



<b>Title:</b> Reclamation! Reclamation!	
<b>Author:</b> Kathy Rusert Acorn High School Mena	
<b>Course:</b> Environmental Science	<b>Duration:</b> One class period
<b>Grade:</b> 9-12	
<b>Objective:</b> After drilling for “oil” and creating a core sample, students will reclaim the property—somewhat!	
<b>Summary of Lesson:</b> Students will create a model of an oil reservoir, remove the oil and then reclaim (clean up) the property.	
<b>Standards:</b> Common Core State Standards, Arkansas State Frameworks	
<b>CODE</b>	<b>STANDARD</b>
SP.3.ES.1	Explain the reciprocal relationships between Earth’s processes (natural disasters) and human activities.
SP.3.ES.2	Investigate the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste.
SP.3.ES.4,	Explain problems related to air quality: <ul style="list-style-type: none"> <li>• automobiles</li> <li>• industry</li> <li>• natural emissions</li> </ul>
SP.3.ES.6-8	Research how political systems influence environmental decisions.
SP.3.ES.7	Investigate which federal and state agencies have responsibility for environmental monitoring and action.
SP.3.ES.8	Compare and contrast man-made environments and natural environments.
NS.4.ES.2	Use appropriate equipment and technology as tools for solving problems (e.g., microscopes, centrifuges, flexible arm cameras, computer software and hardware).



**Teacher Excellence Support System (TESS):**

3b: Using questioning/prompts and discussion, 3d: Using assessment in instruction

**Instructional Strategies and Practices**

Brainstorming and Discussion, Manipulatives, Experiments, and Models, Visuals

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

Creating

**Materials and Resources:**

- Opaque plastic cups (one per student)
- Fudge ice cream syrup
- Chocolate cookies, crushed
- Chocolate chip cookies, uncrushed
- peanuts or chocolate chips
- Whipped cream
- Sprinkles
- Clear Straw (one per student)

**Formative Assessment:**

Reflection Question: Explain how this activity relates to drilling for oil and reclamation following extracting the oil.

**Notes to Teacher:**

This fun activity is intended to accompany a study of reclamation procedures and requirements for oil and natural gas drill sites in Arkansas. Background information on reclamation can be found at [www.adeg.state.ar.us/](http://www.adeg.state.ar.us/) and <http://www.aogc.state.ar.us/> Other sites with relevant information to include:

- <http://www.oilandgasbmps.org/resources/reclamation.php>
- [http://www.blm.gov/wo/st/en/prog/energy/oil\\_and\\_gas/leasing\\_of\\_onshore/og\\_reclamation.html](http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/leasing_of_onshore/og_reclamation.html)

**Student Activity**

1. Ask students to brainstorm to define the term reclamation. Record their ideas, and then look up the word.

Reclamation is “reclaiming the land” so that it is in the same or better condition before drilling.

2. Use an assembly line to put ingredients into colored plastic cups in order to build your natural gas or oil well site. Label each ingredient and relate it to the part it plays in the reclamation site.



**\*\* (Always check for food allergies before conducting the activity)**

- 10 mL (2 teaspoons) Fudge Syrup (oil reservoir)
  - 30 mL (6 teaspoons) Crushed chocolate cookies (permeable soil/rocks)
  - 1 solid chocolate chip cookie (impermeable—creates reservoir for oil)
  - 30 mL (6 teaspoons) crushed vanilla wafers (sand) with peanuts or chocolate chips (rocks)
  - whipped cream to cover (tinted green)
  - Sprinkles (gravel)
3. Use a clear straw to dig through layers to get to oil reservoir (chocolate syrup). Remove the core sample (straw) to observe the layers that are not visible from the surface, and then put the straw back through the same to reach the oil and remove it by sucking on the straw.
  4. Rearrange the surface materials that were disturbed during the drilling process, “reclaim” the land so that it looks as it did before drilling—you have one minute to recover the site.
  5. When students have succeeded in reclaiming the site they may devour their oil well site!
  6. Ask students to explain how this activity relates to drilling for oil and reclamation following extracting the oil.