



habitat in the balance

process skills

This resource guide describes the skills that the **Habitat in the Balance** program is designed to support -- Socio-scientific issue resolution that is part of the foundation of knowledge, skills, and attitudes of Canadian curriculum in Science and Social Studies. Issue resolution, the process of decision-making, is discussed first and then the set of perspectives gathered from curriculum and used in this program are discussed.

decision-making

This program is designed to help students learn some skills needed for decision-making.

PROGRAM ELEMENTS central to developing these skills include:

guide 4
process
page 1

ISSUE AND BACKGROUND INFORMATION that are used to initiate a process of decision-making. An issue is the topic about which multiple choices are available for resolution. These issues are associated with topics that are current and relevant. General research provides a common base of background information. Therefore, the Issue and Background parts of the program contain information for understanding a scenario and placing the exploration in context.

POINTS OF VIEW AND PERSPECTIVES provide the framework for selecting information relevant to a topic. Individuals who have an interest in the outcome of an issue are called 'stakeholders.' Their point of view on the issue provides a 'filter' from which to analyze information. Information is grouped by perspective, and curriculum recognizes seven of those. Some perspectives are more significant to a point of view than others. Therefore, picking a point of view is a valuable prerequisite to deciding the relevance of perspective information about an issue.

DECISION FOR ACTION AND CONSEQUENCES form the resulting conclusion to the research and analysis. Collected information supports a decision when the choice among alternatives is well informed and focused. The action that follows from the decision usually has consequences. Consequences are like 'trade offs.' Selecting an action based on a point of view and the perspectives will have different consequences from an action chosen based on another point of view.

Here's a more detailed look at the decision-making process for your consideration.

THE PROCESS of socio-scientific issue investigation in a classroom, and mirrored in the **Habitat in the Balance** program, may take the following steps to complete:

1. **SELECT AN ISSUE** that relates to human impacts on habitat systems. For example, there are many issues about water that people may be concerned about. You may wish to read the background on several issues prior to selecting the one you wish to investigate.
2. **UNDERSTAND THE QUESTION** of a specific issue.
3. **BEGIN TO RECORD INFORMATION** for when you are ready to choose an action and to communicate with others.
4. **IDENTIFY THE SITUATION** to be resolved for this issue and the details about it.
5. **LIST POSSIBLE ACTIONS** to address the issue, or reduce the effects of it, arising from information relevant to the issue.
6. **REVIEW POINTS OF VIEW** of the people, the stakeholders, impacted by this issue. Select a point of view that interests you and use it as a filter for your information-gathering and choices.
7. **EXPLORE BACKGROUND** information to better understand what is known about the issue and how different actions will address it. This information will likely be of interest to all the different points of view.
8. **USE PERSPECTIVES** as ways of thinking about the information. From your point of view some perspectives may be more significant than others and some may not apply to some points of view at all.
9. **REVIEW AND REFINE NOTES** picked from the most relevant perspectives and making changes to the information gathered so it is clear, concise, and suggests an action on the issue.
10. **SELECT AN ACTION** that best fits with your point of view and informed by the information gathered, producing a statement to explain your choice.
11. **CHECK THE CONSEQUENCES** of the action selected with others who have a similar point of view for consistency with that viewpoint.
12. **PRODUCE A SUMMARY REPORT** with your statement on the issue and information gathered that backs up that choice.

(See Guide 10 “black-line printable” for a user friendly copy of these steps on decision-making.)

Following the preparation of a 'summary report' at the conclusion of the **Habitat in the Balance** program, there are several class activities that will enrich the decision-making process. For example:

13. MEET WITH OTHER POINTS OF VIEW (STAKEHOLDERS) to share statements of choice on the issue.
14. ARRIVE AT A CONSENSUS on how to resolve the issue. Any changes made to the selected actions should be supported by information gathered and presented.
15. EVALUATE the resolution and how it would proceed or occur.
16. NOTE QUESTIONS OR ISSUES arising from an evaluation of the issue resolution. Note that other modules within the **Habitat in the Balance** program may be available to support these questions for further research.

perspectives

Informed decision-making requires an understanding of several perspectives, such as, historic, scientific, technological, environmental, economic, social, and political. These perspectives are common to several curricular learning outcomes that deal with inquiry, analysis, and decision-making. Depending on the issue some perspectives, will be more important than others.

Perspectives that are:

- Historic – refer to continuity or change of events over time and the role they play in influencing decisions and actions,
- Scientific – refer to the data or information that is obtained by systematic investigation, experimentation, and testing,
- Technological – refer to the tools we use to control, modify, and adapt to our environment,
- Environmental – refer to the natural world, the inhabitants, and their relationships with each other and the air, land, and water in which they live, and global connections among them,
- Economic – refer to money, business, the cost of goods and services, the availability of resources, and the value placed on what is bought and sold,
- Social – refer to humans and their interactions with each other as a community and the environment, their cultural traditions, and beliefs, and
- Political – refer to decisions, regulations, and policies made by a governing or authoritative agency.

TRY THIS EXERCISE TO GET PRACTICE IDENTIFYING PERSPECTIVES –
 Statements in the following story have been identified as a fit with these perspectives: **historic**, **scientific**, **technological**, **environmental**, **economic**, **social**, and **political**.

COMPETING INTERESTS FOR GROUNDWATER – RURAL WELLS AND COAL-BED METHANE

For many years groundwater has been used for drinking water and residential use by nearly one third of all Canadians. [historical] Other groundwater uses include: agriculture, mining, manufacturing, and oil and gas production. In Alberta, for example, groundwater supplies about 90% of rural domestic water use and about 43% of agriculture and 14% of industry’s needs. There are about 500 000 domestic wells and about 7 000 are added each year. There are several reasons for this: it is easier and cheaper to drill a well than construct a dam, canal, or reservoir; [technological] [economic] the quality of groundwater is usually higher than surface water; and groundwater is often less susceptible to contamination than surface water. [environmental] As surface water seeps into the ground and travels many metres through the subsurface, many contaminants are filtered and removed. [scientific] Nevertheless, it is necessary to have well water tested to ensure it is safe for drinking. [social]

The demand for natural gas within Canada and the United States has sparked an interest in developing gas deposits that are close existing pipelines. This gas can be obtained more cheaply than other deposits located in more remote regions. [economic] Some natural gas occurs in coal seams, and is called as coal-bed methane. Some of these seams contain groundwater that must first be removed to reduce the pressure on the methane. [scientific] This causes the methane to be released from the coal so it can be extracted and pumped to the surface. Horizontal drilling is a preferred method because it allows more than one a coal seam to be drilled from the same surface drill site. [technological]

One concern is that removing the water from the coal will affect the groundwater in adjacent regions by reducing the groundwater available to rural residents. [social] If removing the water in a coal seam reduces the groundwater, it is not known how long it will take to be replenished by other groundwater or from surface water percolating into the ground. Other concern is that the chemicals used to fracture the coal seams to extract the methane could contaminate the groundwater. [environmental] Rural residents who have used groundwater for domestic needs [social] for many years feel that their right to that water supersedes that of an industry that is new to the area and wants drill for coal-bed methane that may adversely affect the quantity and quality of the groundwater. [historic]

Environment Canada and several provinces have established several research priorities for groundwater. They include: national overviews of groundwater quality, emerging contaminants, groundwater-surface water interactions such as groundwater contribution to stream flow, land use impacts, urban water issues, rural water issues, and contaminated groundwater remediation. [scientific] Groundwater policies fall under the jurisdiction of federal, provincial, and municipal governments. [political] There are conflicting objectives and priorities as agriculture and industry promote increased use, and the environmental groups advocate restraint and conservation. Should all stakeholders and governments participate in establishing policies and the decision-making process?

(See Guide 10 “black-line printable” for a working copy of this Perspective Practice sample.)