

## Connections to School —

NPASS2 after school projects are relaxed, informal and fun. All of the projects stress five common process skills that are mentioned in state and national science standards: observing, investigating, questioning, explaining and problem-solving. Children also gain hands-on experience with important ideas they will learn in school. In Sinking & Floating these ideas include density, weight, displacement, shape, size, buoyancy, volume and equilibrium.

## NPASS2 Master Student Attributes

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National Partnerships for After School Science

### MASTER INVESTIGATOR

Explores creatively  
Does a fair test  
Quality controller



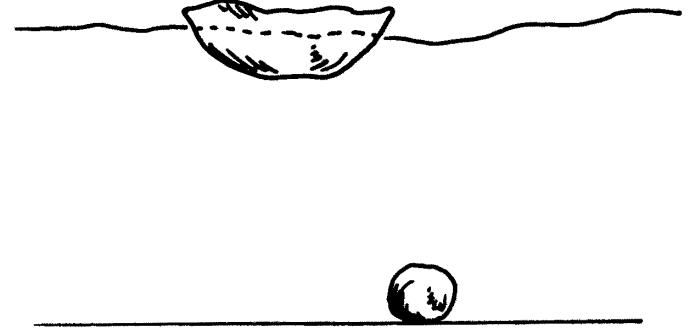
### INVESTIGATING

Investigating should be creative and playful (*I wonder what would happen if...*), and also careful and controlled (*Let's find out exactly how much, how far, ... etc.*).

Find a good mix of these approaches.

# Making Science Fun

## Sinking & Floating: an after school science and engineering project



“What makes some things float while other things sink?” It isn't always what you think!

NPASS2 is a project of  
Education Development Center  
55 Chapel St., Newton, MA 02458  
<http://npass2.edc.org>

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National Partnerships for After School Science

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## FOR PARENTS

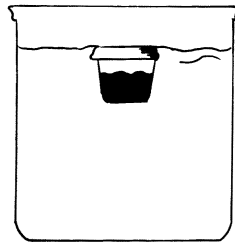
### Summary

Students explore how some items sink and others float. They experience how the concepts of size, weight, shape, material and amount of air affect the floating ability of a variety of materials.

### Activities

The Sinking & Floating activities include:

- What Floats and What Sinks?
- Making Floating Things Sink
- Design a Boat: Making Sinking Things Float
- More About Boats
- Sinking and Floating Liquids



### Materials

- |   |                              |
|---|------------------------------|
| Bucket                                      | 1/2 Gal juice cartons        |
| Mini food containers                        | Nails or pennies for weights |
| Modeling clay                               | Aluminum foil                |
| Assorted small items that sink and/or float |                              |

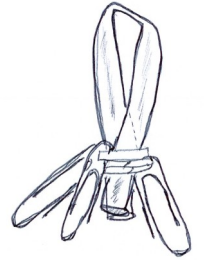
### Questioning

Ask these guiding questions as your child carries out the explorations at home:

- How do size and shape affect whether something floats or sinks?
- Do hollow things always float? Why? Why not?
- Do metal materials always sink? Why? Why not?
- How does air inside something affect whether it sinks or floats?

## FOR KIDS

Make a Cartesian Diver from materials you have at home. Can you make the Cartesian Diver rise and fall "magically" in a closed bottle of water?



—Gather: a bucket and fill it half way with water, a 1-liter soda bottle with cap, a drinking straw (preferably a flexible one that you can see through), a rubber band and some paper clips (about two large or 3-4 small ones).

Procedure: See the youtube video for a demonstration at <http://youtu.be/BiI7DhFgoNQ>

Cut the straw to 5 inches with the flexible part in the middle. Fold the straw at the bend or in half carefully so that it does not crack. Fasten the rubber band around the two ends loosely. Hold the fold up and the rubber band end down. Attach a few paper clips to the rubber band so that they are hanging down. Your Cartesian Diver is now ready to test. Place it in the bucket of water. The top of your diver should bob just at the surface. Adjust its height by allowing a little water inside the straw or by adding and removing paper clips. Then place it into the 1-liter bottle filled with water. Make sure the water fills all the way up to the top. Tighten the cap. Squeeze the bottle gently and see the diver magically fall. When you release your grip the diver rises again. Can you explain why? Hint—Watch the air level inside the straw!

