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Title: Physical Properties of Coal
Level: Primary - Middle (3 - 8)
Time: 30 - 45 minutes
KERA Goals: 1.3, 2.1, 2.3, 2.6, 5.1, and 6.3

Objective:

1. Examine and identify the observable properties of coal.
2. Observe samples of coal and record data in an organized manner.

Materials:

Samples of dirty coal, limestone, sand, sugar, chalk, salt, and sliced muffins or candy bars
Hard lenses
Mortar and pestle
Test tubes or small beakers and water
Student data sheet

Activity:

1. Divide students into small groups an instruct each group to select a member to record data.
2. Instruct the students to observe the color, texture (smoothness or roughness), and the hardness of the coal samples and to record their observations on the data sheet provided.

   (Note: The teacher should design a key/legend to use in filling in the table. Students should be encouraged to make their own observations in addition to the ones listed.)

   Have the students compare their observations of the coal sample with their observations of materials such as limestone chips, sugar lumps, sand, rock, a sliced muffin, or a candy bar.

3. Ask the students to investigate the grind ability of coal and of the other materials by grinding them up with a mortar and pestle. How easy is it to grind each material?
4. Fill several beakers or plastic cups ¼ full of water. Now ask the students to observe the solubility of ground coal and of the other materials by mixing them with water to form a "slurry." (A "slurry" forms when solids do not dissolve in water.) Have the students record their observations. Did any of the materials dissolve? Did any float? Did any sink?
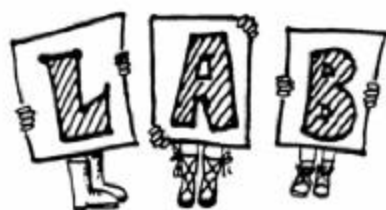
Discussion:

1. Where do the salt and sugar go when they are mixed with water?

2. What would happen if coal was soluble?
3. What things have you learned about coal?

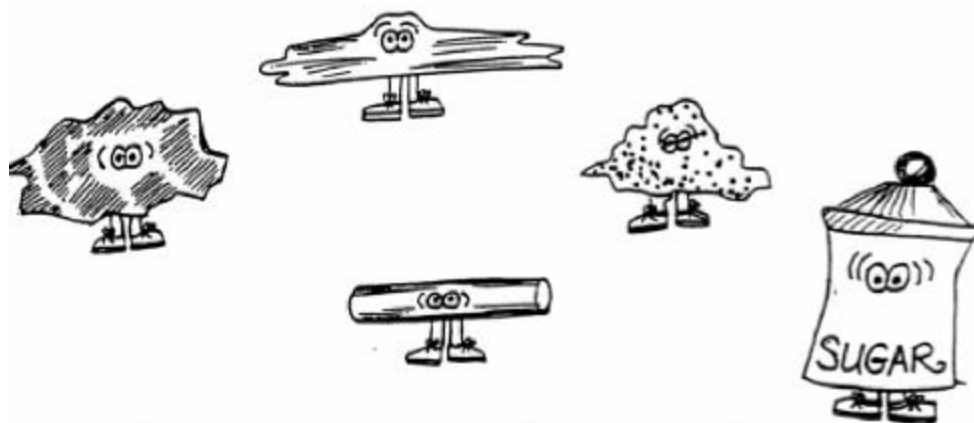| SAMPLES:	Color	Texture	Hardness	Size of Broken Pieces	Dissolve in Water ??
Dirty Coal					
Limestone					
Sand					
Sugar					
Chalk					

Provided by Pittsburgh Energy Technology Center

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