

# FIREBALLS in the sky

## WHAT IS A METEORITE?

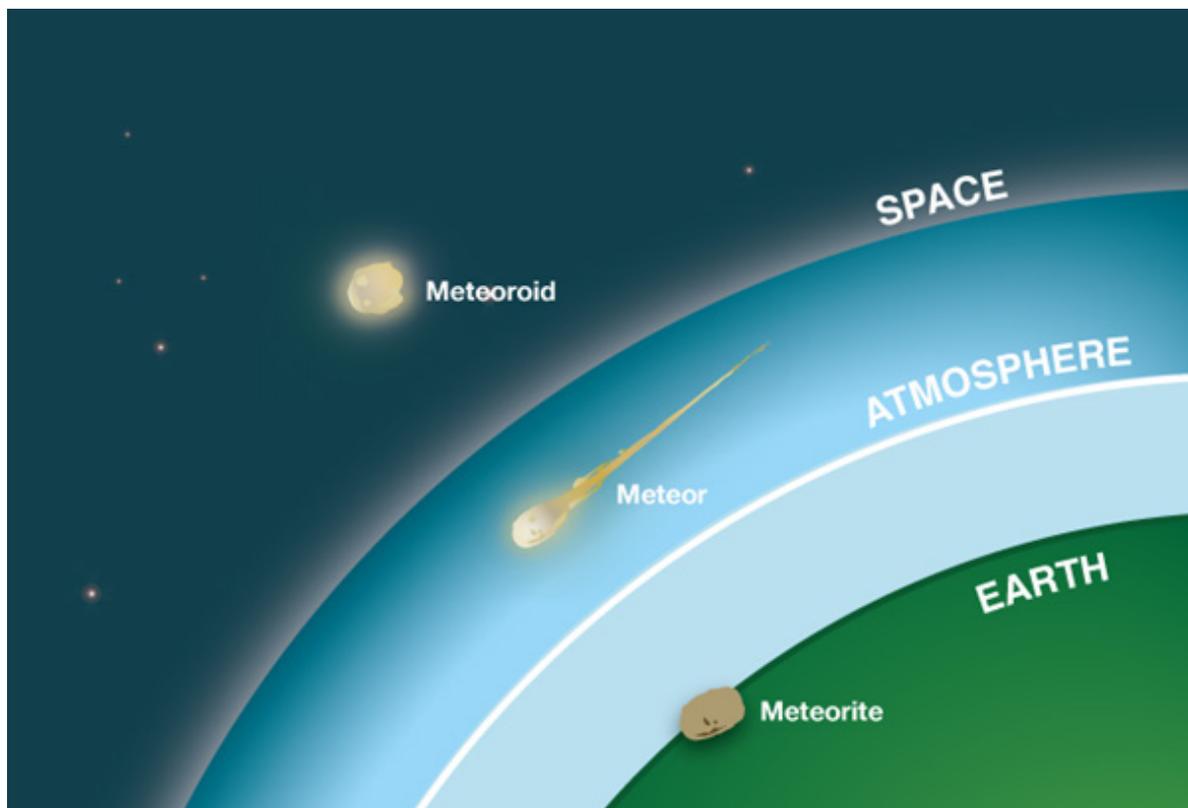
**A meteorite is a rock from space that has fallen to Earth.**

Meteorites are some of the oldest rocks in existence and have remained untouched since the formation of our solar system. Most meteorites are believed to be broken fragments of asteroids, comets and even planets. Meteorites vary in size; the smallest can weigh just a few grams while the largest of meteorites can weigh several tonnes.

**METEOROID? METEOR? OR METEORITE?**  
While a meteorite is still in space it is called a meteoroid. Meteoroids are fragments from asteroids, comets or planetary bodies

which are travelling through space. They can travel for billions of years before hitting anything. Some meteoroids come from the Moon or Mars after being knocked loose by other large objects impacting their surfaces.

When you see bright streaks of light or shooting stars in the sky, you are actually looking at rocks burning up through the Earth's atmosphere. These bright lights are called meteors. Most meteors enter the Earth's atmosphere travelling 40 times faster than the speed of sound. Because they are travelling so fast, they become superheated by the atmosphere and start to melt on the outside.



# FIREBALLS

## WHAT IS A METEORITE?

### in the sky

The bright fireball that we see is caused by the melted surface being torn away and changing its shape. This process of melting away the hot surface is called ablation and keeps the inside of the meteor cold.

#### FIREBALLS AND BOLIDES

Meteors can explode on their way down to Earth, breaking into fragments in a bright flash, or they can survive the entry in one piece. Extremely bright meteors are called bolides or fireballs. These meteors are much larger than normal and can sometimes be brighter than the sun.

#### WHAT DO THEY LOOK LIKE?

When a meteor has hit the ground it is called a meteorite. The outside of a meteorite is normally covered by a thin black fusion crust. The fusion crust forms when the molten surface becomes solid, leaving the inside untouched. Contrary to what you may think, meteorites are not hot when they hit the ground – in fact, they cool down very quickly after landing because they are still cold on the inside.

Meteorites have many types of internal structures and compositions. They can be made out of metal, rocky minerals or a mixture of both. Once a meteorite has landed and been found, we can study its internal structure and learn about how it was formed.

#### GLOSSARY

**Ablation:** The removal of the surface of a re-entering body by vaporisation. The process of ablation prevents the interior of the meteor from being heated but also removes a large amount of the meteor's mass.

**Bolide:** An extremely bright meteor or fireball that is the result of a large meteoroid entering the atmosphere.

**Fusion crust:** Smooth, shiny black surface of a meteorite formed by the flash cooling of the molten exterior after ablation has stopped.

**Meteor:** The bright light given off by a meteoroid as it burns through the atmosphere.

**Meteoroid:** A small rock that is currently travelling through space. Once it has landed on a planet it is called a meteorite.

**Meteorite:** A rock from space that has survived re-entry and landed on the Earth's surface.