



Adapted from an article by Robert Beauford

Objective: To introduce meteorites and reinforce the composition of the solar system; to encourage student interest in space

AAAS Benchmarks for Science Literacy:

The Physical Setting

Many chunks of rock orbit the sun. Those that meet the earth glow and disintegrate from friction as they plunge through the atmosphere – and sometimes impact the ground. Other chunks of rock mixed with ice have long, off-centered orbits that carry them close to the sun, where the sun’s radiation (of light and particles) boils off frozen materials from their surfaces and pushes it into a long, illuminated tail.

Resources or Materials:

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| Large bowl or Bucket | Sheet of paper or plastic |
| Strainer | Filter paper |
| Neodymium magnet | Microscope |
| Microscope slides | Access to a rain spout and rain |

Procedure:

Prior to a likely rain storm, place a large bowl or bucket under the drain spout of a gutter system. Many things will be collected in the bucket in addition to your space dust; pick out any leaves or twigs. Pour the remaining liquid through a strainer lined with filter paper. Spread out this paper on a larger sheet if necessary depending on the amount of material.

Micrometeorites are small (ranging in size from a couple to a couple hundred microns), thus hard to separate from the remaining debris. Because meteorites contain metals, they can be separated from the mix using a strong magnet. Cover the neodymium magnet with another piece of filter paper and slowly pass it over the sheet holding the small gutter debris. Transfer the collected particles to a slide and investigate them under a microscope. High power will be required to see them clearly. Look for particles that are rounded and may have small pits on their surface. This is evidence of a micrometeorite's fiery trip through the atmosphere.

Background information:

Pieces of rock and metal frequently collide with Earth's upper atmosphere. Most of these are no bigger than a golf ball but are traveling at tens of thousands of kilometers per hour. The atmosphere creates enough friction to cause this space debris to heat up – most meteors burn up completely in the atmosphere and never reach the ground.

Those that land on the surface of Earth are called meteorites. Most believe that meteorites are fairly rare, but we are covered with over 40 tons of space dust every day! This material includes bits of comets and chunks of asteroids. A lot of the material that hits the ground is microscopic, much too small to be noticed. These are the tiny specimens known as micrometeorites.

Helpful hints:

- Another source of micrometeorites is snow; collect falling flakes and examine the remaining particles left behind after the water has melted and evaporated.