

# Wash Out



## Grade Level

Middle School and up

## Materials (per team of 2-3 students)

3 paper cups  
Coffee filter  
1/3 cup of sand  
1 Tbsp salt  
Water  
Magnifying glass or hand lens  
Pencils

## Discussion

All that glitters may not be gold but, for centuries, gold has captured the eyes of many throughout the world. Gold-as well as copper, coal, and iron-is extracted from the ground. Engineers find environmentally-friendly ways to prepare and process these natural resources for products that go into our computers or our buildings. One process is leaching.

## Background

Leaching is the action of dissolving out parts of a mixture by percolating liquid. An

analogy could be the hot water in a coffee maker flowing through the ground coffee beans so that the resulting solution contains a substance that was previously trapped in the beans. Similarly, some metals are easily dissolved in acid or water. In this activity, the students will observe the leaching process by dissolving salt out of sand and then precipitating the salt as solid crystals.

## Activity

1. Introduce the class to the meaning of the word "leaching."
2. Explain to the students that in this activity they will be "modeling" the leaching process using a sand and salt mixture to represent crushed ore in a paper cup leach pad and using water as the percolating liquid.
3. Using a pencil, punch holes in the bottom of one paper cup.
4. Line that cup with the coffee filter and tear away any excess filter that sticks out of the cup.
5. Mix the sand and salt and put this "ore" mixture in the lined cup.
6. Fill a second cup with water.
7. Hold the cup of sand/salt over the remaining empty cup and slowly pour

- the water into the sand/salt mixture, catching the drainage in the bottom cup.
- Reverse the positions of the empty cup and the cup of water and pour it through again
  - Set the resulting solution aside in a warm place for at least a week to partially evaporate. Observe the crystals forming in the cup.
  - Set aside one cup of plain water for the class as a "control" for comparison.

*This activity was provided for National Engineers Week by the Junior Engineering Technical Society (JETS), National Energy Foundation and Eastman Chemical Company*

### JETS

*The Junior Engineering Technical Society (JETS) is a national educational organization that promotes excellence in engineering, technology, mathematics and science. For more information call, write or email to:*

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