

RAFT IDEAS

Topics: Density, Minerals, Physical Properties, Metals

Materials List

- ✓ Plastic VHS case
- ✓ EVA foam strips, 5 mm wide (with adhesive backing)
- ✓ Sand (cleaned, “playsand”)
- ✓ Copper B.B.s (or copper “shot” if available; do NOT use lead shot)
- ✓ Scissors
- ✓ Plastic tub (dishpan-size)
- ✓ Water

This activity can be used to teach:

- Property of materials (Next Generation Science Standards: Grade 5, Physical Science 1-3)

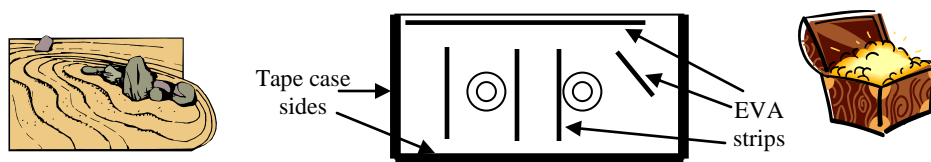
This activity can be used to support the teaching of:

- Knowledge and understanding of the past (National Curriculum for Social Studies: Theme 2, Time, Continuity, and Change)
- Distribution of minerals (Next Generation Science Standards: Middle School, Earth and Space Science 3-1)



Panning for Elements

Find your fortune in the science classroom



Combine fun, treasure hunting, and the study of physical properties (density) in an interdisciplinary activity covering history and physical science.

Assembly

1. Use scissors to cut the flap from a plastic VHS case.
2. Affix EVA foam strips to the bottom of the VHS case as shown above.
3. Mix about 20 copper B.B.s into every liter of sand.
4. Fill a plastic tub with at least 4 inches of water and add about 4 liters of sand.

To Do and Notice

1. With the VHS case pan held horizontally, add one small handful of sand into the left hand side of the VHS case.
2. Holding the left and right sides of the VHS case, submerge it in water. Lift the case slightly out of the water and gently rock and shake it back and forth, while tilting the right side of the case down at a shallow angle.
3. The escaping water should carry the lighter density sand out of the VHS case, leaving higher density copper treasure trapped onto the EVA strips to collect.

The Content Behind the Activity

Panning, a water separation method, has been used to find gold and gemstones well before the Gold Rush. Ancient Mayans panned for gold, diamonds, rubies, and emeralds in Central and South America. From 1848 through the early 1850’s, men (and some women) came to find their fortunes in the great California Gold Rush. During the early Gold Rush, prospectors could easily find gold in riverbeds around northern California. With a few simple tools and a lot of hard work, they often found enough gold to make their long trips to the West Coast well worth the journey. Extreme inflation, however, generally allowed merchants to benefit the most from the situation. Early gold pans were made from steel, but most today are durable plastic. While the design in this activity actually looks more like a sluice, the human energy and action involved makes it an usually-shaped “pan”.

The scientific principles behind this method are density and buoyancy. Gold has a higher density (19.3 g/ml) than sand (rock) (2 g/ml to 5 g/ml), so it will shift to the bottom of a sand/gold mixture when shaken in water. Copper also has a relatively high density: 8.95 g/ml. The pan sorts out gold and other higher-density substances from dirt by “catching” the metal pieces in the EVA foam ridges. Sand and other lower density minerals are washed away.

Web Resources (Visit www.raft.net/raft-idea?isid=539 for more resources!)

For great information on the California Gold Rush, visit:

<http://www.pbs.org/goldrush/index.html>