

LEARNING INQUIRIES

ENERGY-EFFICIENT COMMUNITIES

TIME: 20-30 MINUTES

DEVELOPED BY: CANADIAN GEOGRAPHIC EDUCATION



OVERVIEW/FOCUS QUESTION

Students will research the most populous cities in Canada, examining what these cities are currently doing to be energy efficient and what further steps they could take.

Note: This is a good activity to do after students have completed lesson plans where they investigate their own energy usage. See the resources section for suggested lesson plans.

SUBJECT/TOPIC

**ENERGY-EFFICIENT CITIES,
URBAN PLANNING**

GRADE LEVEL

7-9

LEARNING GOALS

Students will:

- Identify how they use energy and how they conserve it.
- Assess ways a city is currently encouraging energy efficiency in its residents.
- Determine ways a city could become more energy efficient.

MATERIALS NEEDED

- Paper and writing utensils
- Devices with Internet access

CONNECTION TO THE CANADIAN GEOGRAPHY FRAMEWORK

CONCEPTS OF GEOGRAPHIC THINKING

- Interrelationships
- Geographic perspective

INQUIRY PROCESS

- Interpret and analyze
- Communicate
- Reflect and respond

GEOSPATIAL SKILLS

- N/A

LESSON DESCRIPTION

MINDS ON

Students will review how they use energy and discuss steps they can take to reduce their energy usage.

ACTION

Students will be assigned a Canadian city and investigate ways that city seeks to encourage energy efficiency. They will then think of ways the city could improve its energy efficiency.

CONCLUSION

Students will share their ideas and reflect on how energy-efficient cities could become a reality.

LESSON IMPLEMENTATION

MINDS ON

Ask students to think about previous discussions they have had regarding energy use and conservation. How do they use energy and in what ways do they conserve it? Explain that we all need energy in our daily lives to heat and light our homes, for transportation, to produce items we use every day, and more. There are also ways that we can ensure that we are not wasting energy, as evidenced by all the steps students are taking to conserve energy.

Now, ask students what everyday actions they take to lower their energy use. What different transportation methods can students use to get to and from school? What types of recycling and composting programs does their city have? What public transportation is accessible near them? How can families access locally grown food? What types of outdoor spaces are available and how could access to these spaces be important to reduce energy usage? Ask students to reflect on these questions before introducing the activity. Have students complete the Energy IQ [Survey](#) to help them understand the role they have in managing their energy use.

ACTION

Explain to students that individual actions in energy reduction make a difference reducing carbon emissions. It is important that communities and cities develop and expand in a way that makes it easy for residents to make choices that help them reduce their energy usage. The importance of sustainable communities is globally recognized. Goal 11 of the [United Nations' Sustainable Development Goals](#) is the development of sustainable cities and communities. Public spaces and stores that are within walking or biking distance to communities, safe biking routes, and composting and recycling programs are just some of the ways in which cities can help their residents become more energy efficient.

Divide students into small groups and explain that they will be assigned a Canadian city. Students will research ways this city is already incorporating energy efficiency into its transportation systems, buildings, outdoor spaces, services, etc. Students will then explore what else the city could do to be more energy efficient and encourage its residents to use energy more wisely. Assign groups one of the following most populous cities in Canada until all groups have a city. Add or remove cities as necessary for the size of the class.

- Toronto, Ont.
- Montreal, Que.
- Vancouver, B.C.
- Calgary, Alta.
- Edmonton, Alta.
- Ottawa, Ont.
- Winnipeg, Man.
- Quebec City, Que.
- Hamilton, Ont.
- Kitchener, Ont.
- London, Ont.
- Victoria, B.C.
- Halifax, N.S.
- St. John's, N.L.
- Yellowknife, N.W.T.
- Regina, Sask.

Write the following questions on the board to help students think about what their city is currently doing to encourage energy efficiency and changes that could be made in their city.

- What is this city currently doing to work towards energy efficiency and to encourage its citizens to use energy more efficiently? For example, do they have a safe biking network, reliable public transit, or investments in energy-efficient buildings?
- What are the city's plans (if any) to encourage its residents and businesses to become more energy efficient in the future? For example, are there plans for stricter regulations about how buildings are designed to ensure they are as energy efficient as possible? Is the city planning to expand its public transit system?
- How could this city encourage individuals to reduce their energy use inside and outside of the home? For example, would more green spaces such as parks and sports fields encourage people to spend time away from devices? Would a bike rental system encourage people to bike instead of taking their car?

In their groups, students should research their city using the above questions to guide them and then record their answers and ideas. Remind students to be realistic and to think about what is practical with today's technology. A city also needs to be able to support its residents' energy needs and lifestyles. Students should consider the access Canada has to different energy sources as well and the generating capacity of those different energy sources.

Students also have the option of researching sustainable cities around the world for ideas, such as Reykjavik, Portland, Copenhagen, Zurich, and Berlin. Students should examine how these cities are encouraging energy efficiency in their businesses and residents.

CONCLUSION AND CONSOLIDATION

Gather students back together and have groups present their cities, explaining what their city is currently doing to encourage energy efficiency and steps the city could take in the future. Encourage students to explain why their ideas are practical with today's technology and Canada's access to energy resources.

Ask students to reflect on whether energy-efficient cities could be a reality in the future or not and what needs to happen to make them a reality. How can students encourage change within their own communities?

EXTEND YOUR GEOGRAPHICAL THINKING

- Invite a city manager or urban manager to speak to your class about how cities are developed and how changes happen within cities.
- Research energy-efficient cities in the world and what makes them energy efficient.

MODIFICATIONS

- The activity can be done individually or as a whole class instead of in groups.
- The activity can be reduced or expanded depending on students' needs. For example, students could research an energy-efficient home or what entire provinces or territories are doing to become more energy efficient.
- Extension: Have students brainstorm ideas for how to make changes to their own city and present these ideas to their city councillor.

- Extension: Have students use the research they have collected to create a formal project or presentation.

ASSESSMENT OPPORTUNITIES

- Observational notes can be taken during discussion periods.
- Research notes can be collected for assessment.
- Presentations can be assessed.

SOURCES AND ADDITIONAL RESOURCES

- To learn more about energy production and transmission in Canada, visit the [Energy IQ website](#).
- Use the lesson plans [Responsible Energy Development](#), [Canada's Growing Energy](#) and [The Home Energy Audit](#) to help students learn about their energy use and how Canada can meet its energy needs while reducing greenhouse gas emissions.
- Visit the [Best Cities website](#) to learn about their top green cities and the criteria they used to determine them.