



This guide accompanies
[*Science Sustainability 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 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

- pen or pencil
- paper
- clipboard (or hard surface to write on)
- post it notes (optional)
- scissors (optional)
- tape (optional)



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

In advance, send students a list of the materials needed for today's lesson.



PROCEDURE



What We'll Learn

Water can be found in many different places around your home and is used for cooking, cleaning, and drinking. But water leaks waste clean water, can harm your home, 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?

- ☐ 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! Grab your paper and pencil and go on a scavenger hunt around your home 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, sink, shower, or bath in this space? Examine each of these 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 paper, 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 cabinetry and floor in good condition for years to come.

2) If you have other bathrooms, repeat step 2, writing down all the fixtures that use water and checking them for leaks.

3) Next, visit your 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 paper.



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

4) 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! GRAB 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? YOU PROBABLY HAVE TWO OR MORE PLACES WHERE WATER COMES IN FROM PIPES. DO YOU HAVE A TOILET, SINK, SHOWER, OR BATH IN THIS SPACE? EXAMINE EACH OF THESE 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 PAPER, WRITE DOWN THE NAME OF EACH FIXTURE THAT USES WATER. THEN MAKE A SPECIAL NOTE IF YOU SEE ANY LEAKS. (REPEAT FOR ALL BATHROOMS)

2. IF YOU HAVE OTHER BATHROOMS, REPEAT STEP 2, WRITING DOWN ALL THE FIXTURES THAT USE WATER AND CHECKING THEM FOR LEAKS.

FINAL CHALLENGE 1: WATER SCAVENGER HUNT



1. VISIT YOUR 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 PAPER.

2. IF YOU HAVE OTHER KITCHENS, REPEAT STEP 3, WRITING DOWN ALL THE FIXTURES THAT USE WATER AND CHECKING THEM FOR LEAKS.

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5) Some people have a washing machine in their home. 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.

6) If you have a yard with sprinklers, go on a hunt for all the water sources. Make sure to look out for sprinkler heads and water spigots! Record all your findings on your paper.



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.

7) Our homes also have hot water heaters – another source of water. You may know where yours is located, or you may not. Ask an adult to help you find it and check it for leaks.



Tips & Tricks: If you live in an apartment, you may have a communal hot water heater that serves your whole building. These are often stored in garages, crawlspaces, attics, basements, or even their own special closets.

8) Once you've searched your entire home for all the sources of water, let your adult(s) 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 you can do to reduce your energy use. To help you remember to follow these suggestions, grab a pen or pencil and some post it notes. Write down each of the following suggestions on a post it. Then place that note where it will remind you to do the activity. Every time you follow an energy saving suggestion, put a tick mark on the

FINAL CHALLENGE 1: WATER SCAVENGER HUNT



1. Some people have a washing machine in their home. If you do, see if you can spot any leaks.

2. The computer and internet are great tools, but they can also be a source of water leaks. If you have a computer, check for leaks around the monitor and the base.

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appropriate post it. After 1 week, collect all your post its and tally your tick marks. How many times did you reduce your energy use?



Tips & Tricks: Don't have any post it notes? No problem! Just cut some scrap paper into smaller pieces. Use tape to keep them temporarily, but securely, in place near your electric devices.

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 DON'T NEED THEM.

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49. TURN OFF LIGHTS WHEN YOU DON'T NEED THEM.

50. TURN OFF LIGHTS WHEN YOU DON'T NEED THEM.



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 Science Sustainability 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. 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.



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

3. WITH 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!

4. ON AVERAGE, 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 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 SCRAVENGER HUNT

FINAL CHALLENGE 2: REDUCE YOUR ENERGY USE

SUPER SLEUTH CERTIFICATE