

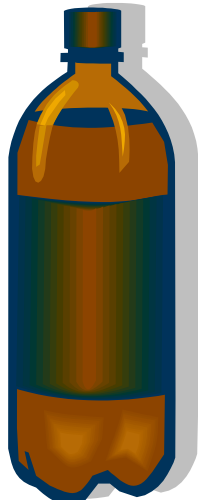
Enhanced Oil Recovery Hands-On Activities

Gas Injection:
The use of carbon dioxide, natural gas, or nitrogen in the petroleum reservoir to increase the pressure placed on the crude oil and push it out of the reservoir.



Try This!

Gas injection is a lot like a sealed bottle of soda. When the bottle is untouched, the soda doesn't move. As soon as you shake the bottle and open it, the carbon dioxide molecules push the soda out of the bottle!



Chemical Injection:
The injection of polymers into the petroleum reservoir to lower the viscosity of the crude oil and allow it to flow more easily.



Try This!

Chemical injection involves two materials that bond together and change their structures. Put vinegar in a cup. Add some baking soda and watch the reaction!



Ultrasonic Stimulation:
The use of a device underground to create vibrations in the petroleum reservoir and shake the oil molecules loose from the surrounding rocks.



Try This!

Ultrasonic stimulation can be simulated with an electric toothbrush and water. With the toothbrush off, water will sit in the bristles. When the toothbrush is turned on, the vibrations will shake the water out of the bristles!

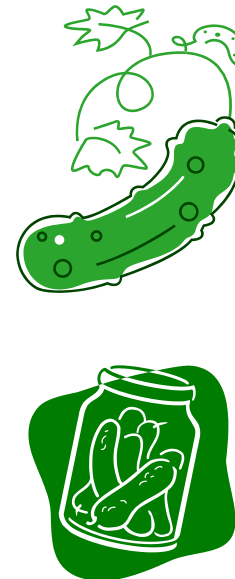


Microbial Injection:
The injection of carbon dioxide producing microbes into the petroleum reservoir to increase the pressure in the pocket, breaking up the long hydrocarbon chains of petroleum, or lowering the viscosity of the crude oil.



Try This!

Fermentation is a process of microbial injection. Look at the difference between a fresh cucumber and a pickle!



Thermal Recovery:
The use of any method to heat the crude oil while in the petroleum reservoir or as it moves up the drillstring, lowering the viscosity and allowing the oil to flow more easily.



Try This!

Thermal recovery can be demonstrated with maple syrup and a straw. Put some syrup in the refrigerator for an hour and then try to suck it through the straw. Put some new maple syrup in the microwave for a few seconds (It will get hot! Be careful!) and then try to suck it through a straw! The difference in temperature creates a difference in viscosity!

