



Assembly Discussion Guide

“Together, we can all be part of the solution to prevent global warming. Every day, each one of us can take steps to reduce climate pollution, making our city and our world a better place for our children.” - GREG NICKELS, Mayor of Seattle

Seattle Climate Action Now, Seattle City Light and Seattle Department of Transportation developed the Shrinking Bigfoot assembly to introduce students to the concepts of global warming, climate change, and how energy use contributes to global warming. Students leave the assembly understanding the choices they can make in their everyday lives to “shrink” their carbon footprints.

The Shrinking Bigfoot assembly encourages students to “take the climate challenge” and become part of the solution at home and at school. This will also help the City of Seattle meet its goal to address climate change.

The purpose of this discussion guide is to provide vocabulary, interesting facts, and some activities. These background materials can be used to build on the concepts introduced during the assembly. Discussion questions and activities can be selected as appropriate for your students’ level or as fits with your curriculum.

During the assembly, Terence and Angela learn about the things in their homes that use electricity and how electricity use can contribute to global warming.

Discussion

- **How have you used electricity today?** Examples include electricity for lights, TV, computer, DVD player, electronic games, home appliances such as refrigerator and microwave, electric toothbrush, toaster, clock, radio, hairdryer, cell phone.
- **Where does the electricity provided by Seattle City Light come from?** Seattle City Light gets over 90% of its electricity from hydropower— using the power of water to generate electricity. The remaining 10% comes from a variety of sources including nuclear, wind, and coal.
- **What is a renewable resource?** This is an energy source that can be replenished over and over again. In addition to hydropower, other examples include solar, wind, and geothermal.
- **What is an example of a nonrenewable resource?** This is an energy source that is being used up and is finite such as oil, natural gas, coal, and other fossil fuels.
- **Why is it important to conserve electricity?** Every energy source has some associated problems. Conserving electricity reduces environmental impacts, conserves natural resources, and reduces the need for additional sources of energy.



Activity

As homework, ask students to explore how they use electricity for lighting their homes. Have students create a basic diagram of a house and make a note of how many lights are in each room, how many bulbs are used, and what kind of bulbs they are. What kind of bulbs are they? (Hint: tell students to ask an adult about CFLs – compact fluorescent light bulbs.) Don't forget to include lamps and night-lights.

Discuss the findings as a class. Ask students: *Which room has the most lights? Which lights are used the most? Are you surprised at how much electricity you need just for lighting? How could you reduce the amount of electricity you use at home for lighting?*

Ask students to make the simple commitment to turn off lights or lamps when they leave a room for one week. Have them report back to the class how easy or difficult this was. Ask students: *Did it become a natural habit? Would you consider this an easy way to conserve (save) electricity?*



Challenge

Ask students to look at the five lights that are on the most and check the wattage of each bulb. Have them estimate how many hours a day that light is on. They can determine how much electricity each light uses in one day with the following calculation: **Wattage x hours used per day ÷ 1,000 = daily kWh of consumption.** Multiply this by 365 to figure out annual electricity used by just that one light bulb.

Think of ways to reduce the electricity used, for example, by replacing the bulb with a lower watt bulb or CFL, by turning it on less, or by turning it off when leaving the room. Calculate the electricity savings.

Vocabulary

electricity, wattage, hydropower, renewable resource, fossil fuels, appliance, compact fluorescent light bulb (CFL)

Did You Know?

- Americans buy 2.2 million light bulbs every day.
- 20% of the electricity in America is used for lighting.
- Lighting represents about 5-10% of a home's electricity use.
- The five light fixtures that use the most electricity in a home are typically the kitchen ceiling light, the living room table and floor lamps, bathroom vanity, and outdoor porch or post lamp.
- Compact fluorescent bulbs use one-quarter the energy of regular incandescent bulbs and last 10 times longer.
- Appliances account for 20% of a home's electricity use. For average examples, an alarm clock uses 88 kWh/year, a computer uses 394 kWh/year, and a refrigerator uses 1,200 kWh/year.

Websites/Resources

Seattle City Light

<http://www.seattle.gov/light/consERVE/global-warming/>

Get Energy Active

<http://www.getenergyactive.org/wisely/tips.htm>

As Angela takes a trip into the atmosphere, she learns that our earth's natural system of keeping the planet warm is on overload from rising greenhouse gas emissions.

Discussion

- **What is global warming?** *Global warming refers to the increase in the earth's average temperature. Certain human activities release greenhouse gases, such as carbon dioxide, into the atmosphere. These gases trap the sun's heat and increase global warming.*
- **What are some human activities that add to global warming?** *Driving in a vehicle releases carbon dioxide. Burning fossil fuels for heat, hot water, and electricity are also significant contributors. Everything we buy and use takes energy to make, transport, and to dispose of; all of which contribute to global warming.*
- **What is the difference between global warming and climate change?** *Climate change is a result of global warming. The term is used to describe the changes in climate caused by global warming, while the term 'global warming' is referring to the earth getting hotter. As the earth's temperature increases and climates change, scientists are concerned how snow, sea level, and other habitat will be affected.*
- **How does climate change affect habitat or animals?** *Animals and plants need certain temperatures and conditions in order to survive. If these change, the plants and animals are severely challenged. Think about the polar bears that need a cold climate or salmon that need cold water for food and habitat.*
- **What can we do to use less gas?** *Carpool, combine trips, take the bus, bike or walk. Buy products from local sources, for example, an apple from Washington instead of New Zealand.*

Vocabulary

global warming, climate change, greenhouse gases, fossil fuels

Did you know?

- Local scientists think that global warming will mean wetter winters and drier summers in the Pacific Northwest, resulting in more flooding and less snow for hydropower, drinking water, and fish.
- Seattle is a national leader in working on ways to reduce greenhouse gas emissions.
- Transportation accounts for nearly half of the greenhouse gas emissions in Seattle.
- You can save one pound of carbon dioxide for each mile of driving you eliminate.
- On average, fresh produce travels 1,500 miles from farm to plate.

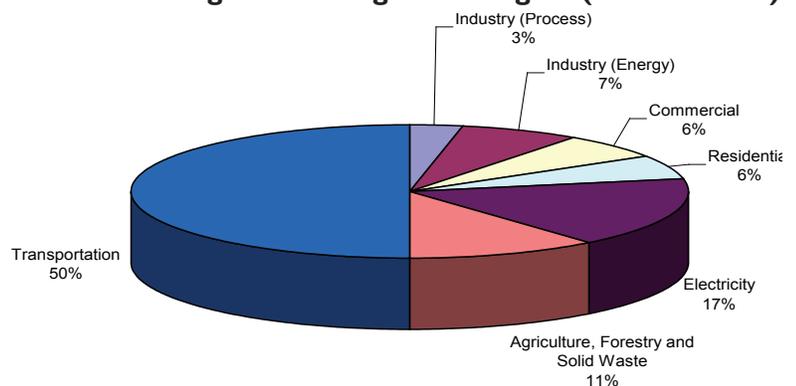
Websites/Resources

Climate Change and Our Planet from NOAA
<http://www.education.noaa.gov/tclimate.html>

US EPA Climate Change

<http://epa.gov/climatechange/index.html>

Sources of greenhouse gases in region (PSCAA 2002)



Activity

Ask students to draw a table with three columns. In column one, list all the places they regularly go in one week, for example: school, home, friend's house, store, etc. Column two should describe how they get there, for example: bus, car, bike or walk. In column three, students should write an alternative idea that does not contribute as much to global warming. For example, if school is in the first column and car in the second column, in the third column might be "Carpool to school with a friend." Ask students to show the results in a bar chart. Discuss how many places are within walking or biking distance, and how many places a car or bus is required. How much do students rely on the family car to get around? Tally the results of the whole class on the board.



Challenge

For the journeys made by car, ask students to find out approximately how many miles they traveled in total. Ask students to research a way to get to at least one location without a car. Is this possible? Could they combine trips or carpool? Make a pledge to cut down on at least one car trip over the next week, and report back on the mileage. Total up the class results and see how much carbon dioxide was avoided. (For every mile reduced, one pound of carbon dioxide is reduced.)

Carbon Footprint

Discussion Questions & Activities

By the end of the assembly, students will understand that their individual actions can reduce the amount of carbon dioxide they generate. If everyone takes some simple and easy steps, together we can make a big difference to address global warming.

Discussion

- **What is a carbon footprint?** A carbon footprint is a way of measuring how much carbon dioxide we send into the atmosphere through our everyday actions.
- **What might be part of a carbon footprint?** Measures include driving your car, riding the bus, using energy or electricity to heat our homes and schools or to heat water for washing clothes or for the shower, energy used to run appliances such as the dishwasher. We are adding to our carbon footprint every time we plug something in. It also takes energy to make everything we buy and use, so simply using “stuff” adds to your footprint’s size.
- **What are some ways to shrink your carbon footprint?** Walk or bike, carpool or ride the bus. Conserve energy by turning off lights or computers when not in use. Take a shorter shower to conserve water and energy used for heating the water. Wash clothes in cold water and hang them to dry. Simply buy and use less “stuff”!



Activity

Ask students to brainstorm a list of all the activities they do that they think contribute to their carbon footprint. Then identify alternatives for each activity that would help reduce their carbon footprint. Which of the alternatives would be difficult to continue and why? But reducing one’s carbon footprint does not have to be painful! Which actions would be really easy to do? Ask the students to try at least three actions over the next week and report to the class at least one action they’d be willing to continue in the future.



Challenge

Make a large picture of the earth and stick it up on the wall. Each time a student takes an action that reduces the size of his/her carbon footprint, have him/her write it on a piece of notepaper and draw a small footprint around it. Tape it on the earth and see if your class can fill the earth with lots of positive actions! At the end of the month, count how many actions the class has completed. Share the easiest ones with the rest of the school and encourage other classes to follow suit.



For More Information

To learn about additional Seattle City Light school programs or to sign up for a teacher workshop on this topic, visit the website: <http://www2.seattle.gov/exploreenergy/> or contact Mark VanOss at (206) 684-3279 or Mark.VanOss@seattle.gov.

Vocabulary

carbon footprint

Did you know?

- If every American home replaced just one light bulb with a compact fluorescent light bulb, we would save enough energy to light more than 3 million homes for a year, more than \$600 million in annual energy costs, and prevent greenhouse gases equivalent to the emissions of more than 800,000 cars.
- Replacing six incandescent bulbs with compact fluorescents reduces CO₂ emissions by 566 pounds a year.
- In the Northwest, vehicles on the road are the largest contributor to our carbon footprint.
- On average, a 10-minute shower uses 25 gallons of water, which takes 3.22 kilowatts electricity to heat. Shower water use can be reduced by about 50 percent simply by replacing the conventional shower head with an energy-efficient model.
- Unplugging TVs, DVD players, game consuls, and other electronics when not in use can reduce your carbon footprint by 500 pounds of CO₂ per year.
- Recycling one aluminum pop can could save enough energy to run a 100-watt bulb for 20 hours, a computer for three hours, or a TV for two hours. Recycling one plastic bottle saves enough energy to power a computer for 25 minutes.

Websites/Resources

EPA Kids Site: Global Warming and Climate Change

<http://www.epa.gov/climatechange/kids/index.html>

Kids Carbon Footprint Calculator

http://www.zerofootprintkids.com/kids_home.aspx

