

Kindergarten

30 minutes

Making Predictions: Sink or Float

Oregon Science Content Standards:

K.2 Interaction and Change: Living and non-living things move.

K.2P.1 Examine the different ways things move.

K.3 Scientific Inquiry: Science explores the natural world through observation.

K.3S.1 Explore questions about living and non-living things and events in the natural world.

K.3S.2 Make observations about the natural world.

Goals:

- introduce students to the scientific method of experimentation
- have students make predictions based on their observations of an object

Concepts:

- Scientists make predictions and test them with experiments.
- We learn, whether a prediction is accurate or not.
- Some materials float and some sink.

Materials:

- various small objects to test if they float or sink: these can be anything from toys to small pieces of wood, corks, silverware, rocks, shells, etc. (enough objects for at least one per child, plus some extras)
- tubs of water (enough for one per table)
- towels for clean up
- if possible, adults/aides/helpers

Lesson Plan:

1. Review what a scientist does: scientists closely examine the world around them (a good definition for observations). Review observations and the distinction between observations and opinions. Allow a few volunteers to make an observation about something in the room such as “I observe that this table feels smooth” or “I observe that it is warm in this classroom” or “I observe that Evan is wearing a red shirt today”. Distinguish between an observation and opinions such as “I like Evan’s shirt”, “I think Evan’s shirt is nice”.

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2. Making observations about the world around you often leads to things you are curious about. Scientists look (listen, smell, etc.) closely at the world around them, making observations, and then ask questions.
3. Tell the class that you have a question and ask their help in answering it. Pull out a bag of objects you have assembled, and show an example object, such as a candle. Your question is whether or not it will sink or float. Ask your students how they could find out the answer to your question? Students will likely come up an experimental design on their own (dropping the object into water to see if it sinks or floats---this is the experiment). Guide the class to come up with the idea.
4. Before doing an experiment, scientists make a hypothesis. A hypothesis is a knowledgeable prediction, based on observations and everything we know about the object. Have the students close their eyes and think about everything they know about the object you are holding and use that information to help them decide if they think it will sink or float. Have the students open their eyes and tell you their hypothesis or prediction.
5. Discuss how scientists then conduct their experiment and compare results to predictions. It is VERY IMPORTANT to emphasize that the goal is NOT to be “correct”, and that in fact, many of the most interesting results are often when the results surprise you. Surprise results are often when we learn the most, lead to even more interesting science questions and experiments, and should be encouraged whenever possible.
6. Have an assortment of objects and a tub or bucket of water at each table. If possible, have a helper to assist at each table or station.
7. At each station, have the students pick an object and take turns telling their prediction for their object(s): “I predict that this spoon will sink” and give a reason “because it is made of metal and feels heavy”. Remind them that a prediction is a BEST guess, not a random guess, based on what is known about the object (although don’t stress too much about being right—just the effort put into trying).
8. Have the students gently drop their object into the water, and then tell everyone at the table what happened.
9. After all students at a station have done their experiment, have them take their object and place it on the table outside of the water and move to the next station.
10. Clean up and regroup on the rug or somewhere where students won’t have water and toys in front of them, to talk about their experiments and what they learned. Have volunteers report their predictions and their results. Have students say why they made a particular prediction. Ask about results that surprised students. Use this question to repeat that being “right” about predictions is not the goal of science, but rather the goal is to learn about the world around us. Ask if any

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patterns can be noticed? (For example: most plastic things float while most metal items sink; that most rocks sink whether they are large or small; etc.)

Assessment: student's ability to make a prediction based on their observations

Tips:

- It is helpful to have one adult per table to monitor the children and listen to their predictions before they do their experiment.
- This can be done as a class with students taking turns telling and testing their predictions.
- It is helpful to have a poster or chart to record student predictions and the results (see example below).
- Have PLENTY of towels and rags to mop up and have the children roll up their sleeves—lots of water will get on the tables.
- When assembling your grab bag of items to test, include some surprises. Candles of different sizes are good as they float and surprise some children; some shells sink a lot faster than kids think; a piece of pumice that floats can be a surprise and lead to questions of “why?” ; etc. Try and get objects to compare: a metal and plastic spoon, so you can ask why one floats and one doesn't (point out the different materials, metal vs. plastic). Students sometimes then adopt the idea that metal will always sink, so bring a ball of wadded up tin foil. Have fun with it!
- To save time, fill up the water tubs prior to class, but hide them. Keeping them hidden allows the students to come up with their own experiment without the hint of tubs of water sitting on their desks.

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Sink/Float Predictions and Results
(Example Chart, filled in)

<u>Object</u>	<u>Prediction</u>		<u>Result</u>	
	<u>Sink</u>	<u>Float</u>	<u>Sink</u>	<u>Float</u>
Plastic spoon	x			x
Metal spoon	x		x	
Tin foil	x			x
Styrofoam		x		x
rock	x		x	