

Adopt a Rancher Outcomes

Curriculum Support for Foundational and Learning Objectives

The following information has been reproduced from Science 10 Curriculum Guide, Saskatchewan Learning 2005, updated 2014

SCI10-CD1: Assess the consequences of human actions on the local, regional, and global climate and sustainability of ecosystems.

- a. Pose questions or problems relating to the effects of human actions on global climate change and the sustainability of ecosystems that arise from personal research.
- b. Reflect upon your personal view of humanity's relationship with the environment.
- d. Evaluate changes in the scientific world view (paradigm shift) of sustainability and human's responsibility to protect ecosystems, considering key milestones and publications such as *Our Common Future*, *Rio Declaration of Environment and Development*, *Agenda 21*, *Convention of Biological Diversity*, and *the Boon Declaration*.
- f. Select, integrate, and analyze the validity of information from various human, print, and electronics sources (e.g., government publications, community resources, sustainable development, and education for sustainable development).
- g. Provide examples of human actions that have contributed to the anthropogenic greenhouse effect.
- i. Reflect upon individual and societal behavioural and lifestyle choices that can help to minimize anthropogenic sources of global climate change.
- j. Develop, present, and defend a position or course of action based on personal research related to mitigating the effects of global or local climate change or to enhancing the sustainability of an ecosystem, taking into account human and environmental needs.

SCI10-CD2: Investigate the mechanisms that influence Earth's climate system including the role of the natural greenhouse effect.

- a. Compare weather and climate, and the impacts of each on daily life. (K, STSE)
- b. Understand that Earth's climate system results from the exchange of thermal energy and moisture between the sun, ice sheets, oceans, solid earth, and the biosphere over a range of timescales. (K)
- c. Investigate how Earth's tilt, rotation, and revolution around the sun cause
- f. Explain the role of natural sources (e.g., volcanoes, fire, evaporation, and living organisms) of the primary greenhouse gases in Earth's atmosphere and how they contribute to the natural greenhouse effect. (K)
- j. Analyze weather and atmospheric data to identify patterns in temperature and atmospheric pressure, and changes in those patterns locally, regionally, and globally.

SCI10-CD3: Examine biodiversity through the analysis of interactions among populations within communities.

- a. Discuss the importance of biodiversity and maintaining biodiversity within ecosystems, biomes, and the entire planet.
- b. Understand that scientists describe biomes as resulting from the interaction of biotic and abiotic factors such as isolation, precipitation, latitude, altitude, and geography.
- d. Estimate the abundance of organisms in a local ecosystems using random (e.g., quadrat), systematic, (e.g., line transect and belt transect) and/or stratified sampling techniques.

- e. Analyze primary or secondary population data to determine the population density, percentage frequency, and/or percentage cover of one or more organisms in an ecosystem.
- h. Investigate various ways in which natural populations attempt to maintain equilibrium, and relate this equilibrium to the resource limits of an ecosystem with reference to concepts such as carrying capacity, natality, mortality, immigration, and emigration.
- i. Examine the relationship between the biodiversity of an ecosystem, its primary productivity, and ecological resilience.
- j. Examine how factors such as invasive species, habitat loss, and climate change affect biodiversity within an ecosystem, and can result in species becoming at-risk (i.e., vulnerable, threatened, and extirpated).

SCI10-CD4: Investigate the role of feedback mechanisms in biogeochemical cycles and in maintaining stability in ecosystems.

- b. Create a representation of a feedback mechanism involved in a specific biogeochemical (e.g., carbon, nitrogen, phosphorus, and water) cycle.
- d. Describe how human actions can affect the flow of energy and the cycling of carbon throughout the environment.
- e. Explain the role of photosynthesis, respiration, and sinks in the cycling of carbon through the environment.
- h. Research the short-term and long-term effects of small-scale and large-scale agricultural practices on the cycling of phosphorus, nitrogen, and other nutrients in an ecosystem.