Geology 12

Foundational Outcomes

NOVA SCOTIA
NOUVELLE-ÉCOSSE

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EECD has made suggestions for prioritizing outcomes to assist teachers as they support student learning. Teachers will need to make their professional decisions based on the needs of their students.

The Foundational Outcomes identified in this document represent outcomes determined to be relevant for future learning in the discipline. Decisions about foundational outcomes were made in consultation with teachers, science specialists and post-secondary institution expectations. The foundational outcomes are meant to guide teachers in making decisions about creating learning experiences that will prepare and engage their learners in a responsive way. However, a teacher's professional judgment remains the most crucial factor for responding effectively to the needs of learners.

It might be relevant for teachers to review or to seek out learning outcomes from an earlier curriculum or grade level in order to support learners moving forward with current curriculum. Sometimes, however, current curricular learnings do not directly rely on learning from the previous year and current curriculum can be engaged in without additional review.

The learning environment (face-to-face, blended, online) will continue to be an important factor that will impact the types of learning experiences with which learners are able to engage. While learning science in a hands-on, experimental way is preferred, should laboratory experiments not be possible due to public health concerns, teachers are encouraged to offer online experiment simulations, to record scientific phenomena to discuss, notice, observe and unpack with learners, to support simple, safe experiments that could be done at home, to provide authentic data that can be analysed etc…

Integrated, project-based learning and inquiry-based learning (especially in areas that connect STSE) allow for learner choice and flexible pacing which is particularly effective for students to not only learn new concepts but also for demonstrating their learning.

It is suggested that the focus for science in grades 9-12 be on using the foundational outcomes to focus on foundational understandings for future learning, encouraging cross-cutting scientific themes and application of learning. Weighting for course modules should be reflective of the amount of time spent exploring the outcomes in the module.

Unit: The Nature of Geology

Subtopic: YOU AND GEOLOGY

- demonstrate an understanding of how geological processes and resources impact our daily lives (360-1)
- provide examples of the relevance of mining to everyday materials used in our lives (117-5)

Subtopic: THE GEOLOGISTS

- describe and give examples of how geologists study the earth (360-9)

Subtopic: EARTH SYSTEMS

- explain how a knowledge of geology might influence our decisions about how we use Earth's resources (360-7)

Unit: Earth Materials

Subtopic: CRYSTALLOGRAPHY

- explain and give examples of basic chemical building blocks and atomic structures (atom, element, molecule, compound) (361-2)
- explain external crystal shape in terms of internal atomic arrangement (361-4)

Subtopic: MINERALOGY

- classify common minerals according to their chemical and physical characteristics (330-3)

Subtopic: PETROLOGY

- classify and identify rocks according to their structure, texture and mineral composition (361-11)
- relate the formation of igneous, sedimentary and metamorphic rocks to the rock cycle (361-13)

Unit: Internal Processes

Subtopic: PLATE TECTONICS

- explain the plate tectonic theory (362-6)

Subtopic: FORCES AND STRUCTURES

- describe the various forces (compressional, tensional, shear) which operate in the Earth and how these forces create faults, folds and mountains (362-3)
- describe the geologic activity associated with plate boundaries and relate this to the rock cycle (362-7)

Unit: Surface Processes

Subtopic: WEATHERING

- describe the process of soil formation and identify the factors involved in the development of different soil types (363-4)

Subtopic: EROSION

- describe and explain the processes by which running water, glaciers, wind and waves cause erosion (363-6)

Subtopic: DEPOSITION

- relate weathering, erosion and deposition of sediment to the rock cycle (363-5)

Unit: Historical Geology

Subtopic: GEOLOGICAL PRINCIPLES

- determine the relative ages of different formations using the principles of uniformitarianism, superposition, original horizontality, original lateral continuity, cross-cutting relationships, and inclusions (364-2)

Unit: Environmental Geology

Subtopic: GEOLOGICAL HAZARDS

- identify factors which influence people to live in geologically hazardous areas (365-3)

Subtopic: RESOURCE ISSUES

- demonstrate an understanding that Earth's systems are complex and cyclic and that the Earth operates chiefly as a closed system (365-4)
- demonstrate an understanding of what is meant by a renewable and non-renewable resource and the concept of sustainable development (365-5)

Subtopic: WASTE MANAGEMENT

- identify and describe the environmental problems associated with waste disposal and management (365-8)