



8. ON TOP OF THE WORLD



Activity overview

This activity explores Canada's North as a region that is rich in energy resources. Students will investigate how energy is transported to the North, the challenges faced by northern communities and how the region compares to the rest of the country.

Grade level

▷ 4–12

Time required

▷ 55–70 minutes

Materials

- ▷ Coloured chains (16)
- ▷ Coloured pylons (20)
- ▷ Energy icons (43)
- ▷ Potential energy cards (4)

Set-up

Place the oil and natural gas map cards, along with chains and pylons, on two different corners of the map.

Introduction

Once students have had an opportunity to explore the Giant Floor Map on their own, challenge them to locate the Arctic Circle (66.33 degrees latitude). Using coloured chains, outline the Arctic Circle and ask students to estimate how much of Canada's land is located above it. Facing north, have a class discussion about what life is like in Canadian communities located above the Arctic Circle. Discuss stereotypes and common beliefs that are held about life in Canada's North and whether they are accurate or not. Highlight that Canada's Arctic makes up more than 40 per cent of Canada's landmass and is home to more than 100,000 Canadians.

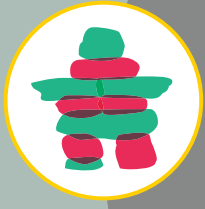
Discuss the patterns they see on the Giant Floor Map with respect to energy transmission lines and production facilities located above the Arctic Circle. Since there is little energy infrastructure in the North, ask students why there might not be much infrastructure and how they think Arctic communities get the energy resources they need. Next, point out the purple dotted lines in the Arctic Ocean. Ask students to say what they think these lines represent, without looking at the legend. Explain that the purple dotted lines illustrate shipping routes. Discuss how these may change as the effects of climate change are increasingly felt in the North. Energy resources, such as oil and gas, are brought into Canada's North by ship because large production facilities do not exist. Ask students where these energy resources are shipped from. Ask the students to discuss the interrelationships involved in transporting energy to the North and how communities might be affected.

Development

Discuss the lack of energy production facilities in Canada's North and why infrastructure development in that region may be more difficult than in other parts of the country. What factors may have inhibited the development of more energy infrastructure in the North? Explain that although most of Canada's northern regions have their energy resources shipped in, Canada's North is filled with pockets of oil and natural gas fields. Ask your students to reflect on the geographic perspective (social, political, economic and environmental) to discuss why energy resources are shipped in when the region has the same resources.

To illustrate the known energy resources in Canada's North, divide your class into two groups. Have each group refer to their map card and use the chains and pylons to map out where those resources are located in the country's northern and southern regions. Have students explore, using their geographic knowledge of the land and climate in Canada's North, which types of renewable and non-renewable energy could be produced in the region. Look at energy resources other than oil and gas in Canada's northern region, and use energy icons to mark them on the map. How might alternative energy such as wind, solar, hydroelectricity, nuclear, biomass and coal be used in Canada's North now and in the future?





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Reflect on news stories that students may have come across about the development of the Arctic for energy production. Using the map as a backdrop, debate the benefits and drawbacks of additional exploration and development.

Conclusion

New technologies are being developed, new facilities are being built, and entire communities are being expanded because of the development of new energy projects. Ask each group to think of two pros and two cons for the expansion of energy resource production in the North and share them with the class. Make sure they consider the geographic perspective, technology, international relations and future demands. Allow each group to share their views with the class.

Extend your geographic thinking

Have your class do a case study on Inuvik, in the Mackenzie Delta in the Northwest Territories. For years, this small community relied on the local natural gas reserve for up to 90 per cent of its electricity and heating. Today, however, the reserve is almost depleted. There are still large natural gas fields below the surface, as indicated by the chains and pylons the students placed on the map. Discuss why this community is not currently drawing on a new reserve. The answer is related to the Mackenzie Valley pipeline, a proposed pipeline designed to tap into northern natural gas reserves and transport it to communities in the North and then south. In 2012, however, this pipeline was put on hold, and at the end of 2017, it was announced that the project participants had dissolved the joint venture for now.

For the case study, ask students to consider the following questions: What problems are facing Inuvik? What are some possible solutions? What concerns have been voiced by members of the community? Why was the Mackenzie Valley pipeline put on hold? How might this pipeline affect communities in the valley? How might geographic perspective determine the next steps for the pipeline? Come up with an alternative route the Mackenzie Valley pipeline could take that would be acceptable to the stakeholders (i.e., the people, organizations and governments that might be affected by the pipeline). Use maps from any of the following Websites: [ArcGIS Online](https://www.arcgis.com/), eurasiangeopolitics.com/arctic-maps/ and native-land.ca. What role might spatial significance (the physical and human features of the location of the proposed pipeline) have played in this issue?

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

- ▷ Latitude, longitude and the grid of the world
- ▷ Map, globe and atlas use (e.g., observing and analyzing relationships)

Essential Element 2: Places and Regions

- ▷ Perceptions of places and regions
- ▷ Regions defined by multiple criteria
- ▷ How culture affects places and regions (e.g., cultural landscapes)
- ▷ Interdependence of places and regions

Essential Element 3: Physical Systems

- ▷ Climate types
- ▷ Ecozones (major ecological communities such as boreal forest, polar regions, grassland, wetlands and desert)

Essential Element 4: Human Systems

- ▷ Processes of cultural diffusion
- ▷ Patterns of culture in Canada and the world (e.g., religion, language, ethnicity, economy)
- ▷ Types and patterns of economic activity (primary, secondary, tertiary, quaternary)