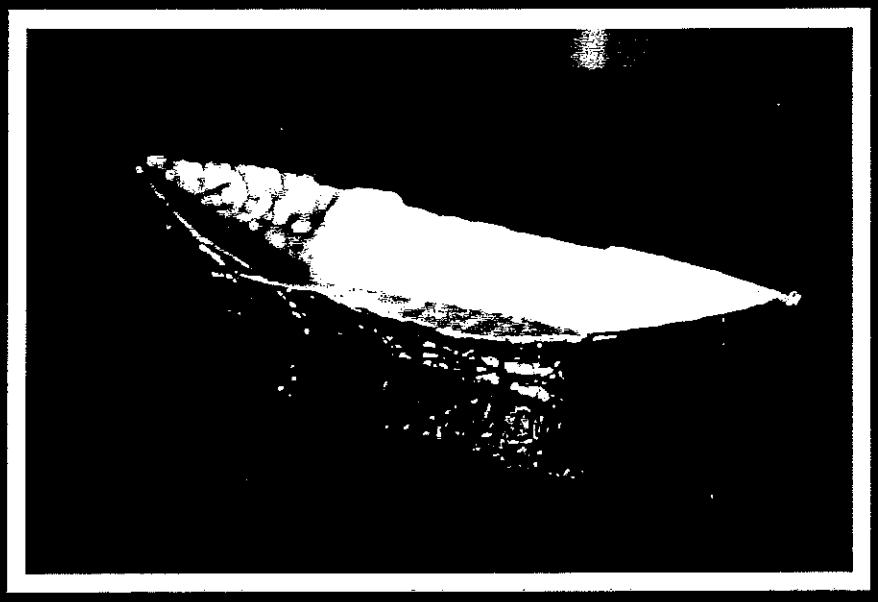
STEM CHALLENGE IN A BAG

#2

Foil Boat Challenge



Perfect for Centers, Take Home STEM or School STEM Nights
Grades 3-6

Using This Product

Thanks for downloading STEM Challenge in A Bag. I've worked hard to come up with engaging STEM activities that students can do independently or in groups with easy to access materials. These can be used for a variety of purposes:

- Take Home STEM
- Centers
- Family Science or STEM nights
- Sub Plans

Each *STEM Challenge in A Bag* download comes with the following:

- Picture of Assembled Kit
- A detailed materials list
- A Title Page to stick in the Bag in both color and black and white. (perhaps copy on cardstock in bright colors)
- Student Instructions for the activity (could be copied to the back of the Title Page and laminated)
- Student Activity Sheet

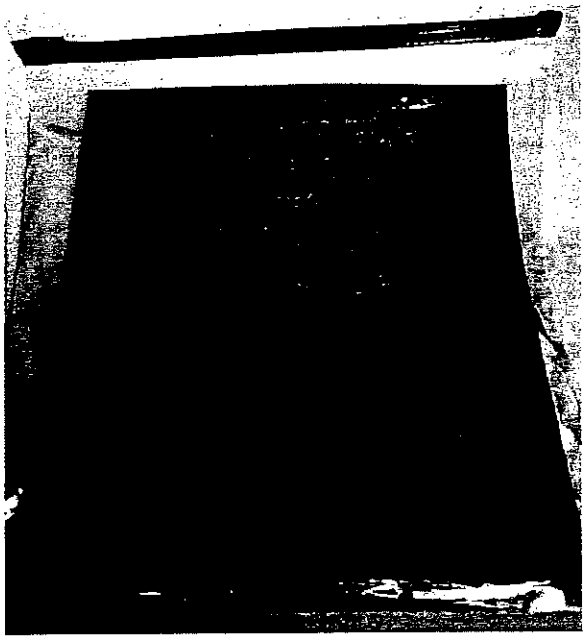
STEM Challenge in a Bag
Foil Boat Challenge

Materials: (Have enough materials to restock the kit if it will be reused by different students)

- Gallon Ziploc Freezer Bags
- 2 Square feet of foil
- 25 pennies

*Students will nee to use a sink or large Tupperware of water to test their boats.

Picture of Assembled Bag



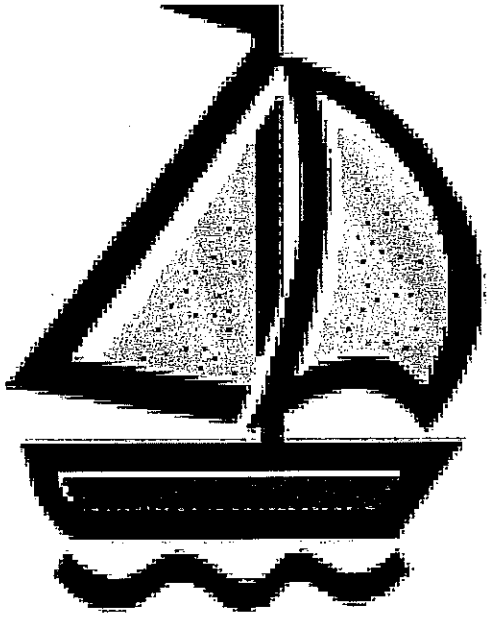
Front

Back

(I copied the directions for the activity onto the back of the cover. Laminating would be a good idea as well)

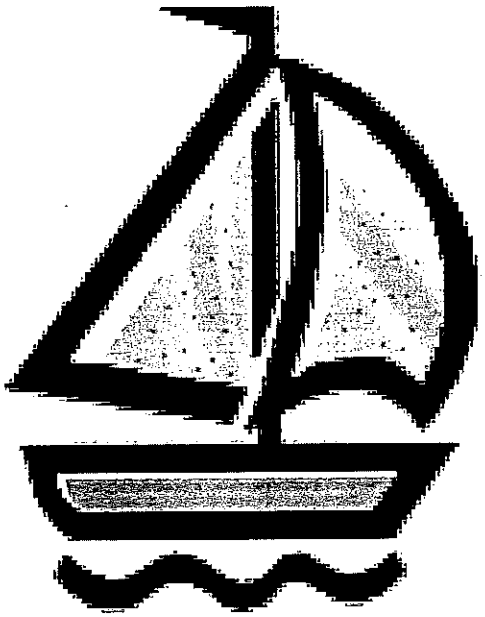
STEM Challenge In A Bag #2

Foil Boat Challenge



STEM Challenge In A Bag #1

Foil Boat Challenge



Activity Instructions

Today you will design a boat using a piece of foil. Once your boat is constructed, you will test it in a sink or large Tupperware of water to see if it floats. If it doesn't float, redesign the boat until it does. Once it floats, you will see how many pennies it can hold before sinking.

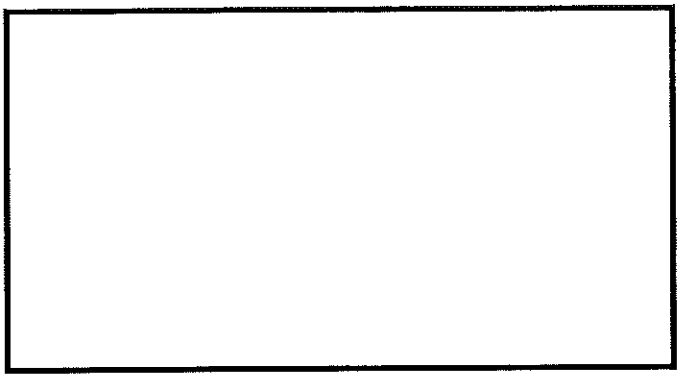
Think of ways you can improve your boat to help it hold more pennies.

Follow the steps on the activity sheet and answer the questions.

Name:_____

Activity Sheet

Step 1: Make a Plan: In the box below sketch out some ideas of how you want to construct your boat



Step 2: Begin building your boat

Step 3: Once you get it floating, test it to see how many pennies it can hold. How many did it hold?_____

Step 4: Think about how you might be able to improve your boat and make some changes.

Step 5: Test your boat again with the pennies. Did you improve your boat? How many pennies was the most you could get it to hold?_____

What was the most challenging part of this project?

_____

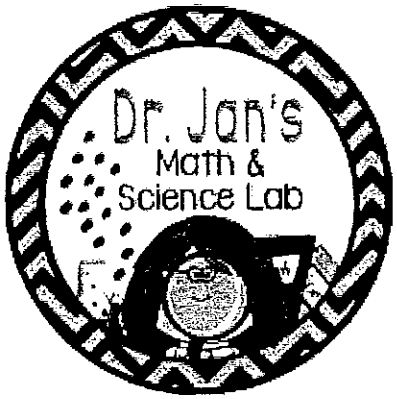
_____

STEM Challenge In a Bag
Foil Boat Challenge

Terms of Use

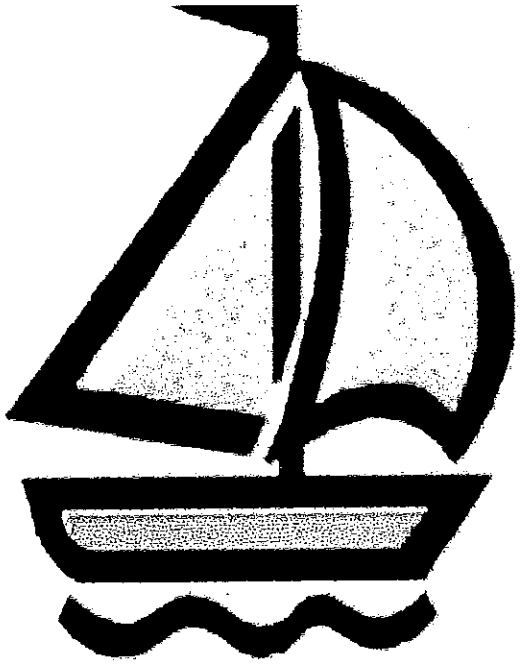
Thanks for downloading this activity. Please take a minute to leave feedback on this product. (You can earn TpT credits for future purchases)

If you and your students enjoy this activity, be sure to check out more engaging activities at my store:



STEM Challenge In A Bag #1

Foil Boat Challenge



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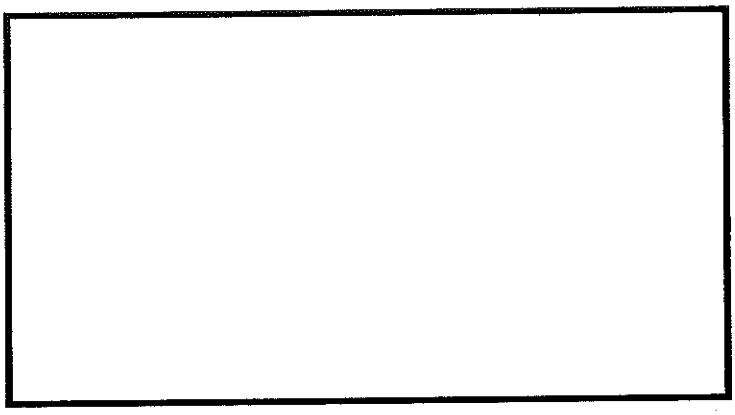

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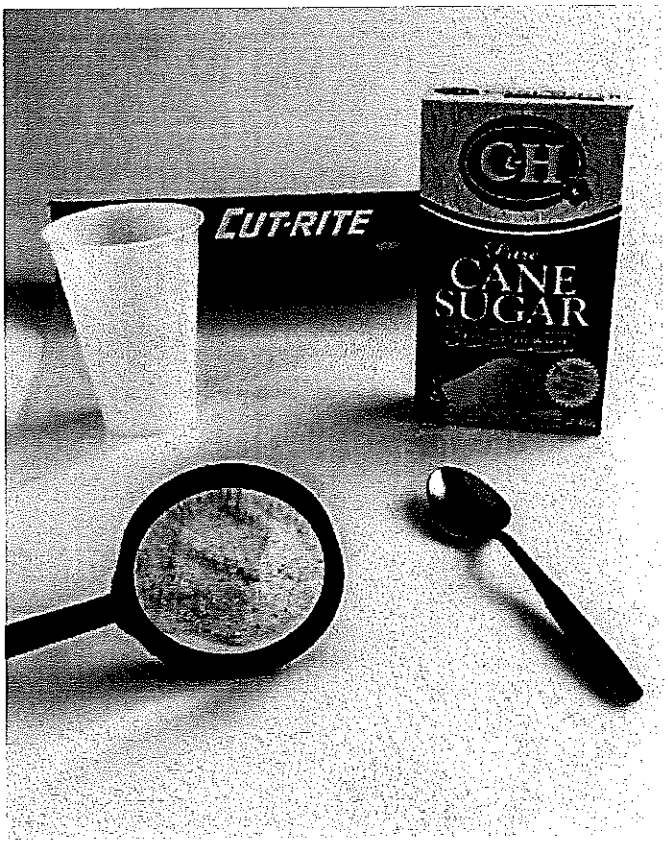
Making A Rock In A Cup

There are three types of rocks-igneous, metamorphic, and sedimentary. Each rock is formed through different processes and made up of varying materials. Igneous rocks are formed through the cooling of melted materials while metamorphic rocks are formed when heat and pressure change other rocks. Sedimentary rocks are composed of pieces of rocks and minerals and even remains of animals and plants. All of these pieces are compressed and held together by other minerals. Some examples of sedimentary rocks include limestone, sandstone, and coquina.



Problem:

How can one create a sedimentary rock? What takes place during the rock cycle?

Materials:

- Wax paper
- Magnifying glass
- Water
- Sugar
- Gravel
- Sand
- Spoon
- Paper cups

Procedure:

1. Pour a spoonful of sand into a paper cup. Pour another spoonful of gravel into the same cup.
2. Fill another cup with a teaspoon of water. Stir in 5 spoonfuls of sugar until it is dissolved.
3. Pour the sugar water mixture slowly into the cup of sand and gravel until it is moistened. Pour off any excess water.
4. Let the "rock" dry then carefully tear the paper cup off over a piece of wax paper.
5. Let the "rock" sit and harden for at least 2 days.
6. Use a magnifying glass to observe your "rock." Draw an illustration of what you see. What kind of rock did you make?

Author: Angela Pike

STEM Websites

1. CyberChase (PBS Kids)

Join the cybersquad. Good guys only, please. PBS Kids show CyberChase offers a range of online resources for future CISOs, including activities and games geared toward learning math, code, and similar concepts.

2. NASA Kids Club

Want to build a rocket? Have at it -- and plenty of other space-related projects and activities -- with the NASA Kids Club.

3. Code.org

Backed by some of the biggest names in tech, Code.org's stated mission is to grow computer science learning by fostering its inclusion in school curriculums. In addition to its Hour of Code series, the site also features an Intro to Computer Science course for K-8, programming tutorials in languages such as Python and JavaScript, mobile app development activities, and other resources.

4. TechRocket

TechRocket's courses for coding, game design, and graphic design are built on the premise that "you're never too young to learn STEM skills." This site includes a heavy focus on building mobile apps and games, from iOS development to Minecraft mods.

5. Engineering, Go For It (eGFI)

Created by the American Society for Engineering Education, eGFI's aim is to foster educational and pre-professional interest in engineering and other STEM subjects from kindergarten through high school. In addition to information on the myriad branches of the engineering field -- from biomedical to computer to mechanical and beyond -- the site features descriptions of professional paths for each, including profiles of real people at work in the field.

6. Zoom (PBS Kids)

Check out activities, games, and downloadable offline projects from PBS Kids' series Zoom, a show made "by kids, for kids" that encourages curiosity and ingenuity across a range of subjects. My almost-5-year-old and I particularly enjoyed the Goldburger to Go game. In related news, I might need some remedial schooling.

STEM APPS

APPS FOR STEM
Monster Physics- upper
Lightbot Hour
Science 360-upper
Move the Turtle- upper
Go Car Go
Crazy Gears
Thinkrolls 2
Busy water
World of Goo
Inventioneers
Hopscotch

Electricity

An Alarming Idea: Designing Alarm Circuits

FICTION

The Magic School Bus and the Electric Field Trip

By Joanna Cole

Small enough to squeeze through power lines, Ms. Frizzle's class learns how electric current travels through the town, lights up a light bulb, heats up a toaster, and runs an electric motor. (48 pages)

Recommended for reading at 3-5 grade level.
Publisher: Scholastic ISBN: 0590446835

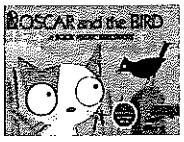
My Light

By Molly Bang

Caldecott Honor artist Molly Bang celebrates the many wonders of the sun, with radiant words and images that illuminate the myriad ways in which the sun gives us energy and power from its light. (40 pages)

Recommended for reading at PreK-3 grade level.
Publisher: Blue Sky Press ISBN: 043948961X

Oscar and the Bird



By Geoff Waring

Oscar finds out how electricity is made and stored, which machines need electricity to work — and why we always need to be careful around wires, batteries, plugs, and sockets. (32 pages)

Recommended for reading at PreK-3 grade level.
Publisher: Candlewick Press ISBN: 0763653020

NON-FICTION

Charged Up

By Jacqui Bailey

Describes how electrical energy is generated in power stations and how it travels through pylons, power cables, and wires into people's homes. Includes activity. (32 pages)

Recommended for reading at 3-5 grade level.
Publisher: Science Works ISBN: 140481129X

Switch On, Switch Off

By Melvin Berger

It seems like magic! It's not - it's electricity. But how does a light actually work? In this clear and simple book learn all about electricity, how it's produced, and how it can be used. At the end you'll learn how to conduct fun experiments that will let you generate electricity yourself! (32 pages)

Recommended for reading at 3-5 grade level.
Publisher: Harper Trohpy ISBN: 006445097X

Conductors and Insulators

By Chris Oxlade

This book looks at electrical conductors and insulators, examining what they are and how we use them. The book considers a range of examples that will be familiar to young readers, and explains the scientific concepts behind electricity in clear, simple language. (32 pages)

Recommended for reading at 2-4 grade level.
Publisher: Heinemann Library ISBN: 1432956787

Continued on next page

Electricity

An Alarming Idea: Designing Alarm Circuits

NEWS ARTICLES

Your Head's Battery

By Sid Perkins
for *Science News for Students*

Fluids in the inner ear can actually power an electronic device, such as an implant.

Recommended for reading at 3–5 grade level.
http://www.sciencenewsforkids.org/2013/01/fluids-in-the-inner-ear-can-actually-power-an-electronic-device-such-as-an-implant/

Cow Power

By Catherine Clarke
for *National Geographic Kids*

A farm in Bridport, Vermont, uses cow manure to generate electricity.

Recommended for reading at 3–5 grade level.
http://kids.nationalgeographic.com/kids/stories/spacescience/cow-power/

How do electric circuits work?

By HowStuffWorks
for *Discovery Kids*

An introduction to electric circuits and circuit component vocabulary.

Recommended for reading at 3–5 grade level.
http://kids.discovery.com/tell-me/curiosity-corner/science/how-do-electric-circuits-work

Rocks

Solid as a Rock: Replicating an Artifact

FICTION

Dave's Down-to-Earth Rock Shop

By Stuart J. Murphy

Josh and his best friend, Amy, have so many rocks, they need to organize their collection. But how? Young collectors will be fascinated by all there is to know about rocks and about classifying — sorting and organizing objects by attributes like color, shape, or size. (40 pages)

Recommended for reading at 2–5 grade level.
Publisher: HarperCollins
ISBN: 0064467295

Fossils Tell of Long Ago

By Aliki

With clear prose and lovely, full-color illustrations, award-winning author and illustrator Aliki describes the different ways fossils are formed and what they tell us about life on Earth long ago. (32 pages)

Recommended for reading at K–3 grade level.
Publisher: HarperCollins
ISBN: 0064450937

The Magic School Bus Inside the Earth

By Joanna Cole

When the class forgets to do its homework, a fieldtrip through the Earth's crust, into the center of the Earth, and out through a volcano will teach them not to forget their assignments again — and then some! (40 pages)

Recommended for reading at 2–5 grade level.
Publisher: Scholastic Press
ISBN: 0590407600

FICTION

Archaeologists Dig for Clues

By Kate Duke

Archaeologists on a dig work very much like detectives at a crime scene. Every chipped rock, charred seed, or fossilized bone could be a clue to how people lived in the past. (32 pages)

Recommended for reading at K–4 grade level.
Publisher: HarperCollins
ISBN: 0064451755

NEWS ARTICLE

Decoding a Beverage Jar

By Kate Ramsayer

for *Science News for Students*

Ancient pottery provides hints of the world's oldest known wine.

Recommended for reading at 3–5 grade level.
http://bit.ly/1cWiqFa

NON-FICTION

Rocks and the People Who Love Them

By Nel Yomtov

Using a graphic-novel format, this engaging and approachable volume relays clear information about different kinds of rocks and different kinds of geologists. (32 pages)

Recommended for reading at 5-8 grade level.
Publisher: Capstone Press
ISBN: 1429679883

Want to suggest other resources for the unit? Write to eie@mos.org.
For science and literacy resources that support other EiE units, visit eie.org.

EiE Engineering is Elementary.
Developed by the Museum of Science, Boston