

Ecosystem in a Jar

Name: _____ Period: _____

Purpose: To build an aquatic ecosystem which can maintain itself. To understand the parts of an ecosystem and the cycles within it.

Materials: A large glass jar (provided by teacher) Please list all materials you will be using. Next to each material justify its purpose. Ex. UV Light- represents the sunlight, continually adding energy

Experimental Design: Draw a picture of your ecosystem and label all organisms within it.

Background Information:

Draw the functioning food web in your ecosystem

Draw an energy pyramid for your ecosystem. Explain how you will balance your pyramid according to biomass (hint: do you have around 10% primary consumers biomass as compared to the biomass of your producers?)

Explain 3 ways energy will be lost in your ecosystem and how will you be certain your ecosystem does not run out of energy?

Diagram the movement of carbon, oxygen, nitrogen and water through your ecosystem. Prove that you have all the necessary components for these cycles to function.

Procedure:

Design the procedures necessary to build and maintain a working ecosystem for 2 weeks.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Hypothesis: (If we (describe what you are doing). . .then our ecosystem will survive for ____ days without help)

Data and Observations: (add additional days if needed)

Qualitative Data:

Written observations. Describe what it looks like, what is alive, what is dead, the interaction between different organisms etc. Use all your senses and be sure to be very detailed.

Quantitative Data:

Graph: Please graph biomass, dissolved oxygen, nitrogen and ammonia in your ecosystem over time. (Use a line graph)

Analysis Questions:

1. In what ways was your ecosystem successful?
2. What were its problems?
3. Which organisms were most numerous at the beginning? What about at the end? (Animals, plants, decomposers?)
4. Draw and label 3 different ecological pyramids for your ecosystem.

5. Explain how your energy pyramid changed over time?
6. Which cycles (carbon, oxygen, water, nitrogen) were working in your jar? How did you know?
7. Which cycles failed? What evidence do you have for their failure? Did any nutrients act as limiting factors?
8. If you were going to make another ecosystem what would you do differently?
9. Describe the original food chain in your jar. Be complete, remember that organisms can be tiny!
10. Draw the food chain in your jar one week into this activity. Draw the food chain at the end. How did it change?
11. Did water act as a limiting factor in anyway to your ecosystem? Why or why not?

Conclusion: In sentence format please explain 3 complete ideas you learned from this project. This should be at least 2 paragraph long. *Be prepared to discuss your results in class**