

DAY 1 SCIENCE CANOE SCHOOL-WHAT MAKES A BOAT FLOAT?

Activity

Students will build a clay boat and determine what design works for holding the maximum amount of weight.

Materials

- * Canoe School Experiment Sheet
- * Medium sized bowl, bucket, or container (at least 6 inches deep)
- * 200-300 Pennies

Essential Question

How can the shape of an object make it float or sink?

Science Concepts In the Lesson

In order for an object to float, it must displace enough water to equal its weight, before it is fully submerged. An object will float if it weighs less than the amount of water it displaces. It will sink if it weighs more than the water it displaces. Differently shaped objects displace water differently, even if they are of the same material and have equal weight. This explains why huge steel ships float even though a ball of steel sinks

<u>Lesson</u>

- 1. Divide the class into groups of 4 5 students.
- 2. Distribute a lump of clay, the Canoe School Experiment Sheet, and medium sized bowl of water to each team. You might want to do this experiment outside because it can get a little messy or wet.
- 3. Have the kids drop the lumps of clay into the bowl of water. It will sink to the bottom.
- 4. Now challenge the kids to shape the clay into a shape that will float. Give the kids 10 15 minutes to experiment with design and fill out the Boat Building and Hypothesis section of the Canoe School sheet. Challenge each group to build a boat that will hold the most weight (pennies) as possible.
- **5.** After each group has built a boat, test each boat to determine how many pennies each boat will hold before spilling the pennies or sinking.

Tips for Using This Activity

* This can be messy. You can out down newspaper or try this activity outside.

CANOE SCHOOL WHAT MAKES A BOAT FLOAT?

Name

Directions - Your group is going to build a clay boat. Your goal is to build a boat that holds as much weight (pennies) as possible.

<u>Hypothesis</u>

What do you think will make your boat hold the most weight before sinking? (For example, shape of the boat, dimensions of the boat, etc.)

<u>EXPERIMENT</u>

Test some boat designs to determine which design you think floats the best and will hold the most weight. Draw the boat design that worked best.

Sketch a picture of the boat you designed.

DATA

How many pennies did your boat hold?

CONCLUSION

What did you learn about boat design? What design helped the boat float the most?

DAY 2 SCIENCE PAPER AIRPLANE MATH AND SCIENCE (PAGES 53 - 57)

DAY 3 SCIENCE QUICK SAND SCIENCE

Activity

Students will make a quicksand like mixture and explore the properties of the mixture.

Materials

- * Corn Starch
- * Water
- * Small Bowl

Essential Question

How a scientist explore the properties of materials?

Science Concepts In the Lesson

Quicksand is a soupy mixture of sand and water where sand is floating in and on the water. It is both a solid and a liquid at the same time, making it a trap to moving animals and people. Quicksand occurs when water has flooded an area of sand and then is trapped in that area. Floods, underground springs, or an earthquake can create ideal environments for quicksand which usually occurs around river beds.

Cornstarch Quicksand

When you quickly stir together the water and the cornstarch, the mixture becomes very thick and acts the same as quicksand. At first, the individual grains of the cornstarch are mixed up, and are not able to easily slide over one another. Why can't they slide over one another? It is because of the lack of water that is between the grains. When the mixture is stirred quickly, more of the water gets between the cornstarch grains, allowing them to slide over one another more easily.

<u>Lesson</u>

Cornstarch Quicksand Directions

A large bowl or other large mouth container A spoon 1 and 1/4 cup cornstarch 1 cup of water Small bowl for each group

- 1. Add the cornstarch to the bowl or container, then slowly add the water to the cornstarch.
- 2. Mix together the cornstarch and water until it is completely blended.
- 3. Start off by dropping some of the quicksand onto a surface, or back into the bowl. Notice how liquid the quicksand is at this point?
- 4. Quickly stir the cornstarch paste until it hardens. Now you can poke holes into the cornstarch mixture, and watch as they slowly fill themselves in just like quicksand. If the mixture starts to turn back into a liquid, simply give the cornstarch mixture another brisk stir, and you'll again have instant quicksand.

5. After students have some time to experiment with the quicks and have them fill out the Quicks and Science paper.

Tips for Using This Activity

* This can be messy. You can out down newspaper or try this activity outside.

Quicksand science

Group Names

What is Quicksand?

Quicksand is a soupy mixture of sand and water where sand is floating in and on the water. It is both a solid and a liquid at the same time, making it a trap to moving animals and people. Quicksand occurs when water has flooded an area of sand and then is trapped in that area. Floods, underground springs, or an earthquake can create ideal environments for quicksand which usually occurs around river beds.

Cornstarch "Quicksand"

When you quickly stir together the water and the cornstarch, the mixture becomes very thick and acts the same as quicksand. At first, the individual grains of the cornstarch are mixed up, and are not able to easily slide over one another. Why can't they slide over one another? It is because of the lack of water that is between the grains. When the mixture is stirred quickly, more of the water gets between the cornstarch grains, allowing them to slide over one another more easily.

Exploring Cornstarch "Quicksand"

What happens when you stir the cornstarch quicksand quickly?

What happens when you move the spoon through the quicksand slowly?

What happens when you leave the quicksand alone?

If you were trapped in quicksand, do you think it would be better to move quickly or slowly? Why?

DAY 4 SCIENCE BUBBLE SCIENCE AND MATH (PAGES 60 - 63)

DAY 5 SCIENCE SCIENCE CAMP CRAFT - MAKE A LAVA LAMP

Activity

Students will make a "lava lamp" in a water bottle.

Materials

- A clean water or soda bottle (You need one water bottle for each group of 3 -5 students)
- 3/4 cup of water
- Vegetable Oil
- Fizzing seltzer tablets (such as Alka Seltzer)
- Food coloring (red works best)

Directions for Building the Lava Lamp

- **1.** Pour the water into the bottle.
- **2.** Use a measuring cup and slowly pour the vegetable oil into the bottle until it's almost full. Wait a few minutes for the water and oil to separate.
- **3.** Add 5-10 drops of food coloring to the bottle (red works well, but any color except yellow works). The drops will pass through the oil and then mix with the water below.
- 4. After the mixture settles and the water is colored, break a seltzer tablet in half and drop the half tablet into the bottle. Watch it sink to the bottom and let the blobby greatness begin! NOTE Don't put the bottle lid on while the Seltzer Tablet is in the water. Once the fizzing stops students can put the lid on the bottle. Students love to experiment with the oil and water mixture, just make sure the lids are on tight! SAFETY NOTE Warn the students not to eat the seltzer or put in in their mouth.
- **5.** To keep the effect going, just add another tablet piece. To make this look even more like lava lamp effect, shine a flashlight through the bottom of the bottle. Do not give students seltzer tablets or the lava lamp to take home or use without adult supervision.

Science Concepts In the Lesson

The oil stays above the water because the oil is lighter than the water (it is less dense than water). The oil and water do not mix. Oil molecules are attracted to other oil molecules, but they will not bond with water molecules.

The seltzer tablet sank to the bottom and started dissolving and creating a gas. As the gas bubbles rose, they took some of the colored water with them. When the blob of water reached the top, the gas escaped and the water sank down to the bottom.