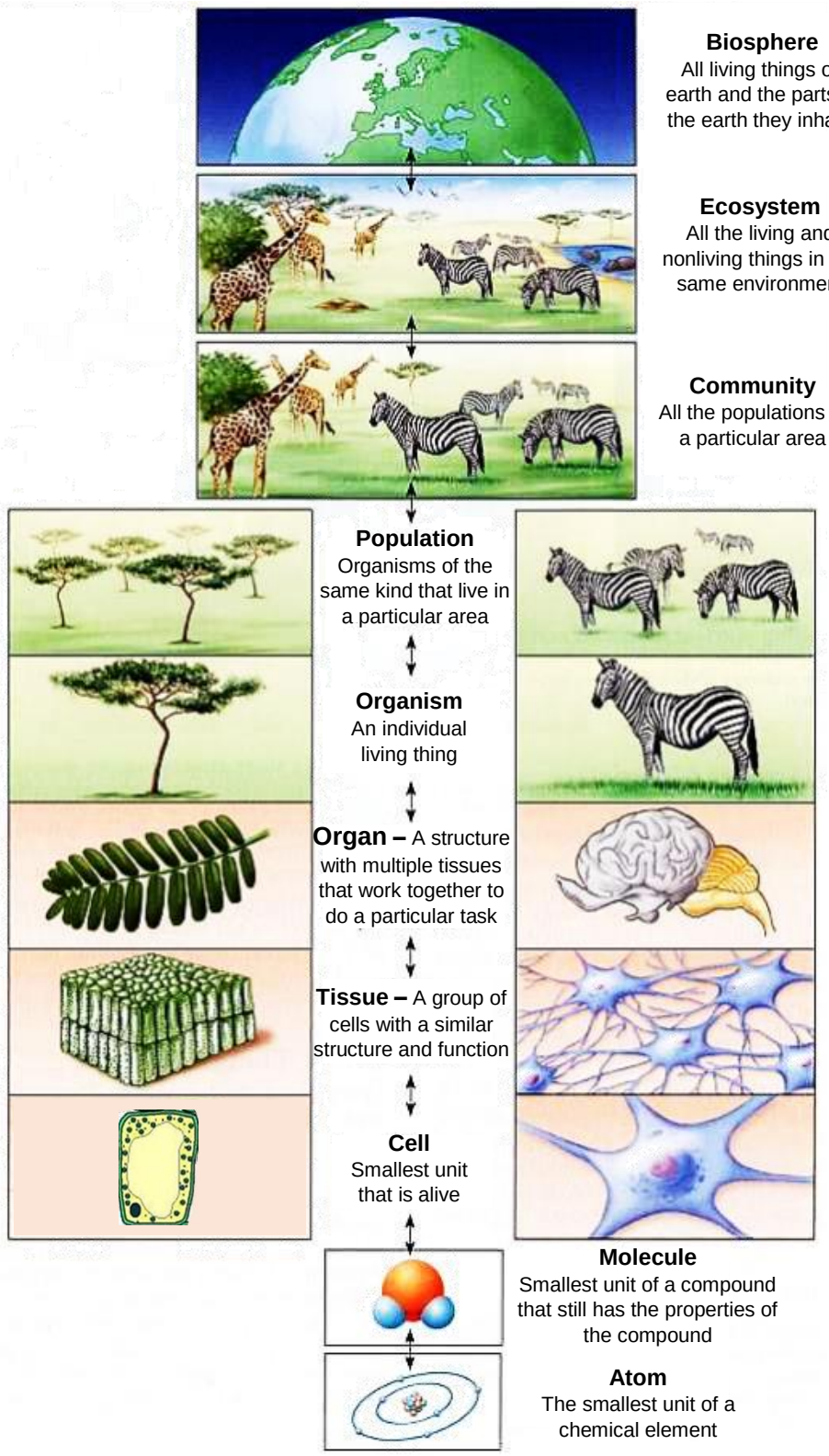
Levels of Organization in Biology[1]

1. This figure shows examples of the levels of organization for an African savanna ecosystem. Fill in the blanks on the right to give examples for a population of frogs living in a pond.



Biosphere
All living things on earth and the parts of the earth they inhabit

Ecosystem
All the living and nonliving things in the same environment

Community
All the populations in a particular area

Population
Organisms of the same kind that live in a particular area

Organism
An individual living thing

Organ – A structure with multiple tissues that work together to do a particular task

Tissue – A group of cells with a similar structure and function

Cell
Smallest unit that is alive

Molecule
Smallest unit of a compound that still has the properties of the compound

Atom
The smallest unit of a chemical element

Examples for a population of frogs living in a pond

_____

_____

_____Frogs in the pond _____

_____

_____

_____

_____

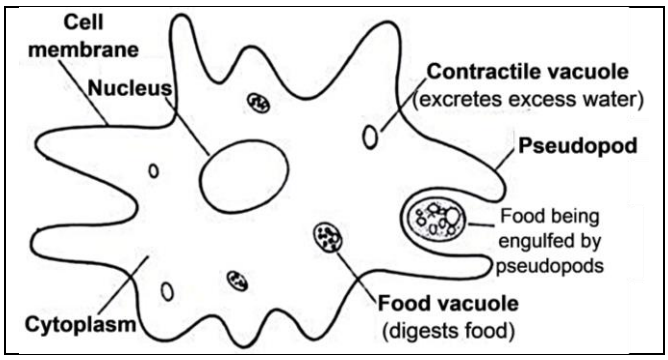
_____

[1] By Dr. Ingrid Waldron, Department of Biology, University of Pennsylvania, and Bradley String, Ridley High School, © 2023. This Student Handout, a PowerPoint presentation, and Teacher Notes with suggested questions and points to include in the PowerPoint presentation are available at https://serendipstudio.org/exchange/bioactivities/LevelsOrganization.

2. The figure in question 1 states that a cell is the smallest unit that is alive. List three characteristics of life that cells have and molecules like water and oxygen do not have.

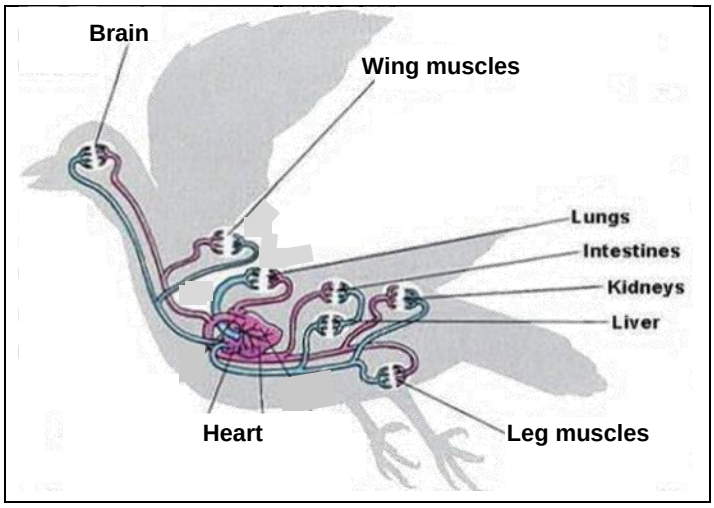
3a. An amoeba is a tiny single cell organism. This figure shows some of the structures in an amoeba. If a scientist took all the molecules in an amoeba and mixed these molecules in a test tube, do you think that this mixture of molecules would be alive?

yes ___ no ___



3b. Explain your reasoning.

In this figure, the labels indicate the heart and the locations of small blood vessels where molecules like oxygen can enter or leave the blood.



4. Explain how the parts of the circulatory system work together to help the bird fly.

5. Give an example to illustrate how a property or ability is only observed at a larger level of biological organization, and not observed in the component parts.

6. Give an example to illustrate how scientists can better understand a complex system by studying its smaller component parts.

7. Match each item in the list on the left with the best match from the list on the right.

_____ Biosphere	A. All living things on earth and the parts of the earth they inhabit
_____ Cell	B. A group of atoms bonded together
_____ Community	C. A group of one kind of organism living in an area
_____ Ecosystem	D. A group of similar cells working together
_____ Molecule	E. Populations of different types of organisms living together
_____ Organ	F. A living individual which contains one or more cells
_____ Organ System	G. A structure with several tissues that work together to accomplish a function
_____ Organelle	H. All the living and nonliving things in the same environment
_____ Organism	I. Parts of a cell such as the nucleus
_____ Population	J. A group of organs working together
_____ Tissue	K. Smallest level at which life exists

8. In the first column below, put the levels of organization listed above in order from smallest to largest. Then, give examples of each level of organization for an amoeba population living in a pond. Use a dash (–) to indicate each level of organization that is not observed in an amoeba.

Level of Organization	Examples for an Amoeba Population Living in a Pond
Smallest:	
Largest:	