Lesson: Self-sustaining Ecosystem	Name:
Teacher:	Date:

Exploring Jar Ecosystems: Understanding How Living Things and Matter Interact

A jar ecosystem is a miniature world where plants, soil, water, air, and sometimes small organisms live together inside a sealed glass jar. In this closed environment, all the parts work together to create a balanced system. Plants use sunlight to make their own food and release oxygen, while water cycles through evaporation and condensation. Each layer in the jar, like pebbles, charcoal, and soil, has a special job to keep the ecosystem healthy. By observing your jar over time, you can see how living things and matter interact, how energy moves, and how important it is for everything to work together.

Fill in the Blank: Fill in the blank with the correct words.

1. A _____ system is one where matter does not enter or leave.
2. The process by which plants make food using sunlight is called _____.
3. In respiration, plants consume _____ and release _____.
4. The tiny cycle of water in the jar, including evaporation and condensation, is called the _____ cycle.
5. Organic material that breaks down to release nutrients is part of _____ cycling.

Word Bank: photosynthesis, nutrient, oxygen, closed, carbon dioxide, water

Multiple Choice Questions: Choose the correct answer from the choices for each question.

1. Which layer in the jar helps prevent mold growth?
   - a) Pebbles
   - b) Soil
   - c) Activated charcoal
   - d) Plants
2. What process allows plants to produce oxygen in the jar?
   - a) Respiration
   - b) Photosynthesis
   - c) Decomposition
   - d) Evaporation
3. What happens to water inside the jar ecosystem?
   - a) It evaporates and never returns
   - b) It circulates through condensation and precipitation
   - c) It disappears

   - d) It stays only in the soil
4. Why is it important to keep the jar sealed?
   - a) To prevent dust from entering
   - b) To maintain a closed environment where matter cycles naturally
   - c) To avoid watering the plants
   - d) To allow direct sunlight in
5. If the plants in the jar die, what will most likely happen?
   - a) The jar will stay the same
   - b) Oxygen levels will drop, affecting other organisms
   - c) Water will stop evaporating
   - d) Soil will disappear

Answer the following questions in complete sentences.

1. Describe the purpose of each of these layers in your jar: pebbles, charcoal, and soil.

   _____

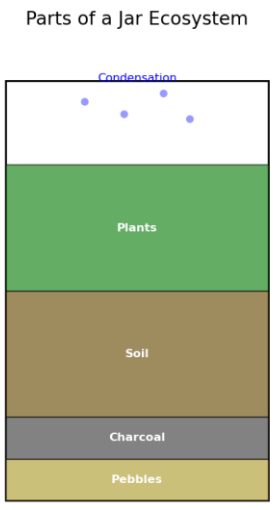
2. What changes did you notice in your jar over time? Include condensation, plant growth, and soil moisture.

   _____

3. How does your jar ecosystem demonstrate the cycling of matter and flow of energy?

   _____

Jar Ecosystem Diagram



ANSWER KEY

Fill in the Blank:

1. closed
2. photosynthesis
3. oxygen, carbon dioxide
4. water
5. nutrient

Multiple Choice:

1. c) Activated charcoal
2. b) Photosynthesis
3. b) It circulates through condensation and precipitation
4. b) To maintain a closed environment where matter cycles naturally
5. b) Oxygen levels will drop, affecting other organisms

Open Ended Example Responses:

1. Pebbles allow excess water to drain, preventing roots from sitting in water. Charcoal helps filter the water and stops mold from growing. Soil holds nutrients and supports the plants' roots.
2. Over time, I noticed drops of water (condensation) on the inside of the jar, the plants grew taller and had new leaves, and the soil sometimes looked wetter or drier depending on the time of day.
3. The jar ecosystem shows cycling of matter through the water cycle (evaporation and condensation), nutrient cycling when dead plant parts decompose, and energy flow from sunlight to plants during photosynthesis.