



Meteor Shower in a Bottle

Meteor showers occur when our planet passes through a stream of dust particles (meteoroids) that were left behind by a passing comet. The particles are swept up by Earth and penetrate the atmosphere so fast that they burn up and appear as brief, fiery streaks of light in the sky. Meteor showers, like the Orionids, Perseids, or Leonids, are usually named after the constellations in which the radiant is located (which constellation they appear to be coming from). This activity will help you understand why meteor showers seem to radiate from one spot, called the radiant.

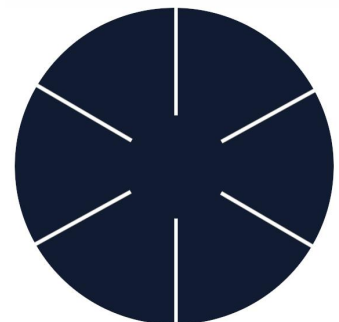
Materials

1 tall, clear plastic water bottle—around 12 inches long
1 inch thick black masking tape or black electrical tape



Directions

1. **Empty** the bottle of all contents, rinse if necessary, and let dry. **Remove** all labels—many bottles have adhesive labels that can be fairly easily removed (this step isn't absolutely required, but it will produce a cleaner effect).
2. **Cover** the bottle with vertical strips of tape, leaving about 6 clear, narrow slits (about 1/16 inch wide) along the length of the bottle, as shown. The clear slits represent the paths of meteoroids as they fall through Earth's atmosphere. Cover the bottom of the bottle and the slanted part on top with tape as well.
3. **Look** through the mouth of the bottle (the open end). What do the lines look like? When we observe a meteor shower in the sky, we look into the distance where the meteors are coming from, like looking into the bottle from the open end. Although the lines along the sides



of the bottle are all parallel to each other, they seem to converge (come together) at the far end of the bottle. This effect is called *perspective* and is the same reason that the parallel rails of a straight train track seem to converge in the distance.

Meteor fun facts

- a. In most cases, the streak of light we call a meteor is caused by a particle about the size of a grain of sand moving at very high speed (as fast as 40 miles *per second*). Most burn up completely about 50 miles above the ground—they're not as close as you might think!
- b. According to NASA, Earth sweeps up about 50-100 tons of meteoritic dust every day. Meteoroids big enough to survive their fiery journey through the atmosphere and land on the ground are relatively rare and are called meteorites.
- c. Single, isolated meteors—called sporadic meteors—can be seen about 4-6 times per hour on a clear, moonless night. These are not necessarily part of a meteor shower.
- d. The most intense meteor showers known—called meteor storms—are very rare and can produce more than 1000 meteors per hour.
- e. The oldest record of a meteor shower was made in 687 BC by Chinese astronomers—that's more than 2,700 years ago!
- f. What to learn more about meteors? Check out this Academy-made video about how to observe meteor showers:

<https://www.calacademy.org/explore-science/how-to-observe-a-meteor-shower>