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Meteors, Meteoroids, and Meteorites

Have you ever seen a falling star? You really saw a meteor. A meteor is a bright streak of light we see in the sky. It only lasts for a few seconds. People often call meteors shooting stars or falling stars because they look like stars falling from the sky. People sometimes call the brightest meteors fireballs. While it is in space, it is called a meteoroid. Meteoroids that reach the Earth are called meteorites.



A meteor appears when a chunk of metallic or stony matter called a meteoroid enters the Earth's atmosphere from outer space. Air friction heats the meteoroid so that it glows. It creates a shining trail of gases and melted meteoroid particles. Most meteoroids burn up before reaching the Earth. Some leave a trail that lasts several seconds. Millions of meteors occur in the Earth's atmosphere every day. Most meteoroids that cause meteors are about the size of a pebble.

Meteoroids travel around the sun in different orbits and at different speeds. The fastest ones move at about 26 miles per second. The Earth travels at about 18 miles per second. So when meteoroids meet the Earth's atmosphere head-on, the combined speed may reach about 44 miles per second, or 158,400 miles per hour!

The Earth meets a number of clusters of tiny meteoroids at certain times every year. At these times, the sky seems filled with a shower of sparks. These clusters have orbits like comets and are believed to be pieces of comets.

There are three kinds of meteorites. They are stony, iron, and stony-iron. Stony meteorites consist of minerals rich in silicon and oxygen, with smaller amounts of iron, magnesium, and other elements. One group of stony meteorites is called chondrites. They are pieces of the same material from which the planets formed. Another group of stony meteorites is called the achondrites. They were once part of a larger body such as an asteroid. The asteroid was large enough to have melted and separated into an iron-rich core and a stony crust. Achondrites come from the outer crust. Stony-iron meteorites come from the inner crust. The iron meteorites come from the metallic core. Iron meteorites are made mostly of iron and nickel. Stony-iron meteorites have nearly equal amounts of silicon-based stone and iron-nickel metal. Meteorites are the oldest rocks ever found. They date back to the beginning of the solar system.

Meteorites reach the Earth's surface because they are the right size to travel through the atmosphere. If they are too small, they will burn up in the atmosphere. If they are too large, they may explode before reaching the Earth's surface. One such meteorite exploded in Siberia in 1908. It left a 20-mile area where trees were knocked down and scorched. There were no traces found of the meteorite. In October 2005, a 1,400 pound meteorite was found in Kansas. Scientists believe it fell about 10,000 years ago. It was covered with several feet of soil and rock. Thousands of small meteorites have been found in Antarctica. Scientists study meteorites for clues to the types of material that formed the planets.

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When large meteorites, asteroids, or comets strike a planet, they make an impact crater. Impact craters are bowl-shaped dimples that measure up to about 25 kilometers in diameter. Scientists have found more than 140 impact craters on the Earth. One of the most famous, the Meteor Crater in Arizona, is about 1,275 meters across and 175 meters deep. It formed nearly 50,000 years ago when an iron meteorite weighing an estimated 300,000 metric tons struck the Earth.

Most impact craters are eroded by wind and water on Earth or have been buried by sediments as the Earth's surface has changed. One very large crater in Mexico was created when an asteroid struck the Earth about 65 million years ago. Many scientists think that this caused large climate changes that led to the extinction of the dinosaurs.

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Questions

- _____ 1. Which of these is called a meteor?
- A. a chunk of metallic or stony matter found in space
 - B. a streak of light caused by something entering Earth's atmosphere
 - C. a chunk of metallic or stony matter found on Earth's surface
- _____ 2. Which of these is called a meteoroid?
- A. a chunk of metallic or stony matter found in space
 - B. a chunk of metallic or stony matter found on Earth's surface
 - C. a streak of light caused by something entering Earth's atmosphere
- _____ 3. Which of these is called a meteorite?
- A. a streak of light caused by something entering Earth's atmosphere
 - B. a chunk of metallic or stony matter found on Earth's surface
 - C. a chunk of metallic or stony matter found in space
- _____ 4. What causes the light of a meteor?
- A. It's the same as the sun.
 - B. It's caused by friction with the Earth's atmosphere.
 - C. It's the same as a comet.
- _____ 5. Most meteoroids that cause meteors are about the size of a pebble.
- A. true
 - B. false
- _____ 6. There are three types of meteorites based on _____.
- A. where they have been found
 - B. what they are made of
 - C. how big they are

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- _____ 7. Why do scientists study meteorites?
- A. for clues to what kind of materials formed the planets
 - B. to find gold or diamonds
 - C. for clues to what kind of materials formed the sun
- _____ 8. When large meteorites hit the Earth, what do they make?
- A. lightning
 - B. fires
 - C. impact craters

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How many of these can you write about? Think! Write! Check all the ones you answered.

- Have you ever seen a meteor? What did you think about it at the time? What do you think about it now?
- Write a paragraph or maybe a poem about a meteor.
