



Module 3:

Environmental Stewardship and You

Unit A: How can you help Indiana's environment?

Caring for Indiana's environment is the responsibility of everyone that lives and works in Indiana. Individuals, business and governments all have the same responsibility to ensure Indiana is a clean, healthy place to live. Environmental stewardship, which is simply the actions people take to care for the earth and its natural resources, is how individuals can help make a difference in their environment.

1. At Home

Being an environmental steward can start in your own home, and making a difference at home starts with you and your family. Knowing how the products you purchase impact the environment, and looking for opportunities to reduce water and electricity use is an easy place to start.

Learning what products are made of and how they are packaged will help you identify the impact your purchases will have on the environment. Are the products you purchased recyclable or biodegradable? Some products we purchase can not be recycled and are made from nonrenewable resources. Products to consider include; groceries, toys, cars, bikes, etc.

a. Waste Minimization


1. Cereal is a simple breakfast or snack. When you buy cereal, should you buy a large box of cereal or get the variety pack of cereal? Let's consider the amount of cereal in each box and the amount of packaging used for each box.
 - In a large box of cereal there are 18 ounces of cereal and 4 ounces of packaging.
 - In a variety pack of cereal with 10 boxes of cereal there are 19.25 ounces of cereal and 12.75 ounces of packaging.
 - The variety pack of cereal uses more packaging than a large box of cereal.

What are the impacts on the environment when you get the variety pack of cereal instead of a large box of cereal?

2. Paper towels are everywhere. We use them at home, in the workplace, and in public restrooms. Sure, they're convenient, but reusable cloth rags, dishcloths, hand towels, warm air dryers and sponges can do the same job.

If everyone in Indiana used a paper towel just one time per week that equals 3,359 tons of paper towels discarded each year in Indiana. That is just one paper towel a week! 2 tons (or 4000 lbs) equals the weight of an average family sedan. If everyone in Indiana used two paper towels a week it would equal 6,718 tons of paper towels discarded each year. If you would like to learn more about how many paper towels go into the waste stream each year use the following formula:

Number of paper towels x 3,359 = _____ tons of paper towels
thrown away in Indiana each year



If you would like to measure your everyday actions and decisions and see the direct impact they have on the amount of waste generate in Indiana visit IDEM at: www.in.gov/recycle/topics/impact

Activity #17:

Let's Plant Some Garbage

Purpose: Students will distinguish between wastes that are and are not biodegradable.

Materials: Garden beds, shovels, popsicle sticks, sharpie, hose or pail, apple core, piece of material (100% cotton), nail, small glass jar (baby food jar works well), pieces of lettuce, newspaper, plastic bag, yarn, aluminum foil, empty pop can (crushed), eggshells, Styrofoam, camera

Instructions: Prepare two or three garden beds (approximately 2 ft by 5 ft) in which to plant the garbage. Dig holes (approximately 4 inches deep) for each item to be planted. Take a picture of each item. Pour a bit of water in the hole, plant an item (garbage), place soil on top of the hole. Label a popsicle stick and place in the ground at each hole, indicating what item has been planted in each location for future reference. Water the garden on a regular basis. After a few months, remove all items from your experimental garden. You may also want to map your gardens in case the popsicle sticks become lost.

Having the students work in small groups (3-4) is preferable for this activity. Reviewing expectations with the students and procedures of how to go about planting the various items prior to going outside is recommended. Planting the garbage towards the beginning of the school year (September – October) is recommended because of appropriate weather conditions for the outdoor activity. Leaving the Garbage Garden a few months before analyzing the results in the spring allows items to degrade if they are going to do so. Carefully brush loose soil from each item and compare it to its original picture.

Discussion/ Follow-up:

After planting garbage in the garden:

- Which items have undergone change and how have they changed?
- What does biodegradable mean?
- What does decompose mean?
- What is the connection between these two terms: decomposition and biodegradability?
- Which types of things are biodegradable and why?
- What happens to materials when they biodegrade?
- From our Garbage Garden, which materials do you think will biodegrade, which will not, and why?
- How will you know the material has decomposed?

After digging up planted garbage:

- Which materials biodegraded?
- Were you surprised by any of the results?
- Were any of your predictions correct?
- What happened to material that biodegraded?
- What is the impact of throwing away non-biodegradable materials in the garbage and sending them to the landfill site, and what are the effects on our environment?
- What actions can you take to prevent this from happening?

Let's Plant Some Garbage developed by William Reid Elementary School in Calgary, Alberta, and published by Evergreen (evergreen.ca).



b. Energy Efficiency

In Indiana most of our electricity comes from burning coal. Coal is a nonrenewable energy source which is mined out of the ground. To help reduce the amount of coal burned in Indiana each year and to help lower your family's electricity bill, you can follow a few simple steps:

- Turn off lights, TV, radio, computer, etc. when not using them.
- Unplug toasters, coffee makers, and microwaves when they are not in use.
- Take short showers.
- Can you think of other ways to save electricity?

Activity #18:

Conserving Electric Energy

Purpose: Students will gain an appreciation for their dependency on electricity by analyzing and contrasting two graphs. The first graph will measure the rate of consumption of a resource when it is used constantly. The second graph will show consumption of a resource if you only use it when it is needed.

Materials: Pen and paper, cookies or crackers (two per student, be mindful of peanut allergies), overhead projector or blackboard

Instructions:

1. Explain to students that most of Indiana's electricity is generated by coal. The demand for electricity is on the rise as the use of microelectronic (e.g., computers) and other electronic equipment increases.
2. Ask students if they think they could live in their homes without electricity for just two hours. What would their lifestyle be like? For homework, ask students to try to survive without using any electricity for two hours. Discuss as a class the items that students will have to abstain from using. The list may include the following:

Radio or stereo	Computer	Microwave	Electric Stove
Hairdryer	Dishwasher	Washing machine	Clothes dryer
Lighting	Video gamer	TV/VCR/DVD	Can opener
Toaster	Coffeemaker	Refrigerator	Garage door opener
Freezer	Alarm clock	Water heater	

3. Make sure students document which hours they went without using electricity and how they had to alter their routine to avoid using electricity. During the next class period, discuss how students felt about not using electricity for that period of time.
4. Explain that fossil fuels, such as coal, oil, and natural gas, are called nonrenewable energy because they are limited in supply. It is important to use these natural resources responsibly so that they will last longer. Tell students they will participate in a brief and tasty activity to demonstrate the use of natural resources.



5. Give each student a cookie or cracker. Give them a signal to begin eating and tell them to raise their hand when they are finished. Count the hands raised every 15 seconds until all the cookies or crackers are eaten. Create a graph like the one on the “Conserving Electric Energy graph sheet” indicating how many students finished eating every 15 seconds.
6. Give each student a second cookie. Tell them that this time they can only take a bite when you say, “Take a bite.” Do this every 15 seconds and have them raise their hand when they have finished the cookie. Count the hands raised after every 15 seconds and create a second graph to indicate the consumption rates. The first cookie is similar to leaving the TV on when you are not watching it, while the second cookie is similar to turning the TV off when you are not watching it. You will not consume as much natural resources if you do not use them when they are not needed.

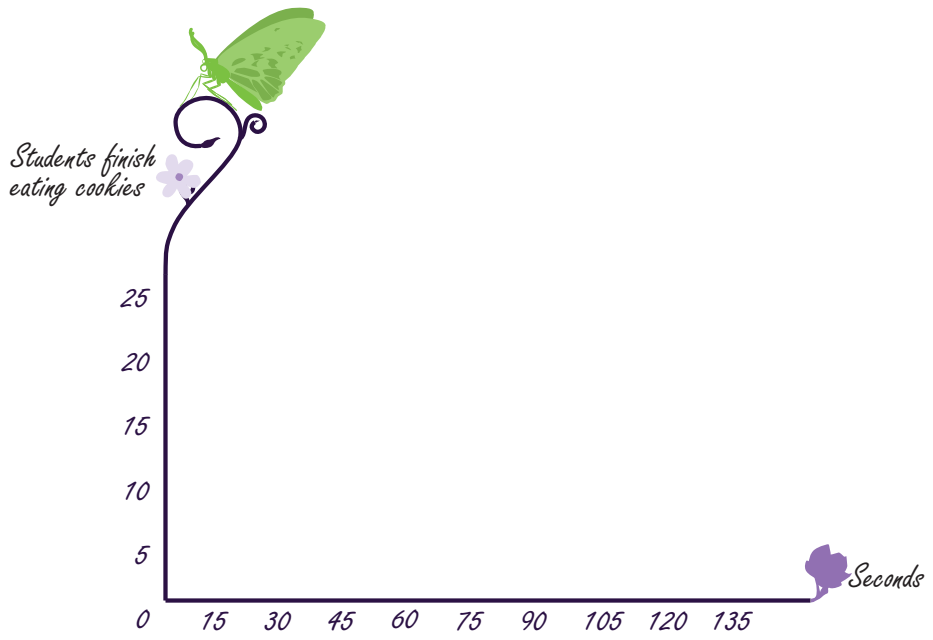
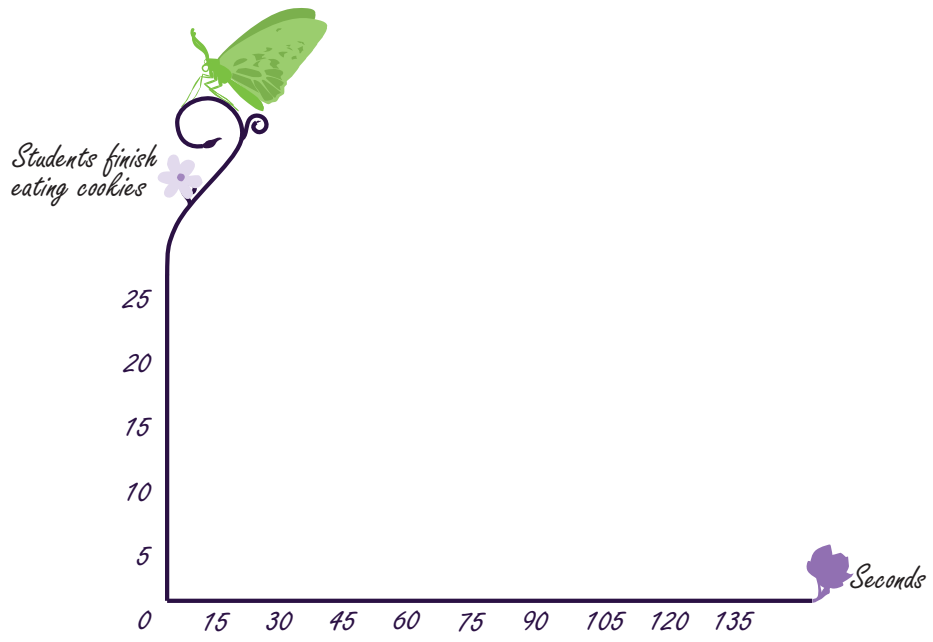
Discussion/ Follow-up:

1. Discuss the two graphs; how are they the same/different?
2. How can we conserve nonrenewable resources?
3. What are a few other resources we could use to power our TV’s, computers, lights, etc?

Activity provided by the American Coal Foundation



Conserving Electric Energy graph sheet



c. Water Use

As we learned earlier, the total amount of water on earth stays the same. The water people and animals drank hundreds of years ago is the same water we have today. What has changed over time is how water is used; we no longer walk to the river to collect water for the day, it is pumped into our homes and schools. One hundred years ago there were approximately 1.7 billion people on earth using the same amount of water that sustain over 6.7 billion people today. Conserving the amount of water we use daily will be beneficial for people, plants and animals today and for future generations. A few simple steps to help reduce the amount of water used everyday are:

1. Turn water off when brushing your teeth.
2. Run the dishwasher and laundry only when you have a full load.
3. Take a short shower vs. a bath

Can you think of other ways to save water?

Activity #19:

Matching Game

Draw a line matching the activities on the left to the amount of water that activity uses on the right.

- | | |
|------------------------------------------------|-------------------|
| 1. Taking a shower | A. 30 gallons |
| 2. Watering the lawn | B. 180 gallons |
| 3. Washing the dishes | C. 4-7 gallons |
| 4. Washing clothes | D. ½ gallon |
| 5. Flushing the toilet | E. 39,090 gallons |
| 6. Brushing teeth | F. 62,600 gallons |
| 7. Drinking | G. 15-30 gallons |
| 8. Producing one ton of steel | H. 9.3 gallons |
| 9. Processing one can of fruit or vegetables | I. 1 gallon |
| 10. Manufacturing a new car and its four tires | J. 9-20 gallons |

[Click here to get a copy of matching Game Sheet for student distribution](#)

These are average amounts of water used by Americans to complete these activities. Indiana has 6,313,520 citizens. What is the total amount of water all Hoosiers use to take a shower? Wash dishes? Flush the toilet? Brush their teeth? How many people live in your town and how much water does your town use?



Matching Game Answers

1. Taking a shower – G. 15-30 gallons
2. Watering the lawn – B. 180 gallons
3. Washing the dishes – J. 9-20 gallons
4. Washing clothes – A. 30 gallons
5. Flushing the toilet – C. 4-7 gallons
6. Brushing teeth – I. 1 gallon
7. Drinking – D. ½ gallon
8. Producing one ton of steel – F. 62,600 gallons
9. Processing one can of fruit or vegetables – H. 9.3 gallons
10. Manufacturing a new car and its four tires – E. 39,090 gallons

Activity courtesy of U.S. EPA: www.epa.gov/safewater/kids/pdfs/activity_grades_4-8_funfactsmatchinggame.pdf

2. Your Community

Communities tend to have people with common interests living in an area together. By becoming involved in your community, you are likely to become involved with people interested in the same activities. Volunteering is one way to make a difference in your community and a great way to meet people interested in the same things as you. By volunteering in your community, you will help make a difference in Indiana's environment. Finding the right place to volunteer will depend on what you and your family enjoy. Do you like to go for walks, explore streams, or go to a playground? You could volunteer at a park, join a clean stream event, or pick up trash at the playground. Volunteering in your community can be done by joining a group of volunteers or by doing it with your family.

Possible Follow-up Questions:

1. Contact your town to learn how much water your community uses a week, a month, a year?
2. After you answer question one, ask about how much water does one person use per day?
3. Did your community recycle more pounds of paper, glass, metal, plastic this year or last year?
4. What jobs are there in the environmental field in your community?

Hints: Hydrologist; Education; Landfill Inspector; Air Inspector; Chemist; Biologist; Engineer; Waste Water Treatment Operator; Park Manager



