

Resources and the Properties of Rocks

Teacher Facilitation Notes

In General . . .

- Project the slide deck in edit mode—do not show it as a slideshow.
- Hide the speaker notes before projecting. (View/Show Speaker Notes)
- Hide the toolbar. (Click on the up arrow at the right end of the tool bar.)
- Call on students to read the various content shown on slides.
- For each investigation, assemble the needed materials for each group and place in a central location for ease of distribution.
- Duplicate copies of the data sheets for each student.

Materials Needed:

Elaborate: Where Does Oil Hide in Rocks?

Limestone rock, 1 per group

Shale rock, 1 per group

Paper plate, 1 per group

Beaker, 1 per group

Timing device, 1 per group

Marker, 1 per group

Sandstone rock, 1 per group

Hand lens, 1 per student

Pipette, 1 per group

Mineral oil, per class

Paper towels

Rock samples can be purchased for a total cost under \$30 from Nasco Education, <https://www.enasco.com/c/Education-Supplies/Science/Earth-Science/Rocks-Minerals?page=2&gridstyle=gridStyle&text=&q=%3Arelevance>

Other Materials

Evaluation

Pencils

Science Notebooks

Engage: Resources in the Earth's Crust

- Read and discuss the opening slide. Do not dwell on the fact that the Earth has several layers—just make sure students understand that the top layer of the Earth on which we live is called the crust.
- Read and discuss the slides about minerals, rocks, and fossil fuels in the Earth's crust. (It is NOT necessary that the students remember the terms igneous and metamorphic rock. These are named on the slide for ease of displaying rocks with different properties. They do need to know what sedimentary rocks are and the properties of these rocks.)

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Explore/Explain: Sediments and Sedimentary Rock

- Review what sediments are and how sedimentary rocks are formed.
- Make sure that students understand that different sedimentary rocks are made of different-sized particles and have different properties.
- Discuss as desired.

Explore/Explain: Properties of Rocks and Fossil Fuels

- Read and discuss the properties of the two types of rock that most often contain oil and natural gas: sandstone and shale. Have students explain why these rocks might hold oil and gas.
- Read and discuss the properties of coal and what makes it different from mineral rocks.
- Discuss as desired.

Elaborate: Where Does Oil Hide in Rocks?

- Before beginning this activity, put 20-30 mL of mineral oil in a small beaker for each lab group.
- Make sure students have easy access to all of the needed materials.
- Review correct science safety rules as necessary.
- Have students label a page in their science notebooks to record observations and data collected during this investigation.
- Ask the following questions before the students record their observations of the three rocks:
 - How are the rocks different? How are they alike?
 - Do you see any pores or small spaces on the surfaces of the rocks?
 - Do any rocks look like they might be able to soak up and store oil or natural gas?
 - Do any of the rocks look like they might be unable to soak up and store oil or natural gas?
- Since this is a timed investigation, have the groups work together as a class. They all read each step together and complete it before moving on to the next step.
- Once the groups have completed the investigation, compare and discuss each group's results. Discuss as desired.

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Evaluate

- Let students complete the quiz independently.
- Discuss evaluation as desired.

Evaluation

- Which of the following properties do sedimentary rocks often have?
 - Shiny surfaces
 - Small holes
 - Large crystals
 - Striped layers

- Which property of shale allows it to store oil and natural gas?
 - Shale was formed millions of years ago.
 - Shale is found deep beneath the Earth's surface.
 - Shale is made up of small bits of clay and minerals.
 - Shale forms in layers that leave space for oil and natural gas to gather.

- What makes coal different from most other rocks? Mark 2 answers.
 - Coal can be burned for fuel.
 - Coal is very black and very hard to break.
 - Coal formed from the remains of ancient plants.
 - Coal forms in the Earth's crust .

- Which property of sandstone allows it to store oil and natural gas?
 - Sandstone has coarse grains and many tiny holes.
 - Sandstone has stripes, or bands, that hold oil.
 - Sandstone is a beautiful orange color.
 - Sandstone can be found all over the Earth.

Evaluation, page 2

5. Study the illustration of the rock below. Explain why this rock might be able to store oil and natural gas below the Earth's surface.



Student answers will vary, but should include: has holes; has large grains or sediments; etc. Accept all reasonable answers students can justify.

6. In which type of rocks are natural gas and oil found?

F Soft rocks

G Fossil rocks

H Sedimentary rocks

J Black rocks

Resources and the Properties of Rocks

Name: _____

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