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PROPERTIES OF MATTER AND ENERGY



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PROPERTIES OF MATTER AND ENERGY

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UNIT 1

PROPERTIES OF MATTER AND ENERGY

CHAPTER 1

PROPERTIES AND CHANGES

Did you know that both of the objects shown are made out of the same substance? However, one sparkles, while the other is dark. How could they be made out of the same substance?

In this chapter learn how substances can change and still stay the same—and how they change into new substances.



In this chapter summarize what you read. That is, sum up in a sentence or two what you read before you turn to a new page.



Topic

PHYSICAL SCIENCE

1

WHY IT MATTERS

Find out how taking a deep breath helps you float in water.

SCIENCE WORDS

matter any solid, liquid, or gas

mass amount of matter in an object

volume the amount of space an object takes up

density the amount of mass in a certain volume of material

physical property a property that can be observed without changing the identity of a substance

physical change a change in size, shape, or state without forming a new substance

solution a mixture of one substance dissolved in another so that the properties are the same throughout

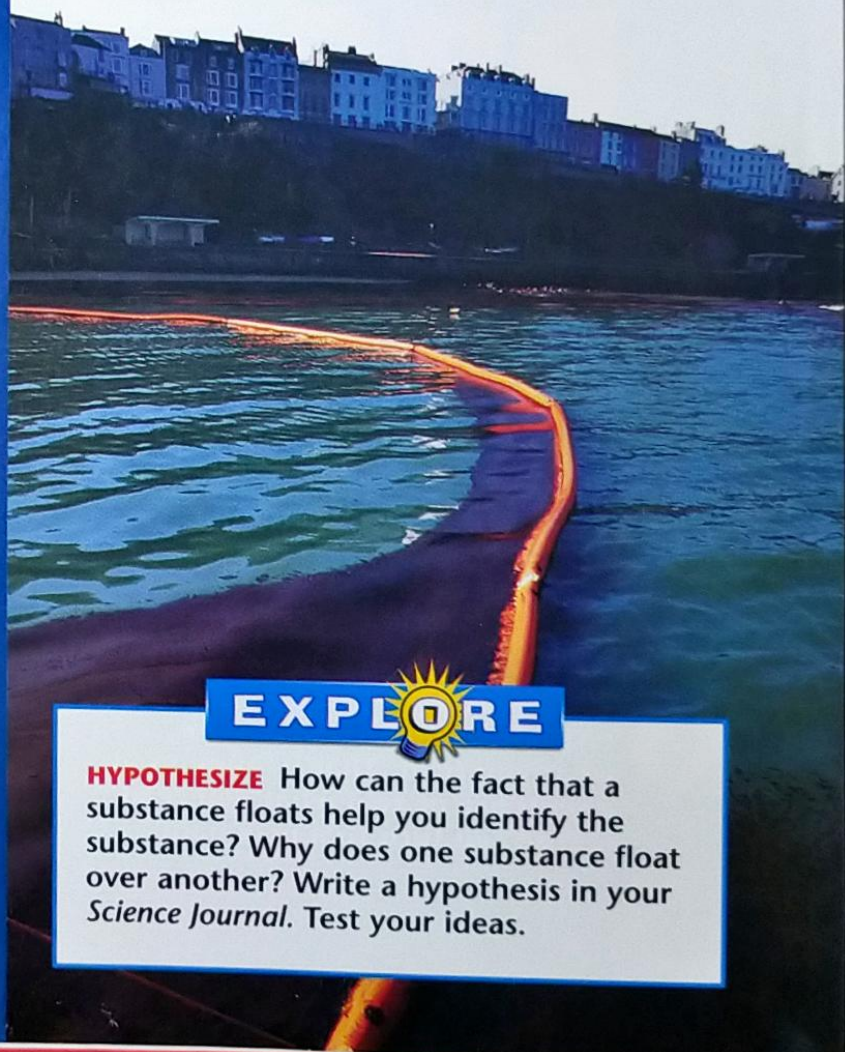
chemical change a change in matter that produces a new substance with different properties from the original

Physical Properties

What happens when large quantities of oil spill into ocean water? How does this problem affect living things in the ocean?

Luckily oil spills can be cleaned up. Can you tell why? Oil floats on top of the water. It does not sink down into the water. It can be cleaned off the surface of the water.

Why does oil float on water? Does the weight of oil and of water have anything to do with it?



EXPLORE

HYPOTHESIZE How can the fact that a substance floats help you identify the substance? Why does one substance float over another? Write a hypothesis in your *Science Journal*. Test your ideas.



Investigate What Things Float on Others

Identify substances by how they float on top of each other.

PROCEDURES

- 1. MEASURE** Pour 20 mL of water into the 100-mL graduated cylinder, and add one drop of food coloring. Stir.
- 2. MEASURE** Measure out 20 mL of corn oil into a plastic cup. Slowly pour the corn oil down the spoon into the water. In your *Science Journal*, describe what happens.
- 3. EXPERIMENT** Continue the process in step 2 by adding 20 mL each of the baby oil and then the corn syrup.

CONCLUDE AND APPLY

- 1. COMPARE AND CONTRAST** What happened to the liquids as you added them to the cylinder?
- 2. COMMUNICATE** In what order were the liquids arranged? In your *Science Journal*, draw and label an illustration that shows which liquids appeared on top, in the middle, and on the bottom.

GOING FURTHER: Problem Solving

- 3. PREDICT** How will other objects float or sink in the water—a lump of clay, a birthday candle, a piece of cork? Make a prediction and test your ideas.
- 4. EXPERIMENT** Why do the liquids stack up as they do? How might using equal amounts of the liquids and a balance help you tell?

MATERIALS

- 100-mL graduated cylinder
- blue food coloring
- 20 mL each of corn oil, baby oil, corn syrup, and water, each in a plastic cup
- spoon
- four 10-mL graduated cylinders (for measuring the liquid)
- small lump of clay
- small piece of cork
- small (birthday) candle
- balance and masses
- *Science Journal*

