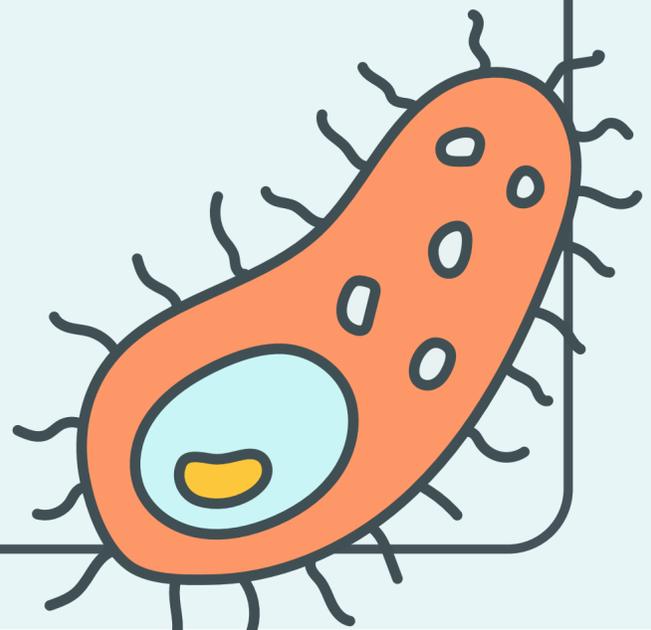
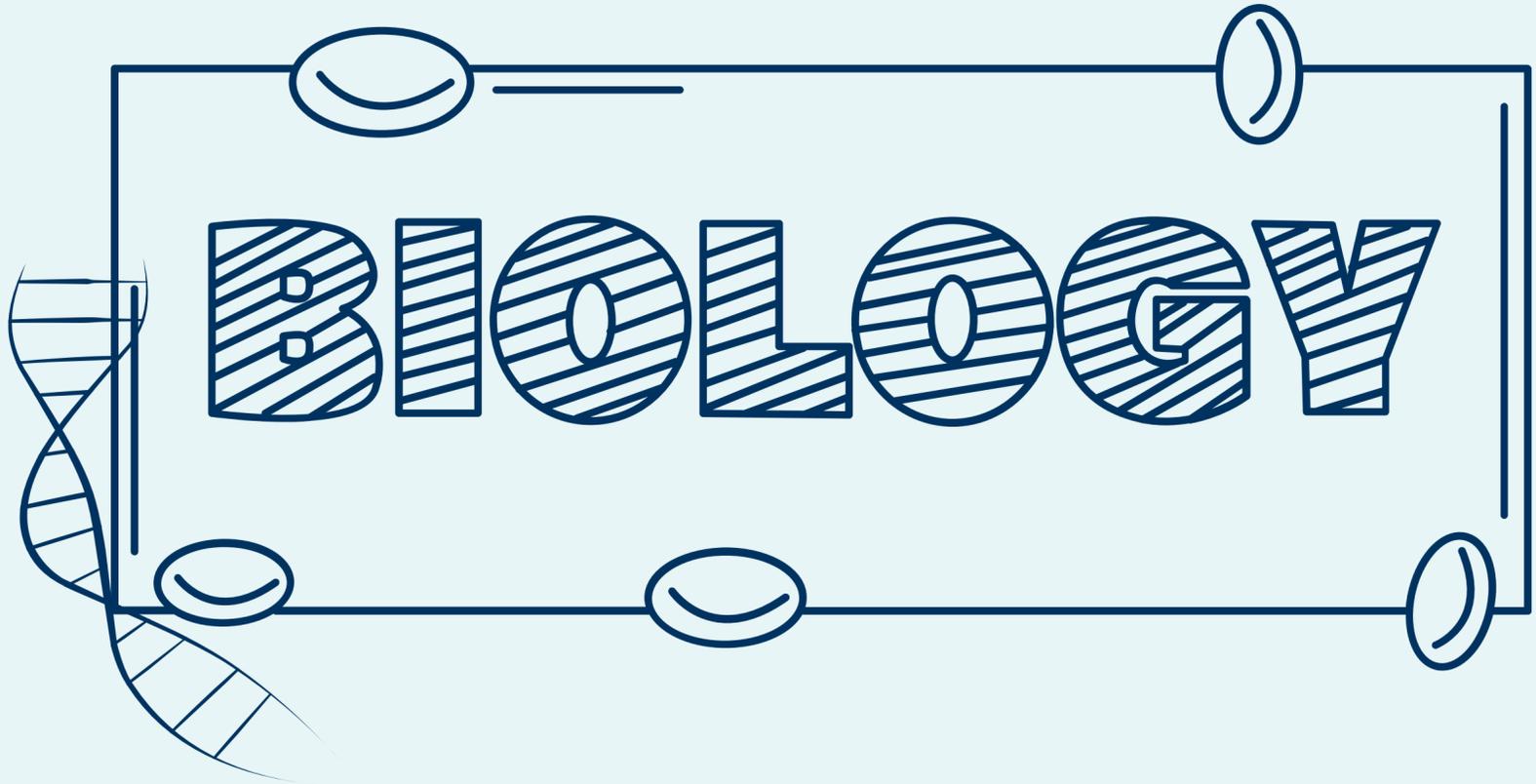


Quiz time

Lec 1



1. What is the central theory of biology that explains the diversity and adaptation of life?

- A. Systems Biology
- B. Reductionism
- C. Evolution
- D. Emergent Properties
- E. Cellular Theory

2. Which of the following is NOT a property of life?

- A. Order
- B. Response to the environment
- C. Evolutionary adaptation
- D. Inorganic growth
- E. Energy processing

3. The biological hierarchy of life includes all of the following EXCEPT:

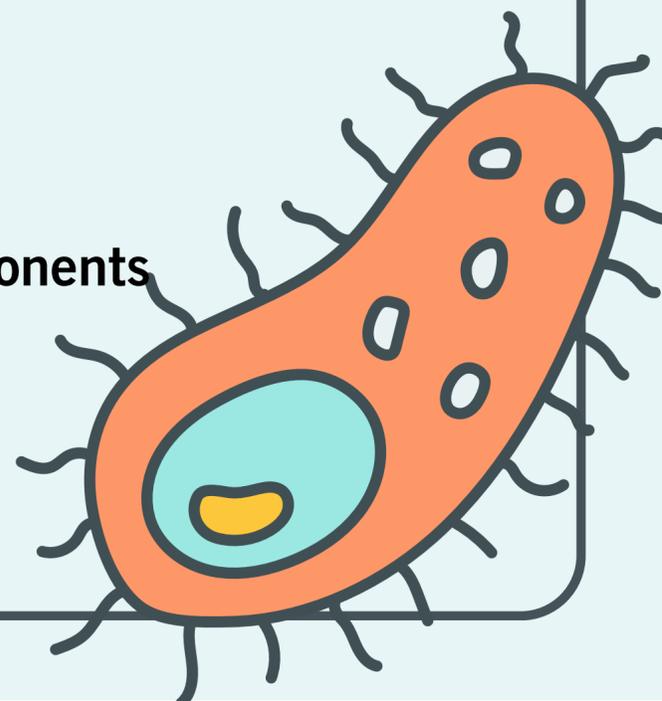
- A. Molecule
- B. Cell
- C. Organ
- D. Population
- E. Mineral

4. Emergent properties are best described as:

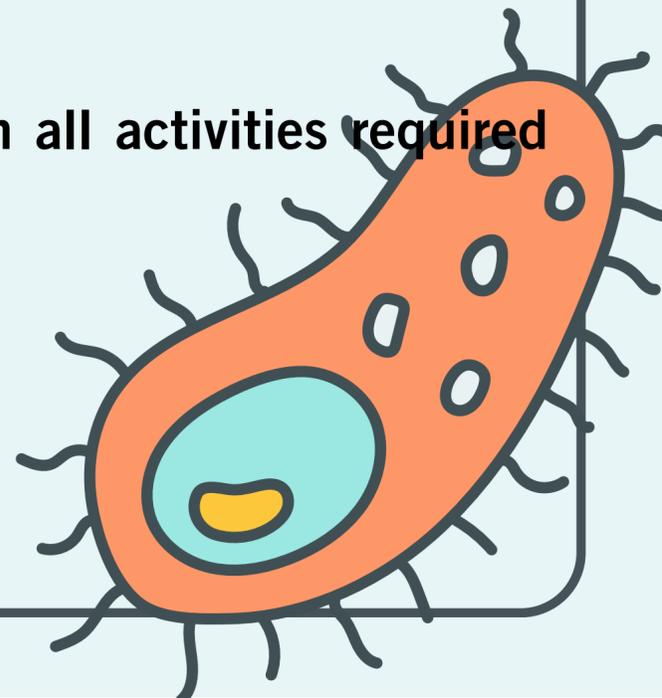
- A. Properties that exist only in non-living systems
- B. Properties that arise from the interaction of components in a system
- C. Properties that are only visible under a microscope
- D. Properties that are identical at all levels of organization
- E. Properties that are only found in ecosystems

5. Reductionism involves:

- A. Studying only the most complex biological systems
- B. Breaking down complex systems into simpler components
- C. Focusing only on emergent properties
- D. Ignoring molecular interactions
- E. Studying only whole organisms



6. Which of the following is an example of systems biology?
- A. Studying the structure of a single enzyme
 - B. Analyzing the effect of a blood pressure drug on multiple organs
 - C. Observing a single cell under a microscope
 - D. Isolating a gene sequence
 - E. Describing the anatomy of a leaf
7. In an ecosystem, the two major processes are:
- A. Energy conversion and reductionism
 - B. Nutrient cycling and energy flow
 - C. Positive and negative feedback
 - D. Growth and development
 - E. Cellular respiration and photosynthesis only
8. Which process is responsible for the flow of energy entering as light and exiting as heat in an ecosystem?
- A. Nutrient cycling
 - B. Energy conversion
 - C. Reductionism
 - D. Evolutionary adaptation
 - E. Bioinformatics
9. The statement "structure and function are correlated" is best illustrated by:
- A. A leaf being thin and flat to maximize light capture
 - B. A cell using DNA as genetic information
 - C. Negative feedback in metabolic pathways
 - D. The use of bioinformatics in data analysis
 - E. The cycling of carbon in the atmosphere
10. The lowest level of organization that can perform all activities required for life is the:
- A. Organelle
 - B. Tissue
 - C. Cell
 - D. Molecule
 - E. Atom



11. All cells share which of the following characteristics?

- A. Presence of a nucleus
- B. Ability to perform photosynthesis
- C. Enclosed by a membrane and use DNA
- D. Presence of mitochondria
- E. Ability to move

12. Which technology is essential for advances in systems biology at the molecular level?

- A. Light microscopy
- B. High-throughput technology
- C. Stethoscope
- D. Centrifuge
- E. Thermocycler

13. Bioinformatics is defined as:

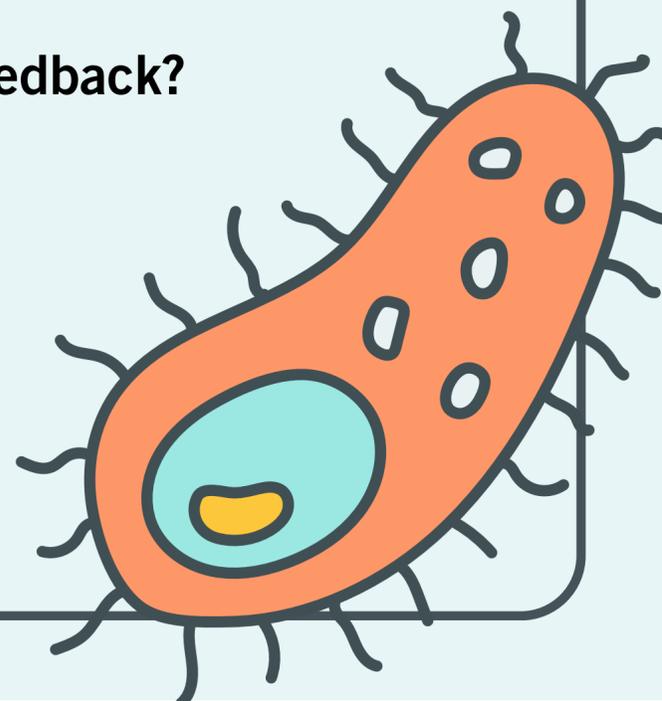
- A. The study of biological ecosystems
- B. The use of computational tools to process biological data
- C. The reduction of complex systems to simpler parts
- D. The study of evolutionary adaptations
- E. The analysis of fossil records

14. In a negative feedback mechanism:

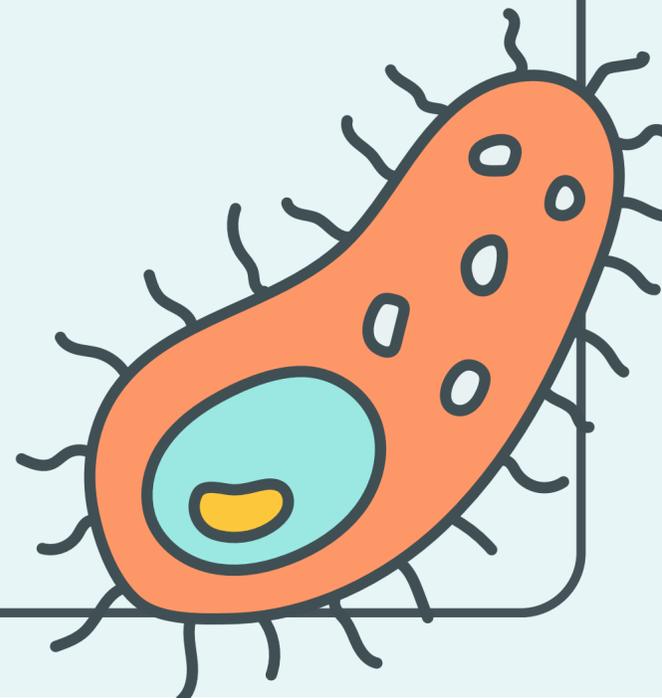
- A. The product accelerates the process
- B. The product inhibits the process
- C. There is no effect on the process
- D. The process becomes random
- E. The product is eliminated entirely

15. Which of the following is an example of positive feedback?

- A. Thermoregulation in mammals
- B. Blood glucose regulation
- C. Fruit ripening in plants
- D. Enzyme inhibition by excess product
- E. Population control in ecosystems



16. The image on page 15 showing infoldings of membrane and mitochondria is likely illustrating the relationship between:
- A. Structure and function
 - B. Reductionism and systems biology
 - C. Energy flow and nutrient cycling
 - D. Positive and negative feedback
 - E. Cells and organs
17. Which of the following best describes the role of evolution in biology?
- A. It is a minor concept only relevant to animal species
 - B. It explains the unity and diversity of life
 - C. It is only applicable to molecular biology
 - D. It contradicts the concept of emergent properties
 - E. It is unrelated to the biological hierarchy
18. The interaction between organisms and their environment includes:
- A. Only biotic factors
 - B. Only abiotic factors
 - C. Both biotic and abiotic factors
 - D. Only energy exchange
 - E. Only nutrient cycling
19. Which of the following is a result of energy conversion in living systems?
- A. DNA replication
 - B. Nutrient cycling
 - C. Work performed by organisms
 - D. Emergent properties
 - E. Reductionism
20. The ability of cells to divide is the basis for:
- A. Energy flow
 - B. Reproduction, growth, and repair
 - C. Evolutionary adaptation only
 - D. Nutrient cycling only
 - E. Bioinformatics



ANSWERS :

1. C. Evolution
2. D. Inorganic growth
3. E. Mineral
4. B. Properties that arise from the interaction of components in a system
5. B. Breaking down complex systems into simpler components
6. B. Analyzing the effect of a blood pressure drug on multiple organs
7. B. Nutrient cycling and energy flow
8. B. Energy conversion
9. A. A leaf being thin and flat to maximize light capture
10. C. Cell
11. C. Enclosed by a membrane and use DNA
12. B. High-throughput technology
13. B. The use of computational tools to process biological data
14. B. The product inhibits the process
15. C. Fruit ripening in plants
16. A. Structure and function
17. B. It explains the unity and diversity of life
18. C. Both biotic and abiotic factors
19. C. Work performed by organisms
20. B. Reproduction, growth, and repair

