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TEACHER TIPS

- I've tried to prevent these activities from being crafts, which is always tempting for me. While I LOVE an attractive final product, I tried to focus more on the science behind the design. I did not show students a final version to copy. Instead, I want students to develop their original ideas.
- While I love elaborate projects, I've kept these STEM activities fairly simple. They should be able to be completed in one class period of about one hour.
- I like to have students work in groups of four. This helps minimize the amount of materials you will need for the activities. It also allows students to work collaboratively.
- Since we all have different needs, I have included an **editable version** of the recording sheets.

TEACHER NOTES

As my curriculum and instructional challenges increase, I am constantly seeking ways to integrate my curriculum and standards. This product was created to make the integration of social studies, science, and even a little research a bit easier for teachers. These STEM or STEAM activities are centered around major events in United States history. Hopefully, these lessons will not only engage students and encourage critical thinking, but will also allow students to understand and appreciate these historical events on a deeper level.

Each activity comes with detailed teacher notes, an explanation of how the activity relates to the historical event, a suggested materials list, a suggested list of websites for further exploration, and example photos. There is also a two page printable for students. I have used the same format for each of the printables, so that students will quickly become adjusted to your expectations and procedures. The printable will take students through the complete design process. The first page of the printable is used to get students started with the activity. It explains the directions and gives students the parameters in which they will be working, as well as guide students through research questions. You may use the second page of the activity if you plan to have students test and revise their design, which is part of the STEM/STEAM process. However, I too am teaching in the real-world, and I understand that we are not always able to go through the entire process, which is why the second page is always an optional page.

When doing these activities, I avoid telling students exactly which materials to use. Instead, I give a suggested list that students may choose from. I also try to avoid telling students HOW to create their project, even though it is so tempting to do. I allow students to build designs that will fail during this time, because that is a part of the learning process. However, I do provide support and guidance, as well as guided questions that will hopefully move students in the right direction.

I hope you enjoy this resource as much as I do! Please let me know if you have any questions, and don't forget to tag me @ashleigheducationjourney when sharing your students' work!

CREATE A NAVIGATIONAL TOOL

European Explorers did not have modern day technology such as GPS devices to navigate the open water. Instead early explorers relied on navigational tools such as the compass. In this STEM activity, students will build a compass with specific constraints. Students should use what they know about magnets and earth science to build a compass out of everyday materials. The constraints for this activity are:

- The compass should be handheld.
- The compass should point to the north when resting.
- The compass should show the four cardinal directions.

To test this activity, have students compare the direction their compass is pointing to a “real” compass. You can even use an app on your phone to download a compass.

SUGGESTED MATERIALS

There is no mandatory or required material for this activity. The list below simply provides a few suggestions for students and teachers.

- small, shallow, plastic containers (large enough for needles to move freely-ex: petri dishes)
- needles
- magnets
- clear, plastic cups
- string
- rubber bands
- markers
- water
- foam
- cardboard

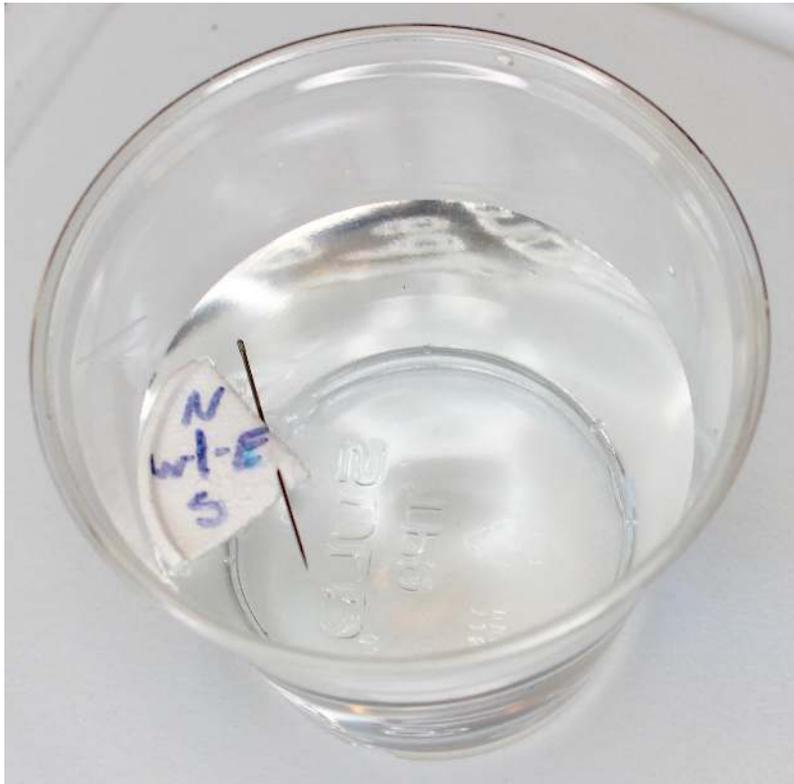
SUGGESTED WEBSITES

- <https://exploration.marinersmuseum.org/object/compass/>
- <http://www.explainthatstuff.com/magnetism.html>
- <https://wonderopolis.org/wonder/how-does-a-compass-work>

SUGGESTED VIDEOS

- <https://www.youtube.com/watch?v=4DINhbkPiYY>

CREATE A NAVIGATIONAL TOOL



Build a Navigational Tool

STEM challenge

The Challenge

In this STEM activity, you will build a compass that would allow you to navigate the open waters. You should use what you know about magnets and earth science to build a compass out of everyday materials. The constraints include:

- The compass should be handheld or fit in your hand.
- The compass should point to the north when resting.
- The compass should show the four cardinal directions.

Question

What are the parts of a magnet?

How can you magnetize metal?

Why does the tip of the compass always point to the north?

Brainstorm

What should you consider as you build your compass? What materials will work best?

My Plan

Sketch your design here.

Test

Can your compass fit in your hand?

Does your compass point to the north when resting?

Does your compass show the four cardinal directions?

Revise/Improve

Did your plan work? What changes can you make to improve your design?

Retest

Can your compass fit in your hand?

Does your compass point to the north when resting?

Does your compass show the four cardinal directions?

Reflect

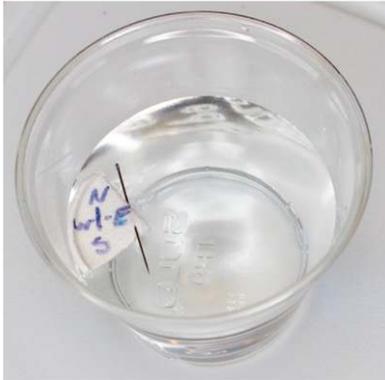
Did your improvements work? What are your next steps?

What went well?

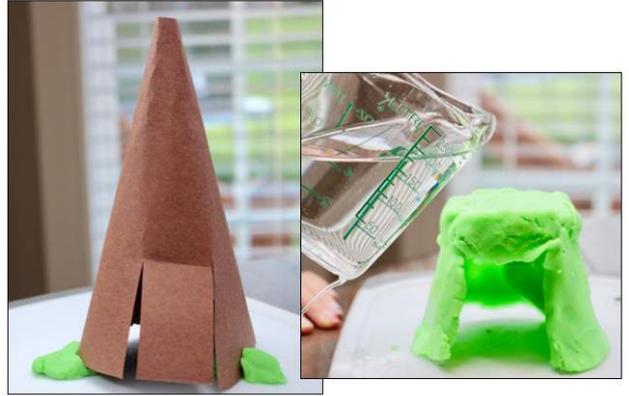
What could you do differently next time?

What did you learn through this activity?

CREATE A NAVIGATIONAL TOOL

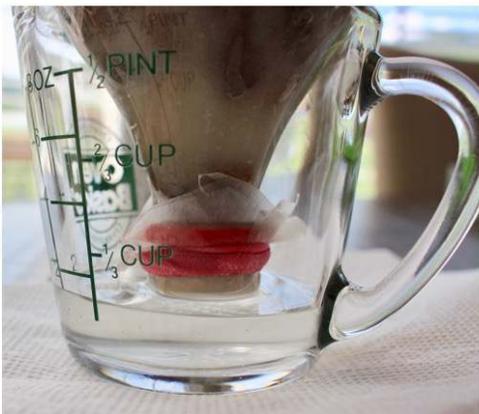


CREATE A NATIVE AMERICAN HOME



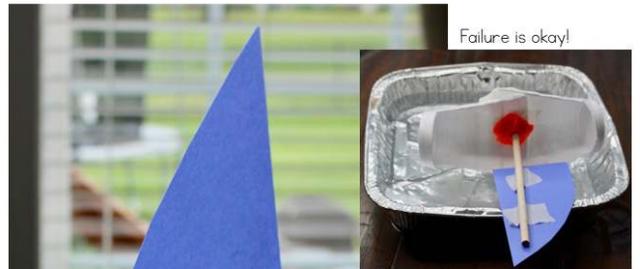
PURIFY WATER

notice the
dirty water

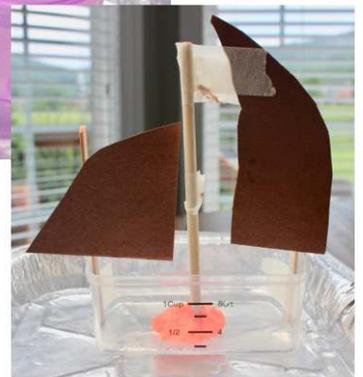


CREATE A SHIP

Failure is okay!



Our focus is more on design
than style and overall
appearance.



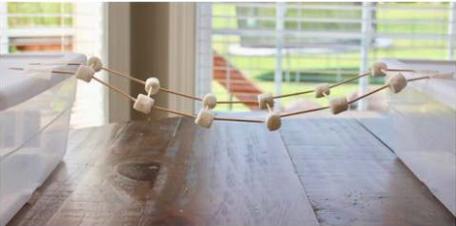
CREATE A WATERWHEEL



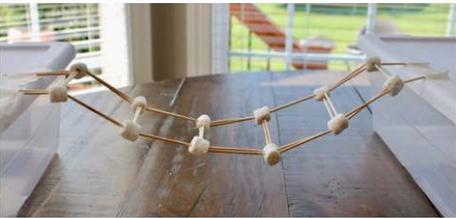
CREATE WIND POWER



CREATE A BRIDGE

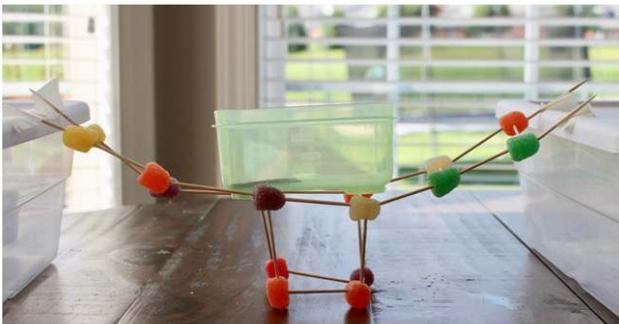


This single strand bridge did not work. It could not support any additional weight.



The extra toothpicks made it sturdier.

Gum drops and a center support are other design options.



CREATE A POWDER HORN

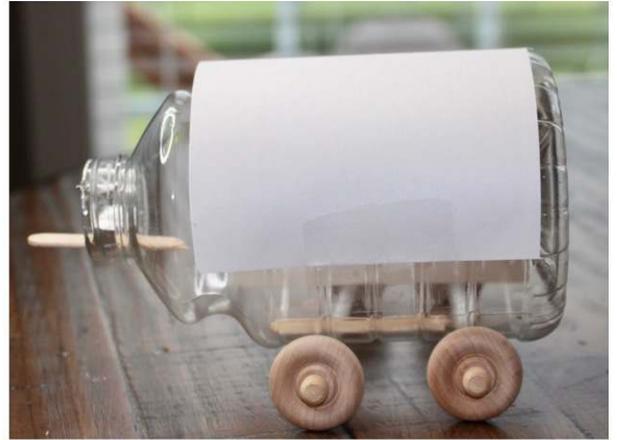


CREATE A TEA CONTAINER



Notice how dark the water gets when the tea is wet.

BUILD A COVERED WAGON



CREATE A BLANKET



Students used broken pieces of foam and plastic wrap. They learned how they could make the insulation better by breaking the foam into smaller pieces.

Students used aluminum foil. They learned how they could layer multiple materials to add insulation.



Use what materials work for you! True story—our puppy completely destroyed a sleeping bag, so I gathered all of the down stuffing and used it as an optional material for this lesson.



CREATE A COTTON GIN

I typically avoid showing students pictures of completely projects before beginning a STEM project. However, since this is a bit more complicated, I do show students examples of this project.

