

AFTER EARTH

For Teachers: The following lesson plan is designed for use with an on-line ecological or carbon footprint calculator tool. We recommend these:

“Global Footprint Network”

<http://www.footprintnetwork.org/en/index.php/GFN/page/calculators/>

- an ecological footprint calculator which calculates how many “earths” of resources humanity would need if everyone consumed an equal amount to the person inputting data. The action items at the end of this calculator are not as well designed for student use and discussion as those incorporated into the one described below.

“CoolClimate Network”

<http://coolclimate.berkeley.edu/carboncalculator>

- a carbon footprint calculator which calculates footprints in terms of metric tons of CO₂/year. This calculator has a particularly nice “action” component at the end, which may be used even if you do not use this calculator for the exercise. We have written our lesson around the other calculator because this one asks for information that most students will not know such as gross family income, R-values of insulation in their walls and attic, and monthly utility bills.

Key concept: Humans, like all other living things, consume resources and produce wastes that leave an “ecological footprint” on the planet. The goal of this lesson is to.

Objective: To explore the concept of ecological footprint in a meaningful way by having students calculate their own personal ecological footprints.

Overview: Directions for the exercise are contained in the body of the lesson plan.

- Students will first gain some related vocabulary. We recommend that you allow students to access the web freely to define these terms, and then conduct a discussion to agree as a class on a definition for each term.
- Students should then collect data about the way they live and enter it on their lab sheets. This phase could be assigned as homework
- Students enter their data into one of the online calculators listed above (or another one from the web). This phase could be done in pairs or small groups.
- Discussion and follow-up questions are at the end of the lesson on the lab sheet, and can be discussed as a class or written by students.

AFTER EARTH

- Possible formative assessments for this lesson:
 1. *After Earth* is a movie, so it isn't real. But if the people in the movie's history (and their governments) had really understood ecological footprints, do you think the story might have been different? How?
 2. Do you think there is any parallel between your current behavior relative to the global environment and that of the ancestors of Will and Jaden in the film "After Earth"? Describe those parallels, or contrast their actions with yours in a well-constructed paragraph. Include in your paragraph the terms words that you defined at the beginning of this lesson.

AFTER EARTH

Global Change Ecological: Footprint Lesson Plan

Objective: To calculate your personal ecological or carbon footprint

Humans, like all other living things, consume resources and produce wastes that leave a “footprint” on the planet.

What is your piece of humanity’s “ecological footprint”? You can answer that question by figuring out the energy costs of your daily, weekly, monthly and yearly activities. You will use an online calculator to determine your ecological footprint after you learn some terms and gather some data.

Let’s start with some terms: Define below:

Ecological Footprint

Carbon Footprint

Square Footage

Recycle

PCR recycled plastic product

Carbon offset

Before you can use an ecological footprint calculator, you need to gather some information about the way you live

Housing:

Check the type of housing you live in:

- Apartment/Condominium
- Duplex
- Single Family Home
- High-rise Apartment or Condominium
- Luxury Apartment or Condominium
- Luxury Home

AFTER EARTH

How many people live with you?

What is the approximate square footage of your house/apartment? Calculate this number by measuring how wide your house is, and then how long. Then multiply these numbers to get total square footage, and write it here:

How do you heat your home? Check one:

- Electric
- Gas Furnace
- Oil Heat
- Propane
- Wood Stove (will usually have back up of one of above)
- No Heat

Do you use air conditioning or fans in the summer?

- Air Conditioning
- Fans
- Neither
- Both

Food

Fill out the chart below:

Yesterday or today's meals	My "average" meals
The last time I ate breakfast, I had:	Most mornings I eat these things
At snack time before lunch I ate:	Most days I have these snacks before lunch:
At lunch I ate:	My "typical" lunch:
After school snack yesterday:	My favorite after-school snack:

For supper last night I had:	My favorite supper is:

Now look back over the food you listed. Where was that food grown or produced? For example, if you ate salad, were the greens grown locally (within 20 miles) in your state, or in another state? If you had an apple or orange, or a banana or a kiwi, did it come from your backyard, from local farmers, from your state, from another state or from another country? Next to each food you listed above, write:

“L” for local—your garden or your town,

“S” for from your state,

“*” for further than 200 miles, or from the next state

“X” for from across the country or from another country.

Now use your list from above as a reference and answer the questions below to draw some conclusions about your food consumption.

Estimate what percentage of your food comes from within 200 miles of your home?

Estimate what percentage of your food comes from sources further than 200 miles away?

How much of your food comes in plastic containers?

Does your family use a lot of packaging just to eat?

Transportation:

How many miles is it from your home to school?

Besides school, what activities do you travel to each week? (Sports, music lessons, friend’s houses, club activities, meetings, etc.)

Total up how many miles you likely travel each week.

AFTER EARTH

Check each form of travel you use below, and write in how many miles a week you travel using it.

- Bus (school or other) _____ miles/wk
- Private car—driver only _____ miles/wk
- Light Rail _____ miles/wk
- Bicycle _____ miles/wk
- Walking _____ miles/wk
- Motorcycle/Moped _____ miles/wk
- Carpool _____ miles/wk

Vacations: Does your family take a vacation? What resources do you use for this? Will you fly in an airplane this year? How many hours will you travel in the plane round trip?

Household waste:

How many trashcans a week do you and your family fill up? (When you take out the trash, how many cans are there?)

Do you recycle and/or compost? How much of your trash do you recycle? How much do you compost?

**** Now follow the links provided by your teacher to the online ecological calculator. Follow the directions and record your results here:**

Choose a partner and compare your results with theirs. In two sentences, compare and contrast your results using the data you recorded above.

Follow up and discuss the below questions:

What was the biggest surprise to you when you used the calculator?

How did your results compare to your partner's results? Why do you think this is so?

How does the distance that your food travels to get to your grocery store change your carbon footprint? Your ecological footprint?

If more people live with you in your house or apartment does it change your ecological footprint for better or worse? How?

What are some ways that you can change the way that you and your family use resources to reduce your ecological footprint?

Do you think that purchasing "carbon offsets" works? Would you ever do this? Why or why not?

AFTER EARTH

To expand your understanding of actions you can take to change humanity's global footprint, click on the link below and then choose the "Take action" tab. These actions will help focus your thinking about what real changes we can make to change our footprint. Which one(s) of these can you pledge to do in your life?

<http://coolclimate.berkeley.edu/carboncalculator>