story, Collaboration Station, we learn about the power of working together and sharing ideas. Today, we will put that into practice with a fun creativity challenge.

Your challenge is to think outside the box and come up with different things a paper plate can be used for. Use your crayon to draw or write all around the plate on the butcher paper. Be creative and think of as many ideas as you can!

Remember, each of you has a different color crayon, so we should see lots of ideas from everyone. After brainstorming, you will share your ideas and come up with one great idea together.

Let's use our imagination and teamwork to make something amazing!

Name: _____



COLLABORATION STATION

Ask What can your team make with a paper plate?

Imagine and Plan

ABOUT US:

Carly and Adam have been creating STEM curriculum for elementary students since 2015. In 2018, they created the Elementary STEM Teachers with Carly and Adam Facebook Group to bring like-minded educators together to collaborate around STEM topics. As a result of the collaboration in the STEM Facebook group, they launched the STEM Teacher Summit online conference in June of 2020. Carly and Adam believe in the power of teacher collaboration. We Teach STEM Better Together! You can connect with Carly and Adam at www.carlyandadam.com as well as on Facebook, Instagram, and Twitter.

FOLLOW US ON SOCIAL MEDIA:

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