Science Investigates Life and Our Planet

A. Fill in the Blanks

Complete the sentences with the correct scientific term.

1. The process by which water vapor in the air turns into liquid water, forming clouds, is called _____.
2. Living or once-living components of an ecosystem are called _____ factors.
3. Molten rock found beneath the Earth's surface is called _____.
4. An organism that eats both plants and animals is known as an _____.
5. In an experiment, the variable that the scientist changes on purpose is the _____ variable.

B. Match the Following;

Match the term in Column A with its correct definition in Column B. Write the letter of the correct definition in the space provided.

Column A (Term)	Column B (Definition)
1. Photosynthesis	A. A large, moving piece of the Earth's lithosphere.
2. Ecosystem	B. A rock that has been changed by extreme heat and pressure.
3. Tectonic Plate	C. An educated guess or testable prediction for an observation.
4. Metamorphic Rock	D. The process plants use to convert light energy into food.
5. Hypothesis	E. A community of organisms and their non-living environment.

C. Practice Problems

These questions require a bit more thought. Write your answers in complete sentences where necessary.

1. Differentiate between a biotic factor and an abiotic factor. Give two examples of each.

2. Arrange the following levels of organization in order from simplest to most complex: Organism, Cell, Organ, Tissue, Organ System.
3. Describe the role of a decomposer (like fungi or bacteria) in a food web. Why are they essential?
4. What is the difference between weather and climate?
5. Explain how the movement of tectonic plates can cause an earthquake.
6. Draw a simple food chain with at least four levels. Label the producer, primary consumer, secondary consumer, and tertiary consumer. (Draw in the box below)

7. Name the three main types of rocks and briefly describe how each is formed.
8. What is a hypothesis? Why must it be testable?
9. List the four main stages of the water cycle.
10. What is the difference between a carnivore, an herbivore, and an omnivore?

D. Warm-up Questions

Answer these quick questions to get your brain warmed up!

1. What is the basic unit of all living things?
2. What is the name of the process plants use to make their own food using sunlight?
3. Name one non-living (abiotic) factor found in an ecosystem.
4. What is the outermost, rocky layer of the Earth called?
5. What is the first step of the scientific method?

E. Challenge Questions

Think critically and apply your knowledge to answer these challenging questions.

1. If a major predator (like a wolf) is removed from an ecosystem, what are two possible effects this could have on the populations of other organisms in its food web?
2. Explain the relationship between the rock cycle and plate tectonics. How do they influence each other?
3. A scientist wants to test the effect of different amounts of fertilizer on the height of tomato plants. Identify the independent variable, the dependent variable, and at least two controlled variables in this experiment.
4. Why is the Earth's core so important for life on the surface, even though we can't see or touch it? (Hint: Think about magnetism).
5. Describe one type of symbiotic relationship (mutualism, commensalism, or parasitism) and provide a real-world example.

F. Application Questions

Apply scientific concepts to real-world scenarios.

1. A hiker gets lost in a forest. List two abiotic factors and two biotic factors they must consider for their survival.
2. You find a rock that has clear layers of sand and small pebbles cemented together. What type of rock is it most likely to be, and how do you know?
3. Consider this food chain: Grass → Grasshopper → Frog → Snake. If a disease suddenly wipes out most of the frog population, what is the likely short-term effect on the grasshopper and snake populations?
4. A new city is built next to a large, ancient forest. List two potential negative impacts the city's growth could have on the forest ecosystem.
5. You observe that your houseplant's leaves are turning yellow. Formulate a simple, testable hypothesis to explain this observation.

G. True or False

1. All living things are made of organs. _____
2. The Earth's mantle is a completely solid, rigid layer. _____
3. Producers, like plants, get their energy by eating other organisms. _____
4. Climate describes the atmospheric conditions at a specific, short-term moment. _____
5. A food web shows a single, linear pathway of energy transfer in an ecosystem. _____