



8th Grade: Celestial Body

Course description: Many of the natural forces that shape our world come from things outside of it. We experience tides as a result of the moon's gravity while it orbits the Earth. The sun provides a relatively steady influx of radiant energy that forms the foundation of Earth's food webs. Over the course of these classes, students will begin understanding how Earth's systems are affected by its place in the larger celestial community.

Day 1: The class will introduce Earth's rotational axis and the effects that phenomenon is responsible for in our day to day lives (such as our 24-hour day/night cycle). Students will learn how the tilt of Earth's axis is what causes seasons to change and how the uneven heating of Earth's surface causes it to be hotter at the equator and cooler at the poles.

Demonstration: In order to understand how the Earth moves in relation to the sun, students will create a model of our solar system that they can use to simulate orbital paths. Students will be prompted to create seasons on their model Earth and show the differences in the celestial bodies' positions to one another for each of these times. Students will also get to see various live animals that are affected by season changes and learn how they keep warm during the winter.

Day 2: Students will be focusing on the sun for this class. As they look at how our solar system's star shapes up compared to other stars in the universe, they will get an idea of how powerful stars really are. From there, they will discuss and begin to see how the sun's responsible for heating our Earth.

Demonstration: Students will create a solar oven using magnifying lenses that they will take outside to roast marshmallows (harnessing the Sun's energy for a tasty snack). Students will also get to meet some "cold-blooded" animals and discuss their need to externally regulate the temperature around them through movement either to or away from a heat source and then briefly introducing the concept of uneven heating of the Earth's surface by the sun.

Day 3: Students will learn how the light from the moon is just light reflected from the sun. Using their model of our solar system from the first class as a reference, students will discuss why the moon is responsible for tides and what other effects it has on Earth.

Demonstration: Students will learn that the moon's gravity is responsible for the creation of tides. Students will discuss the difference between spring and neap tides and create their own ocean in a bottle to understand how tides work.

Day 4: Now that the students are familiar with the sun, moon, and Earth, it is time for students to apply what they've learned to a more realistic scenario. Students will go outside and measure out the proper distances to create a scale model of our solar system.

Demonstration: Students will go in the parking lot and attempt to create a scale version (proper distances and object sizes) of the sun, moon, and Earth. Then they will get to use the human hamster balls and water balloons to simulate meteors heading towards our solar system.