



The Secret Phases of the Moon



- ★ Grade level: elementary cycles 2 and 3
- ★ Type of show: interactive multimedia with live commentary from an astronomy interpreter
- ★ Length: 45 minutes
- ★ Availability: as of February 4, 2014, Monday to Friday at 10:30 a.m. (except Mondays from September to February)
- ★ Information and reservations: **514-868-3056**

Essential knowledge

Cycle two

Describes the shape, colour and texture of an object or a substance — Associates the cycle of day and night with the rotation of the Earth — System involving the Sun, Earth and the Moon — Stars and the galaxies — Terminology related to an understanding of Earth and the universe.

Cycle three

Describes the impact of certain natural phenomena on the environment or on the well-being of individuals — Describes the shape, colour and texture of an object or a substance — Associates the cycle of day and night with the rotation of the Earth — System involving the Sun, Earth and Moon — Solar system — Stars and the galaxies — Terminology related to an understanding of Earth and the universe.

Subject-specific competencies in science and technology

Cycles two and three

Competency 1: To propose explanations for or solutions to scientific or technological problems.

Competency 3: To communicate in the languages used in science and technology.



Summary

Have you ever seen a total solar eclipse? The scientific interpreter at the Rio Tinto Alcan Planetarium plays the role of an eclipse chaser who is sharing his passion with us, his audience. The Milky Way Theatre converts into a spaceship that will carry us through space and time. Our journey begins on April 8, 2024, at Mont Mégantic east of Sherbrooke where we watch the next total solar eclipse visible from Quebec. From this location, a true mecca for Quebec astronomers, we observe the eclipse and the phenomena that go along with it. The Moon passes in front of the Sun, the solar corona appears, near-total darkness envelops us, and the stars and planets come out. It's an incredible experience. But what causes this phenomenon, and how can we become expert eclipse chasers?

First we need to learn about the sky, the Moon, the Earth and the Sun. From our time-travelling spaceship, we can view the night sky over Montreal with its constellations, stars, planets and Moon. In this starry sky, most stars are actually suns. Our ship takes us into space to see these stars at a distance. Then we fly back close to the Sun and see objects orbiting our star: they are the planets. Our Earth is the third planet from the Sun. As we travel closer to Earth, the Moon becomes visible.

Only in the past 400 years have people had a good understanding of the objects making up our solar system. Before that, our ideas about the Sun and Moon came mostly from myths and legends. The show delves into a few legends from North America and Africa. When we look at the Moon nowadays, what do we see in the lunar maria?

From Earth, the Moon doesn't always look perfectly round and bright to us. At times, it appears as a crescent or a half-circle or a not quite full circle. Sometimes it may even be completely invisible in the sky. These different shapes are the lunar phases and are known as crescent, quarter, gibbous, full and new moons.

Next, our spaceship flies above the Earth-Moon-Sun system to show us how the Moon's revolution around our planet enables people on Earth to see these different shapes. We learn that during a full moon, a lunar eclipse sometimes occurs if the Moon is perfectly aligned with the Earth and the Sun. Yet what we really want to know is what causes a solar eclipse. When a new moon occurs, the three objects in the Earth-Moon-Sun system are exactly aligned. Seen from Earth, the lunar disk will pass directly in front of the Sun. But the Moon is small, and this phenomenon is visible only from certain locations on Earth. During the eclipse on April 8, 2024, the Moon's shadow will pass over Mexico, the United States, southern Quebec, New Brunswick, Prince Edward Island and Newfoundland.

This total solar eclipse is what we hope to see a decade from now. The older elementary students will be adults by then and can experience this extraordinary event for real. Our show wraps up with photos of people observing eclipses around the world and their shouts of joy.