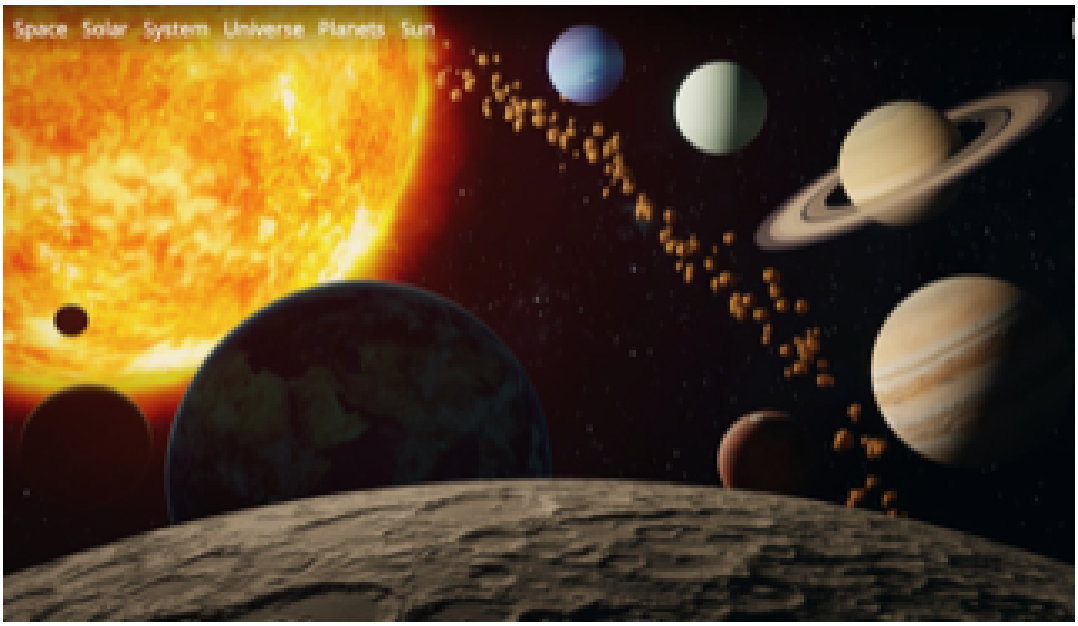
Lesson + Activity:
Space - A Series of Lessons



Grade Level(s)	Timeframe
6-8	60 min

ABSTRACT

This series of classes covers the topics: Environment of Space, Orbits and Weightlessness, Solar System, Phases of the Moon, Earth Seasons, Stars and Constellations, What are all the Reasons We Launch Satellites into Space?, Canadian Accomplishments in Space. These lessons have been taught in grade 6 since 2011, with updates.

010 - Space - A Series of Lessons - Rev 1

Uses Scratch program for some demonstrations. (No programming needed.)

Alternate search terms: satellites, orbits, solar system, stars and constellations, Canadian accomplishments in Space

Series: Space

Time: 3 lessons of 60 minutes each.

LESSON FILES

010_2.zip

GETTING READY

This is a series of 3 lessons as follows:

A. Environment of Space; Orbits; Weightlessness of Astronauts in Spacecraft

You can show the WORD file on the screen. It has a question for discussion on one page, the answer on the next page, next question, next answer, and so one.

The Scratch program on page 6 can be run to show when that an object is travelling fast enough around the Earth, it will stay in orbit, rather than falling to the Earth. Because an astronaut is falling inside a falling spacecraft, the astronaut floats inside the spacecraft, give the appearance of weightlessness or 'microgravity'. If you are in the classroom, this can be illustrated using a cereal box with top cut out and window in front (simulated spacecraft) and a small toy (simulated astronaut). A student can stand on a desk and hold the spacecraft and astronaut with one hand. The student releases both at the same instant. The class must watch closely, but they can see the astronaut floating the spacecraft.

The video also shows that the lower the altitude of the body orbiting the Earth, the fastest it must travel in order not to fall to the Earth. The table in the WORD file shows examples of satellites, including the Moon, which show that this is true.

B. Solar system, Moon and Stars

Follow the discussion of solar system, moon, Earth's seasons, stars and constellations and viewing the International Space Station (ISS) as shown in the WORD file.

The photos of the solar system model and the Excel spreadsheet by Bob Thomas give an idea how small the planets are, compared to the distances from the Sun. If the students are in the classroom, they can make a scaled solar system model, as described in the WORD file. Explain the phases of the Moon and the Earth's seasons, using the web sites shown.

For the constellations, you can use either the planisphere or Stellarium or both.

Explain how to view the ISS, how to read the table of viewings, and how we can see it when we are in darkness (after sunset) but the ISS is in sunlight.

C. What do we Use Space for? And Canadian Accomplishments in Space

Ask what we use Space for, or in other words, we do we launch satellites and rockets into space. After discussion, work through the web sites shown in the 'What Do We Use Space For' WORD file.

Then show the Canadian Space Accomplishments. Canada has a proud history in Space. We 'punch above our weight'. Maybe the students will become astronauts or space engineers!

D. Research Projects

If the teacher is interested, 2 research projects are proposed for the students. One is to select a planet or other solar system body and find answers to key questions. The other is to select a constellation, comet or other 'outer space' body to research. Make the presentation as interesting as possible. Explain how to use 3 significant figures when quoting numbers about space.