Our place, our energy, our future

Duration
75 minutes

Lesson overview
Students will investigate what it means to be sustainable in the context of energy and place. They will apply their understanding of sustainability and interconnectedness to identify and evaluate different energy resources in various regions in B.C.

Objectives
Students will be able to:

• analyze the concepts of sustainability and interconnectedness
• describe how energy and place are related to the concepts of sustainability and interconnectedness
• identify and evaluate different energy resources in different regions in B.C.
• discuss possibilities and challenges in providing sustainable energy in B.C. now and in the future

Curriculum connections - Science
Big idea
• the biosphere, geosphere, hydrosphere and atmosphere are interconnected, as matter cycles and energy flows through them

Content
• matter cycles within biotic and abiotic components of ecosystems
• sustainability of systems
• First Peoples’ knowledge of interconnectedness and sustainability

Curricular competencies
• experience and interpret the local environment
• use knowledge of scientific concepts to draw conclusions that are consistent with evidence
• consider social, ethical and environmental implications of the findings from their own and others’ investigations
• contribute to care for self, others, community and world through personal or collaborative approaches
• communicate scientific ideas, claims, information and perhaps a suggested course of action for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions and representations
• express and reflect on a variety of experiences, perspectives and worldviews through place
What you’ll need

- computer, projector and screen
- Energy Primers Handout
- Places in B.C. Handout
- Our Place, Our Energy, Our Future Student Handout
- Our Place, Our Energy, Our Future Slideshow
- Our Place, Our Energy, Our Future Notes
- Our Place, Our Energy, Our Future Teacher Notes

Preparation

- Review Our Place, Our Energy, Our Future Slideshow and Our Place, Our Energy, Our Future Teacher Notes for Activity 1.
- Print a class set of Our Place, Our Energy, Our Future Notes for Activity 1.
- Print a set of Energy Primers and Places in B.C. for each group for Activity 2.
- Print a class set of Our Place, Our Energy, Our Future Student Handout for Activity 2.

Lesson notes

- To help students understand the relationship between sustainability and interconnectedness, review food webs and the connections between the various components in a web (i.e. plants, water, animals, sunlight, etc.). The natural gas pipeline system and electricity grid in B.C. are useful mechanical examples of an interconnected energy system. Discuss what happens to the other components in the web or grid when one thing is damaged or severed.
- There are many different types of energy sources in B.C. In this lesson, primers are provided with information about seven energy types. The primers are designed to encourage critical thinking and are not intended to provide comprehensive information. Encourage students to undertake additional research, as desired.
- Feel free to include other methods of generating electricity and add them into the Energy Primers.

Word list

coal  energy  geothermal  hydro  interconnectedness  natural gas
petroleum  place  solar  sustainability  wind

Lesson activities

Activity 1: Our place our energy our future slideshow (15 minutes)

- Introduce the lesson with some key questions. Have slide one of the Our Place, Our Energy, Our Future Slideshow projected as students enter the room.
- Have students consider and informally discuss the key questions.
- Show the Our Place, Our Energy, Our Future Slideshow to introduce the concepts of sustainability, interconnectedness, energy and place using the Our Place, Our Energy, Our Future Teacher Notes.
- Have students take notes during the slideshow, recording questions they have that come up during the presentation.
Activity 2: Energy and place audit (50 minutes)

Part A: Discussion (15 minutes)

• Facilitate an open discussion about sustainability and interconnectedness in the context of energy in B.C. Suggested questions to engage discussion include:
  - What does it mean to be sustainable in relation to energy?
  - Why is the concept of interconnectedness important in relation to energy?
  - How might sustainability vary from place to place with regard to energy?
  - How do different places in B.C. produce/use sustainable energy?
  - How do the different energy types affect the interconnectedness of each place?

• Have students write in their notes what they think sustainability and interconnectedness mean in relation to energy in B.C., then share their definitions in groups of three or four.

Part B: Activity (35 minutes)

• Divide the class into seven groups.

• Hand out Energy Primers, one of the seven different Places in B.C. and one Our Place, Our Energy, Our Future Student Handout to each group.
  - Each group should have a set of seven energy primers, one place in B.C. and one student handout.

• Have each group discuss and identify the different types of energy in their region of B.C. Encourage students to use both the Energy Primers as well as other sources of information (i.e., the Internet, textbooks, etc.).

• Have each group complete the Our Place, Our Energy, Our Future Student Handout.

Activity 3: Group discussion questions (10 minutes)

• In their groups, have students write down and discuss the following questions:
  - What do you envision is an ideal future in terms of sustainable energy in B.C.?
  - What are some of the challenges and choices in ensuring B.C. has sustainable energy for now and the future?
  - How can we address these challenges?
  - Do the students have any other questions regarding sustainable energy in B.C.?

Assessment

• Observe and assess student participation during the lesson, based on their ability to:
  - analyze the concepts of sustainability and interconnectedness
  - describe how energy and place are related to the concepts of sustainability and interconnectedness
  - identify and evaluate different energy resources in different places in B.C.
  - discuss possibilities and challenges in providing sustainable energy in B.C. now and in the future

• Review the Our Place, Our Energy, Our Future Notes and Our Place, Our Energy, Our Future Student Handout, to assess students’ ability to critically analyze various energy sources in relation to different places, and the concepts of sustainability and interconnectedness in B.C.
Extensions

- Show videos that provide an overview of each energy source.

- Instead of auditing each region’s energy types in class, assign the student handouts for homework for next class. Students could then spend additional time researching, presenting or representing their findings on the selected place and recommended energy types.

- Assign an inquiry-project to the students based on the discussion questions from activity 3. Each student is a member of an energy system design team tasked with developing a new energy system for a community of their choice in B.C. They should research the local geography of the community prior to completing the next section. On a piece of blank paper, students write down the following:
  - Three priorities: identify and explain your top three priorities in designing an energy system (e.g. reduce environmental impact, decrease cost, increase reliability).
  - Three challenges: identify three challenges that one might encounter in designing an energy system (e.g. economic costs and access to infrastructure).
  - Three solutions: identify a solution for each challenge encountered in designing an energy system (e.g. raise property taxes, carbon tax).

Definitions

c**oal**: a fossil fuel composed of black or dark-brown combustible mineral substances from long-decayed vegetable matter

e**nergy**: derived from the use of physical or chemical resources, especially to provide light and heat or to work machines

g**eothermal**: thermal energy generated and stored inside the Earth

**hydro**: of, relating to, or providing water, water power, or hydroelectricity

i**nterconnectedness**: the quality or condition of being interconnected and interrelated; often linked to worldviews that see a oneness in all things; a relationship between things that recognizes a change in one area can effect change in another area or areas

n**atural gas**: a fossil fuel composed of a combustible mixture of gaseous hydrocarbons that accumulates in porous sedimentary rocks, usually consisting of over 80 per cent methane together with minor amounts of other gases

**petroleum**: a fossil fuel composed of naturally occurring hydrocarbons, generally in yellow-to-black liquid form, found in geological formation beneath the Earth’s surface; commonly refined into various types of fuels

p**lace**: any environment, locality, or context with which people interact to learn, create memory, reflect on history, connect with culture, and establish identity

**solar energy**: a renewable energy that harnesses radiant light and heat from the Sun using a range of technologies, to generate electricity, heat and other uses

**sustainability**: the ability to be sustained or supported indefinitely; the capacity to endure; a socio-ecological process of caring for the environment and conserving natural resources, thereby supporting diverse, productive and resilient biological and human systems indefinitely

**wind energy**: energy derived from wind used to generate electricity or mechanical power