

Sustainability Science Sleuths

Day 10



This guide accompanies
[*Sustainability Science Sleuths Day 10*](#)

PRIOR TO TEACHING



Subject

You Make a Difference



Program Length

45 minutes – 1 hour



Program Objective

Congratulations! You have learned all about Earth's natural resources. Now it's time to do your part – you can make a difference and help conserve water and energy. And it's not even hard! Through a simple water scavenger hunt and by leaving yourself reminders around your school or home, you can reduce your water and energy use.



Next Generation Science Standards

4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.



What I Need Today

SUPPLIED BY TEACHER/STUDENTS:

paper
pencil
scissors



Vocabulary

Sustainability – Using resources (such as water and energy) wisely so we can continue using them in the future. Some natural resources can be reused over and over again (like energy generated from the sun), but some have a limited supply (such as clean fresh water or fossil fuels like gasoline).

Natural Resources – Something found in nature that can be used by people, including light, air, water, plants, animals, and fossil fuels.

Conserve – The act of protecting things found in nature so they will continue to be around in the future.

Data Collection Chart – A visual way to gather and store information collected during observations or experiments.

Incandescent Bulbs – The most common type of light bulb found in homes until 2010, these bulbs turn electricity into light by sending the electric current through a thin wire called a filament. These bulbs get very hot and release a lot of their energy as heat instead of light, meaning they aren't very energy efficient.

Halogen Bulbs – A type of light bulb that is slightly more energy efficient than an incandescent bulb; still produces a lot of heat.

Compact Fluorescent (CFL) Bulbs – Often shaped like a coil, these bulbs don't produce as much heat (and last much longer) than incandescent bulbs. While they are much more energy efficient, they contain mercury and need to be brought to a S.A.F.E. Center instead of being thrown in the garbage (sent to the landfill).

Light-Emitting Diode (LED) Bulbs – A relatively recent light bulb design, these bulbs create a lot of light while using very little energy (they are very energy efficient). They last a long time and don't have mercury, so they are safer than CFL bulbs.

Vampire Energy – An electronic device that sucks out power even when it is not being used, such as a charger that has finished charging its device or a computer or TV in standby mode.



Instructor Prep

Divide students into groups of 3 or 4 students per group for today's activity.



PROCEDURE



What We'll Learn

Water can be found in many different places around your school and home and is used for cooking, cleaning, and drinking. But water leaks waste clean water, can harm your home or school, and mean you have to pay for water you aren't using, so it's important to find and fix leaks as quickly as possible. From finding and fixing leaky pipes to reducing your energy use, through these simple final challenges, you can become a conservation expert!



What Will Happen?

Scientists ask questions and make predictions before they start investigating. Have your students hypothesize: how many water sources are in my home or school?

- ☐ 1
- ☐ 2-3
- ☐ 4-5
- ☐ 6-9
- ☐ 10+

What to Do

REVIEW - DAYS 1-9



As a Science Sustainability Sleuth, you have learned all about Earth's natural resources that are necessary for us to live and thrive. Now it's time to put your new-found knowledge into practice, as you complete these two final challenges.





FINAL CHALLENGE 1 - WATER SCAVENGER HUNT

Scavenger hunt time! You can choose to do this as a whole class or divide your students into their groups. Have your students take a pencil and their journals or a piece of paper and go on a scavenger hunt around your school looking for water sources.

1) Start in a bathroom. Where does the water come from in this room? You probably have two or more places where water comes in from pipes. Do you have a toilet and sink in this space? Is there perhaps a shower? Examine each of the fixtures to find out where the water comes in and where it goes out (look for pipes, faucets or shower heads, and drains). While you're looking, do you see any leaks? On your chart, write down the name of each fixture that uses water. Then make a special note if you see any leaks.



Fun Fact: When you have a water leak, you are paying extra money for clean water to be wasted (it's not even "going down the drain"!). Getting the leak fixed saves water, money, and will help keep the room and floor in good condition for years to come.

2) If you can, visit your school's kitchen. You may only have one water source in the kitchen, or you might have several. Let's start with the sink. Where does the water come in? Where does the water go out? Do you see any leaks? Record your observations on your chart.



Fun Fact: Scientists use data collections charts every single day, no matter what the experiment is.

3) Do you have other water sources in your kitchen? Some might be hard to find. Look for a dishwasher, ice maker, or refrigerator water dispenser. Make sure to make note of everything you find.



Tips & Tricks: Many water-using kitchen appliances are large and should only be moved by a plumber. You can search the area around them for pools of water, but don't worry about trying to find the pipes that bring water to these large appliances.

FINAL CHALLENGE 1: WATER SCAVENGER HUNT



1. SCAVENGER HUNT TIME! LEAD YOUR PAPER AND PENCIL AND GO ON A SCAVENGER HUNT AROUND YOUR HOME LOOKING FOR WATER SOURCES.

FINAL CHALLENGE 1: WATER SCAVENGER HUNT



1. START IN A BATHROOM. WHERE DOES THE WATER COME FROM IN THIS ROOM? THE TOILET HAS TWO PLACES WHERE WATER COMES FROM: THE TOILET FLUSH VALVE AND THE TOILET DRAIN. THE SINK HAS ONE PLACE WHERE WATER COMES FROM: THE FAUCET. THE SHOWER HAS ONE PLACE WHERE WATER COMES FROM: THE SHOWER HEAD. WHERE DOES THE WATER GO OUT IN EACH OF THESE PLACES? WRITE IT DOWN. MAKE SURE TO LOOK FOR ANY LEAKS. IF YOU SEE ANY, WRITE IT DOWN. IF YOU DON'T, WRITE "NO LEAKS".

2. NOW VISIT A KITCHEN. WHERE DOES THE WATER COME FROM IN THIS ROOM? THE SINK HAS ONE PLACE WHERE WATER COMES FROM: THE FAUCET. THE DISHWASHER HAS ONE PLACE WHERE WATER COMES FROM: THE WATER INLET. THE REFRIGERATOR HAS ONE PLACE WHERE WATER COMES FROM: THE WATER DISPENSER. WHERE DOES THE WATER GO OUT IN EACH OF THESE PLACES? WRITE IT DOWN. MAKE SURE TO LOOK FOR ANY LEAKS. IF YOU SEE ANY, WRITE IT DOWN. IF YOU DON'T, WRITE "NO LEAKS".

FINAL CHALLENGE 1: WATER SCAVENGER HUNT



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FINAL CHALLENGE 1: WATER SCAVENGER HUNT



1. NOW VISIT YOUR KITCHEN. WHERE DOES THE WATER COME FROM IN THIS ROOM? THE SINK HAS ONE PLACE WHERE WATER COMES FROM: THE FAUCET. THE DISHWASHER HAS ONE PLACE WHERE WATER COMES FROM: THE WATER INLET. THE REFRIGERATOR HAS ONE PLACE WHERE WATER COMES FROM: THE WATER DISPENSER. WHERE DOES THE WATER GO OUT IN EACH OF THESE PLACES? WRITE IT DOWN. MAKE SURE TO LOOK FOR ANY LEAKS. IF YOU SEE ANY, WRITE IT DOWN. IF YOU DON'T, WRITE "NO LEAKS".



4) Some schools have a washing machine. If you do, see if you can spot any leaks.



Tips & Tricks: Like dishwashers and refrigerators, washing machines are large appliances, so look around the area for leaks, but don't try to pull them out or away from where they live.

5) Time to visit your playground or outdoor area. Go on a hunt around the grass and other outdoor plants, looking for some of the water sources. Make sure to look out for sprinkler heads and water spigots! Record all your findings on your chart.



Fun Fact: Even if you don't have an outdoor space, consider investigating your local outdoor green space to see if you can spot a water leak. We have a limited supply of clean water, so it is important for us to report any leaks to the appropriate authorities so they can get fixed as quickly as possible.

6) Once you've searched your entire school for all the sources of water, let the proper authorities know if you have spotted any leaks.



Fun Fact: Congratulations! You are a conservation expert. Keep up the good work and remember to check for water leaks every so often. And while you're at it, can you think of ways you can use less water?



FINAL CHALLENGE 2 - REDUCE YOUR ENERGY USE

1) There are simple things we can do to reduce our energy use. To help your students remember to follow these suggestions around their homes, have them fold and cut a piece of paper into 8 squares. Then, write down each of the following suggestions on a different piece of paper. When they bring the papers home, they can tape them where it will remind them to do each activity. Every time they follow an energy saving suggestion, they can put a tick mark on the appropriate piece of paper. After 1 week, they can collect their papers and tally their tick marks. How many times can they reduce their energy use in one week?

FINAL CHALLENGE 1: WATER SCAVENGER HUNT



1. Some schools have a washing machine. If you do, see if you can spot any leaks.

FINAL CHALLENGE 1: WATER SCAVENGER HUNT



1. If you have a sprinkler system, see if you can spot any leaks. Make sure to look out for sprinkler heads and water spigots. Record all your findings on your chart.

FINAL CHALLENGE 1: WATER SCAVENGER HUNT



1. Once you've searched your entire school for all the sources of water, let the proper authorities know if you have spotted any leaks.

FINAL CHALLENGE 2: REDUCE YOUR ENERGY USE



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2) Turn off lights when you don't need them.



Fun Fact: Different types of light bulbs use different amounts of energy: incandescent and halogen bulbs use a lot of energy, whereas compact fluorescents (CFL) use about 75% less energy and light-emitting diodes (LED) are about 80% more efficient than traditional incandescent bulbs.

3) Air dry dishes.



Fun Fact: If you use a dishwasher, consider skipping the drying cycle, as this uses energy. Instead, you can open the dishwasher door when the washing cycle has finished and let the dishes air dry.

4) Turn down the heat in the winter.



Fun Fact: If you lower the temperature of your home a little in the winter, you can keep warm by bundling up with sweaters, blankets, and scarves instead.

5) Turn up the temperature in the summer.



Fun Fact: Instead of using air conditioning to keep your home at the perfect temperature in the summer, try using fans to help you cool down.

6) Unplug chargers and devices when not in use.



Fun Fact: Some scientists estimate that 75% of the electricity used by household electronics is consumed when they are not in use. Sometimes called "vampire energy", this energy is being sucked out of the plugs while not powering anything.

7) Take shorter showers.



Fun Fact: It takes energy to heat your water, so shorter showers means you are saving energy (and water, too!).

FINAL CHALLENGE 2: Reduce Your Energy Use

1. Turn off lights when you aren't using them.



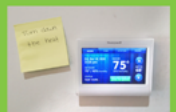
FINAL CHALLENGE 2: Reduce Your Energy Use

2. Air dry dishes.



FINAL CHALLENGE 2: Reduce Your Energy Use

3. Turn down the heat in the winter.



FINAL CHALLENGE 2: Reduce Your Energy Use

4. Turn up the temperature in the summer.



FINAL CHALLENGE 2: Reduce Your Energy Use

5. Unplug chargers and devices when not in use.



FINAL CHALLENGE 2: Reduce Your Energy Use

6. Take shorter showers.





8) Use sunlight instead of lamps.



Fun Fact: Sunlight is a natural way to light your home. When a source of energy can be regrown in 1-2 human lifetimes, it is called a “renewable” energy source. Solar power and wind farms are some well-known forms of renewable energy.

9) Turn the TV off when not in use.



Fun Fact: Different TVs use different amounts of electrical energy to operate, but no matter what type of TV you have, there's no need to waste electricity if no one is watching it.

10) After a week, remember to gather your post its and count how many times you saved energy. Congratulations! You are an energy saver. Now keep up the good work!



Fun Fact: In California, we get our electrical energy from lots of different sources. The most common are natural gas (by 2030, 20% of the natural gas produced by SoCalGas, the gas provider for most of Southern California, will be renewable natural gas), solar (renewable), and hydroelectric (renewable). California also gets about 7% of its electrical energy from wind farms (renewable) and 6% from geothermal plants (renewable).



CELEBRATE

Congratulations! You have completed Sustainability Science Sleuths and have become a conservation expert!

CONCLUSION



What I Discovered

Distribute the certificates and have your students reflect on what they discovered. We would love to see pictures or read stories about how your students responded to this program. Please email pictures and/or stories to educationemail@discoverycube.org.

FINAL CHALLENGE 2: Reduce Your Energy Use

1. THE SUNLIGHT instead of LAMPS.

2. SUNLIGHT IS A NATURAL WAY TO LIGHT YOUR HOME. WITH A SOURCE OF ENERGY CAN BE REGROWN IN 1-2 HUMAN LIFETIMES, IT IS CALLED A "RENEWABLE" ENERGY SOURCE. SOLAR POWER AND WIND FARMS ARE SOME WELL-KNOWN FORMS OF RENEWABLE ENERGY.



FINAL CHALLENGE 2: Reduce Your Energy Use

1. TURN THE TV OFF WHEN NOT IN USE.

2. DIFFERENT TV'S USE DIFFERENT AMOUNTS OF ELECTRICAL ENERGY TO OPERATE, BUT NO MATTER WHAT TYPE OF TV YOU HAVE, THERE'S NO NEED TO WASTE ELECTRICITY IF NO ONE IS WATCHING IT.



FINAL CHALLENGE 2: Reduce Your Energy Use

10. AFTER A WEEK, REMEMBER TO GATHER YOUR POST-ITS AND COUNT HOW MANY TIMES YOU SAVED ENERGY. CONGRATULATIONS! YOU ARE AN ENERGY SLEUTH. NOW KEEP UP THE GOOD WORK!

11. AS A CONSUMER, WE GET OUR ELECTRICAL ENERGY FROM DIFFERENT SOURCES. THE MOST COMMON ARE NATURAL GAS (BY 2030, 20% OF THE NATURAL GAS PRODUCED BY SO-CAL GAS, THE GAS PROVIDER FOR MOST OF SOUTHERN CALIFORNIA, WILL BE RENEWABLE NATURAL GAS), SOLAR (RENEWABLE), AND HYDROELECTRIC (RENEWABLE). CALIFORNIA ALSO GETS ABOUT 7% OF ITS ELECTRICAL ENERGY FROM WIND FARMS (RENEWABLE) AND 6% FROM GEOTHERMAL PLANTS (RENEWABLE).



What I Discovered:

REFLECT ON THE ACTIVITIES BELOW.
WHAT DID YOU LEARN? WHAT DO YOU WANT TO KNOW MORE ABOUT?

FINAL CHALLENGE 1: WATER SCAVENGER HUNT

FINAL CHALLENGE 2: REDUCE YOUR ENERGY USE

SUPER SLEUTH CERTIFICATE