

Earth and Space Science, Grade 12

University Preparation

SES4U

This course develops students' understanding of Earth and its place in the universe. Students will investigate the properties of and forces in the universe and solar system and analyse techniques scientists use to generate knowledge about them. Students will closely examine the materials of Earth, its internal and surficial processes, and its geological history, and will learn how Earth's systems interact and how they have changed over time. Throughout the course, students will learn how these forces, processes, and materials affect their daily lives. The course draws on biology, chemistry, physics, and mathematics in its consideration of geological and astronomical processes that can be observed directly or inferred from other evidence.

Prerequisite: Science, Grade 10, Academic

Big Ideas

Astronomy (Science of the Universe)

- The development of more sophisticated technologies has enabled us to achieve a deeper, more thorough understanding of the origin and evolution of the universe.
- Scientific theories about the universe are refined and altered as new evidence is discovered.

Planetary Science (Science of the Solar System)

- Space exploration and the technologies that have been developed to facilitate it have had positive and negative effects on society, the economy, and the environment.
- Space exploration presents many hazards.
- Interactions among bodies within the solar system have an impact on the existence of life.

Recording Earth's Geological History

- Earth is very old, and its atmosphere, hydrosphere, and lithosphere have undergone many changes over time.
- Changing conditions on Earth over time have had positive and negative effects on life on the planet.

Earth Materials

- Exploration for and extraction and refining of materials from below the surface of Earth have positive and negative effects on the economy, society, and the environment.
- Different types of rocks have different origins, properties, characteristics, and uses.

Geological Processes

- Earth's lithosphere is constantly changing as the result of natural phenomena and human activity.
- Specialized technologies have enabled us to increase our knowledge and understanding of Earth's structure and have improved the ability of scientists to monitor and predict changes in the lithosphere.