

NAME \_\_\_\_\_ DATE \_\_\_\_\_

(Example of Student Lab pages to accompany Earth Science: Earth Resources – Day 17 & 18 Lesson Plans)

**FOSSIL FUELS**  
**FORMATION, LOCATON AND RECOVERY**  
**Geologist and Engineers at Work**

**PART A – Coal Formation**

**Problem:**

How is coal formed from layers of plant remains? Explain the four stages of this cycle.

**Hypothesis:**

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**Materials:**

Lab boxes with a shallow rectangular pan or tray, 4 shredded paper samples, 1 plastic cup, water, a flat-bottomed container

**Procedures:**

1. Pour a small amount of water into the pan or tray to cover an area of about a 10 cm square. This water represents a bog or swamp.
2. Pile the shredded paper towel sample on top of the water so that it begins to absorb the water. This represents the first stage of coal development as the decaying “plant material” forms into peat.
  1. Record your observations below. (Describe what is happening to the paper towel.)
  2. Next, take your second layer of “sediment” (one color of the shredded copy paper) and pile it on top of the wet paper towels. Use your flat-bottomed container and apply pressure to the entire surface area of the layers of “sediment”.
3. Record your observations below, being sure to make a statement of change. Which layer represents the peat at this point? What stage of development does the other layer represent?
4. Add the third layer of “sediment” (the second color of shredded copy paper) to the pile. Again apply pressure to this layer and observe what happens to the layers below.
5. Record your observations and describe what is happening to each layer of “sediment” in your model.
6. Finally add the fourth layer of “sediment” (the shredded construction paper) and apply pressure. Observe the changes you see in the layers of “sediment” in your model.

7. Record your observations and discuss how the layers have changed. What has happened to the water? What part do you think this played in the formation of coal?

**Observations:**

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**Conclusion:**

(Answer to the problem question)

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**Part B – Locating Fossil Fuels**

**Problem:**

Why do geologists examine and test rocks and soil types when trying to locate sites to drill for petroleum and natural gas?

**Hypothesis:**

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**Materials:**

Part B: lab boxes with 4 clear plastic cups, 1 with about 5 cm pea gravel, 1 with about 5 cm sand, 1 with a solid rock on the bottom, and 1 with a small square of household sponge on the bottom (to represent a sedimentary rock such as limestone or sandstone), a beaker, colored water and a tray

**Procedures:**

1. Set the 4 sample cups on the tray in a row and fill your beaker about half full with the colored water.
2. Slowly pour a small amount of the colored water, which represents oil and/or natural gas, into each cup. These cups contain sand, gravel, a solid rock or a “sedimentary rock” (sponge).
3. Observe and compare the ability of the “oil or gas” (colored water) to be absorbed or flow through each sample. Observe from both the top and the sides of each plastic cup and record your observations below.

**Observations:**

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**Conclusion:**

(Answer to the problem question)

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**Part C – Recovery of Fossil Fuels**

**Problem:**

How can you use a model to show one method that geologists and engineers use to retrieve petroleum from within the Earth?

**Hypothesis:**

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**Materials:**

Lab boxes with safety goggles, 1 beaker, colored water, a pre-assembled “drilling apparatus” and a funnel

**Procedures:**

1. Remove the pre-assembled cup apparatus from the lab box and make a scientific drawing of it. You will notice some beans and/or macaroni in a layer of oil at the bottom of the larger cup. This represents petroleum trapped in layers of rock within the Earth.
2. Make a “before” drawing of your model and label which part represents the petroleum, the sedimentary rock layers, and the parts of the drilling rig.
3. Attach the funnel to the top of the straw according to your teacher’s directions.
4. Slowly pour the colored water from the beaker into the funnel so that it flows through the straw into the lower cup. You will want to keep pouring water until it fills the lower chamber and overflows through the second opening in the bottom of the top cup.
5. Observe the behaviors of the oil, water and “rock” materials.
6. Record your observations below by making another scientific drawing of your model to show what happened when the water was poured into the oil. Label your “after” picture.

**Observations:**

BEFORE

AFTER

**Conclusion:**

(Answer to the problem question)

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