

# A STEM in the Park

## Take Home Activity

# STEM

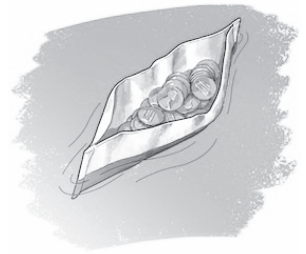
in the **PARK**™

Science, Technology, Engineering, and Mathematics

## What Floats Your Boat?

### ***What You Need***

- Tub of water (clear plastic, if possible)
- Aluminum foil
- Small items to test for buoyancy (floating property)
- Natural items that are used to make boats.



### ***History***

When the region of Northwest Ohio was being settled in the 1800s, people were traveling by water on different types of boats. Native Americans had already been navigating the rivers in canoes. The early boats were made of materials that were available, such as bark and logs for canoes. Wood was used for rafts, sailboats, schooners, flat boats, canal boats, and later steamships. Today ships are made of iron and other metals.

The early boats on the local rivers carried needed supplies from the East to the settlers. They also carried crops, and natural resources from the area back east. What kind of things do you think were shipped? James Wolcott of Maumee built steamboats and had a shipping business, using Lake Erie to transfer goods to and from New York. (You can visit his mansion in Maumee, Ohio.)

***Continued on back***

## ***Experiment & Discover:***

- How do these heavy boats float?
- Test the bark, wood and items that are used to make boats. Do they float or sink?
- What makes an object float or sink?
- Do heavy objects sink and lighter objects float?
- Make a boat from the aluminum foil. Try to make it float.
- Try to load some “cargo” onto your boat. For each item you place in your boat, predict (make a hypothesis) whether or not it will sink the boat.
- Why do you think each item either sinks or floats?
- Try to add multiple items of the same kind. Can adding more make the boat sink? Why or why not? How many items might make your boat sink? Test to see if your prediction is right.

## ***Conclusions***

- What can you determine from your investigation?
- What properties do the items that sank have?
- What properties do the items that floated have?
- There is an explanation. When you place an object in the water, it takes up the space that the water was using, and the water in the container moves out of the way and rises. The amount of water that rises is the water that is “displaced.”
- If the object is heavier than the “displaced” water, the item sinks. If the object weighs as much as or less than the “displaced” water, then it floats.
- Volume and mass play a part: a bowling ball and a balloon of the same size will have similar volume (space of the container). The bowling ball, weighing 12 pounds, has more “mass” (how much material an object contains) than the balloon that is filled with air, weighing about .02 pounds. The water it would take to fill the bowling ball or balloon would weigh about 10 pounds. The weight of the water keeps the balloon afloat. The weight of the bowling ball cannot be supported by the water, so it sinks.
- Increasing the volume decreases the “sinking property.” Large boats displace lots of volume of water, so the weight of the water can keep it afloat. The boat contains large areas of air, making it less dense.

***This activity is brought to you by Maumee Valley Historical Society***

