

Built From Within

Trace how small parts build a living organism.

SC.6.L.14.1 "Describe and identify patterns in the hierarchical organization of organisms from atoms to molecules and cells to tissues to organs to organ systems to organisms."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each word or phrase that names a level of organization. Number the first appearance of each level 1 through 7 to show the order from smallest to largest.

A Runner's Working Body

- ① During a sprint, a runner's body works as a set of nested levels. At the smallest level, atoms such as carbon, hydrogen, and oxygen are particles of matter. Atoms join in fixed arrangements to make molecules. For example, glucose is a molecule that stores chemical energy, and water is another molecule. Molecules are much smaller than a cell. Cells use molecules to carry out life functions, including releasing energy from glucose for movement and repair.
- ② A heart muscle cell is one living unit that contracts. Many similar heart muscle cells, along with material around them, form cardiac muscle tissue. The heart contains cardiac muscle tissue plus other tissues, so it is an organ. The heart and blood vessels work together in the circulatory system. This organ system moves blood through the runner's body. The runner, made of many organ systems working together, is one organism with a coordinated internal environment.
- ③ The order from atoms to organisms is a hierarchy because each larger level is built from the levels before it. Atoms make molecules, molecules are parts of cells, and similar cells make tissues. Different tissues combine in organs. Organs work together in organ systems, while organ systems together make an organism. A level can have a special job, yet it also depends on the levels around it. This repeating build-up helps scientists organize and study living things.

2 ANSWER WITH EVIDENCE Use the passage

- 1 A sample contains atoms joined in fixed arrangements, but it is not a cell. What level of organization is the sample? Explain why.

- 2 A scientist observes many similar cells working together. What level of organization do the cells form?

- 3 A structure contains several different tissues working together as one body part. What level of organization is the structure?

- 4 How is an organ system different from an organism?

3 YOUR TURN Your own words

Choose an organism not named in the passage, and use outside knowledge or a reliable source. Write seven labeled lines that trace one connected path from an atom to that organism, showing how each example is part of the next level.

PART 1 • READ AND MARK

Underline each word or phrase that names a level of organization. Number the first appearance of each level 1 through 7 to show the order from smallest to largest. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	A sample contains atoms joined in fixed arrangements, but it is not a cell. What level of organization is the sample? Explain why.	It is a molecule because atoms join in fixed arrangements to make molecules.
2	A scientist observes many similar cells working together. What level of organization do the cells form?	They form a tissue.
3	A structure contains several different tissues working together as one body part. What level of organization is the structure?	It is an organ.
4	How is an organ system different from an organism?	An organ system is a group of organs working together. An organism is made of many organ systems working together.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Atom: carbon atom in a glucose molecule Molecule: glucose molecule in a cardiac muscle cell Cell: cardiac muscle cell in cardiac muscle tissue Tissue: cardiac muscle tissue in a dog's heart Organ: heart in the circulatory system Organ system: circulatory system in a dog Organism: dog

For Questions 1 through 4, accept only the hierarchy levels and relationships supported by the passage. In the open task, accept other organisms and examples when all seven levels are in order and each example is correctly connected to the next level.