

Exploring Our Galaxy (5th grade) Pre-Visit Activities

Vocabulary List and Student Definitions (elementary level):

- **Sun-** the closest star to earth, our sun is a medium sized yellow star.
- **Galaxy-** a grouping of over 1 million stars, including the objects that orbit the stars.
- **Planet-** a massive sphere which orbits a star
- **Asteroid-** large chunks of rocks and metals which orbit the sun in the asteroid belt.
- **Comet-** large chunks of ice, dust, and gases which streak through space.
- **Moon-** a natural satellite which orbits a planet
- **Constellation-** a large group of stars which form a pattern in the night sky.

Teacher Background and Supporting Information

1. Our Galaxy:

- a. Our galaxy is named the Milky Way because of the milky blur made by the many stars which can be viewed from earth.
- b. Galaxies can be classified into different shapes including elliptical, spiral, barred spiral and irregular. The Milky Way is a spiral galaxy.
- c. Each branch off of the central spiral of our galaxy is called an "arm". Our solar system is located near the end of an arm.

2. Our Solar System:

- a. The 8 planets of our solar system, from closest to the sun to farthest are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- b. The first 4 planets are considered the inner planets. These planets are terrestrial with rocky surfaces. Venus, Earth, and Mars all have atmospheres within which erosion can occur.
- c. The last 4 planets are considered the outer planets. These planets are large gas giants with liquid slushy surfaces. All of these planets have moons and a ring system.
- d. Out in empty space, outside of the atmospheres of the planets, space is a vacuum. Because of a lack in gas molecules, objects from earth would behave differently in space if not properly outfitted or stored.

3. Our Moon:

- a. The moon is the earth's only natural satellite, meaning it is not manmade, and orbits earth due to the force of gravity.
- b. We only see one side of the moon because the moons revolution around the earth is perfectly in sync with earth rotation.
- c. The surface of the moon has many craters.

Student Activities

1. Making a Spiral Galaxy
 - a. Each group of students will need a clear bowl, water, food coloring and an object for stirring (spoon or popsicle stick). Students can be placed into group of 2-3.
 - b. Fill bowls with water then stir gently in one direction with the spoon so that the water is spinning in the bowl. Place a single drop of food coloring in the center of the rotating water.
 - c. The center of the water will rotate rapidly while slow moving spiral arms will form around the center. This resembles our galaxy, but only if all the stars had formed exactly at the same time. Scientists believe the stars in the Milky Way did not form at the same time.
 - d. To simulate the formation of the Milky Way, refill the bowl with clean water and repeat the experiment, dropping on three or four food coloring drops near the center.
 - e. Each drop will form its own arm of the spiral, the length and speed of the arm depending on its distance from the center. Because stars in the Milky Way form at different times and continue to form, the Milky Way has been able to remain a spiral for billions of years.

2. Ask a scientist
 - a. As a class, create a KWL chart focusing on the planet Mars. Students will discuss the things they **know** about Mars, and list the things that they **want to know** about the red planet and its exploration.
 - b. Visit the NASA website for the Jet Propulsion Laboratory <http://www.jpl.nasa.gov/kids/index.cfm> Students can visit this site independently, or this can be done as a whole class if technology is available.
 - c. Click on the link for the activity "Ask Dr. C" or type in <http://marsdata1.jpl.nasa.gov/DrC/>
 - d. Generate questions for Dr. C based on the "want to know" section of the KWL chart. Type in the questions and read the responses.
 - e. Finish the activity by filling out the "L" section of the chart, what the students **learned**.