Clues to Life

Use evidence to compare bacteria, viruses, and crystals.

L.6.1.1 "Use argument supported by evidence in order to distinguish between living and non-living things, including viruses and bacteria."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline clues that support calling a sample living, and circle clues that support calling it nonliving. Use your marks to defend your answers with evidence.

Three Tiny Samples

1 At a science museum, a guide describes three tiny samples: pond bacteria, virus particles, and salt crystals. Each sample can appear to grow or increase in number, but these changes alone do not prove that something is alive. Scientists look for a set of clues: living things are made of cells, use energy, and can make more of their own kind. An individual may not do all these things at every moment. A sleeping animal still has living cells. Scientists compare several clues before making a claim.

2 The pond bacteria are each made of one cell. In warm water with food, a bacterium takes in nutrients and uses them for energy. Its cell grows, then divides into two cells. Each new cell can take in food and divide again. A bacterium does not need to enter another organism's cells to make more bacteria. A colony can form on a dish, but the colony is not a single giant creature. It is a group of many tiny living cells.

3 A virus has genetic instructions inside a protective coat, but it is not a cell. Outside a host cell, it cannot take in food or make copies of itself. Once it enters a living cell, it uses that cell's tools to make new virus particles. Most scientists classify viruses as nonliving. Salt crystals also seem to grow: dissolved salt can stick to a crystal and make it larger. But a crystal has no cells, uses no food for energy, and does not carry out a cell's life processes. Growth alone is not proof of life.

2 ANSWER WITH EVIDENCE

Use the passage

1. Are the pond bacteria living? Support your claim with two clues from the passage.

2. A virus has genetic instructions. Why do most scientists still classify it as nonliving? Give two pieces of evidence.

3. A salt crystal can get larger. Why is that not enough evidence to call it living?

4. An exhibit label says, "Anything that becomes more numerous is living." Use evidence about two samples to explain why the label is misleading.

3 YOUR TURN

Your own words

Imagine a newly found soil speck: it has one cell, takes in nutrients, and uses them for energy, but no one has seen it divide. Write three sentences that state whether it is likely living, give two clues as evidence, and suggest one observation that could strengthen or change your claim.

ANSWER KEY

Clues to Life

GRADE 6 · L.6.1.1

PART 1 · READ AND MARK

Underline clues that support calling a sample living, and circle clues that support calling it nonliving. Use your marks to defend your answers with evidence. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Are the pond bacteria living? Support your claim with two clues from the passage.	**Yes. Each bacterium is a cell, uses nutrients for energy, and can divide into new cells. Accept any two of these clues.**
2	A virus has genetic instructions. Why do most scientists still classify it as nonliving? Give two pieces of evidence.	**A virus is not a cell, and it cannot take in food or make copies of itself outside a host cell. Accept any two of these clues.**
3	A salt crystal can get larger. Why is that not enough evidence to call it living?	**It gets larger when dissolved salt sticks to it, but it has no cells and does not use food for energy.**
4	An exhibit label says, "Anything that becomes more numerous is living." Use evidence about two samples to explain why the label is misleading.	**Bacteria can divide on their own and are living cells. Viruses can become more numerous only by using a host cell, so increasing in number alone does not show that something is living.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The soil speck is likely living, although its ability to reproduce is still unknown. It has a cell and uses nutrients for energy, which are two clues of life. I would watch it in a dish with food to see whether its cell divides.

Accept supported claims that distinguish a single clue, such as growth or increasing in number, from the combined evidence for life. For Your Turn, accept a cautious claim if the student uses both given clues and proposes an observation related to reproduction.