

Material Preparation

MATERIALS

- scissors
- water table or plastic dishwashing basin
- rolling pin
- water
- plastic tablecloth
- sheet of 9" x 12" construction paper
- clear tape
- paper towels
- ¼ cup of modeling clay (do not use play dough)
- aluminum foil sheets

For each child:

- four sheets of 6" x 6" aluminum foil
- Ask Me About Water sticker

TEMPLATES

How to Make a Paper Boat

PREPARE IN ADVANCE

- Practice creating a paper boat using *How to Make a Paper Boat* until you can make the boat without using the instructions.
- Make a clay boat that will float:
 - Roll out the clay until it is about ¼" thick.
 - Shape it into a simple boat; fold the edges up high enough to keep the boat watertight.
 - Test in advance to ensure it floats.
- Cut out four 6" x 6" squares of aluminum foil for each child.
- Fill a water table or dishwashing basin two-thirds full with water.



SET UP THE LESSON AREA

- Cover the table with a plastic tablecloth.
- Place the following items on the table: sheet of construction paper, clear tape, aluminum foil squares, water basin, clay boat and paper towels.



OBJECTIVE

Children will explore how sinking and floating is influenced by an object's shape.

EXCITE

1. Gather the children in the ECHOS lesson area. Display the brightly colored paper. Begin to fold the paper into a paper boat. Encourage children to guess what you are making. **What do you think I am doing with this paper?** Accept responses as you fold the boat.
2. Show the children the finished boat. **Do you know what it is now? Yes, it's a *model* of a *boat*. It is a small copy of a real boat.** Place the boat in the water. **Do you see how it floats? Today we are going to learn how the *shape* of an object helps it float.** Remove the boat right away so it doesn't sink.



INTRODUCE

1. Hold up the clay boat. **What is this? Yes, it is another boat. Do you think the boat will sink or float if I place it in the water?** Wait for the children to respond. Place the clay boat gently in the water.
2. **Does the boat sink or float? Yes, it floats. Do you think I can make the clay sink by changing its shape?** Listen to the children's responses.
3. Remove the boat from the water and roll it into a ball. **Let's see what happens.** Build excitement by counting to three and then releasing the ball. **One, two, three... Ah, it sank. Did I add any clay to make the ball heavier? No. It's the same piece of clay. What's different? Yes, the shape.**



4. **What happened to the clay when it was shaped into a boat?** Prompt children to say that it floated. **What happened when it was shaped into a ball?** Prompt children to say that it sank. **The shape of an object can make it sink or float.** Remove the clay ball from the water.
5. Gently place one square of aluminum foil flat on the water. **Look how this piece of aluminum foil paper floats. How do you think I can make it sink?**
6. Remove the piece of aluminum foil from the water basin. Fold the square tightly six times to make a very compact 1" square and press hard on top of it to remove any pockets of air. If the folded aluminum square has any air bubbles, it won't sink. **What do you predict will happen when this small piece of folded aluminum foil paper is placed in water?** Listen to the children's responses.
7. **Let's see.** Place the square of folded aluminum foil in the water. Listen to and observe the children's reactions. **What happened? Yes, the small piece of aluminum foil paper sank. Were your predictions correct?** Accept responses. **Now it's your turn.**



Flat 6" x 6" square



Folded 1" square

EXPLORE

1. Give each child an aluminum foil square. **Use this foil to create a shape that floats.** Provide time for the children to create their own aluminum foil shapes. Provide assistance as needed. Replace torn aluminum foil, if needed.
2. **When your shape is ready, you can test it. Try it. Place it in the water and see what happens.** Discuss the outcome of each child's new shape.



3. Give each child a new aluminum foil square. **Now, try to make a different shape. When your shape is ready, you can test it. Place it in the water and see what happens.** Discuss the outcome of each child's shape.

4. **You were all great explorers today!**




INTERACT

Interact to accommodate children's individual needs and strengths. Use these suggested strategies as needed:

- Water play can make the floor slippery. Be sure to wipe up all spills immediately or use a floor mat to protect the floor.
- As a classroom management strategy, designate children to be official *splash wipers* to help keep the area dry during the lesson.
- As an extension, challenge students to make shapes using larger (12" x 12") squares of aluminum foil.



OUTCOMES

1. Regroup the children in the ECHOS lesson area. **What did we discover today?** Listen to the children's responses. If needed, use the suggested prompts to elicit key concepts and vocabulary. Encourage responses from everyone.
 - **What happened to the ball of clay in the water?**
 - **What happened to the clay boat?**
 - **What happened when you placed your aluminum paper shape in the water?**
 - **What happened when you changed the shape of the aluminum foil paper and placed it in the water?**
2. Recap and review the unit key concepts by asking and prompting children to recall something they learned from any of the prior *Water Play* lessons.
3. Give each child an *Ask Me About Water* sticker.

Remind the children to tell their family something they have learned about what shapes float in water.
4. After you have completed *Lesson #4: Unsinkable Shapes* with all children in your classroom, place the ECHOS materials suggested below near your water table to encourage exploration.

VOCABULARY

- boat
- model
- shape



paper boat

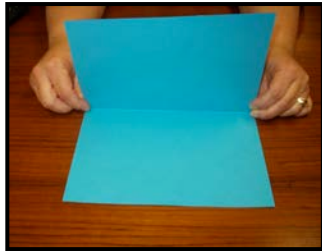


clay boat

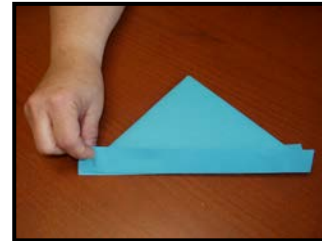


aluminum foil shapes

How to Make a Paper Boat



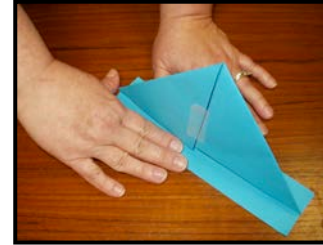
1. Fold paper in half horizontally from top to bottom.



5. Flip over and fold in flap on the other side.



2. Position the open side away from you. Fold the two corners of the creased edge down toward the center of the paper.



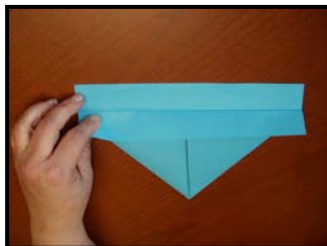
6. Use your fingers to flatten the flaps.



3. Use a one-inch strip of tape to secure the two corners.



7. Make sure the boat can stand up by itself on a flat surface.



4. Fold the bottom of one side to create a flap.