

Space Day Teacher's Resource Guide

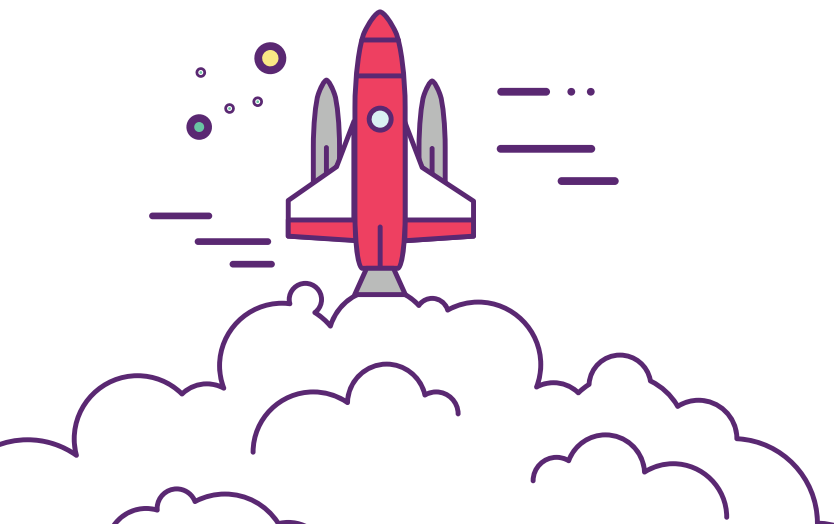
Science Museum Oklahoma

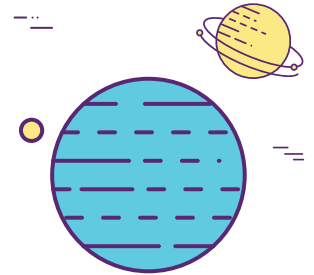
Space Day

Space Rocks! Stars may make up the majority of the mass in our solar system, and gas giants are huge planets, this year we take a look at the smaller, harder bits of the solar system, the parts that rock!

Join us May 3, 2024 as we celebrate Space Day with a variety of hands on activities at Science Museum Oklahoma. We will explore planets, moons, asteroids, and meteorites. Launch into an investigation of space rocks, starting with the rocky planets like the earth and the moon. Hold a real piece of outer space in your hand while you learn to tell a meteorite from a meteor-*wrong*.

The activities on the following pages can be performed in a classroom or at home. Also, keep an eye out on social media and the Science Museum Oklahoma YouTube page for more activities celebrating Space Day!





Recipe for a Comet

Fun fact: Did you know that comets are often referred to as "dirty snowballs" or "icy mudballs" because they are made of ice, dust, and organic material? These cosmic snowballs have been zooming through our solar system since its formation over 4.6 billion years ago!

What you'll need:

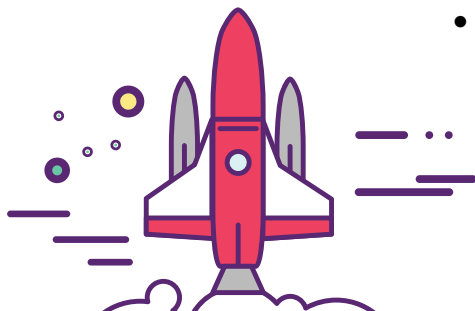
- Water
- Small rocks or pebbles (to represent the comet's rocky material)
- Corn syrup or molasses (for the organic compounds)
- A small amount of flour (as cosmic dust)
- Glitter (to mimic the ice and give it a cosmic glow)
- A large mixing bowl
- A spoon or spatula for mixing
- Freezer bags

What to do?

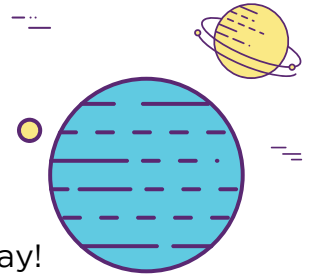
1. In your mixing bowl, start by adding 1 cup of water. This will freeze to represent the ice that makes up the majority of the nucleus of the comet.
2. Add a handful of small rocks or pebbles to symbolize the rocky material comets carry.
3. Pour in 2 tablespoons of corn syrup or molasses to represent the organic compounds found in comets.
4. Sprinkle 1/4 cup of flour into the mix to act as cosmic dust.
5. For a bit of cosmic sparkle, add a generous amount of glitter.
6. Mix all the ingredients together until you have a gooey, sticky mixture.
7. Once mixed, transfer your comet concoction into a freezer bag and shape it into a ball or oval – your very own comet nucleus!
8. Place the freezer bag in the refrigerator for a few hours to firm up. This will make your comet model a bit more solid enough to touch and hold, while safe and non-toxic, it may be slightly sticky.

Discuss:

- Explore the importance of comets in the solar system and how they are "time capsules" containing the original material from which the solar system formed.
- Discuss how the "tail" of a comet is formed when it passes close to the Sun, causing its icy components to sublimate and create a visible atmosphere and tail.



Safety Note: This activity is designed to be safe and non-toxic, making it suitable for children under supervision. However, small objects like pebbles should be handled carefully to avoid choking hazards for younger kids.



Meteors in the Gutter

Fun fact: Earth is bombarded with about 100 tons of cosmic dust every day! These tiny particles come from asteroids and comets and sometimes, after a long journey through space, they end up in our gutters as micrometeorites.

You can discover micrometeorites right in your own backyards. While large meteorites are rare, micrometeorites are surprisingly common and very easy to find. This activity highlights the constant interaction between Earth and the rest of the solar system, making space science exciting and accessible.

What you'll need:

- Strong Magnet
- Resealable Plastic Bag
- White paper
- Magnifying glass or a small microscope
- A small brush (to gently remove particles from the magnet)

What to do?

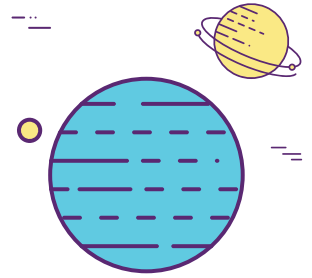
1. Encase the strong magnet in the resealable plastic bag. This makes it easier to collect and remove tiny particles without them getting stuck to the magnet permanently.
2. Gently drag the magnet across areas where rainwater runoff collects, such as gutters, the ground beneath downspouts, or even on the roof (with adult supervision).
3. Once you've collected some material on the bag, carefully remove the magnet. The metallic particles will be stuck to the inside surface of the bag.
4. Use a small brush to transfer these particles onto a piece of white paper.
5. Examine the particles with a magnifying glass or microscope. Small, spherical particles are micrometeorites. They may have a shiny or matte finish.

Discuss:

- Discuss the origins of micrometeorites and their journey through space to Earth.
- Explore the importance of micrometeorites in scientific research, such as understanding the composition of distant cosmic bodies.

Safety Note: This activity is safe and suitable for children under supervision. The use of a strong magnet and climbing to collect samples should always be conducted with an adult present to ensure safety.

By searching for micrometeorites, students not only learn about the vast amount of space material that constantly enters Earth's atmosphere but also get to hold a piece of space in their hands. This engaging, hands-on activity is perfect for sparking curiosity and wonder about the universe around us.



Crater Creator – Investigating Impacts

Fun Fact: The Moon's surface is covered in craters because it has no atmosphere to protect it from space debris. Every time a meteoroid crashes into the Moon, it leaves behind a crater. Earth has craters too, but many are eroded by weather, covered by vegetation, or filled with water over time!

Create craters of your own by dropping different objects into sand, learning about the factors that influence crater formation on celestial bodies. This hands-on activity simulates the impact events that have shaped the surfaces of planets and moons throughout our solar system.

What you'll need:

- A large tub of flour or sandbox filled with sand
- A selection of balls, marbles, and rocks of various sizes and weights (to simulate meteoroids)
- Ruler or measuring tape (for measuring craters)
- Graph paper for recording results
- A sieve and cocoa powder or colored chalk dust (optional, for highlighting crater features)

What to do?

1. Fill your tub or sandbox with a deep smooth layer of sand or flour to simulate your planet or moons surface.
2. From a set height (start with 1 meter), drop your selected "meteoroid" objects one at a time into the sand.
3. After each impact, measure the diameter and depth of the crater created. Use the graph paper to record your findings.
4. Optional: For a more detailed examination of the crater, sift a thin layer of cocoa powder or chalk dust over the crater. This will help highlight the raised rim and any rays emanating from the crater.
5. Experiment with changing the height from which you drop objects, the angle of impact, and the size/weight of the objects to see how these variables affect the crater's size and shape.

Discuss:

- How do the different angles of impact affect the shape of the crater?
- Does the object's speed and size determine the energy of the impact and, consequently, the size of the crater?
- What can craters reveal about the geological history of celestial bodies?

Safety Note: This activity is safe and suitable for children under supervision. The use of a strong magnet and climbing to collect samples should always be conducted with an adult present to ensure safety.

This activity shows students how impacts from space sculpt the surfaces of planets and moons. By exploring the dynamics of crater formation, students gain insights into the processes that have shaped, and continue to shape, our solar system.