

LEARNING INQUIRIES

CANADA'S GROWING ENERGY NEEDS AND ITS ENERGY DEPENDENCE

TIME: 60-90 MINUTES

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OVERVIEW/FOCUS QUESTION

How can Canada meet its growing energy needs and reduce its greenhouse gas emissions while ensuring sustainable energy development?

SUBJECT/TOPIC

ENERGY DEPENDENCE

GRADE LEVEL

GRADE 8

LEARNING GOALS

- Read a map
 - a. Decode the landscape of a place
 - b. Understand human impact on the landscape
 - c. Connect different geographic scales
 - d. Use mapping terminology
- Interpret a geographic issue
 - a. Understand how the geographic issue is treated
 - b. Evaluate different perspectives on the issue
 - c. Identify the complexity of the issue
- Build awareness of global citizenship
 - a. Show the global nature of any geographic issue
 - b. Examine human actions for the future
 - c. Evaluate solutions to global issues

MATERIALS NEEDED

- Internet
- Energy Factbooks
- Paper, pencils, glue
- iPads/Chromebooks
- Notebooks

CONNECTION TO THE CANADIAN GEOGRAPHY FRAMEWORK

CONCEPTS OF GEOGRAPHIC THINKING

- **Spatial Significance:**

- community, distance, diversity, identity, location, place, region, setting, site, situation, space
- identify where places are located on the Earth's surface
- determine the unique characteristics of places based on natural and/or human characteristics
- analyze the spatial distribution of various elements of the Earth system

- **Patterns and Trends:**

- change, distribution, location, flow, transition
- identify characteristics that are similar and that repeat within a natural or human environment [patterns]
- analyze characteristics (spatial, social, political, economic, physical or environmental) of a particular place over a period of time [trends]
- examine changes that occur within and between places, processes, and/or characteristics over time [transitions]

- **Interrelationships:**

- connections, globalization, impacts, interactions, interdependence, processes, sustainability, systems
- identify connections that exist within natural and human environments
- identify connections between natural and human environments
- recognize that the interconnected parts of an environment work together to form a system
- determine the relationships that exist within a system
- analyze the relationships that exist between systems to determine the impacts that systems have on one another

- **Geographic Perspective:**

- ecological, scale, local, national and global, worldview, stakeholder
- identify the spatial and ecological context of geographic issues, events, developments and phenomena
- identify potential stakeholders and recognize their points of view
- investigate and analyze issues through a holistic lens by integrating other disciplinary perspectives (e.g., economic, political, cultural, social, environmental, Indigenous)
- use geographic information, skills and data to solve problems, make decisions, and formulate plans of action

INQUIRY PROCESS

- **Formulate questions:** Students have to find and answer the specific geographical question assigned to them.
- **Gather and organize:** They will read and study the Energy Factbooks. They will have to choose the right data and images to complete their research.
- **Interpret and analyse:** They will have to consider different perspectives coming from each stakeholder and evaluate the best solution to answer the problem.
- **Draw conclusions:** They will use different ways to show their conclusion (e.g., graphic organizer, model).
- **Communicate:** They will have to present their energy, the issue, the groups involved and their positions, and the answer to the first question about their energy type.

GEOSPATIAL SKILLS

- **Foundational elements:**
 - compare information/content of large-scale and small-scale maps and imagery
 - use large- to small-scale maps, as appropriate, to investigate a specific area
 - identify and analyze phenomena at local, regional, and national scales

- **Spatial representations:**

- use inset maps to show a location in reference to another
- compare information content from different perspectives
- read isoline maps, cartograms and thematic maps
- use appropriate map types and map elements to communicate intended messages
- create a sketch map of a country
- apply interpretation elements to identify features
- create interpretation key
- extract information from true colour and false colour remote sensing images
- detect changes in features (e.g., urban growth, water pollution, vegetation disease) from true colour and false colour remote sensing images
- compare information/content at different resolutions and scales
- record and describe local spatial phenomena with photos, sketches, 3D models

- **Technology:**

- extract information from various scales
- interpret land cover and land use
- identify data artifacts
- determine layered content required for a specific inquiry
- select and use appropriate base maps for chosen locations and for specific inquiry
- use pre-selected layer/content required for inquiry
- interpret and analyze information from layers placed on map

- **Fieldwork:**

- use fieldwork to collect, analyze and draw conclusions from geographical data
- use multiple sources of increasingly complex information

LESSON IMPLEMENTATION

MINDS ON

Starting point:

Turn off the lights and all electronics in the classroom and ask the following questions:

- Imagine that the electricity goes out for an hour. What would happen?
- Imagine a full day without electricity. Imagine that no source of energy is available. What would you do?

Electricity has become a central element in our daily lives. When we cannot do without something (e.g., our phones), we say we are dependent on that thing. With climate change becoming increasingly more important, countries around the world are looking to reduce their energy consumption, but also to turn to green energy. The use of fossil fuels is thus singled out, despite our dependence on this resource.

Focus question:

As a major producer and consumer of fossil fuels, Canada faces a major dilemma. How can Canada meet its growing energy needs while ensuring sustainable energy development and reducing greenhouse gas emissions?

Assign students to research:

- Renewable and non-renewable energy sources
- The largest energy-consuming countries
- The largest energy-producing countries

ACTION

Ask students to answer one of the following questions by having them research different energy resources in different Canadian provinces and by assessing their impact on the environment and surrounding populations.

Here are the themes for your research:

- The wind turbine in Canada: a wind of change? (Quebec and Ontario)
- Is it possible to produce oil in Alberta while protecting the environment? (Alberta)
- Hydroelectricity in Quebec: can we, and should we, develop it to infinity? (Côte-Nord, Quebec)
- Living alongside a dam: advantages or disadvantages? (James Bay)
- Nuclear power: an economic or environmental choice? (Ontario)
- Biomass: a solution for the future? (Canada)
- Lifestyle and energy consumption: are we making the right choices? (Canada)
- Natural gas: an economic and ecological solution? (Nova Scotia)
- Tides: useful or useless? (Nova Scotia)
- Geothermal energy: possibility of heating? (Western provinces)
- Solar panels: expensive technology? (Ontario)
- Coal: should it be banned? (Saskatchewan)

Students will present their research in the form of kiosks accessible to other students at the school. Students will visit the other booths and ask questions to their fellow researchers.

CONCLUSION AND CONSOLIDATION

Try to answer the question:

How could Canada meet its growing energy needs while ensuring sustainable energy development and reducing GHG emissions?

EXTEND YOUR GEOGRAPHICAL THINKING

As part of this project, teachers can organize meetings with local communities to assess energy needs and how they get their supplies in this area. Afterwards, students could propose solutions to reduce either energy consumption or to make the energy consumption of the locality greener.