

Energy: A Day in My Life

GRADE LEVELS	3 rd - 12 th
SUBJECTS	Physical Sciences
DURATION	Activity: 30 minutes
SETTING	Classroom

Objectives

In this activity, students will:

1. learn how energy is part of their everyday lives.
2. brainstorm ways to conserve energy in their daily lives.

Materials

pencils

Energy: A Day in My Life Worksheets (1 per student)

transparency of “Energy: A Day in My Life Worksheet” (optional)

Vocabulary

- ❖ Carbon Footprint: a measurement of the impact humans have on the environment based on the amount of carbon emitted to the atmosphere from their actions
- ❖ electricity: a form of energy used to give heat, light, and power that comes from the force and motion of electrically charged particles
- ❖ natural gas: a mixture of hydrocarbon gases that occurs naturally beneath the earth's surface and is used as fuel for cooking and heating homes
- ❖ gasoline: a highly flammable fuel derived from petroleum and used in internal-combustion engines in automobiles, motorcycles, and small trucks

Teacher Background

We use energy for lighting our homes and offices, to heat and cool our buildings, to transport ourselves and our products, to power our computers, to process and refrigerate our food, and much more. Humans’ use of energy is important. It not only helps make us comfortable, but it helps keep us alive. When cities experience black outs, it is not just inconvenient, but it is also dangerous.

Although the use of some energy makes our lives safer and more enjoyable, we often overuse and waste energy. This can have negative consequences for the environment. A lot of the ways that we get energy, like burning fossil fuels, cause air pollution and contribute to climate change through carbon emissions. Our lives have become intimately tied to energy, and yet sometimes we don’t even realize all the things that we do during a day that require energy and all the ways that we can conserve energy and therefore have less of a carbon footprint.

In this activity, students are forced to think about the energy they use in a typical day. Students will be presented with a blank worksheet to fill in, but the completed worksheet below provides sample answers for teachers.

Activity	Why it uses Energy (heat, cool, light, motion)	Energy Form (electricity, natural gas, gasoline)	How to decrease Carbon Footprint
Example Entry: Brush my teeth with electric toothbrush	To charge toothbrush - motion	Electricity	Use a non-electric toothbrush. Use solar panels for electricity.
Morning shower	To heat and move water	Natural gas used to heat water; electricity used to move water	Take a shorter shower. Take fewer showers. Use solar-power to heat water.
Take food from refrigerator	To keep food cold and safe to eat	Electricity	Close refrigerator door. Buy a more efficient refrigerator.
Eat food	Transportation - motion	Gasoline	Grow your own food. Eat local food because it uses less gasoline.
Cook food	To heat food	Usually natural gas or electricity	Keep tops on pots and pans when heating. Use a solar oven.
Drive to school	Transportation - motion	Gasoline	Walk, bike, or take the bus.
Turn on the lights	To produce light	Electricity	Turn off lights when not in use. Use compact fluorescent light bulbs.
Use computer	To produce light and motion inside computer	Electricity	Put computer to sleep or turn it off when not in use.
Drink water	To transport, cool, and heat	Gasoline to transport; natural gas or electricity to heat and cool.	Turn off the faucet when not using it.

Activity

Introduction

Ask students whether using energy is good or bad? Lead a brief discussion on this topic, making sure to explain that energy can make our lives safer and more enjoyable, but that we often use too much energy and that can have negative environmental consequences, including pollution and global climate change. Introduce the term carbon footprint by explaining to students that in order to help decrease pollution and climate change, people are trying to decrease their carbon footprints, which means they are trying to decrease the amount of carbon released to the atmosphere from their actions. For example, since people burn fossil fuels like gasoline to power cars and coal to produce electricity, two ways to decrease your carbon footprint are to drive less and use less electricity. Or, you can drive a vehicle that doesn't use fossil fuels and get your electricity from sources like solar and wind.

Procedure

1. Ask your students “What was the first thing you did today that required energy?”
2. Write your students’ responses on the board. If they need assistance you can suggest a few activities such as turning on the lights or eating food from the refrigerator. Only write a few responses on the board to get the students started.
3. Tell students that different forms of energy are used for different activities. Write the words “electricity, natural gas, and gasoline” on the board. Ask students where we get these energy forms and what they are used for. With your students make a table like the one below.

Energy Form	Original Resource	Used for this purpose
Electricity: most of these original resources are used to produce movement to run a generator, which can convert motion into electrical energy	Coal, natural gas, oil, hydroelectric, nuclear, wind, solar, ...	Lighting, heating, cooling, motion
Natural gas: burned directly after extraction from ground	Natural gas	Heat water, cook food, heat homes
Gasoline: made by processing crude oil	Oil	Transportation

4. Tell students that this activity is going to make them think about all the ways that they use these forms of energy in their everyday lives.
5. Divide students into pairs.
6. Distribute a worksheet to each student.

7. Tell students to work in pairs to think about the various activities in their daily life that require energy. But, emphasize that each student should complete their own worksheet based on their own daily activities. Working in pairs is just to help each other generate ideas.
8. Tell students that the left column of the sheet is to write down their activities that use energy. The second column is to write why it uses energy: heat, cool, light, or motion are the typical options. The third column is to write down what energy form is used. Student may not know how to fill in all the boxes in this column, so tell students it is okay to hypothesize about the energy form based on the table you made on the board. The last column is for brainstorming ways to reduce your carbon footprint from this activity.
9. Go over the example answer in the first row with students. When discussing the last column, tell students that their ideas can either be for ways to reduce their energy use like using a non-electric toothbrush or ways to make the energy they do use less harmful to the environment, like switching to solar-powered electricity.
10. Give students time to work with their partners and fill out the rest of the table.

Wrap-Up

Once students have filled out their worksheets, bring the whole class together to fill out a class table either on the board or on a transparency by having students share their activities.

References

Adapted from Earth Systems 10, Stanford University. (2006). *Week 9: Land Use Change & Energy*. Stanford, CA: Earth Systems 10 Teaching Assistant Team.

Correlated California Content Standards

Grade Three

Physical Sciences

- 1c. Students know machines and living things convert stored energy to motion and heat.

Grade Four

Physical Sciences

- 1g. Students know electrical energy can be converted to heat, light, and motion.

Grade Six

Physical Sciences

- 3b. Students know that when fuel is consumed, most of the energy released becomes heat energy.

- 6a. Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

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Directions: Fill in the chart below based on the activities you do during a typical day.

Activity	Why it uses Energy (heat, cool, light, motion)	Energy Form (electricity, natural gas, gasoline)	How to decrease Carbon Footprint
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