


SUMMER STEM




Popsicle Rescue

Question. Which material will keep a popsicle from melting?

Materials	Procedure
<ul style="list-style-type: none">• Cloth• Paper towels• Newspaper• Packing peanuts• Aluminum foil• Other potential insulators 	<ul style="list-style-type: none">• Build an insulator that will keep the popsicle from melting.• Place a control popsicle directly in the freezer to determine the baseline.• One child will be off.• Can they win?

Sailboat Challenge

Question. How can a sailboat float and carry cargo?

Materials	Procedure
<ul style="list-style-type: none">• Aluminum foil• String• Tape• Scissors• Straws• Dowels• Pennies• Measuring tape• Stopwatch 	<ul style="list-style-type: none">• Build a sailboat that can carry a pre-determined number of pennies or weights as cargo!• Measure the distance and speed of the sailboat's journey.• Consider if the sailboat sinks at any part of its journey. Why did this happen?• How could you make the sailboat stronger so that it could carry heavier cargo?

perfect for the
END OF THE YEAR



Ice Cream in a Bag

Materials

- 1 gallon zippered plastic bag
- 1 quart zippered plastic bag
- 4 cups ice
- $\frac{1}{4}$ cup salt
- 2 bowls
- 2 spoons
- towel

Ingredients

- 1 cup whole milk
- 1 tsp. vanilla extract
- 2 tbsp. sugar



Procedure

1. Pour the milk, vanilla extract, and sugar into the smaller plastic bag. Squeeze out the air and seal the bag carefully.
2. Place the small bag inside of the large bag. Pour the ice and salt on top of the smaller bag and seal the bag carefully.
3. Gently toss the bag for 10 minutes.
4. When the ice cream is ready, carefully spoon it into bowls and enjoy!

Question: What is the purpose of including the salt with the ice?

Popsicle Rescue

Question: Which material will keep a popsicle from melting?

Materials

- Cloth
- Paper towels
- Newspaper
- Packing peanuts
- Aluminum Foil
- Other potential insulators



Procedure

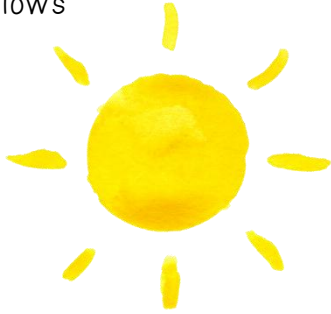
- Build an insulator that will keep the popsicle from melting.
- Place a control popsicle directly in the sunlight to allow it to melt.
- Once the control popsicle melts, check the other popsicles to see which insulator worked most effectively.
- Consider why one insulator may have worked better than another. Was it a matter of the design or material?

Solar Oven

Question: Is it possible to cook something using only the sun?

Materials

- Aluminum foil
- Oven-building materials (optional)
- Gloves
- Thermometer (optional)
- Marshmallows



Procedure

- Using the foil and any other materials provided, make an oven to cook the marshmallows.
- Use gloves to protect your hands when handling the oven and cooked marshmallow.
- Use a thermometer to collect data on the different ovens.
- Consider how to get the sun's rays directly onto the marshmallow.
- Consider which design was most effective and why.

Sailboat Challenge

Question: How can a sailboat float and carry cargo?

Materials

- Aluminum Foil
- String
- Tape
- Scissors
- Straws
- Dowels
- Pennies
- Measuring tape
- Stopwatch



Procedure

- Build a sailboat that can carry a pre-determined number of pennies or weights as cargo!
- Measure the distance and speed of the sailboat's journey.
- Consider if the sailboat sinks at any part of its journey. Why did this happen?
- How could you make the sailboat stronger so that it could carry heavier cargo?

Design a Kite

Question: How do kites stay suspended in the air?

Materials

- Measuring Tape
- Stopwatch
- Paper
- Scissors
- Straws
- Tape
- String
- Dowels
- Plastic Bag



Procedure

- Using any combination of the materials provided, design a kite that will fly.

Questions to consider:

- How long does the kite fly?
- Does the length of the kite's tail have an effect on its flight?

Build a Tent or Teepee

Question: What forces make a tent sturdy and stable?

Materials

- Pieces of cloth or fabric
- Shoeboxes
- Scissors
- Paper
- Straws
- String
- Sticks
- Blankets
- Newspaper



Procedure

- Using any combination of materials, students can design both model and full-scale tents.
- Identify where the forces (pushing or pulling) are that contribute to making the tent sturdy and stable.

Insect Observation House

Question: What is a safe container for observing an insect?

Materials

- Jar or container
- Mesh or netting
- Natural resources such as sticks, leaves, grass, etc.



Ideas

- Using your container and what you have found in nature, design a home for observing an insect.
- Make a scientific drawing of the insect and record observations about its appearance and behavior.
- Remember to set the insect free when you are finished observing it for a short amount of time!

Fairy House

Question: What natural resources can make a sturdy structure?

Materials

- Natural Resources
- Sticks
- Grass
- Rocks
- Petals
- Leaves
- Seashells
- Soil
- Clay



Ideas

- Using your natural resources, build a home for a fairy.
- Using paper or clay, make a fairy to live in the house.
- Write and illustrate a colorful storybook about your fairy!

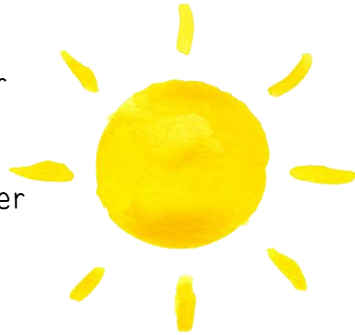


Sun-Print Science

Question: How can the process of diffusion and the sun create a patterned work of art?

Materials

- Watercolor Paper
- Watercolor Paints
- Pipette
- Water
- Paintbrush
- Scissors
- Black Paper
- Tray
- Tape
- Cup of Water



Procedure

- Tape your watercolor paper onto a tray or cookie sheet.
- Cut out different sized shapes of the black construction paper.
- Use a paintbrush to cover your paper with water.
- Use the pipette to drip drops of paint onto the wet paper.
- Dip the black construction paper into the water and lay them on top of the painting.
- Set the painting in the sun to dry. Remove the black paper.

Evaporation Station

Question: Where does water go when it evaporates?

Materials

- Bowl of water
- Pipette or eye dropper
- Crayons
- Watercolor paints
- Watercolor paper
- Tray
- Tape
- Timer
- Sunny window



Procedure

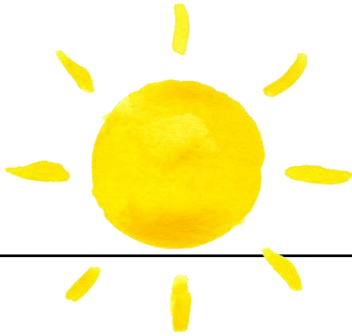
- Tape the watercolor paper to a tray or cookie sheet.
- Use a pipette or eye dropper to create a puddle of water in the middle of your paper. Using a crayon, draw around the puddle of water and place the paper in a sunny window.
- Set the timer for a certain amount of time (such as 1 hour), and then draw around the puddle using another colored crayon. Continue this process until the puddle is gone from the paper.
- Once the paper is dry, paint over the puddle art with watercolors to create a beautiful work of art!

Human Sun Dial

Question: How are shadows related to the Earth's rotation?

Materials

- Outdoor space (ex. parking lot)
- Sidewalk chalk
- Tape measure
- Notebook for recording scientific observations
- Camera (optional)



Procedure

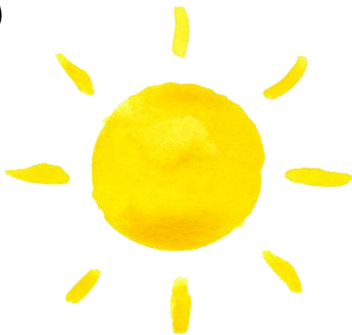
- On a sunny day with little clouds, find an open cement area with no shade and plenty of space.
- Place an 'X' on the spot where you are standing.
- Use sidewalk chalk to trace your shadow at least 3 times throughout the day.
- Note the time and location of the sun in the sky in your observation notebook.
- Use the sidewalk chalk to record the time next to each tracing.
- Use adjectives to describe your shadow, and compare them between tracings.
- Predict where your shadow will be during your next tracing!

Sunscreen Science

Question: Is sunscreen spray or lotion more effective?

Materials

- Sunscreen Spray
- Sunscreen Lotion
- Black construction paper
- Paintbrush
- Cookie cutter person (or other shape)



Procedure

- Using the cookie cutter as an outline, fill in the designs: Using the paintbrush, fill in one of the shapes with sunscreen spray and the other with sunscreen lotion.
- Be sure to either wash the paintbrush completely or use a different one for the lotion and spray.
- Place the paper in the sun. After a specified amount of time (several hours), see which form of sunscreen did a better job of keeping the paper from fading.

My Blueprint

Name: _____

Date: _____

Draw & describe your process:

Draw & describe what you learned:

Name: _____

Date: _____

Task: _____

Materials: _____

ASK

IMAGINE

PLAN

CREATE

IMPROVE



THE ENGINEERING DESIGN PROCESS

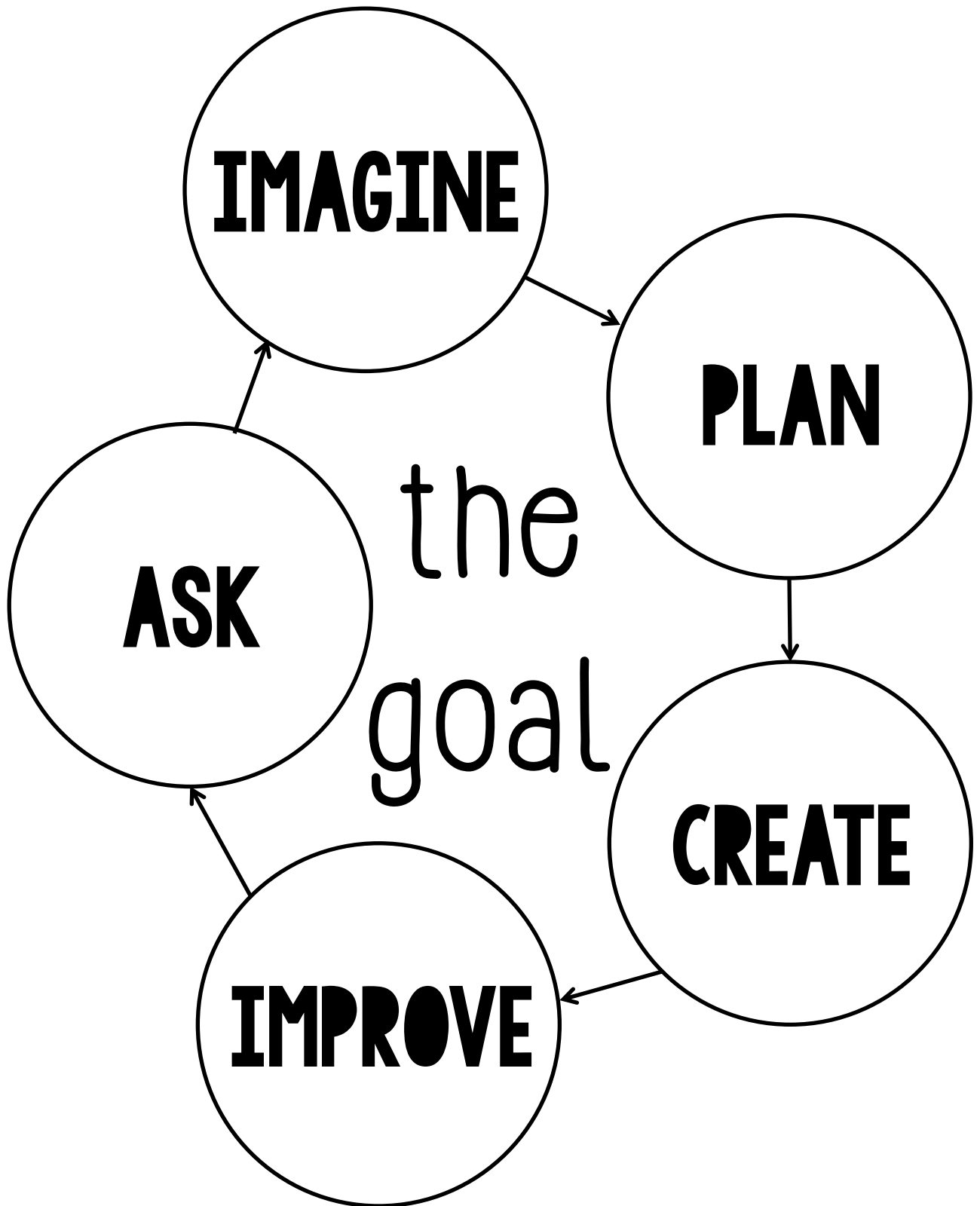
ASK & IMAGINE

PLAN

CREATE

REFLECT & IMPROVE

The Engineering Design Process



The Engineering Design Process



ask	What is the problem? What have others done? What are the constraints?
imagine	What are some solutions? Brainstorm ideas. Choose the best one.
plan	Draw a diagram. Make a list of materials you will need.
create	Follow your plan and create it. Test it out!
improve	Make your design even better. Test it out again!



THE ENGINEERING DESIGN PROCESS

my question	my ideas
	



ASK & IMAGINE

1.

2.

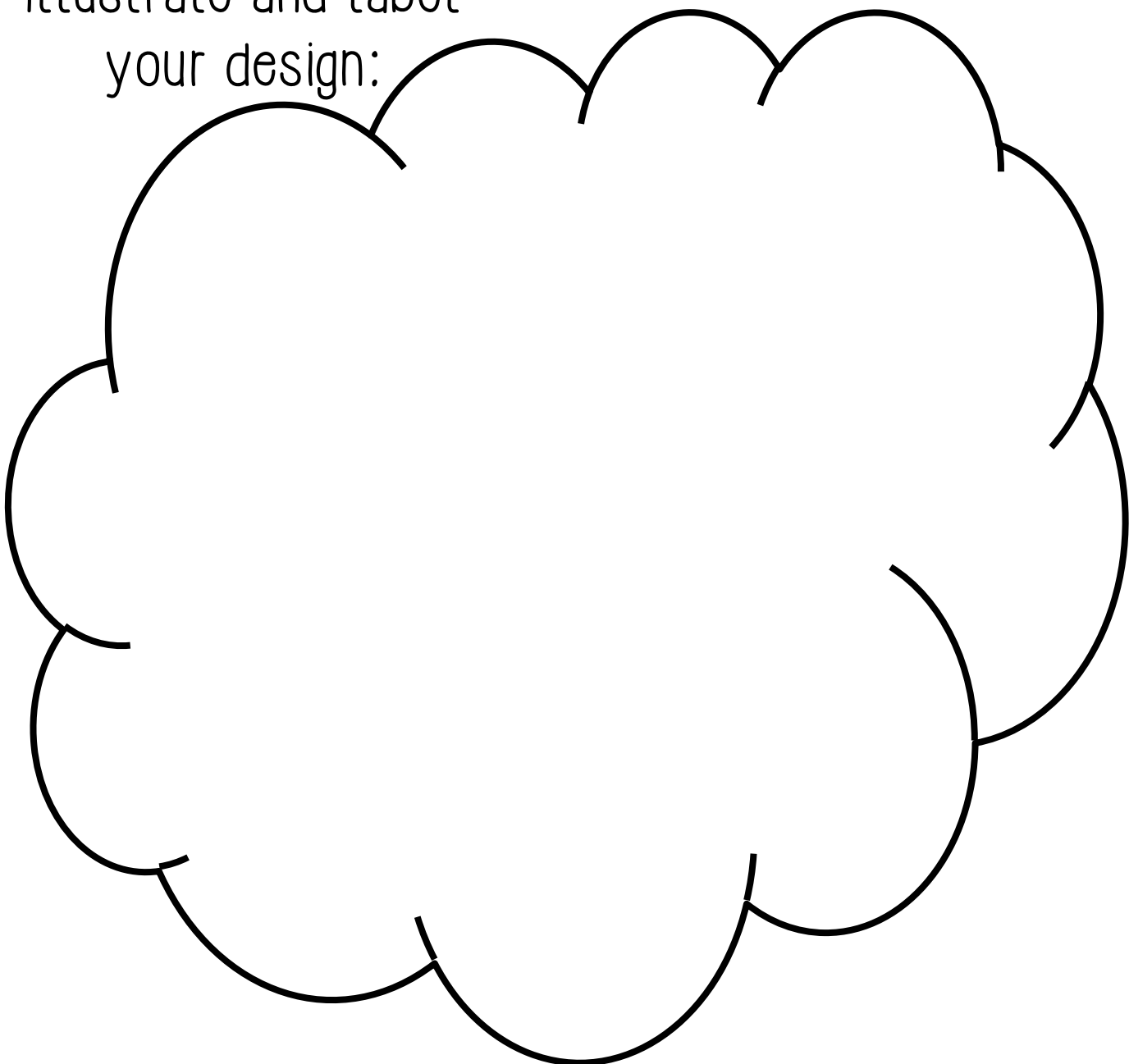
3.

4.

5.

PLAN

Illustrate and label
your design:



CREATE

What worked well:

What I can improve:

REFLECT & IMPROVE

Thank You

Thank you so much for your purchase!
Feel free to contact me with any questions.

♥ Megan Joy

Miss Megan in Room 11

[CLICK HERE TO VISIT MY BLOG FOR MORE PRODUCTS AND FREEBIES!](#)

Graphics from the following...



Let's be social!



Terms of Use: Copyright 2017, Megan Joy. Purchase of this product gives the buyer the right to reproduce the pages for personal classroom use only. Copying any part of this product and placing it on the internet in any form is strictly forbidden and would be a violation of the Digital Millennium Copyright Act (DMCA). If you have found this resource posted online, please contact me.

Thank you for your cooperation!

