Science 9

Foundational Outcomes

NOVA SCOTIA
NOUVELLE-ÉCOSSE

2020–2021

Website References

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Prepared by the Department of Education and Early Childhood Development

This is the most recent version of the current curriculum materials as used by teachers in Nova Scotia.

Science 9

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: Atoms and Elements

Subtopic: PHYSICAL AND CHEMICAL CHANGES

- describe changes in the properties of materials that result from some common chemical reactions (307-13)

Subtopic: ATOMIC THEORY

- use models in describing the structure and components of atoms and molecules, and explain the appropriate operational definition (307-14, 208-7)

Subtopic: PERIODIC TABLE

- identify examples of common elements, and compare their characteristics and atomic structure (307-15)
- identify the elements and number of atoms, given a chemical formula (307-16)

Unit: Characteristics of Electricity

Subtopic: ELECTRIC CURRENT

- describe the flow of charge in an electrical circuit and explain the factors affecting the circuit (109-14, 308-16)
- investigate, in the laboratory, and compare qualitatively, static electricity and electric current (210-7, 308-15)

Subtopic: SERIES AND PARALLEL CIRCUITS

- describe series and parallel circuits involving varying resistance, voltage, and current (308-17)

Subtopic: ELECTRICITY, ENERGY AND THE ENVIRONMENT

- determine quantitatively the efficiency of an electrical appliance that converts electrical energy to heat energy (308-19)

Unit: Space Exploration

Subtopic: THE UNIVERSE

- describe and explain the apparent motion of celestial bodies (312-4)
- provide and describe examples of how Canadian research projects and careers are supported through science and technology (112-6, 112-11)

Subtopic: THE SOLAR SYSTEM

- describe the composition and characteristics of the components of the solar system (312-5)
- describe the effects of solar phenomena on Earth (312-6)

Unit: Reproduction

Subtopic: CELLULAR PROCESSES

- illustrate and describe the basic processes of mitosis and meiosis (304-11)

Subtopic: REPRODUCTION

- compare sexual and asexual reproduction in terms of their advantages and disadvantages (305-3)

Subtopic: GENETICS

- discuss factors that may lead to changes in a cell's genetic information (305-5)