Tin Foil Boat Experiment



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Teachers: Examples of problems engineers attempted to solve are:

- 1. How to make clean water when it has been polluted.
- 2. Not enough housing or transportation in an area.
- 3. Water shortages on lands that have no pipes to transport it.
- 4. What to do with buildings that are too old and the structure is in poor condition



Teachers: Introduced an Engineer from an underrepresented group.



Anyone can be an Engineer, but this is Jeanette Jo Epps. She is an Aerospace Engineer. Aerospace Engineering is the primary field of engineering concerned with the design, development, testing, and production of aircraft, spacecraft, and related systems and equipment. Ms. Epps works for NASA and has done tests in environments that are similar to space.

Teachers: Descriptions of some fields of engineering.



Electrical Engineer: Focuses on what powers the society. Example: a circuit, a lights switch, a power line.



Agricultural Engineer: Focuses on farming and soil types for the type of plant, climate, and growth.



Chemical and Biological Engineer: Focuses on the life cycle in plants, environments and humans.



Civil Engineer: Focuses on building designs and population growth.

Teachers explain the engineering design process



Vocabulary: Let's Review

- 1. Density: How heavy or light an object is for its size.
- 2. Force: A pull or push that causes a change in motion.
- 3. Stability: When an object is not easily moved or tipped.
- 4. Buoyancy: Measurement of the push of an object upward.
- 5. Gravity : Measurement of the downward pull of an object.

Engineering Design Process

Connect at least one science concept (see eval form for examples)

The science concept when building boats is that gravity pulls the displacement water down that cause an upward force of the boat which is known as Buoyancy. The buoyancy force helps maintain the boat's stability to avoid being it sink into the water. The boat must also be less dense and less weight cable of floating above water.

Engineer Design Process

Create and build a boat that can float above the water while carrying heavy objects without sinking.

- You will be given:
 - 6 Sheets of foil
 - 4 Straws
 - 2 Feet of tape
- The goal of this experiment is to build a boat using these materials that can hold two 8 oz weights when placed at the same time
- You will have 2 minutes to draw your design and 15 minutes to build your boat

Share with other teams:

- 1. What did you notice with your boat?
- 2. What didn't work so well?
- 3. What did work?
- 4. What did work but you want to try differently?
- 5. If you had other materials for this project, what would you do differently and why?

Engineering Redesign Process

Now think....What went wrong with your boats or how could you improve it?

Please take a moment and answer the questions on the "Revise" page and let me know what your group put down when everyone is finished

Things to consider:

- 1) Is the bottom of your boat flat so it can stay up without being tipped over?
- 2) Is the boat fully secured enough so water can't get through?
- 3) Is there a surface on the inside of the boat that can equally hold the weights better?

New Objective: Design a boat that can hold three (3) 8 oz weights when placed at the same time.

- You will be given:
 - o 6 Sheets of foil
 - 4 Straws
 - 2 Feet of tape

Questions about the redesign

Please answer the questions on the handout under where it says "My revised boat able to hold..."

After everyone has finished, as a group tell us your responses.

5E Instruction



5E Instruction

Engage	Your Task
How did you connect the past with the present?	
Explore	Your Task
How did you get involved in your learning?	
Explain	Your Task
How did you communicate what was being learned?	
Elaborate	Your Task
How did you apply new information learned?	
Evaluate	Your Task
How did you check yourself to see what was learned?	