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Derricks to Desks Seminar  
August 10, 2008

### Lesson Plan

Standards: Earth Science: 3e. Students know rock, water, plants, and soil provide many resources, including food, fuel, and building materials, that humans use.  
Investigation and Experimentation: 4g. Follow oral instructions for a scientific investigation.

Objectives: The students will study and understand the formation of hydrocarbons.  
The students will list items needed in order to find hydrocarbons.  
The students will observe how the different densities of oil and water cause migration through permeable layers of rock.

Anticipatory Set: Today we are going to learn something about the Planet that we live on. We will learn about the formation of hydrocarbon.

Materials: Overhead projector, camera, overhead pen, overhead screen, pages 2,3 and 5 in Bit of Fun with PetroMolly & PetroMack Energy Activity Book (Association of Desk and Derrick Clubs), Migration and Trapping of Natural Gas and Oil (Ohio Oil and Gas Energy Education Program), plastic bottle with lid, gravel, vegetable oil, permanent marker, water, crayons, pencils, and paper.

Procedures: Explain to the students what makes hydrocarbon.  
Read the information on pages 2 and 3 in Bit of Fun with PetroMolly & PetroMack Energy Activity Book.  
Show the pages read to the students.  
Explain to the students that the Earth is like a layered cake.  
Write on the overhead the different names of the layers.  
Group students in groups of five per group.  
Have students write three things needed in order to form hydrocarbon.

Experiment: Shaking It Up

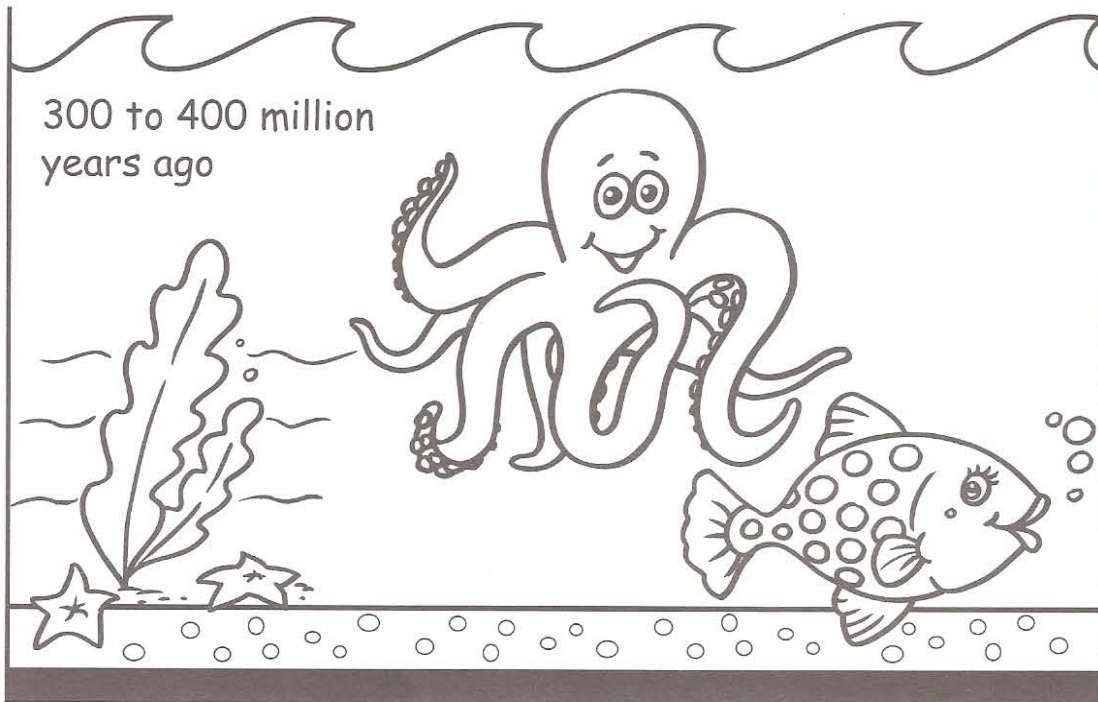
1. Mark the container at the halfway point. Use the marker to divide the two halves in half again, so that the container is now divided into fourths.
2. Label from the bottom  $\frac{1}{4}$ ,  $\frac{1}{2}$ , and  $\frac{3}{4}$ .
3. Add gravel to fill the container to the  $\frac{1}{4}$  mark.
4. Add water to fill the container to the  $\frac{1}{2}$  mark.
5. Add oil to fill the container to the top.
6. Close the container and make sure that it is tightly sealed.
7. Shake the container about 15 seconds.
8. Put the container down and observe what happens over the next four minutes.  
Record your observations using drawings or words.
9. Repeat steps 7 and 8 at least three times and note how things change.

Assessment: Informal-Checking each group in following directions. Formal assessment-student's observation record.

Closure: Today we have learned about the formation of hydrocarbon, the layers that make up the Earth. We have also experimented with three materials to see how oil and water cause migration through permeable layers of rock. Tomorrow we will explore oil seeps.

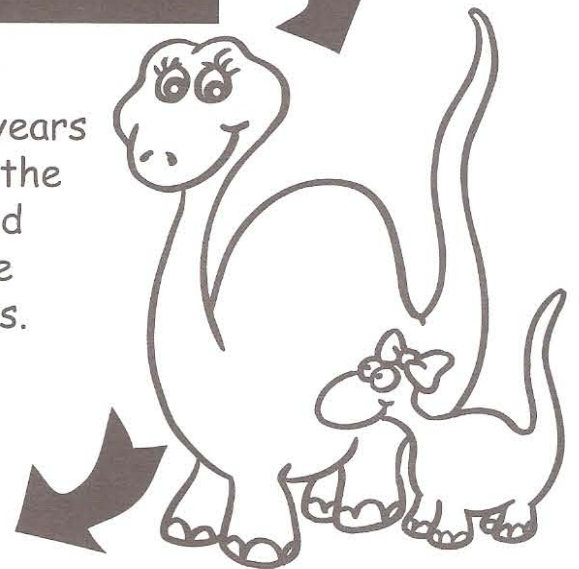
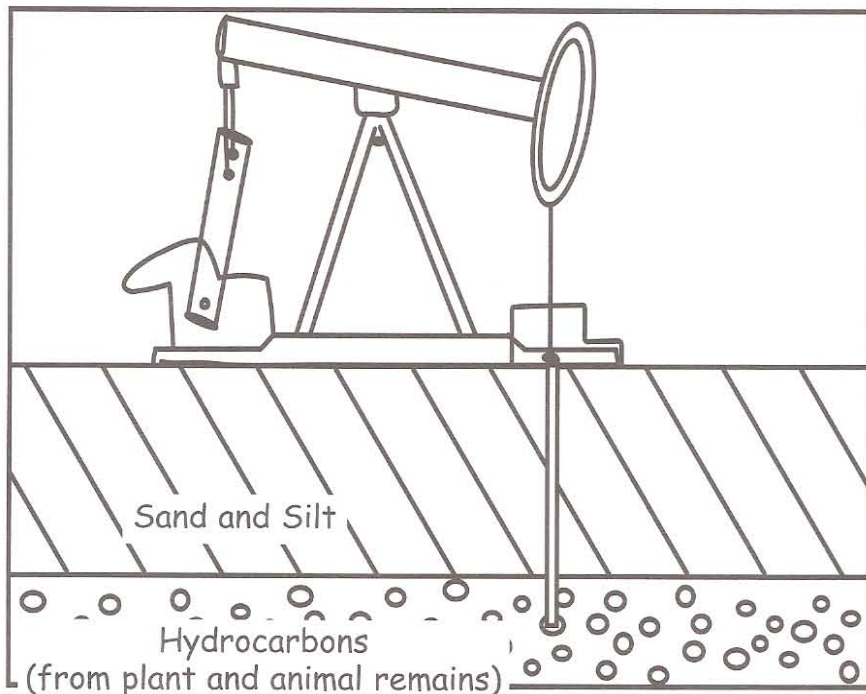
Active Participation Activities: Listening, speaking, writing, drawing, and looking.

# Hydrocarbon Formation



Long before the dinosaurs, oceans covered most of the earth. The oceans were filled with tiny sea animals and plants.

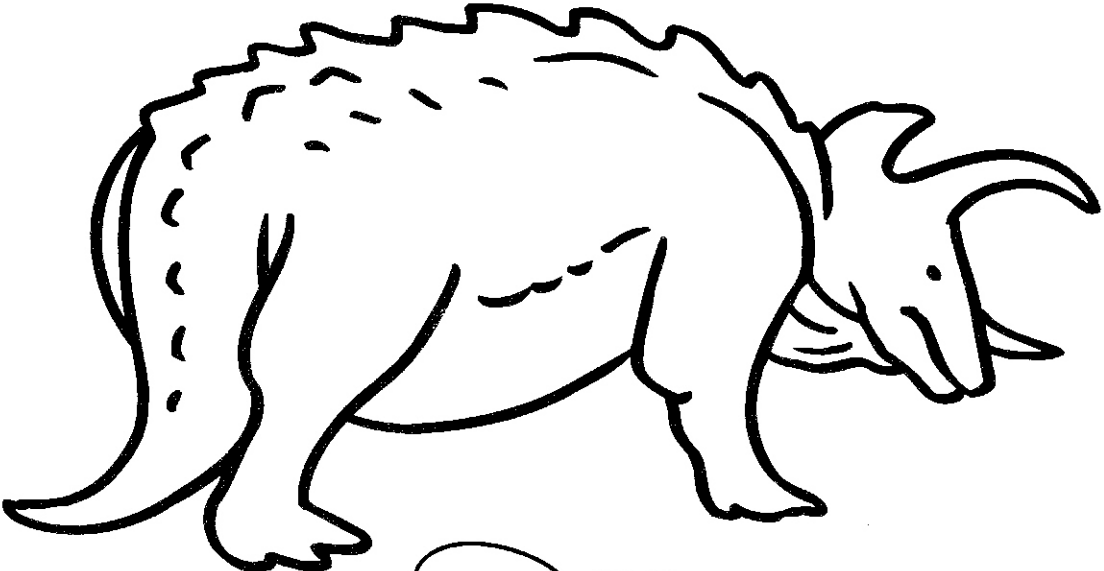
As the plants and animals died, they sank to the ocean floor. Sand covered them and millions of years passed. The weight of the water and heat from the earth turned them into sandstone, limestone, and other types of sedimentary rock, and turned the organic matter into petroleum (oil) or natural gas.



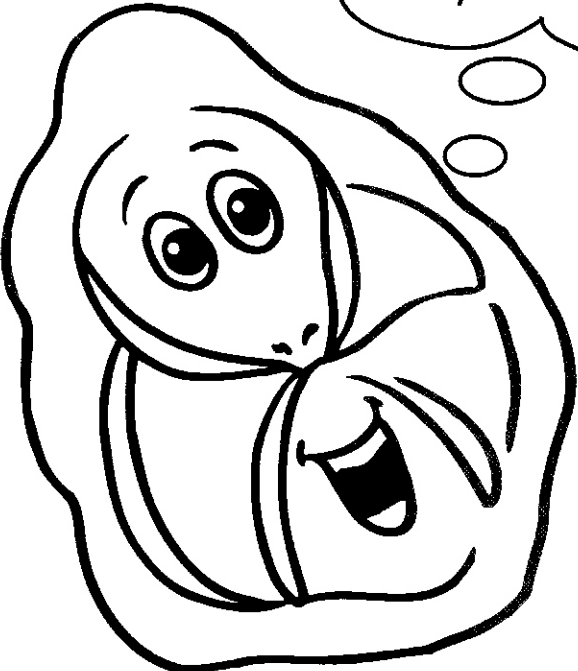
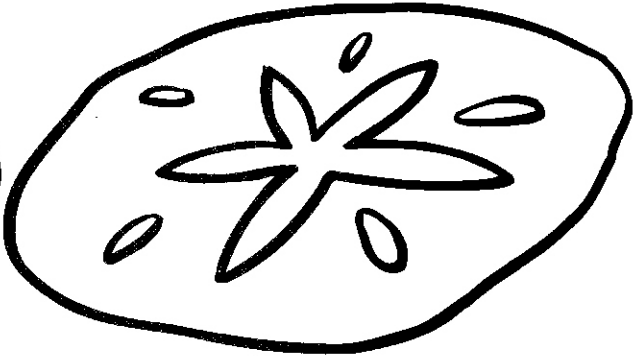
Today, we drill through layers of sand, silt, and rock to reach the rock formations that contain oil and gas deposits (hydrocarbons) that were made millions of years ago. Since it took millions of years to form and can't be made in a short time, we call oil and gas nonrenewable.

Dinosaurs and microfossils helped make petrochemical byproducts.

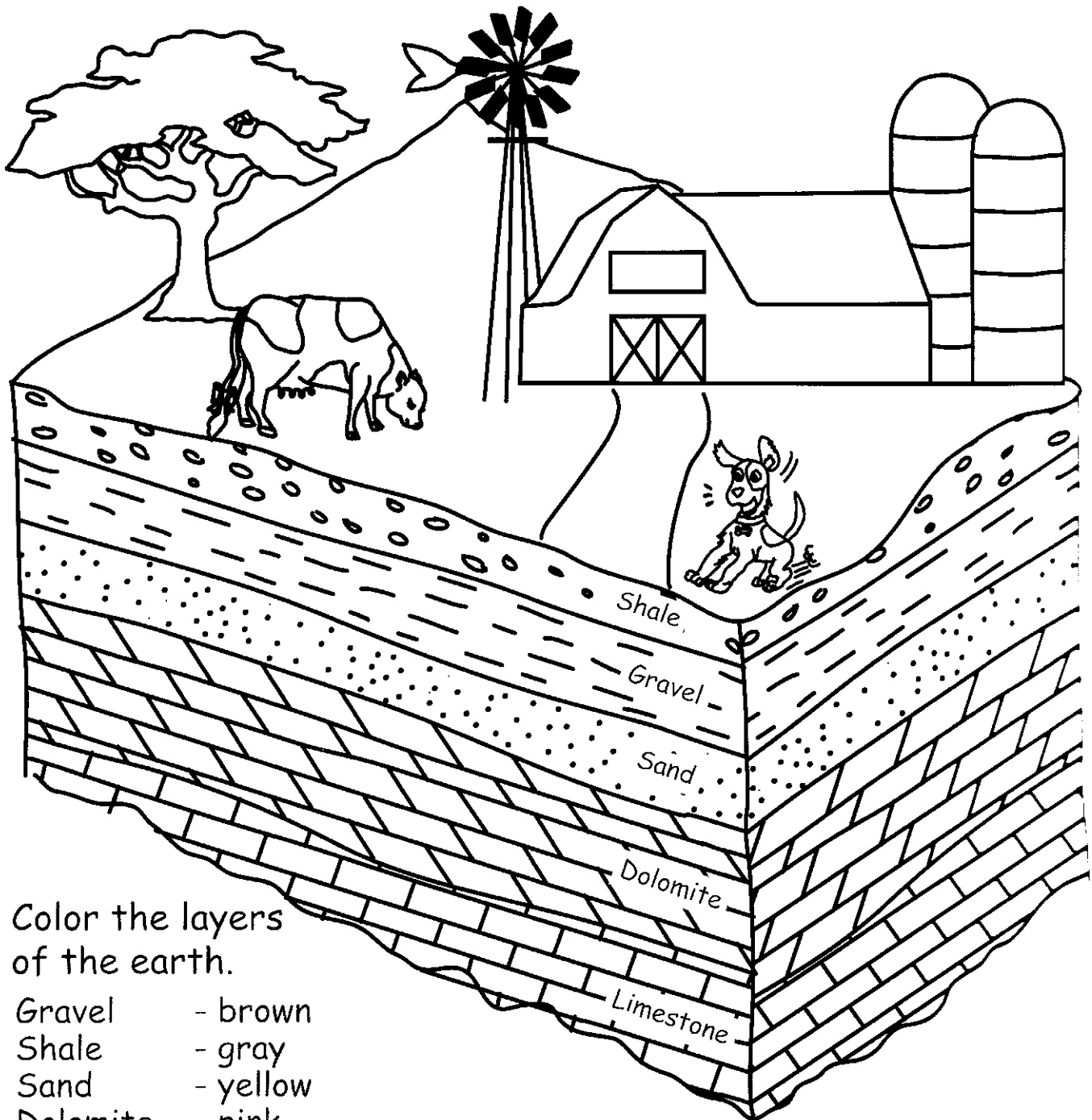
Covered by sand and rocks over many years, plant and animal life formed hydrocarbons.



"Hi. I am a fossil of a shell, and I am glad you are learning about hydrocarbons."



The earth is like a large piece of cake with many layers. Each layer is a different flavor and represents the passage of time.



Color the layers of the earth.

- Gravel - brown
- Shale - gray
- Sand - yellow
- Dolomite - pink
- Limestone - blue

Color the layers of the earth.