

LEARNING INQUIRIES

THE ENERGY LIFECYCLES OF EVERYDAY ITEMS

TIME: 60-75 MINUTES

DEVELOPED BY: CANADIAN GEOGRAPHIC EDUCATION



OVERVIEW/FOCUS QUESTION

Students will track the life of an item to understand how different types of energy are involved throughout the lifecycle of that item.

This lesson plan can be used independently or as an extension for the lesson plan [How much energy do I use?](#)

SUBJECT/TOPIC

ENERGY, LANGUAGE

GRADE LEVEL

GRADES 4-6

LEARNING GOALS

Students will:

- Understand the energy involved in creating, transporting, selling and buying items that we consume and use everyday.
- Assess ways in which an item's energy consumption could be lessened at different points in its life.

MATERIALS NEEDED

- Pencil
- Lined paper
- Item Worksheet
- Coloured pencils (optional)
- Devices and Internet for research (optional)

CONNECTION TO THE CANADIAN GEOGRAPHY FRAMEWORK

CONCEPTS OF GEOGRAPHIC THINKING

- Spatial significance
- Interrelationships

INQUIRY PROCESS

- Ask geographic questions
- Acquire geographic resources
- Communicate
- Reflect and respond

GEOSPATIAL SKILLS

- Location

LESSON DESCRIPTION

MINDS ON

Students will discuss items that require energy and expand their understanding beyond things that require energy in the present moment to things that require energy to be produced, transported, packaged and stored (e.g., things we consume, wear and use every day).

ACTION

Students will write a story about an object, tracking its energy story throughout its lifetime.

CONCLUSION

Students will brainstorm ways that energy could be saved at different points in their item's life.

LESSON IMPLEMENTATION

MINDS ON

Ask students to think about items they use that need energy and ways that students could lessen the amount of energy required by different items. Ask students to look around the classroom and individually brainstorm all the things that can be linked to energy, and then have them share their ideas with a classmate.

Bring students together as a group and have them share their ideas. Students will most likely name things that are plugged in, like a computer, a telephone, overhead lights or the projector. Now, ask students to think about objects that are not plugged in, like desks, what they're wearing, or items in their lunch bag. What do these items have to do with energy? How have these items required energy in their lifetimes? While they may not require energy at the moment to function, they require energy to be produced, transported, packaged, sold, stored and disposed of. As a group, create a new list of items in the classroom and how they are linked to energy.

ACTION

Now, students will have the chance to write a story telling the history of one item and how energy is involved at different parts of its life. Explain to students that the term "life cycle," as it relates to an object in the context of energy, is the different stages that object goes through, from its creation to its disposal, and the energy involved at each stage. These stages include: The sourcing and extraction of raw materials, how those materials are processed into a usable object, transportation to the market, how that product is used and how it is disposed of. To help students choose their item, suggest a category that they can choose from; for example, food (have them pick an item from the lunch bag), things they are wearing (coats, glasses, shoes) or things they use (cell phone, water bottle, car).

If desired, have students fill out the Item Worksheet to help them get started. Then, have them create an energy timeline of their chosen item to help them plan their story. Demonstrate by drawing or writing what a timeline of an item would look like using the white/blackboard. For example, a cucumber's timeline might look like this:

- A farmer plants a seed that came from a cucumber into the ground.
- To help the plant grow, farmers use fertilizers. Fertilizers require energy to be created and transported to farms (using electricity and gasoline).
- Water needs to be pumped to the location to help the cucumber grow.
- Usually, sunlight is used to grow plants, but in some cases, electric lighting or heating might be needed in a greenhouse.
- Humans, or machines powered by gasoline, must care for the plant.
- Once the cucumber has ripened, it might be packaged in something that took energy to create (e.g. plastic wrap produced from fossil fuels).
- Gasoline is needed to transport the cucumber to the store, and energy might be used in the transportation truck to keep the food cold so it doesn't spoil.
- If you rely on transportation such as cars or buses, you use energy to go to the store to buy the cucumber (gasoline).
- Energy is used to run the store (electricity).
- You use energy in your fridge to store the cucumber (electricity).
- You might compost the leftovers of the cucumber, which goes to a facility that needs energy to run. The plastic wrap packaging gets thrown out and goes to a landfill which also takes energy to run (electricity, gasoline-powered vehicles).

Now that students have completed their timeline, have them write a short story about the life of their item, including all the important steps in which the item has used energy. If necessary, students can do research on how an item is created. Students should also include what type of energy is used (e.g., gasoline, electricity, etc). Students can write their story from the perspective of their item (i.e. personifying their item and writing in the first perspective) or from a third-person perspective. Students can also include illustrations if they wish. See the Modifications section for more options in creating stories.

CONCLUSION AND CONSOLIDATION

Have students study their item's energy timeline and come up with three areas where energy could be saved in the lifetime of their item. For example, buying cucumbers that are grown locally means that there is less energy needed to transport the cucumber from the farm to the market. Students can share their ideas with the class.

EXTEND YOUR GEOGRAPHICAL THINKING

- Have students explore the [Energy IQ Interactive Map](#) to learn more about energy production and transmission in Canada.
- Invite a farmer or company spokesperson to speak to the class about ways in which their farm or company is working to reduce energy use.
- Have students write a letter to a company that would produce the item they chose, listing ways in which the company could reduce their energy usage.
- Place 10 different items on a tray. Pick up one item, and ask students to brainstorm ways in which this item has consumed energy in its lifetime. Continue for each item.
- Have students create a map of their item's journey.

MODIFICATIONS

- Instead of a story, students could create an infographic, a poster, a comic book or a skit explaining how their item has used energy in its lifetime.
- Story length can be adjusted for student needs.
- To illustrate the example of a cucumber, pre-write the different points in the cucumber's energy story on index cards and mix them up. Distribute the cards to student volunteers and have them line up and read out their cards. Have students work together to line up students with cards in the correct timeline order.
- Extension: Explore the concept of the circular economy with students and how it could relate to their item.

ASSESSMENT OPPORTUNITIES

- Teachers can take observational notes of students' ideas during discussions.
- Students can share their timelines and stories with a peer or the teacher for feedback.
- Teachers can assess the final copies of students' stories.
- Students can write down their three ideas for energy reduction in the Conclusion section and submit for assessment.

SOURCES AND ADDITIONAL RESOURCES

- Visit the [Energy IQ website](#) for more information about renewable and non-renewable energy.
- [How We Make Stuff](#) is a website that illustrates the manufacturing process of some items and suggests ways that we can do things differently.
- The video [Life of a Plastic Bottle](#) illustrates how much energy goes into creating a plastic bottle and what happens once it is discarded.
- Visit the website [Petroleum in Real Life](#) to learn more about how petroleum is used in everyday products.

STUDENT ACTIVITY SHEETS

ITEM WORKSHEET

WHAT IS MY ITEM?
WHERE DID MY ITEM COME FROM?
WHO OR WHAT WAS INVOLVED IN CREATING MY ITEM?
WHERE WAS MY ITEM CREATED?
HOW WAS MY ITEM CREATED?