
SENIOR 3 CURRENT TOPICS IN THE SCIENCES: SUGGESTIONS FOR INSTRUCTION AND ASSESSMENT

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Linking General and Specific Learning Outcomes to Suggestions for Instruction and Assessment

In Senior 3 Current Topics in the Sciences, the following four General Learning Outcome (GLO) foundation areas often operate simultaneously, rather than consecutively or in isolation:

- GLO A: Nature of Science and Technology
- GLO B: Science, Technology, Society, and the Environment (STSE)
- GLO C: Scientific and Technological Skills and Attitudes
- GLO D: Essential Concepts

The learning outcomes are listed on the following page.

The unique instructional design of *Senior 3 Current Topics in the Sciences: A Foundation for Implementation* (with its emphasis on local decision making about content) naturally demands a different set of document characteristics than what Manitoba science teachers have grown accustomed to. For instance, this curriculum document *cannot* become operational by beginning with GLO A, and then proceeding to GLO B, and so on. What the document does provide—together with its key support document *Senior Years Science Teachers' Handbook* (Manitoba Education and Training)—are suggestions for instruction and assessment that relate in particular ways to one of the four foundation areas.

Therefore, if teachers are involved in a component of a particular unit that has an emphasis on the nature of science, they will want to consult one or more of the instructional and assessment strategies suggested within the section of this document entitled GLO A: Nature of Science and Technology. If the tasks at hand take more skills or mastery learning-based approaches, teachers will identify productive strategies within the section entitled GLO C: Scientific and Technological Skills and Attitudes.

It is important to recognize that this section of the document also provides a *constructivist approach* to the teaching and learning cycle (Activating, Acquiring, and Applying), and assessment priorities can be summarized as follows:

- Identify the targeted learning outcomes as having come *naturally* from the context of the science content in a unit of study.
- Formulate a set of priorities for teaching and learning.
- Carefully select and implement teaching and learning strategies that will be successful with students and their learning climate.
- Assess, along the way, through observation of processes and student products.
- Record, for reporting purposes, appropriate information for students, their parents, and other educators and stakeholders.

General and Specific Learning Outcomes for Senior 3 Current Topics in the Sciences

GLO A: NATURE OF SCIENCE AND TECHNOLOGY

Differentiate between science and technology, recognizing their strengths and limitations in furthering our understanding of the world, and appreciate the relationship between culture and technology.

SLO A1: Distinguish critically between science and technology in terms of their respective contexts, goals, methods, products, and values.

SLO A2: Recognize both the power and limitations of science as a way of answering questions about the world and explaining natural phenomena.

SLO A3: Identify and appreciate the manner in which history and culture shape a society's philosophy of science and its creation or use of technology.

SLO A4: Recognize that science and technology interact and evolve, often advancing one another.

SLO A5: Describe and explain disciplinary and interdisciplinary processes used to enable us to investigate and understand natural phenomena and develop technological solutions.

GLO B: SCIENCE, TECHNOLOGY, SOCIETY, AND THE ENVIRONMENT

Explore problems and issues that demonstrate interdependence among science, technology, society, and the environment.

SLO B1: Describe scientific and technological developments, past and present, and appreciate their impact on individuals, societies, and the environment, both locally and globally.

SLO B2: Recognize that scientific and technological endeavours have been, and continue to be, influenced by human needs and by societal and historical contexts.

SLO B3: Identify the factors that affect health and explain the relationships of personal habits, lifestyle choices, and human health, both individual and social.

SLO B4: Demonstrate a knowledge of, and personal consideration for, a range of possible science- and technology-related interests, hobbies, and careers.

SLO B5: Identify and demonstrate actions that promote a sustainable environment, society, and economy, both locally and globally.

GLO C: SCIENTIFIC AND TECHNOLOGICAL SKILLS AND ATTITUDES

Demonstrate appropriate inquiry, problem-solving, and decision-making skills and attitudes for exploring scientific and/or technological issues and problems.

SLO C1: Demonstrate appropriate scientific inquiry skills, attitudes, and practices when seeking answers to questions.

SLO C2: Demonstrate appropriate technological problem-solving skills and attitudes when seeking solutions to challenges and problems related to human needs.

SLO C3: Demonstrate appropriate critical thinking and decision-making skills and attitudes when choosing a course of action based on scientific and technological information.

SLO C4: Employ effective communication skills and use a variety of resources to gather and share scientific and technological ideas and data.

SLO C5: Work cooperatively with others and value their ideas and contributions.

GLO D: ESSENTIAL CONCEPTS

Explore, understand, and use scientific knowledge in a variety of contexts.

SLO D1: Use the concepts of similarity and diversity for organizing our experiences with the world.

SLO D2: Recognize that the universe comprises systems and that complex interactions occur within and among these systems at many scales and intervals of time.

SLO D3: Understand the processes and conditions in which change, constancy, and equilibrium occur.

SLO D4: Understand how energy is the driving force in the interaction of materials, processes of life, and the functioning of systems.