



United Nations
Educational, Scientific and
Cultural Organization



**MOUNT
ARROWSMITH**
BIOSPHERE REGION

BIOSPHERE BOOKLETS

Lesson Plans & Activities

ECOLOGICAL FOOTPRINTS

SUMMARY/OVERVIEW

Grades:
3-5

Prep Time:
5 Minutes

**Learning
Environment:**
Indoor

**Total Lesson
Length:**
2 hours

DESCRIPTION:

Utilizing the [Global Footprint Networks Footprint calculator](#), this booklet has students reflect on their consumption patterns to determine their ecological footprint.

Students will have the opportunity to learn about their impact on the planet and set sustainable goals in order to reduce their ecological footprints.

CURRICULUM EXPECTATIONS:

Questioning and predicting:

- Make predictions and develop explanations for results.
- Identify questions about familiar objects and events that can be investigated scientifically.

Processing and analyzing data and information:

- Experience and interpret the local environment.
- Compare results with predictions, suggesting possible reasons for findings.
- Identify patterns and connections in data.

BACKGROUND:

An ecological footprint is a measure that estimates the land and sea area needed to provide renewable resources that a population consumes and to absorb the waste they generate. Essentially, it is the supply and demand of nature. The Global Footprint Network designed a calculator to determine individual footprints and bring awareness to individual impact on planet earth. It is important to understand one's ecological footprint as it allows for a personal reflection of how our behaviors impact surroundings and natural resources.

LESSON PLAN

TIME	ACTIVITY	LOCATION	MATERIALS
1 hour	1. Introduction to Topic	Indoor	Printed worksheet
20 mins	2. Ecological Footprint Calculator	Indoor (at home)	Printed worksheet (and access to internet)
30 mins	3. Discussion and Reflection	Indoor	Printed worksheet
10 mins	4. Conclusion	Indoor	N/A

TIME	ACTIVITY	LOCATION	MATERIALS
1 hour	1. Introduction	Indoor	Printed worksheet

Introduction: Ecological Footprints

GOAL: Introduce the concept of ecological footprints and allow students to make predictions about their consumption habits.

PREPARATION: Print activity worksheet (page 3 and 4).

LESSON PLAN:

INTRODUCTION: Initial Discussion (20 mins)

1. Ask students if they know what an ecological footprint is. Explain that it is the total area of land required to **support** an activity or population. It includes environmental impacts such as water use, crop and grazing land for food production, resource production, and waste.
2. Show students the video below, titled "The Ecological Footprint Explained" by Moovly (1:20 mins) <https://www.youtube.com/watch?v=fACkb2u1ULY>
3. Introduce and explain the following concepts to students (from the global footprint network).
 - a. **Earth Overshoot Day**
 - i. Earth Overshoot Day in 2021 for the world was July 29. This means that if everyone continues to consume and utilize earth's resources the same way, by July 2021 they will have used as much from nature as earth can renew for the entire year.
 - b. **Global Hectares (Gha)**
 - i. Are biologically productive hectares (about 10,000 square meters, or about 2.5 times the size of a football field). Currently the planet has about 1.7 global hectares available per person (all of earth's productive area divided into the earth's human population).
 - c. **Planets Needed**
 - i. The calculator activity later shows us how many planets will be needed to support a lifestyle if everyone lived like "you". The number will reflect how many global hectares and planets are needed to support consumption habits.
 - d. **Carbon Footprint**
 - i. Is the amount of CO₂ emissions in tons that a person creates per year.

HANDS ON: Pre-Activity Worksheet (20 mins)

4. Hand out the **ACTIVITY HANDOUT WORKSHEET** (page 3 and 4).
5. Have students complete the worksheet individually (**pre-activity section ONLY**).
6. Once completed, ask students to share their answers with the class or in groups.

Activity Handout

Pre-Activity Section

1. Define “ecological footprint” in your own words:
2. What sustainable (“green”) actions do you and your family take to reduce your consumption? (E.g. walk to school, grow your own food, take the bus, turn off electronics when not in use, buy used or fixed things rather than brand new)
3. What areas of consumption (water, food, waste, travel) do you think are contributing to your ecological footprint most? Least?
4. If everyone lived like you, how many earths do you **think** we will need to support everyone? (Note: this is just a prediction. Do you think you have a small or a high natural resource consumption?)

STOP HERE and wait for further instruction

Ecological Footprint Calculator Section

1. Go to <http://www.footprintcalculator.org/>
2. Click on “Take the First Step”
3. Complete the quiz. **You may need your family’s help to answer questions you are unsure about.** It is important to answer questions as honestly as possible.
4. Once finished, click “Skip to View My Results.” Then answer questions below.

Q1. What was your Earth overshoot day? _____

5. Hover over the orange icon beside the date, and answer the question below:



Q2. In your own words, what is an earth overshoot day?

Q3. How many planet earths would be required if everyone lived like you? _____ earths.

6. Next, click the orange "See Details" box, and answer the questions below.

Q4. Break down your ecological footprint.

(Scroll over consumption categories, and record number of GHA or global hectares needed to sustain your consumption habits)

_____ Food _____ Shelter _____ Mobility _____ Goods _____ Services

Q5. What is your ecological footprint? _____ GHA (global hectares).

Q6. What is your carbon footprint? _____ CO₂ emissions in tons per year.

7. Next, click the orange "How do you feel" box, choose one of the answers, based on how you feel about your results of the Ecological footprint.

Q7. What answer did you choose? Circle below.

Shocked Inspired Helpless Worried Embarrassed Confused

Q8. Please explain why you feel that way.

TIME	ACTIVITY	LOCATION	MATERIALS
20 mins	2. Ecological Footprint Calculator	Indoor	Printed worksheet

Ecological Footprint Calculator

GOAL: Complete the ecological footprint calculator from the *Global Footprint Network* to have students gain understanding about their consumption habits.

PREPARATION: N/A (worksheet already printed, pages 3-4).

LESSON PLAN:

ACTIVITY PREPARATION:

1. Inform students that the next activity is to calculate each of their ecological footprints based on their family’s consumption habits (pages 3-4, continue from where they stopped previously).
2. If in a classroom setting, complete the quiz with your students and explain how you are answering the questions along with how to answer worksheet questions.
 - a. Due to the nature of these questions, they may need family assistance to properly answer questions.

TAKE HOME ASSIGNMENT:

3. Have students complete the questionnaire online (at home), and fill out answers on the worksheet ([Ecological Footprint Calculator Section](#)).
4. Ask students to reflect and think about their answers and results.



TIME	ACTIVITY	LOCATION	MATERIALS
30 mins	3. Discussion and Reflection	Indoor	Printed worksheet

Reflection

GOAL: Have students reflect on what they have learned by answering questions and developing sustainable goals to reduce their ecological footprints.

PREPARATION: Print worksheet (page 7 and 8).

LESSON PLAN:

1. Go through the Ecological Footprint section of the prior worksheet with students, have them discuss their answers.
2. Afterwards, ask students how they feel their class did? Are there changes that can be made for more sustainable living/environmentally friendly living?
3. Have students complete the reflection questions on the [REFLECTION WORKSHEET](#), and use the [ecological footprint worksheet](#) to set goals for reducing their ecological footprints.
 - a. The [ecological footprint worksheet](#) has five sections (food, shelter, mobility, goods, and services) mentioned in the prior activity. Students must describe or draw ways they and their family can reduce their ecological footprint.

Reflection Worksheet

Q1. How do you think your ecological footprint compares to the class?

Q2. Was your prediction about how many planet earths you need correct? How far off were you?

Q2A. Why do you think your prediction was higher or lower?

Q3. What were your two highest consumption categories? (Food, shelter, mobility, goods, or services).

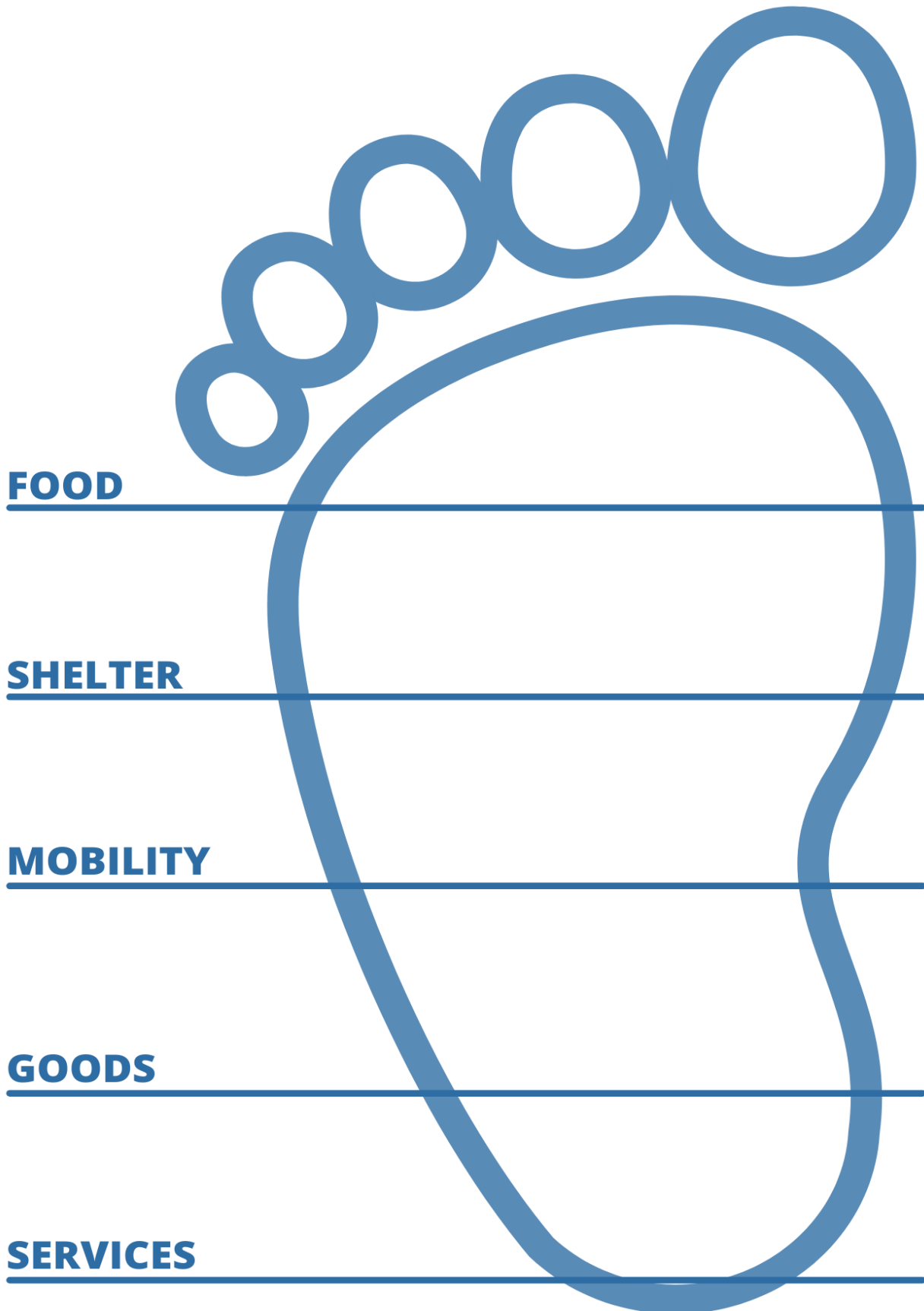
Q4. Why do you think these are your highest consumption categories?

Q5. Did this activity make you want to make changes to reduce your ecological footprint? Explain why.

Next activity instructions:

In the footprint below, there are five consumption categories (food, shelter, mobility, goods, and services) that affect your ecological footprint. Use words or pictures to describe how you will make efforts to **reduce** your **ecological footprint** and further your **earth overshoot day**.

Think: How can you reduce consumption? How can you live more sustainability? What areas are most important in your life?



TIME	ACTIVITY	LOCATION	MATERIALS
10 mins	4. Conclusion	Indoor	N/A

CONCLUSION

1. Have students discuss some of the ideas they came up with to reduce their ecological footprints. Some examples could include:
 - Walk to school
 - Eat more vegetables and less meat
 - Turn off lights when not in use
 - Shower instead of bath
 - Recycle more
 - Plant a garden
 - Play outside instead of using electronics
2. Ask students if this activity has made them think differently about how they will consume earth's resources.
3. Ask students what they can do as a class to reduce their ecological footprints.



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Show us your results! Snap a picture and share it with us on social media,
or email it to the MABR Coordinator at



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