

# ECOLOGICAL FOOTPRINT CALCULATOR



## What is your Impact on the earth?

We can calculate how much land we use up with a simple calculator. Our lifestyle can affect the sustainability of the area.

### Transport

Your score

#### Distance travelled annually by private car

- More than 15,000 miles **12**
- Between 10,000 and 15,000 miles **10**
- Between 1,000 and 10,000 miles **6**
- Less than 1,000 miles **4**
- No miles by car **0**

#### Distance travelled annually by public transport

- More than 20,000 miles **12**
- Between 15,000 and 20,000 miles **10**
- Between 10,000 and 15,000 miles **6**
- Between 1,000 and 10,000 miles **4**
- Less than 1,000 miles **2**
- No car miles **0**

#### Holiday Destination

- Close to home (UK) **2**
- Short distance away (Europe) **6**
- Long flight away (Rest of World) **20**

### Energy

#### What is your average quarterly gas or oil bill?

- More than £250 **8**
- Between £150 and £250 **5**
- Between £50 and £150 **3**
- Less than £50 **1**

#### What is your average quarterly electric bill?

- More than £250 **10**
- Between £150 and £250 **7**
- Between £50 and £150 **5**
- Less than £50 **1**

#### From what source does your energy supply come from?

- Renewable / Green tariff **2**
- Non Renewable **15**

### Food/Commodity Consumption

Your score

#### Are you:

- Vegan **2**
- Vegetarian **4**
- Regular meat eater **8**
- Heavy Meat eater **10**

#### The main type of food consumed is:

- Mostly fresh, locally grown **2**
- Mix of fresh and convenience **6**
- Mostly convenience **12**

#### How many newspapers or magazines do you buy or get delivered each week?

- More than 20 **8**
- Between 10 and 20 **6**
- Between 1 and 10 **4**
- None **0**

#### How much furniture and other commodities such as machines, gadgets do you purchase each year?

- More than 7 **10**
- Between 5 and 7 **8**
- Between 3 and 5 **6**
- Less than 3 **4**
- Hardly any, or second hand **2**

### House and Garden

#### What type of property do you live in?

- Large sized house **10**
- Medium sized house **7**
- Small sized house **4**
- Flat / apartment **2**

#### How many other people live in your household?

- No other person **14**
- One other person **12**
- Two other people **10**
- Three other people **8**
- Four other people **6**
- Five other people **4**
- More than five people **2**

See also: <http://www.myfootprint.org>

Source: Bristol City Council

### House and Garden (continued)

Your score

#### How many children do you have in this household?

No children	0
One child	3
Two children	6
Three children	8
Four children	10
More than four children	12

### Domestic Waste and Recycling

#### Amount of domestic waste produced each week (a full large bin is approx 30kg)

More than 120kg	50
Between 90 and 120kg	40
Between 60 and 90kg	30
Between 30 and 60kg	20
Between 15 and 30kg	20
Less than 15kg	5

#### To dispose of waste, you're going to use up valuable land. So, start this section with 24 points. Do you recycle the following items?

Glass	Subtract 4 points
Plastic	Subtract 4 points
Paper	Subtract 4 points
Aluminium	Subtract 4 points
Steel cans	Subtract 4 points
Food waste	Subtract 4 points

#### Helpful hints for reducing your 'footprint'

- Find your nearest recycling facilities by visiting <http://www.recyclenow.com>
- Stop junk mail by writing to Mailing Preference Service, Freepost 22, London, W1E 7EZ
- <http://www.cuttingyourcaruse.co.uk> - tips on driving less and saving money while you're at it
- <http://www.ecocentre.org.uk> - information about renewable energy including how to get a grant to convert your home
- <http://www.environment-agency.gov.uk> - The water resources section has good information on water-saving

### Water Consumption

Your score

#### If you have a dishwasher, how many times do you run it on an average week?

More than 9 times	3
Between 4 and 9 times	2
Between 1 and 4 times	1
Not applicable	0

#### If you have a washing machine, how many times do you run it on average each week?

More than 9 times	3
Between 4 and 9 times	2
Between 1 and 4 times	1
Not applicable	0

Your total

### Results

#### Less than 60 Points

Congratulations! Very little land and resources are needed to support your lifestyle. If everyone lived like you, then the human existence and the Earth would continue to prosper sustainably. Well Done!

#### 60-120 Points

Your footprint has more of an impact on the Earth's resources. This represents the European average. If everybody lived as you do, we would need an entire extra planet to support us.

#### 120 - 180 Points

Your footprint uses a large share of the Earth's resources. It is close to the UK average. If everyone lived like you, we would need 3 planet Earth's just to support us.

#### More than 180 Points

Your footprint is close to that of the North American average. If everyone lived like you, we would need 4 planet Earth's just to support us.

- Give real nappies a try. Contact the real cotton nappy company [caroline@cottonnappyco.com](mailto:caroline@cottonnappyco.com) or **01267 275630**

- <http://www.traidcraft.co.uk> - promotion of fair trade products

For more tips see 'A Guide to Sustainable Living in Carmarthenshire'

<http://www.thecarmarthenshirepartnership.org.uk>

## Calculating Your Carbon Footprint

**Go to:** [http://www.epa.gov/climatechange/emissions/ind\\_calculator.html](http://www.epa.gov/climatechange/emissions/ind_calculator.html) and complete this worksheet as you enter the information requested by the online calculator. *Note: Use the Tab button to navigate through this online calculator.*

1. <b>Transportation:</b> According to the calculator, how many pounds of CO <sub>2</sub> /year do you generate from transportation?	_____ lbs/year
2. <b>Home Energy:</b> According to the calculator, how many pounds of CO <sub>2</sub> /year does your home generate through the use of natural gas, electricity, or fuel oil (kerosene/propane)?	_____ lbs/year
3. <b>Home Waste:</b> According to the calculator, how many pounds of CO <sub>2</sub> /year does your household generate from waste (before taking recycling into account)?	_____ lbs/year
4. <b>Recycling:</b> After accounting for your household's recycling efforts, how many pounds of CO <sub>2</sub> /year does your household generate from waste?	_____ lbs/year
5. Subtract answer for step #4 from the answer for step #3 to determine how many pounds of CO <sub>2</sub> your family saves by recycling.	_____ lbs/year
6. The online calculator will estimate your annual total emissions (also known as your carbon footprint). How many TOTAL pounds of CO <sub>2</sub> does your household generate per year?	_____ lbs/year

7. **What Can You Do to Reduce Emissions?** Now, proceed through the section of the online calculator titled "What You Can Do to Reduce Emissions" and read through the list of actions (on the left side of the screen) you can take on the road, at home, and to reduce waste to determine if there is at least one action you can take to reduce your emissions. List the actions you select below:

How much would your emissions be reduced by if you took these actions? \_\_\_\_\_ lbs/year

If you took these actions, what would your **new total CO<sub>2</sub> emissions** be? \_\_\_\_\_ lbs/year

8. Please bring this completed worksheet to the Environmental Science Institute on Wednesday July 9<sup>th</sup>.



Created by UNC-Chapel Hill's Environmental Resource Program

## Calculating Your Household's Carbon Footprint

The phrase "household carbon footprint" is frequently used to describe the total CO<sub>2</sub> emissions associated with a household's energy consumption, which includes transportation. The EPA has estimated that the average four person household in the US emits 83,000 pounds of CO<sub>2</sub> in a year. Ask your parent for your household's recent electric, gas, and/or oil bills so you can more accurately calculate your household's energy consumption. Since your energy bills vary by season, use an average of winter and summer values if you can. Ideally, complete this activity with your parent.

**Go to:** [http://epa.gov/climatechange/emissions/ind\\_calculator2.html](http://epa.gov/climatechange/emissions/ind_calculator2.html) and complete this worksheet as you enter the information requested for **Section I** (Current Emissions) of the online calculator.

*Note: Use the Tab button to navigate through this online calculator.*

<p><b>1. Transportation:</b> According to the calculator, how many pounds of CO<sub>2</sub>/year does your household generate from transportation? If your household has two or more vehicles, add up the "pounds of CO<sub>2</sub> per year" amounts in the right-hand column of the worksheet.</p>	<p>_____ lbs CO<sub>2</sub>/year</p>
<p><b>2. Home Energy:</b> According to the calculator, how many pounds of CO<sub>2</sub>/year does your home generate through the use of natural gas, electricity, or fuel oil (kerosene/propane)? Add up the "pounds of CO<sub>2</sub> per year" amounts in the right-hand column of the worksheet.</p>	<p>_____ lbs CO<sub>2</sub>/year</p>
<p><b>3. Home Waste:</b> According to the calculator, how many pounds of CO<sub>2</sub>/year does your household generate from waste before recycling is taken into account)?</p>	<p>_____ lbs CO<sub>2</sub>/year</p>
<p><b>4. Recycling:</b> After accounting for your household's recycling efforts, how many pounds of CO<sub>2</sub>/year does your household generate from waste?</p>	<p>_____ lbs CO<sub>2</sub>/year</p>
<p>5. Subtract your answer for step #4 from your answer for step #3 to determine how many pounds of CO<sub>2</sub> your family saves by recycling.</p>	<p>_____ lbs CO<sub>2</sub>/year</p>
<p>6. The online calculator will estimate your household's annual total emissions (also known as your carbon footprint). How many TOTAL pounds of CO<sub>2</sub> does your household generate per year? <i>This amount will be indicated at the bottom of the screen after you have entered your recycling information ( at the end of Section I).</i></p>	<p>_____ lbs CO<sub>2</sub>/year</p> <p>OR</p> <p>_____ lbs CO<sub>2</sub>/year per household member</p>
<p>7. According to the online calculator, what is the average carbon footprint for a household of the same size?</p>	<p>_____ lbs CO<sub>2</sub>/year</p>
<p><b>8. What Can You Do to Reduce Emissions?</b> Now, proceed through Section 2 of the online calculator titled "Reduce Emissions" and with a parent review and discuss the list of actions you can take on the road, at home, and to reduce waste to determine if there are at least two actions you can take or have already taken to reduce your emissions. Use section 3 to answer the following questions.</p> <p>How much would your CO<sub>2</sub> emissions be reduced by if you took these actions? _____ lbs/year</p> <p>If you took these actions, how much money would you potentially save? \$ _____</p> <p>If you took these actions, what would your <b>new total CO<sub>2</sub> emissions</b> be? _____ lbs/year</p>	

Title: The Ecological Footprint

Grade Level(s): 3-4

Time/Date:

School:

Teacher:

Directions to school, class:

Contact Info:

Vocabulary: Words & Concepts your class may be learning, look these up yourself too!

**Ecological** - the relationship/connection between all living things and their environment

**Sustainability** - achieving satisfying lives for everyone without hurting nature—now and in the future.

Materials and Equipment: List these before and while you plan and revise so you're prepared.

Black board

Someone Else's Shoes Activity Sheet (download from website)

Worksheet to calculate footprint for the teacher (download from website)

What is your class accomplishing?: Learning & Activity Goals, Objectives

- Understand what the ecological footprint is and describe the 5 categories that contribute to it.
- Make the connection between lifestyle and size of the ecological footprint
- Identify and execute ways to reduce their own ecological footprint
- Understand that the Earth has its limitations to sustain humans

### PROCEDURE

The Spark: Introductions, Demonstrations, Show and Tell, Topic Intro (Break the ice!) ~5-10min

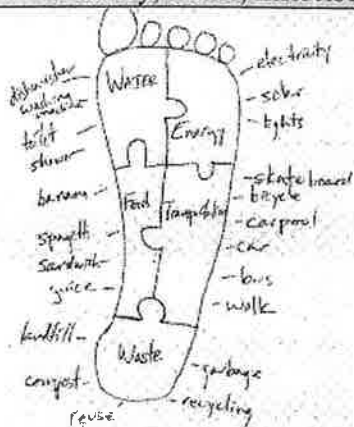
*Hello everyone, Today we're talking about the ecological footprint. Write 'ecological footprint' on the board and draw the outline of a footprint next to it (see picture). As humans we depend on the Earth. Earth provides us with food, air, water, energy. All our actions – eating, drinking driving, switching the light on, and buying clothes—make an impression on the earth; we use a part of nature. The ecological footprint is a way to describe the human impact on the earth; the imprint that we leave when we use nature. Our ecological footprint can be measured. Has anyone measured his/her ecological footprint before?*

The ecological footprint is: (write on the board) **The amount of productive land needed to produce all the things we use (food, clothing, houses, etc.) and to absorb the waste we produce in our every day lives.**

Brainstorming, Getting ideas, Connecting ideas (assess their knowledge!) ~10-20min

Explain that only 16% of the Earth is useable land (70% is water and the rest is too cold, dry, high) and that a lot of our food, clothes and other products are made on land in other countries. *With how many people do we have to share this land? (6 billion and rising). What happens if we use more than our share of land? (then someone else has less) Is this fair?*

Activity, Game, Exercise, Debate, Puzzles, Problem Solving, Role Play(Pt. II or Cont...) ~10-30mins



*We can divide the ecological footprint in 5 categories that contribute to our ecological footprint. In what 5 ways do humans leave an impact on the Earth? Write the answers on the board. End up with these 5 categories: **water, food, energy, transportation and waste.** Divide the footprint outline on the board in 5 parts and label each part (use picture as example). *These 5 categories represent the amount of nature that we use. The Earth's resources are limited, and if we don't take care of it carefully they will run out.**

*All the things we do in our every day lives have an impact on the Earth. Some things are positive and other things are negative. All the things we do can be placed in the 5 categories we mentioned before. Point at the categories on the board and repeat them. What are some things you did this morning when you got up? What are some other things we do in our everyday lives? Make notes*

next to the appropriate category in the footprint drawing (use picture as example). Ask the students in what category their answers fit (e.g. I biked to school- transportation). Once the footprint is complete ask the class what things are positive for the ecological footprint (make it smaller) and which things are negative (make it bigger). Explain that without the positive actions the footprint would be even bigger.

Activity, Game, Exercise, Debate, Puzzles, Problem Solving, Role Play(Pt. II or Cont...) ~10-30mins

Draw a footprint and write 1.9ha in it. *1.9ha is the amount of land each person in the world can use, without hurting the environment. How many hectares does the average person **actually** use? Do you think it's higher or lower than the 1.9ha we should be using to keep the planet healthy?* Draw a bigger footprint on the board and write 2.3ha in it. *We are using 2.3 ha each, that means that on average everybody uses 0.4 ha too much. How is this possible? We overuse the land. We use more than what is healthy for the Earth. We consume more resources than nature can restore and create more wastes than nature can recycle. At this point humans start to harm nature, reducing the resources on which we depend.*

*How many hectares does the average Canadian use? Accept a few guesses, and then get a volunteer to put the real figure (8.8ha) up on the board, with a big footprint. If the average per person is 2.3 ha, and Canadians use 8.8 ha each, what does that mean? It means that other people in other countries can use less than they would actually need! In India people can only use 0.5ha per person to live from (draw a small footprint). This is a tiny amount of land to get all the things you need from. Many people that live here and in other poor countries don't have enough land to get everything they need to survive. Emphasize the difference between Canadian footprints and Indian footprints. Get some reactions from the class. Is it fair that we use so much more than what is healthy for the Earth?*

*The goal of the ecological footprint is to make you realize that you're probably living a lifestyle that is unfair to others. Who is your current lifestyle being unfair to? Write on the board: 1. To Other Plants and Animals 2. To the Future generations 3. To Other People*

Explain: 1. *Humans are not alone on this planet—we share it with at least 10 million other species. Unfortunately, species around the world, such as tigers and frogs are in danger of dying out because of human activities.* 2. *To future generations. If we use all Earth's resources now, then there will be nothing left for our children and other generations.* 3. *Footprints of nations vary a great deal... many countries don't have access to the resources they need, and their footprints are tiny while our footprints are big.*  
*Is one of these 3 factors more important than another? Is it more important to be fair to other nations than other species, or should we be fair to people and animals now before we care about what will happen in the future? Why or why not?*

There is no "right" answer to this question, hopefully responses will focus on trying to balance all three types of fairness, or that supporting one type may promote another or saying they all have value and can't be compared.

Activity, Game, Exercise, Debate, Puzzles, Problem Solving, Role Play(Pt. II or Cont...) ~10-30mins

How can we reduce our footprint? Let the students write down solutions for the following activities in each category (write the table on the board to help them focus).

Water	Shower? Yard? Washing machine? Drips? Teeth brushing, Dishwasher?
Energy	Lights? Appliances? Computer?
Food	Meat? Local? Composting? Processed?
Transportation	Car? Public transportation? Carpooling? Fuel efficient?
Garbage	What is thrown out vs. recycled/repurposed? Excess packaging.
Home	Size? In a city? Heated? Duplex? Apartment?

Contingency, Plan B, extra game or activity (Back up plan) ~5-10mins

1. Play the game Someone Else's Shoes Activity (additional material on website)
2. Give the teacher a form for the ecological footprint, to copy and fill out with the class after your lesson (3 day project). If you have time you can explain the exercise already during your lesson, or let the class estimate how big their footprint is, using the last 3 days.

Review, Conclusion and steps towards continued action ~5-10mins

*You have just learned about ecological footprints. So now what are you going to do differently when you go home, or when you are here in your classroom? Do you think what you have learned today is important? Why?* Encourage the class to calculate their footprint, change some things in their lives and then re-calculate it!

References

<http://www.myfootprint.org/>

Great work ecoMentor! After use of Lesson Plan revise, add ideas and repeat!



# How Big is My Ecological Footprint?

*Measuring their dependence on nature on a typical day can give students a new understanding of the connection between personal lifestyle choices and the health of the planet*

by Tim Turner

**Subject areas:** mathematics, science, social studies

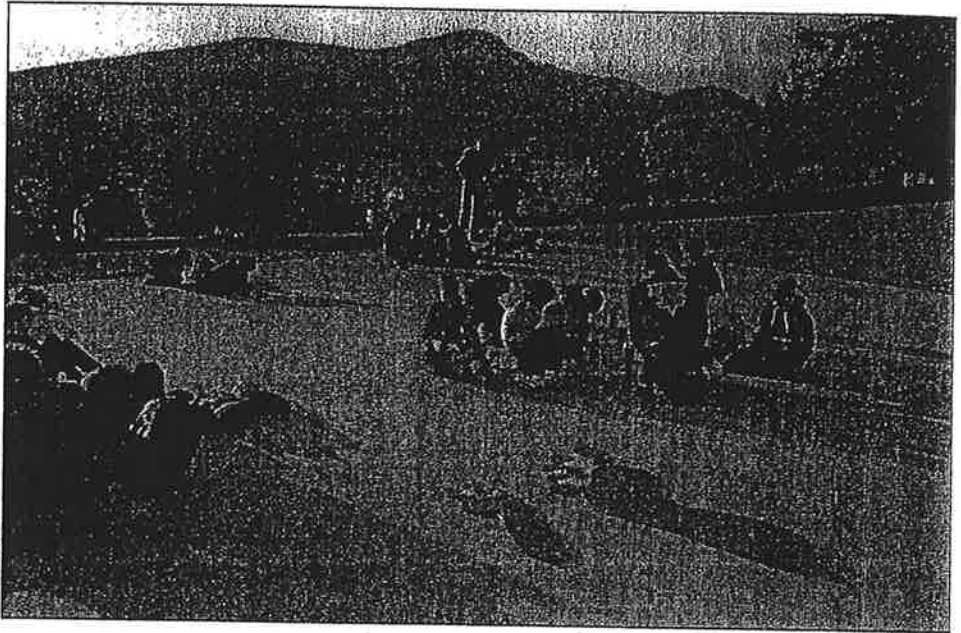
**Key concepts:** ecological footprint, lifestyle, sustainability

**Skills:** lifestyle analysis, critical thinking

**Location:** indoors

**Time:** 1 hour

**Materials:** chart paper, colored markers (blue, green, brown, and black), copy of Personal Eco-Footprint Calculator for each student



Tim Turner

*Students calculating their ecological footprints at the Sea to Sky Outdoor School in British Columbia.*

Each of us consumes some of the Earth's products and services every day. How much we take depends on the ways in which we satisfy our needs and wants — the many habits that together create our lifestyle. We can ask ourselves these questions to get a better sense of what these habits are: How much water do I use on a typical day? What do I eat and how much do I eat? How much food do I waste? How do I transport myself and how far do I go? How much clothing and footwear do I have and how often do I replace it? What and how much stuff do I buy? How much energy and materials are required to keep me dry and warm/cool? How much garbage do I produce? How much land and energy is used for my recreational activities?

Our answers to these questions reflect the demand that each of us places on nature. In the 1990s, sustainability gurus Mathis Wackernagel and Bill Rees coined the term “ecological footprint” to refer to the load or demand that we place on the Earth's resources. An ecological footprint is a measure of how much of the Earth's biologically productive land and water is needed to produce our food, material goods, and energy, and to absorb our waste.

Having students calculate their ecological footprint gives them a concrete understanding of their own personal impact on the Earth's systems and offers a means of assessing the sustainability of their lifestyles. More than that, engaging students in an ecological footprint analysis elicits curiosity, enthusiasm, and genuine interest in taking action to reduce the demand they place on nature. Students like the fact that the analysis focuses on their own lives, and they understand its clear message: that their choices — and hence they, themselves — can make a difference. Calculating one's ecological footprint reinforces the notion that sustainability is a journey and not a destination and that it is participatory, not a spectator sport. It serves as a simple guide to living, working, and playing in ways that don't cost the Earth.

## How much Earth do we have?

Our “living” Earth has a surface area of 51 billion hectares, but less than one quarter of this — under 12 billion hectares — is biologically productive for human use. This is the amount of land available on the planet to

provide all of the food, water, and other materials that we need to support ourselves. To help students visualize this, create a pie graph that shows how the Earth's surface area is divided.

1. Begin by drawing a large circle on chart paper. Explain that the circle represents the surface area of the Earth.
2. Draw lines to divide the pie into land and water: 28 percent of the Earth's surface is land and 72 percent is water.

3. Focusing on the 28 percent of the pie that is land:

- color about two-thirds of the land area green to represent the 19 percent of Earth's surface that is biologically productive for human use (i.e., land that is fertile enough to support agriculture, forests, or animal life).
- color the other third of the land area brown to represent the 9 percent of Earth's surface that is marginally productive or unproductive for human use (e.g., land that is paved, covered by ice, lacks water, or has unsuitable soil conditions).

4. Explain that processes such as desertification, soil erosion, and urbanization are constantly reducing the amount of biologically productive land on Earth. To show this, draw small brown tentacles reaching from the border of the brown segment into the green segment.

5. Now, focusing on the water realm:
  - color about one-twentieth of the water section blue to show that 4 percent of the Earth's surface is lakes and oceans that are biologically productive for human use (i.e., yield more than 95 percent of the global fish catch).
  - color the remaining section black to show that 68 percent of the Earth's surface is ocean that is marginally productive or unproductive for human use (i.e., yields only about 5 percent of the global fish catch).

6. Draw black "tentacles" from the unproductive-water segment to the productive-water segment to represent processes that contribute to loss of

fertility in lakes and oceans. These include the destruction of coral reefs, oil spills, overfishing (of both marine and lake species), and shoreline development.

7. This leaves a pie chart featuring four segments of varying sizes — an excellent picture of our "living" planet. Label the sections, noting the percentage of the Earth's surface that each represents and listing the forces represented by the "tentacles."

**Wrap-up:** Remind students that only the green and blue sections — about 23 percent of the Earth's surface — are biologically productive. This small percentage of land and water is all we have to produce all of our food, materials, and energy, and to absorb our waste. These

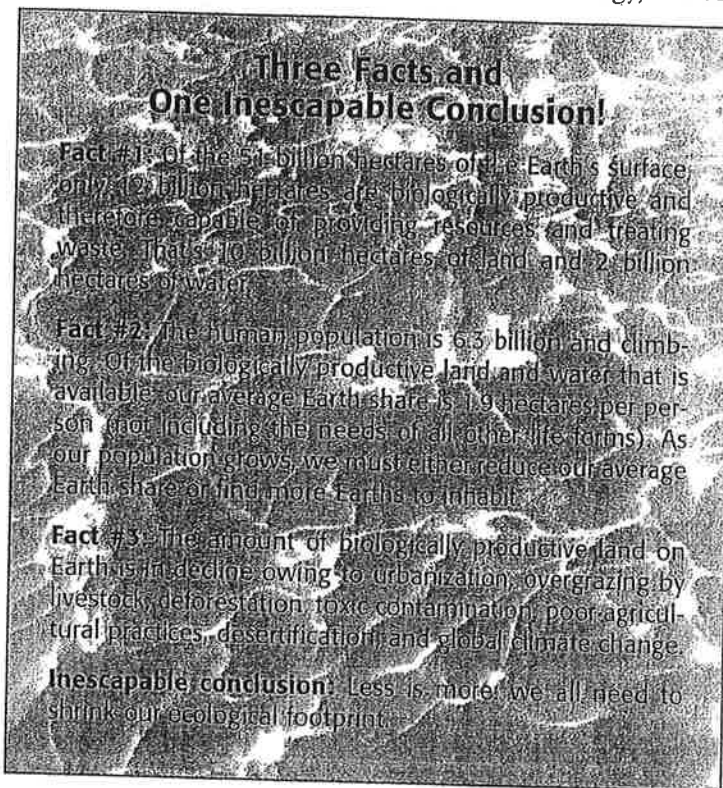
precious slices of the Earth's surface are also needed by the other 10 million or more species with whom we share the planet.

## Calculating a footprint

Have students complete the Personal Eco-Footprint Calculator to estimate how much of the Earth's biologically productive land and water is needed to support their own lifestyles. The calculator is divided into eight categories that represent the many ways that we "consume" nature each day. Explain to students that it is not a scientific survey, but it

does give a good approximation of the impact of one's lifestyle on a typical day. More detailed lifestyle analyses include other considerations that usually increase the size of one's ecological footprint. Therefore, the calculation derived from this calculator should be seen as a simplification and an underestimate of reality.

Students may point out that some lifestyle choices, such as the size of their house or the number of family cars, are not under their direct control. Explain that the calculator is meant to provide a snapshot of their lives at present, and that the baseline information they gather will help them to monitor the impact of changes they make in their lifestyles. They may, for example, make different choices if they purchase their own house or car in the future. The connection between these lifestyle considerations and their future ecological footprints is an important learning outcome of using the Footprint Calculator.





## Personal Eco-Footprint Calculator

Procedure: Complete each of the charts for a typical day in your home community. Add the points on each chart to obtain a subtotal for that category, and transfer it to the summary chart. Use the grand total to calculate your ecological footprint.

### Water Use

- |  |                 |
|--|-----------------|
|  | <b>My Score</b> |
| 1. My shower (or bath) on a typical day is:              | _____           |
| No shower / no bath (0)                                  |                 |
| 1-2 minutes long / one-fourth full tub (50)              |                 |
| 3-6 minutes long / half full tub (70)                    |                 |
| 10 or more minutes long / full tub (90)                  |                 |
| 2. I flush the toilet:                                   | _____           |
| Every time I use it (40)                                 |                 |
| Sometimes (20)   |                 |
| 3. When I brush my teeth, I let the water run. (40)      | _____           |
| 4. I washed the car or watered the lawn today. (80)      | _____           |
| 5. We use water-saving toilets (6-9 liters/flush). (-20) | _____           |
| 6. We use low-flow showerheads (-20)                     | _____           |
| 7. I use a dishwasher on a typical day. (50)             | _____           |
| <b>Subtotal:</b>   | _____           |

### Food

- |   |                 |
|---|-----------------|
|   | <b>My Score</b> |
| 1. On a typical day, I eat:                       | _____           |
| Beef (150/portion)                                |                 |
| Chicken (100/portion)                             |                 |
| Farmed fish (80/portion)                          |                 |
| Wild fish (40/portion)                            |                 |
| Eggs (40/portion)                                 |                 |
| Milk/dairy (40/portion)                           |                 |
| Fruit (20/portion)                                |                 |
| Vegetables (20/portion)                           |                 |
| Grains: bread, cereal, rice (20/portion)          |                 |
| 2. _____ of my food is grown locally.             | _____           |
| All (0)   |                 |
| Some (30)   |                 |
| None (60)   |                 |
| 3. _____ of my food is organic.                   | _____           |
| All (0)   |                 |
| Some (30)   |                 |
| None (60)   |                 |
| 4. I compost my fruit/vegetable scraps and peels. | _____           |
| Yes (-20)   |                 |
| No (60)   |                 |
| 5. _____ of my food is processed.                 | _____           |
| All (100)   |                 |
| Some (30)   |                 |
| None (0)  |                 |
| 6. _____ of my food has packaging.                | _____           |
| All (100)   |                 |
| Some (30)   |                 |
| None (0)  |                 |
| 7. On a typical day, I waste:                     | _____           |
| None of my food (0)                               |                 |
| One-fourth of my food (100)                       |                 |
| One-third of my food (150)                        |                 |
| Half of my food (200)                             |                 |
| <b>Subtotal:</b>                                  | _____           |

### Transportation

- |   |                 |
|---|-----------------|
|   | <b>My Score</b> |
| 1. On a typical day, I travel by:   | _____           |
| Foot (0)  |                 |
| Bike (5 per use)  |                 |
| Public transit (30 per use)   |                 |
| Private vehicle (200 per use)   |                 |
| 2. Our vehicle's fuel efficiency is _____ liters/100 kilometers (gallons/60 miles). | _____           |
| less than 6 liters / 2 gallons (-50)  |                 |
| 6-9 liters / 2-2½ gallons (50)  |                 |
| 10-13 liters / 3-3½ gallons (100)   |                 |
| More than 13 liters / 3½ gallons (200)  |                 |
| 3. The time I spend in vehicles on a typical day is:                                | _____           |
| No time (0)   |                 |
| Less than half an hour (40)   |                 |
| Half an hour to 1 hour (60)   |                 |
| More than 1 hour (100)  |                 |
| 4. How big is the car in which I travel on a typical day?                           | _____           |
| No car (-20)  |                 |
| Small (50)  |                 |
| Medium (100)  |                 |
| Large (SUV) (200)   |                 |
| 5. Number of cars in our driveway?  | _____           |
| No car (-20)  |                 |
| 1 car (50)  |                 |
| 2 cars (100)  |                 |
| More than 2 cars (200)  |                 |
| 6. On a typical day, I walk/run for:  | _____           |
| 5 hours or more (-75)   |                 |
| 3 to 5 hours (-25)  |                 |
| 1 to 3 hours (0)  |                 |
| Half an hour to 1 hour (10)   |                 |
| Less than 10 minutes (100)  |                 |
| <b>Subtotal:</b>  | _____           |

### Shelter

- |   |                 |
|---|-----------------|
|   | <b>My Score</b> |
| 1. Number of rooms per person (divide number of rooms by number of people living at home) | _____           |
| Fewer than 2 rooms per person (10)  |                 |
| 2 to 3 rooms per person (80)  |                 |
| 4 to 6 rooms per person (140)   |                 |
| 7 or more rooms per person (200)  |                 |
| 2. We share our home with nonfamily members. (-50)  | _____           |
| 3. We own a second, or vacation home that is often empty.                                 | _____           |
| No (0)  |                 |
| We own/use it with others. (200)  |                 |
| Yes (400)   |                 |
| <b>Subtotal:</b>  | _____           |

# Personal Eco-Footprint Calculator

## Energy Use

- |   |          |  |
|---|----------|--|
| 1. In cold months, our house temperature is:                            | My Score |  |
| Under 15°C (59°F) (-20)   | _____    |  |
| 15 to 18°C (59 to 64°F) (50)  |          |  |
| 19 to 22°C (66 to 71°F) (100)   |          |  |
| 22°C (71°F) or more (150)   |          |  |
| 2. We dry clothes outdoors or on an indoor rack.                        | _____    |  |
| Always (-50)  |          |  |
| Sometimes (20)  |          |  |
| Never (60)  |          |  |
| 3. We use an energy-efficient refrigerator.                             | _____    |  |
| Yes (-50)   |          |  |
| No (50)   |          |  |
| 4. We use compact fluorescent light bulbs.                              | _____    |  |
| Yes (-50)   |          |  |
| No (50)   |          |  |
| 5. I turn off lights, computer, and television when they're not in use. | _____    |  |
| Yes (0)   |          |  |
| No (50)   |          |  |
| 6. To cool off, I use:  | _____    |  |
| Air conditioning: car / home (30 for each)                              |          |  |
| Electric fan (-10)  |          |  |
| Nothing (-50)   |          |  |
| 7. Outdoors today, I spent:   | _____    |  |
| 7 hours (0)   |          |  |
| 4 to 6 hours (10)   |          |  |
| 2 to 3 hours (20)   |          |  |
| 2 hours or less (100)   |          |  |
| <b>Subtotal:</b>  | _____    |  |

## Clothing

- |   |          |  |
|---|----------|--|
| 1. I change my outfit every day and put it in the laundry. (80) | My Score |  |
| 2. I am wearing clothes that have been mended or fixed. (-20)   | _____    |  |
| 3. One-fourth of my clothes are handmade or secondhand. (-20)   | _____    |  |
| 4. Most of my clothes are purchased new each year. (120)        | _____    |  |
| 5. I give the local thrift store clothes that I no longer wear. | _____    |  |
| Yes (0)   |          |  |
| No (100)  |          |  |
| 6. I buy hemp instead of cotton shirts when I can. (-10)        | _____    |  |
| 7. I never wear ___ % of the clothes in my cupboard.            | _____    |  |
| Less than 25% (25)  |          |  |
| 50% (50)  |          |  |
| 75% (75)  |          |  |
| More than 75% (100)   |          |  |
| 8. I have ___ pairs of shoes.                                   | _____    |  |
| 2 to 3 (20)   |          |  |
| 4 to 6 (60)   |          |  |
| 7 or more (90)  |          |  |
| <b>Subtotal:</b>  | _____    |  |

## Stuff

- |  |          |  |
|--|----------|--|
| 1. All my garbage from today could fit into a:               | My Score |  |
| Shoebox (20)   | _____    |  |
| Large pail (60)  |          |  |
| Garbage can (200)  |          |  |
| No garbage created today! (-50)                              |          |  |
| 2. I reuse items rather than throw them out. (-20)           | _____    |  |
| 3. I repair items rather than throw them out (-20)           | _____    |  |
| 4. I recycle all my paper, cans, glass, and plastic. (-20)   | _____    |  |
| 5. I avoid disposable items as often as possible.            | _____    |  |
| Yes (-10)  |          |  |
| No (60)  |          |  |
| 6. I use rechargeable batteries whenever I can. (-30)        | _____    |  |
| 7. Add one point for each dollar you spend in a typical day. | _____    |  |
| Today was a Buy Nothing Day (0)                              | _____    |  |
| <b>Subtotal:</b>   | _____    |  |

## Fun

- |   |          |  |
|---|----------|--|
| 1. For typical play, the land converted into fields, rinks, pools, gyms, ski slopes, parking lots, etc., added together occupy: | My Score |  |
| Nothing (0)   | _____    |  |
| Less than 1 hectare / 2½ acres (20)   |          |  |
| 1 to 2 hectares / 2½ to 5 acres (60)  |          |  |
| 2 or more hectares / 5 or more acres (100)  |          |  |
| 2. On a typical day, I use the TV or computer   | _____    |  |
| Not at all (0)  |          |  |
| Less than 1 hour (50)   |          |  |
| More than 1 hour (80)   |          |  |
| 3. How much equipment is needed for typical activities?   | _____    |  |
| None (0)  |          |  |
| Very little (20)  |          |  |
| Some (60)   |          |  |
| A lot (80)  |          |  |
| <b>Subtotal:</b>  | _____    |  |

## Summary

Transfer your subtotals from each section and add them together to obtain the grand total.

- Water use \_\_\_\_\_
- Food \_\_\_\_\_
- Transportation \_\_\_\_\_
- Shelter \_\_\_\_\_
- Energy Use \_\_\_\_\_
- Clothing \_\_\_\_\_
- Stuff \_\_\_\_\_
- Fun \_\_\_\_\_
- Grand Total:** \_\_\_\_\_

My ecological footprint is:  
 Grand Total divided by 100 = \_\_\_\_\_ hectares  
 (to convert to acres, multiply hectares by 2.47)

## Sharing Earth fairly

Once students have calculated their ecological footprints, they can compare their results with others and determine whether the Earth could sustain the human population if everyone lived as they do.

1. Have students consider how their results compare with the following average ecological footprints:  
United States: 10 hectares (24 acres) per person  
Canada: 9 hectares (22 acres) per person  
Italy: 4 hectares (9 acres) per person  
Pakistan: less than 1 hectare (2 acres) per person
2. Have students calculate how much of Earth's biologically productive land is available to each person on the planet. To do this, they divide the total area of biologically productive land (12 billion hectares) by the number of people on the planet (about 6.3 billion). This amount (1.9 hectares / 4.7 acres per person) is known as the Average Earth Share.
3. Have students calculate how many Earths would be needed if every human had an ecological footprint the size of theirs. To do this, they divide their ecological footprint by the Average Earth Share. (If the ecological footprint is in acres, divide by 4.7; if it is in hectares, divide by 1.9.) Discuss: How many additional Earths would be needed to meet human demands if everyone lived as we do? What insights come from this knowledge?

**Wrap-up:** To follow up, remind students that the limited amount of biologically productive land that supports us also needs to provide food, water, and shelter for more than 10 million other species. These needs were not factored into the Average Earth Share, which represents the needs of humanity only. Consider, too, the implications of living in a world where 80 percent of the human family use 20 percent of available resources, while 20 percent (i.e., those of us in wealthier countries) use 80 percent of available resources.

### Extensions:

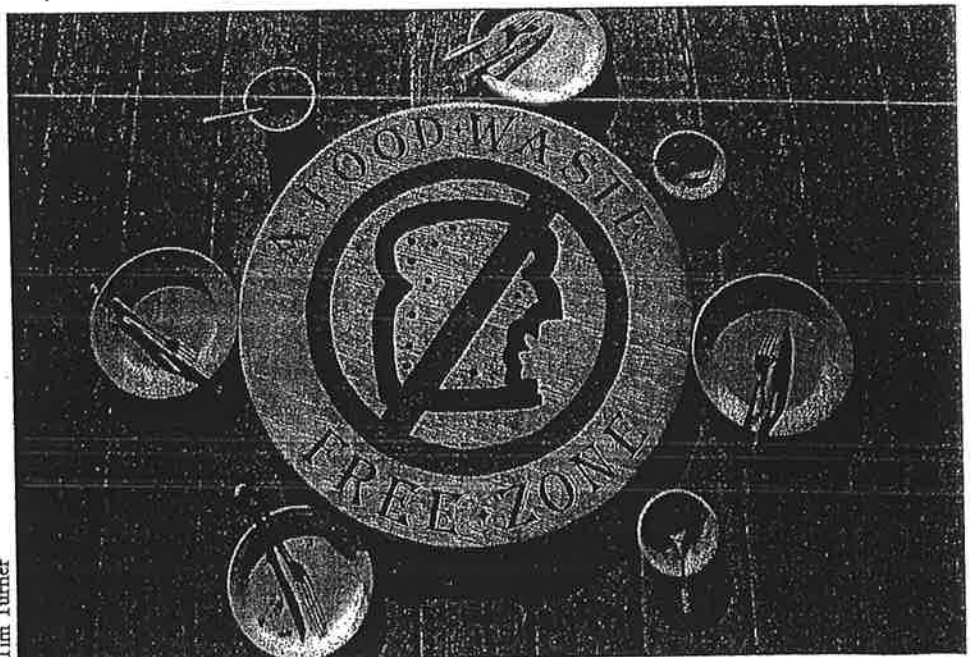
- An ecological footprint calculation provides a baseline from which to measure progress toward a smaller footprint and a more sustainable lifestyle. Challenge students to set goals for themselves in each lifestyle category (i.e., to eat less meat or to spend more time outdoors) and have them calculate their footprints again after an agreed-upon interval of time.

- The Personal Eco-Footprint Calculator assumes that the habits identified reflect how one always lives; however, we know that lifestyle is influenced by factors such as a person's age or time of year, and an ecological footprint will expand or shrink accordingly. Many residential outdoor and environmental education centers ask visiting students to calculate their ecological footprint twice: the first calculation is based on their activities on a typical day at the center, while the second is based on their daily routines and habits at home. Students often find that their ecological footprint is as much as 400 percent larger at home, yet most agree that the simplified living in the outdoor center ranks high on their quality-of-life index. This exercise provides a helpful comparison that debunks the myth that a person's quality of life is directly proportional to consumption.

*Tim Turner is a sustainability educator with the Sea to Sky Outdoor School located on Keats and Gambier islands in Howe Sound, northwest of Vancouver, British Columbia.*

### RESOURCES

- Wackernagel, Mathis, and William Rees. *Our Ecological Footprint: Reducing Human Impact on the Earth*. New Society Publishers, 1995.
- <[www.ecofoot.net](http://www.ecofoot.net)> The most extensive site for educators interested in using the ecological footprint tool with their students.
- <[www.panda.org/news\\_facts/publications/general/livingplanet](http://www.panda.org/news_facts/publications/general/livingplanet)> WWF's Living Planet Report lists the ecological footprints of 150 countries.
- <[www.davidsuzuki.org](http://www.davidsuzuki.org)> David Suzuki's Nature Challenge identifies the ten best things one can do to protect nature. This is an excellent follow-up project to help students in their ongoing efforts to shrink their ecological footprint.
- <[www.seatosky.bc.ca](http://www.seatosky.bc.ca)> The Sea to Sky Outdoor School website provides access to such teaching resources as the Ecospherotron, Lifesavers, and Earth 100, which complement the ecological footprint.



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