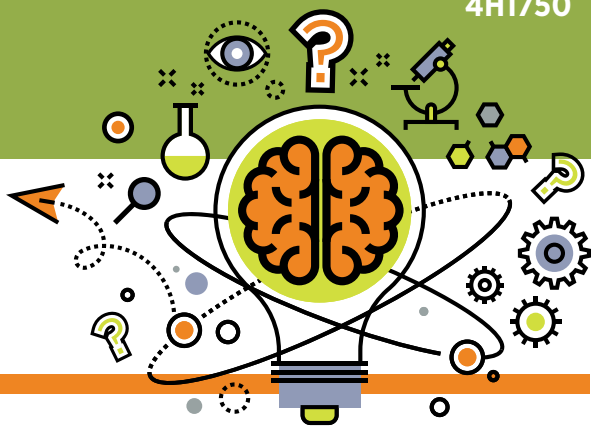
TEACHING SCIENCE
...when you don't know diddly-squat



Why do some things float and others sink?

Purpose:

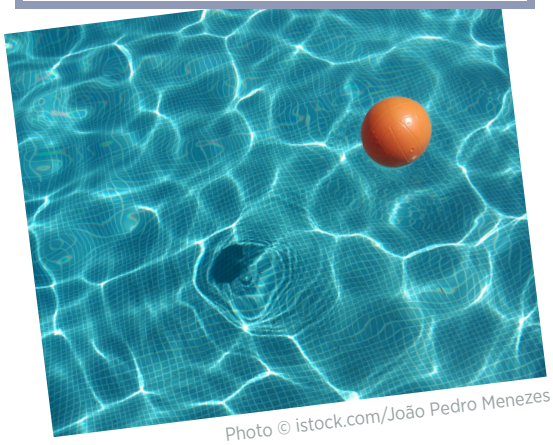
The purpose is **not** to teach specific content, but to teach the process of science – asking questions and discovering answers. This activity encourages young people to try to figure things out for themselves rather than just read an answer on the internet or in a book. As a leader, try not to express your opinion, but let the youth engage in arguments based on evidence.

Time required:

20 minutes or multiple days depending on the interest and questions the youth have

Materials:

- ❏ Golf ball and pingpong ball (or any two objects that are roughly the same size, where one sinks and one floats)
- ❏ Bucket, basin or bowl (something that will hold water)
- ❏ Water
- ❏ Other items that might float or sink



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SCIENCE PRACTICE:
Asking questions and defining problems

1. *Why do some things float and others sink?* Have them share their answers. Don't share your ideas. After they have given answers, follow up with more questions.

SCIENCE PRACTICE:
Planning and carrying out investigations

2. *Do things that are the same size weigh the same? Why or why not?*
3. Give a youth a golf ball and pingpong ball. Ask the group:
   a. *Which weighs more or feels heavier?*
   b. *Which is bigger or has a greater volume?*
4. Ask the group: *Do you think the balls will sink or float in water? Why?*
5. Drop each ball into a bucket of water. *What happened?*
   a. **Density** (Density=mass/volume) describes the relationship between **mass** (weight) and **volume** (space something takes up). *What statement can you make about density and the two balls you just dropped in the water?*

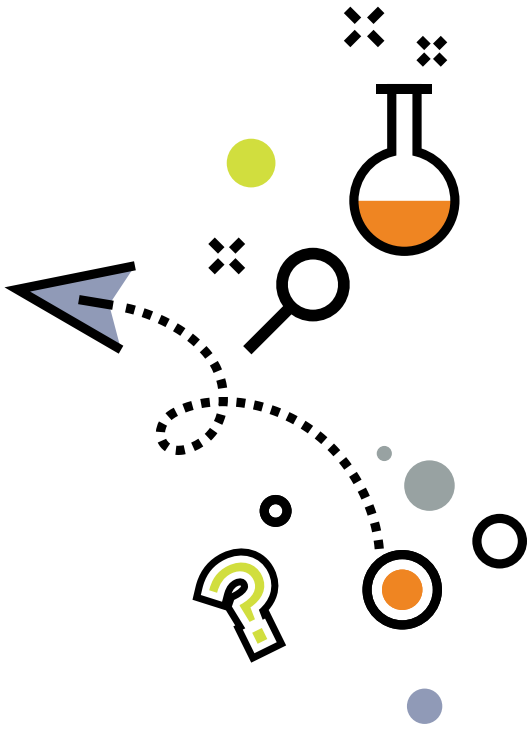
SCIENCE PRACTICE:
Constructing explanations and designing solutions

6. *Why did the golf ball sink and the pingpong ball float? Are there other things that are the same size and one might sink and one might float?*

SCIENCE PRACTICE:
Engaging in argument from evidence

7. Gather other items that you think might or might not float. Predict whether each item will sink or float, then test them. *Can you accurately predict what will sink and what will float? Why or why not?*

You do not need all the answers to teach science. You simply need an inquisitive mind and to be willing to carry out an investigation.



Other thoughts:

- *Do you think there are solid items that might float?*
- *Does the weight of an object affect whether it floats?*
- *What would it take to sink a pool noodle? A balloon? Beach balls?*
- *Is there anything that is too heavy to float?*
- *Is there anything too light to sink?*
- *Why does a boat float until you poke holes in it?*
- *Why do huge metal boats still float?*

Science & Engineering Practices:

These eight Science and Engineering Practices come from *A Framework for K–12 Science Education* (National Research Council, 2012, p. 42). These research-based best practices for engaging youth in science are connected to in-school science standards that all children must meet.

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigation
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

Reference:

National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas.* Washington, DC: National Academies Press.

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