



<b>Title:</b> How Fossil Fuels Are Formed	
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<b>Course:</b> Science	<b>Duration:</b> One 45 minute class period
<b>Grade Level:</b> 8	
<b>Objective:</b> The Theory of Superposition tells us that in an undisturbed section of crustal material, the oldest layer is at the bottom and the youngest layer is at the top. In this activity, students will discover how “fossil” fuels are formed and why they are not renewable.	
<b>Summary of Lesson:</b> Students will learn how fossil fuels are formed when they analyze narratives for “then” and “now” and create visual timelines for Paleozoic, Mesozoic and Cenozoic Eras. Using the narratives, students will trade information and label features for the other group. After designing a graphic organizer to compare and contrast the information, students will write a 5-paragraph essay demonstrating understanding.	
<b>Standards: CCSS, Arkansas State Frameworks, Next Generation Science Standards, Other</b>	
<b>Code:</b>	<b>Standard:</b>
MS-PS1-4	Develop a model that predicts and describes changes in particle motion, temperature and state of a pure substance when thermal energy is added or removed.
MS-ESS2-2	Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.
MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geosciences processes.
ESS.8.8.4	Synthesize and model the result of both constructive and destructive forces on land forms.
<b>Teacher Excellence and Support System:</b>	



Communicating with Students, Using Discussion Techniques, Engaging Students in Learning, Using Assessment in Instruction

**Instructional Strategies and Practices:**

Identifying Similarities and Differences, Note Taking, Reinforcing Effort and Providing Recognition, Cooperative Learning, Setting Objectives and Providing Feedback, Advance Organizers, Brainstorming and Discussion, Drawing and Artwork, Graphic Organizers, Models, Movement, Storytelling, Visualization and Guided Imagery, Visuals, Writing

**Bloom's Level:** *(Highest Level Only)*

Creating

**Materials and Resources:**

Materials for each group

- 6 sheets of plain white paper for each group of three students
- Post-It Notes
- Colored Paper
- Colored Pencils
- Copies of Student Handouts (See Student Handouts)

**Formative Assessment:**

Graphic Organizer

Exit Slip

**Teaching Notes:**

For additional activities and labs relating to how fossil fuels are formed, go to [www.energy4me.org](http://www.energy4me.org) or [www.need.org/needpdf/Fossil%20Fuels%20to%20Products.pdf](http://www.need.org/needpdf/Fossil%20Fuels%20to%20Products.pdf)

**Student Activity:**

1. Begin by dividing the class into two sections—Then and Now.
2. For each group of three students in “Then” Group, students will need the following:
  - Copy of narratives for Paleozoic Then, Mesozoic Then and Cenozoic Then eras
  - 6 sheets of plain white paper
  - Colored pencils
3. Students read, highlight and discuss the narrative for the each era, then draw the plants and animals that were present in that era on separate sheets of paper. They may need to research organisms to determine physical properties.
4. For each group of three students in the “Now” Group, students need the following materials:
  - Copies of narratives for Paleozoic Now, Mesozoic Now and Cenozoic Now
  - 6 sheets of plain white paper



- Colored pencils

5. Students read, highlight and discuss the narrative for the each era, then draw the plants and animals that were present in that era on separate sheets of paper. They may need to research organisms to determine physical properties.
6. After both groups have completed their illustrations, they will trade “Then” and “Now” narratives and use small post-it notes to label highlighted parts on the other group’s illustrations.

Performance Assessment: Students will create a graphic organizer comparing and contrasting the two diagrams and write a five-paragraph essay that will explain their findings.

Exit Slip Critical Thinking Question: Why are oil and gas called “fossil fuels?”

**See Student Handout**