



1. UNDERSTANDING CANADA'S ENERGY MIX



Activity overview

This activity teaches students how to read the Giant Floor Map by taking a closer look at its symbols, colours and labels. The students will then examine where Canada's energy is produced and how it is transmitted.

Grade level

▷ K–12

Time required

▷ 20–25 minutes

Materials

- ▷ Energy icons (43)
- ▷ Coloured stacking blocks (100)
- ▷ Coloured chains (4)
- ▷ Arrow cards (30)
- ▷ Map legend cards (4)
- ▷ Teacher energy information card (1)

Set-up

Organize the energy icons by type and read over the teacher energy information card to familiarize yourself with Canada's different energy resources.

Introduction

Introduce students to the map and give them time to explore it. Ask how the five main components of a map have been implemented: title, border, compass, legend and scale. Have students find each component on the Giant Floor Map and discuss its location.

Teach students how to read the map in further detail by examining its different colours. Begin by asking them to explain why certain colours are used for the land and for the water. Next, bring their attention to the layer of colours that depicts energy on the map. Ask them to explore what each colour and line represent.

Finally, using the legends, have students look at the energy symbols on the map. What symbol is used for oil sands mining? What symbol is used for nuclear energy? Where are processing plants and refineries located? Where are renewable energy symbols located versus non-renewables? Ask students if they observe any patterns. What might account for these patterns? What is the most common symbol on the map? What is the least common symbol on the map?

Explain that in Canada, energy is produced in 10 different ways: crude oil, natural gas, hydroelectricity, wind, coal, biomass, solar, nuclear, natural gas liquids and tidal. Ensure that students can locate on the map at least one symbol for each type of energy, and make note of the ease or difficulty they have in finding each symbol.

Development

Using the percentages on the teacher information card, have students use props to create a visual representation of the relationship between all 10 types of energy. Students may want to use chains to make a line graph, or blocks to show the percentage of energy produced by each energy source. Ask students to use the map as the backdrop for their visual representations, and have them observe any patterns that develop.

Ask students to identify how the spatial significance and the geography of Canada play a role in the location of each energy type. Discuss with your students whether they were surprised by these percentages or locations. Do these percentages match the dominant colours on the map (red, purple and blue transmission lines)? Remind students that the information on the map is showing the types of energy produced and transmitted, not the types of energy used.

Have students list the different ways they interact with energy and which types of energy are required in their daily lives. Remind students that they should think about transportation, housing, hobbies, food and all other aspects of their lives. Next, ask





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students to look at your province or territory and determine the relationship between how they interact with energy and the types of energy produced in your province or territory. Discuss whether your province or territory is able to produce all the types of energy that your students use.

Conclusion

Conclude with a group discussion about the different types of energy produced in your province or territory specifically and in Canada more broadly. Lead the discussion by asking: What patterns and trends can be observed in the production and transmission of energy in Canada? How does Canada's geography influence the type of energy produced, how is this energy produced, and how is it transmitted in Canada? How might these challenges affect relationships among provinces, territories and/or other countries?

Extend your geographic thinking

For younger students, do this as a class. For older students, divide the class into groups and assign each a different type of energy. Have each group determine the direction of energy flow during the production phase and during the transmission of Canada's resources, and have them show this by placing the arrow cards on the map. Once all groups have placed their arrows on the map, discuss what might account for any patterns that appear. Highlight how some energy sources, like natural gas and crude oil, are first transported to production facilities. Energy sources like wind, nuclear and hydroelectricity do not need to be processed in this way. Ask students what factors might determine how an energy source gets to a community.

Discuss whether the direction of flow for all types of energy is what they expected, or if they were surprised to see where Canada's energy comes from and goes to.

With older students, discuss the Paris Agreement, North American Free Trade Agreement (NAFTA) and other major international agreements that Canada is a part of. Discuss whether they think these agreements, new and old, will have any effect on the current flow of energy and energy resources, and have them alter the map accordingly.

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

- ▷ Locations of continents and oceans
- ▷ Major cities of the provinces
- ▷ Provinces and territories of Canada

Essential Element 2: Places and Regions

- ▷ Concept of physical features (e.g., mountains, plains, hills, oceans and islands)
- ▷ Regional analysis of geographic issues and questions

Essential Element 4: Human Systems

- ▷ Transportation (people and goods) and communication networks
- ▷ Types of economic activity (resources, manufacturing, service)
- ▷ Regional development in Canada and the world

Essential Element 5: Environment and Society

- ▷ Introduction of resources
- ▷ Human modification of the physical environment (e.g., construction of dams, strip mining, draining wetlands)
- ▷ Effects of human modification of the physical environment (e.g., global warming, deforestation, desertification, urbanization)