



Long Range Grade 4 Science and Technology Plan

Term 3: Earth and Space Systems – Rocks, Minerals and Erosion

Specific Expectations

Understanding Basic Concepts

- describe the difference between minerals (composed of the same substance throughout) and rocks (composed of two or more minerals);
- classify rocks and minerals according to chosen criteria, relying on their observations (e.g., colour, texture, shape);
- recognize that there are three classes of rocks: igneous, sedimentary, and metamorphic;
- compare different rocks and minerals from the local environment with rocks and minerals from other places;
- describe the effects of wind, water, and ice on the landscape (e.g., ice breaking rocks into soil), and identify natural phenomena that cause rapid and significant changes in the landscape (e.g., floods, tornadoes, heavy rainstorms);
- investigate and describe ways in which soil is formed from rocks;
- identify and describe rocks that contain records of the earth's history (e.g., fossils), and explain how they were formed.

Developing Skills of Inquiry, Design and Communication

- follow procedures that ensure their safety by covering rock samples with a cloth when chipping and by wearing safety goggles;
- test and compare the physical properties of minerals (e.g., scratch test for hardness, streak test for colour);
- formulate questions about and identify needs and problems related to objects and events in the environment, and explore possible answers and solutions (e.g., create a mould of a fossil and use the mould to make a replica of the fossil to demonstrate how the fossil was formed; design and carry out an investigation using sand structures to show the relationship between volume of water and erosion);
- plan investigations for some of these answers and solutions, identifying variables that need to be held constant to ensure a fair test and identifying criteria for assessing solutions;

- use appropriate vocabulary, including correct science and technology terminology, in describing their investigations and observations (e.g., use terms such as *hardness*, *colour*, *lustre*, and *texture* when discussing the physical properties of rocks and minerals);
- compile data gathered through investigation in order to record and present results, using tally charts, tables, and labelled graphs produced by hand or with a computer (e.g., use a chart to record findings obtained through a mineral hardness test);
- communicate the procedures and results of investigations for specific purposes and to specific audiences, using media works, oral presentations, written notes and descriptions, drawings, and charts (e.g., put together a labelled exhibit of rocks found in the local environment; create a chart of the physical characteristics of different types of rocks and minerals).

Relating Science and Technology to the World Outside the School

- distinguish between natural features of the landscape and those that are the result of human activity (e.g., Niagara Escarpment, farm land, vineyards);
- determine positive and negative effects of human alteration of the landscape (e.g., use of farm land for housing developments; use of wilderness areas for cultivation of crops; creation of parks);
- identify ways in which soil erosion can be controlled or minimized (e.g., by planting trees, by building retaining walls), and create a plan for reducing erosion of soil in a local field or plot;
- design, build, and test a system to control the effects of soil erosion;
- identify the many uses of rocks and minerals in manufacturing, and in arts and crafts (e.g., china, iron fences, soapstone carvings, jewellery, coins);
- conduct their investigations of the outdoor environment in a responsible way and with respect for the environment (e.g., leave the site of the investigation as they found it, putting back objects examined where they found them and taking away all equipment brought to the site).