Resource Conservation Experiment
Home Edition

Name _____

In class we have been learning how coral reef ecosystems are impacted by human activity. Now let's look our household activities. In this project, you will design an experiment to determine how successfully your family can conserve natural resources. You will:

- Set up an experiment
- Collect one week of data (without anyone knowing)
- Create a conservation plan with your family
- Collect one more week of data while your family follows your plan
- Analyze your two weeks of data to determine how effective your conservation plan was.
- Create a final "publishable", typed version of your lab report with a decorative cover page.

Choose one of the three levels to proceed.

LEVEL 1	Choose one of the two experimental questions below and ask for the "Level 1 Energy Project Lab Sheet" or the "Level 1 Water Project Lab Sheet": ♻ By starting some **water** saving strategies, how much water can I save at my house? ♻ By starting some **energy** saving strategies, how much energy can I save at my house?
LEVEL 2	Use a "Resource Conservation Experimental Lab Sheet" to custom design your own experiment based on one of the following questions: ♻ By starting some **water** saving strategies, how much water can I save at my house? ♻ By starting some **energy** saving strategies, how much energy can I save at my house?
LEVEL 3	Design **your own** experimental question which addresses a **variety** of resource conservation issues at your home. Use a "Resource Conservation Experimental Lab Sheet" to create an experiment based on your question.

*** Resource factoids on the following pages were taken from the DEHNR Discovery Pack published by Motorolla. Electricity and water costs were taken from 2004 local utility bills.

Ways to collect conservation data:

- Read your electric meter daily for a week and calculate daily energy usage. Keep a journal of qualitative data about the kinds of appliances used in your house and the events that occurred over the week that could have affected your results.

- Read your gas meter daily for a week (if you have one) and calculate daily energy usage. Keep a journal of qualitative data about the use of household appliances that require gas. (Note: Most of the time gas is used for heat, hot water,and cooking appliances.)

- Read your water meter daily for a week (if you have one) and calculate daily water usage. Keep a journal of qualitative data about the use of water in your house and the kind of events that occurred over the week that could have affected your results.

Other ways to collect data:

- Keep a chart in each bathroom and record the number of toilet flushes, and the minutes in the shower. Then calculate the following:

  # of minutes in the shower x 5 = total gallons of water used

  # of toilet flushes x 6 = total gallons of water used

- Keep a chart in your laundry room and chart each load of clothes you do. Then calculate the following:

  # of loads of clothes x 50 = total gallons of water used

- Keep a chart next to your favorite electrical appliance in your house. Record how many hours the appliance is left on each day. Look at the wattage on the back of the appliance and calculate kWH:

  I Kilowatt hour = 1000 watts of energy used for 1 hour

Why save energy?

- Every kiloWatt-hour of electricty costs your parents approximately $0.11.
- If a 100 watt light bulb is on for half a day, every day for a year, it can use enough energy to burn almost 400 pounds of coal. Burning that coal will create nearly 1000 pounds of global warming gases!
- Every gallon of gasoline burned in a normal vehicle produces 19 pounds of carbon dioxide pollution.
- Every kiloWatt hour of electricity produces 1.8 pounds of carbon dioxide.
- Every therm of natural gas (used for home heating/cooking) produces 12 pounds of carbon dioxide pollution.

- Recycling paper saves energy and trees, too! Every day in America, we cut down two million trees to make new paper and throw away about 42 milion newspapers that could have been recycled! For every pound of paper recycled, we are saving approximately 16 mature trees!

Ways to save energy:

- Turn off lights, television, and other appliances when not in use.
- Keep your thermostat set no higher than 68° F in the winter. Just turning the thermostat down 1 or 2 degrees can save a lot of energy!
- The more watts an appliance uses, the more energy it uses. Do an inventory of household appliances and determine which ones use the most energy. Cut down on your use of those appliances. (HINT: Most energy goes into heating and cooling!)
- Take a shorter shower or a slightly cooler shower. Hot water uses a lot of electricity!
- Recycle! One pound of recycled paper saves 1.75 kWh of electricity.
- Replace old light bulbs with energy efficient fluorescent bulbs. One of these bulbs can save the energy equivalent of 600 pounds of coal over the life of the light bulb.
- Walk or ride your bike instead of taking a car!
- Keep light bulbs dusted. Dusty light bulbs use more electricity than clean ones.
- Insulate well! 50% of the energy used for heating and cooling is wasted through open fireplaces, under doors and around windows. Make sure windows in your room are closed tightly when the heater or air conditioner is running. On cold nights, pull down the shades and close the curtains in front of your windows. This makes a wall in front of the window that helps keep heat inside.
- Only wash and dry full loads of clothes! Washers and driers take lots of energy! Keep the lint screen on your clothes drier clean. It uses less energy that way!

Why save water?

- If your parents are on the city water system, every 1000 gallons of water and sewage service costs them approximately $7.35. [Rates vary with season. This rate does not include the standard service fee added each month.]
- As the number of people in the world increases, so does the need for water. Although water seems to be everywhere, 97% of the water on earth is salt water. We have yet to develop a technology affordable enough to turn salt water into drinking water!
- Water shortages occur all of the time. All it takes is a drought, and water use gets restricted. If our population continues to grow, and we continue to waste water, restrictions could be in place for us all of the time.
- The average Chapel Hill household uses 6,000 gallons of water EVERY DAY! Our community uses approximately 10,000,000 gallons of water EVERY DAY! Not only is that a lot of water, but it also takes a lot of energy for OWASA to treat all of that water.

Ways to Save Water:

- Every 5 minutes in the shower uses approximately 25 gallons of water! Take shorter showers, or turn off water when soaping and shampooing.

- Only wash full loads of dishes in the dishwasher.

- Toilets use the most water in the house! Most toilets use more water than is really needed with each toilet flush (about 6 gallons of water per flush!) You can save 1-2 gallons of water by putting a "Water Displacement Device" in the tank of your toilet. This is a heavy object that takes up space so less water will be used each time the tank refills. To do this, remove the label off of an empty plastic soda bottle. Place some small rocks in the bottom to weigh it down, and fill the rest of it with water. Put on a cap. Take the lid off of your toilet tank, and flush the toilet to empty the tank. Place the bottle in the tank, making sure it doesn't get in the way of the arm or chain that makes the toilet flush. Replace the tank lid. (You can also use a brick or another heavy object, as long as it doesn't leave a deposit in the water.)

- Only wash full loads of clothes in the washing machine. Most washing machines use around 50 gallons of water for each wash! Washing machines are the 2nd largest home water users!

- When taking baths, fill bathtubs up half way instead of to the top.

- Check for leaking faucets in your house and have an adult fix them. Leaky faucets can waste up to 20 gallons of water a day…enough water to fill a swimming pool in a year! Check outside faucets, too!

How your final project will be graded:

	Student Check	Points Earned
Your title is written as a question that can be answered through experimentation	_____	____/3
You have a clear purpose and hypothesis. They are each more than just one sentence. Your purpose explains the environmental issue and what you hope to do about it. Your hypothesis gives a clear reason based on your prior knowledge for what you think your answer will be.	_____	____/5
You have identified your independent and dependent variables.	_____	____/2
You have identified the constants and the materials used in your experiment.	_____	____/3
You have clearly described a step-by-step procedure you followed while conducting your experiment.	_____	____/5
You have organized your quantitative data in a spreadsheet with rows and columns clearly labeled.	_____	____/5
Appropriate quantitative data from the spreadsheet has been carefully analyzed, compiled, and graphed to best assist in answering the experimental question.	_____	____/5
A daily log of qualitative data has been attached noting any daily observations that could have an impact on the results.	_____	____/5
You have written a 1-2 paragraph conclusion that includes the following: o Specific examples of qualitative and quantitative data you gathered o Analysis of how this data helps you reach an answer to your question (or possibly a reason why your data is inconclusive at this point) o Discussion of any outside variables/issues that came up which may have affected your results o Explanation of what your data tells you about resource management… a big picture view of what is at stake… what kind of an impact your plan could have on the environment… what that means for our future.	_____	____/10
You have a neat and creative cover page for your lab.	_____	____/2
The lab report is neat, well organized, and error free (correct spelling, grammar, punctuation, capitalization, etc).		
TOTAL		**/50**