

Skills Worksheet

Critical Thinking**ANALOGIES**

In the space provided, write the letter of the pair of terms or phrases that best completes the analogy shown. An analogy is a relationship between two pairs of words or phrases written as **a : b :: c : d**. The symbol **:** is read "is to," and the symbol **::** is read "as."

- _____ 1. antibiotic : bacteria ::
a. insecticide : insect
b. ant : cockroach
c. pesticide : insecticide
d. insect : species
- _____ 2. biotic : abiotic ::
a. rocks : sand
b. air : organism
c. organism : water
d. species : population
- _____ 3. organism : habitat ::
a. community : population
b. fish : coral reef
c. shelter : nest
d. squirrel : pond
- _____ 4. population : species ::
a. field mice in Florida : field mice
b. field mice in Florida : field mice in Maine
c. field mice : rodents
d. total organisms in a prairie : total bison in a herd
- _____ 5. natural selection : evolution ::
a. jogging : running
b. floods : rain
c. dog : cat
d. studying : passing a test
- _____ 6. skeleton : human body ::
a. foot : birds
b. egg : frogs
c. cell walls : fungi
d. rock : sand
- _____ 7. plants : land ecosystems ::
a. sand : desert ecosystems
b. phytoplankton : water ecosystems
c. forests : trees
d. snow : winter
- _____ 8. Hawaiian honeycreeper's beak : obtaining nectar ::
a. sunburn : wearing sunscreen
b. buying stamps : getting mail
c. insect's skeleton : keeping warm
d. sweet nectar : attracting pollinators
- _____ 9. cone : pine tree ::
a. flower : rose bush
b. leaves : oak tree
c. fruit : wildflowers
d. roots : cactus
- _____ 10. vertebrates : animals ::
a. bacteria : protists
b. angiosperms : plants
c. molds : bacteria
d. algae : fungi

Critical Thinking *continued*

INTERPRETING OBSERVATIONS

Read the following scenario, and answer the questions below.

Imagine that a population of rabbits was released during the winter into an ecosystem that is covered with snow most of the year. Fifty percent of the rabbits were dark gray and 50 percent of the rabbits were white. The only animal in the ecosystem that eats rabbits is a species of hawk.

The next winter, scientists visit the area and observe the rabbit population. As expected, the overall rabbit population has grown and the percentage of white rabbits has increased.

11. Explain what probably caused the increase in the percentage of white rabbits.

12. Predict what would happen to the rabbit population if the climate changed and the ecosystem only had snow a few months out of the year. Explain your answer.

13. Use a rabbit population as an example to explain Darwin's theory of evolution by natural selection.

Critical Thinking *continued*

AGREE OR DISAGREE

Agree or disagree with the following statements, and support your answer.

14. A tiny Chihuahua and a huge Great Dane have no common ancestors.

15. Prescribing antibiotics for every human disease will help eliminate diseases caused by bacteria.

16. A community can contain two populations of the same species.

Critical Thinking *continued*

REFINING CONCEPTS

The statements below challenge you to refine your understanding of concepts covered in the chapter. Think carefully, and answer the questions that follow.

17. A family has an infestation of ants and wants to get rid of them. Why are insect pests difficult to control?

18. A friend says that it does not matter what happens in other ecosystems and that you won't be affected because you live in the city. Do you think your friend is right? Justify your answer.

19. It is safer to eat mushrooms grown on farms because many mushrooms that grow in the wild are poisonous. Imagine that to ensure that no one ate poisonous mushrooms, chemicals were used to kill fungi in a forest. How would this affect the forest ecosystem? Explain your reasoning.

Answer Key

Concept Review

MATCHING

- | | |
|------|-------|
| 1. d | 6. g |
| 2. i | 7. b |
| 3. j | 8. f |
| 4. c | 9. e |
| 5. a | 10. h |

MULTIPLE CHOICE

- | | |
|-------|-------|
| 11. a | 16. b |
| 12. a | 17. d |
| 13. b | 18. b |
| 14. a | 19. d |
| 15. d | 20. a |

Critical Thinking

ANALOGIES

- | | |
|------|-------|
| 1. a | 6. c |
| 2. c | 7. b |
| 3. b | 8. d |
| 4. a | 9. c |
| 5. d | 10. b |

INTERPRETING OBSERVATIONS

- The hawks would see the dark gray rabbits more easily than the white rabbits when snow was on the ground because the white rabbits would blend in. Therefore, the hawks probably ate more gray rabbits than white rabbits. More white rabbits lived to reproduce.
- During most months the remaining dark gray rabbits would blend in with the surroundings better than white rabbits would. Hawks would eat fewer dark rabbits than white rabbits. The rabbit population would change to include more gray rabbits because they would more likely survive to reproduce.
- More rabbits are born than can survive. The rabbits in a population differ in the traits that they have. Some of these traits give rabbits advantages that help them survive. Rabbits can then reproduce and pass these traits on to their offspring. Each generation

of rabbits has proportionately more organisms with advantageous traits.

AGREE OR DISAGREE

- Disagree; although they have very different characteristics, both dog breeds are a result of thousands of years of artificial selection. Humans bred the ancestors of today's wolves to produce the variety of dogs we have today. Wolves and different kinds of dogs are closely related.
- Disagree; antibiotics may kill many bacteria, but the bacteria that remain are more resistant to the antibiotics. This use of antibiotics promotes the evolution of resistant populations of bacteria. Over a period of time, diseases can't be controlled as effectively with the same antibiotics. This makes diseases harder to treat and more people may get them.
- Disagree; by definition, a population is made up of all the members of the same species that live in the same place at the same time. A community is made up of all the populations in the same place at the same time. If organisms are members of the same species and live in the same community, they all are part of the same population.

REFINING CONCEPTS

- Insects are difficult to control because they are small and can get into a home easily, they don't need much food to survive, they move quickly and can hide in small spaces easily, they reproduce quickly, and they can become resistant to insecticides.
- No; all ecosystems are interconnected. Answers may vary. Sample answer: Humans in the city rely on resources, such as water and food, from other ecosystems. Anything that affects water, air, land, or living things can affect the city's food and water supply. Also, air in the city comes from other ecosystems. A

forest fire far away can affect the air in the city.

- 19.** The forest floor may become littered with branches, leaves, and dead trees because fungi play an important role in breaking down dead organisms. Although bacteria also break down dead organisms, the lack of fungi could decrease the rate of decomposition of biotic factors in this forest ecosystem.

Active Reading

SECTION: ECOSYSTEMS: EVERYTHING IS CONNECTED

1. living and nonliving things
2. each other; abiotic factors
3. living and once living
4. nonliving
5. “without” or “not”
6. B
7. A
8. A
9. B
10. B
11. A
12. A
13. B
14. A
15. B
16. A
17. 1
18. 5
19. 2
20. 3
21. 4

SECTION: EVOLUTION

1. when it contains a gene that allows it to break the chemical down into harmless substances
2. the evolution of pest resistance among corn pests
3. the ability of one or more organisms to tolerate a particular chemical designed to kill it
4. Answers may vary.
5. 3
6. 1
7. 2
8. 6
9. 4

10. 5
11. It contains a gene that allows it to break the chemical down into harmless substances.
12. the attempt to control pests and bacteria with chemicals
13. They have a pesticide-resistant gene.
14. evolve

SECTION: THE DIVERSITY OF LIVING THINGS

1. b
2. a
3. c
4. b
5. d
6. a
7. miniature skeletons
8. Like bacteria, fungi break down bodies and body parts of dead organisms and sometimes cause diseases.
9. Bodies and body parts of dead organisms are broken down.
10. athlete’s foot
11. They give blue cheese its strong flavor.
12. Yeasts produce the gas that makes bread rise.

Map Skills

1. Organism: any individual from a population. Population: human; oak tree; blue-jay; toad; squirrel. Community: park.
2. oak tree; toad
3. biotic
4. Answers may vary.
5. Answers may vary but students should recognize that a decrease in the human population would most likely lead to an increase in the non-human population.

Quiz

SECTION: ECOSYSTEMS: EVERYTHING IS CONNECTED

- | Matching | Multiple Choice |
|----------|-----------------|
| 1. b | 6. d |
| 2. e | 7. b |
| 3. a | 8. a |
| 4. d | 9. a |
| 5. c | 10. d |