



Sustainable Ecosystems - Eco-bottle Lab

Teach With Fergy - SAMPLE

The full version includes two versions of the lab in order to provide you with an option for your handout. If you'd like to give a copy to the students but don't want the extra spacing or pictures, simply print off the student version, 4 pages vs. 12. I've also converted the files to .pdf
If you have any questions or concerns, please feel free to send me an email.

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If you like what you see, please add me on TpT - <http://www.teacherspayteachers.com/Store/Teach-With-Fergy>

All sections of text that have been removed appear as

Your task

Every year humans pollute the skies and waterways, which harm the animals and plants that live there. Runoff from the fertilizer you use to make your lawn look nice, salt that keeps our roadways safe in winter and pesticides we use to keep bugs away from our crops and gardens all make their way into our ecosystems. Increases in CO₂ from cars and factories can lead to acid rain, which can severely impact living things. Collectively we call this impact "The Human Factor". The purpose of this lab is to have you plan and conduct an experiment that investigates how humans impact ecosystems and determine whether these actions are sustainable or not.

You will be investigating how your "human factor" impacts the quality of soil, water, and the organisms inside your ecosystem. You will be required to analyze the effect this 'human factor' has on the populations of terrestrial and aquatic organisms by interpreting your collected data and drawing conclusions.

The "Human Factor"

You must choose one treatment or "human factor" to investigate.

- Different chemical fertilizers
 - Treat your
-
-
-
-
-
- Oil
 - You can use a variety of oils here, usually vegetable oil is preferred.
-



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Your chosen Factor is: _____

You will be working in pairs with a single bottle each. The bottles can be small 500 ml/16 oz. or large, 1L/32 oz. One group member will supply the control bottle (nothing altered) while the other supplies the experimental bottle (where the human factor is introduced).

How to create your bottle:

Step 1:

Using scissors cut a small opening in your water bottle. Cut about 1/3 of the way down from the cap.

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Cut around the entire bottle until the top separates.

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Step 2:

Poke a small hole in the cap using the scissors or some other sharp object.



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Step 3:

Flip the top



Step 4:

Fill the bottom with



Your Lab Report

You will be submitting a lab report at the conclusion of this task, which must be typed and include the headings below. A rough area has been left below each to give you space for notes as you move through the lab.

Introduction:

Gather background information about the topic and make inferences based on this information. Come up with a question to investigate the effect of the human factor you choose on an aquatic and terrestrial ecosystem.

Variables:

.....

.....

Hypothesis:

Create an

Example: "If the height"

Design/ Procedure:

The design of the experiment is extremely important and will count for a great deal of your mark. A lab design includes all of the **numbered steps** (not a paragraph) necessary to reproduce the lab. Your lab needs to be repeatable by someone else.

1. Visualize doing the experiment yourself. Determine which steps need to be completed in a logical order.
2.
3.
4.
5. Be sure to include 5 or more variations of your independent variable in order to obtain a trend in the data.

Your design should be based on a **2.5 week timeframe** and should include:

- how often will you apply your treatment (i.e. every day, once a week)?
-
-
-

You will need to clearly show how your experimental design will answer your question.

Materials:

List the materials you will use in your experiment. Include materials to make the eco-bottle as well as those that will be applied to your eco-bottle (pesticides, fertilizer, etc.). This should be in point form.

Results:

1. Create a table to record all observations, both

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2. **Tables must have the following criteria:**

- a.
- b.

3. If you have quantitative data then you will have to display this data in a graph. **Graphs must have the following criteria:**

- a.
- b.
- c. Done

4. Calculations (if necessary) are performed here.

Discussion:

- Explain why the trends that were stated in the Results section occurred. You may need to think about the data and draw on background knowledge about the topic.
- State

Complete the following Discussion questions.

1. Would
2. What conditions
3. Explain what changes you

Conclusion:

- Brings the lab to a close by summarizing the findings and either accepting or rejecting the original hypothesis.
- Written in

Must include three main statements:

- The hypothesis
- The
- Therefore the

Eco-bottle Lab Rubric

Student names: _____ & _____

/40

	Exceeds expectations	Meets expectations	Not quite meeting expectations	Needs significant improvement	Well below expectations
	Level 4	Level 3 Description (all boxes checked)	Level 2	Level 1	R
Introduction		<input type="checkbox"/> <input type="checkbox"/>			
Hypothesis		<input type="checkbox"/> <input type="checkbox"/>			
Lab Design		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Results		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Discussion		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Conclusion		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Conventions		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Creativity		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Lab Skills		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
Work Ethic		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			

Teacher marking note:

Each requirement can receive a maximum mark of 4 for that section. There are ten sections so the lab is out of 40 marks total.

If the student checks off all the boxes within the section they receive a Level 3 (3 marks). Going above and beyond allows them to earn that extra mark in each section. Going above and beyond can mean including additional research, pictures, expressing a deeper understanding, etc.

Please find below a series of enlarged pictures which better show what you and your students should expect during the lab.





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