Rhode Island Energy™

a PPL company

e-SMARTkids

EXPERIMENT TIPS

Rocks That Trap Gas

This basic experiment appears in the section *Natural Gas Science*.

Materials:

Students will need the materials listed:

- Sand
- Clay
- Magnifier
- Two 8 oz. wide-necked glass jars or beakers
- 16 oz. of water in a measuring cup

Objective:

Students will learn to recognize that sand is more porous than clay. They will draw parallels between these materials and the types of underground rock layers that allow natural gas to collect. They will understand that sand behaves like reservoir rock (it lets the water pass through it like the reservoir rock allows water to seep into it) and that clay behaves like cap rock (it stops the water like the cap rock stops the gas from dispersing).

Getting It Across:

Have students read the information and follow the steps on the page. Make sure they understand the concept of porousness—that some materials are full of pores that are permeable by water and gas.

Questions and Answers:

1. Feel the sand and clay with your hands. How do they feel different from each other? (Students should notice that the sand feels grainier than the clay.)

2. Use your magnifier to examine the sand and clay. What differences do you see? (With the magnifier, students may be able to see spaces between grains of sand—a clue that the sand is more porous than the clay.)

3. Fill one jar almost full to the top with sand and the other almost full with clay. (Make sure students leave some space at the top of the jar.)

Continue >

Rhode Island Energy™

a PPL company

e-SMARTkids

EXPERIMENT TIPS

Rocks That Trap Gas (continued)

4. Are the jars full? What do you think will happen if you add water to them? (After students fill the jars they will both appear nearly full. Some students will know that the jars contain air as well as sand and clay, and that the water will displace some of the air between the sand grains when it is poured in, but will just sit on top of the clay.)

5. Fill each jar to the top with water. Where does the water go? (The water goes between the grains of sand. It sits on top of the clay and may go into spaces, if any, that are between chunks of clay.)

Analysis:

In order for natural gas to accumulate underground, there needs to be porous rock for the gas to seep into (called reservoir rock), and a layer of very dense rock (called cap rock) above the reservoir rock to keep the gas from leaking to the surface. Which of your jars behaves like reservoir rock? Which behaves like cap rock? (The jar with sand behaves like reservoir rock. The jar with clay behaves like cap rock. However, while the water in this experiment flows down through the sand, in a gas trap the gas rises upward through the reservoir rock until it is stopped by the cap rock.)