

Biology Milestone: Unit 4 Topics (Equilibrium)

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. A plant species growing in a certain location has one variety that grows best in wet soil and another variety that grows best in dry soil. Which outcome is MOST LIKELY to occur at the end of an extended drought at that location?
- a. The variety that prefers dry soil will show an increase in population. c. Both varieties will compete for space, so the size of both populations will remain the same.
- b. The variety that prefers wet soil will show an increase in population. d. Both varieties will adapt to the new conditions, so the size of both populations will remain the same.
- _____ 2. A student is making a table to show the ways in which cell structures help to maintain homeostasis. Which cell structure should the student use to BEST complete the table?

How Cell Parts Help Maintain Homeostasis

	Produces ATP When Needed	Allows and Controls the Passage of Substances
Cell Part	Mitochondrion	?

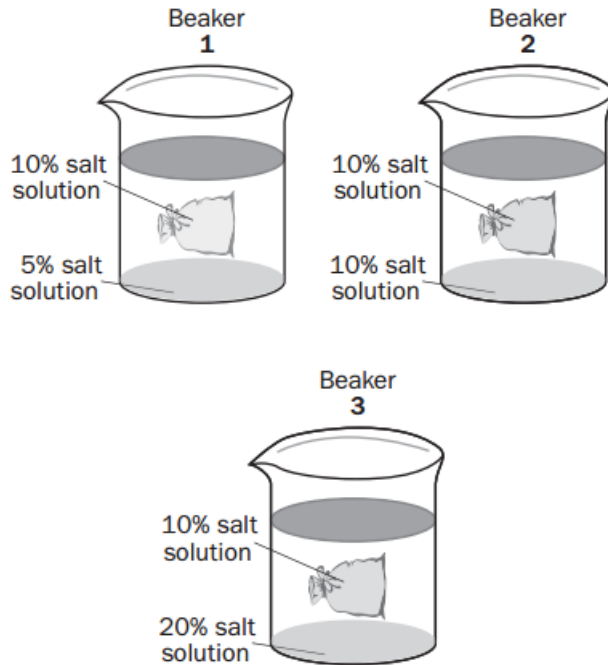
- a. nucleus c. cell membrane
- b. cytoplasm d. endoplasmic reticulum
- _____ 3. The table shows the changes in size of the populations of grasses, shrubs, and trees over 150 years. What type of succession was taking place?

Changes in Plant Population Size over Time

	Year 1	Year 50	Year 100	Year 150
Grasses	60	30	15	10
Shrubs	0	12	15	4
Trees	0	2	5	25

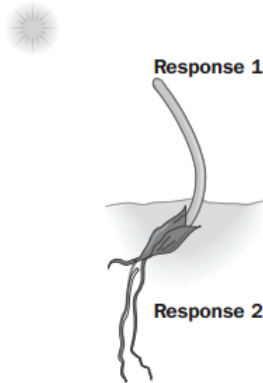
- a. primary succession because trees replaced bushes c. primary succession because there was a decrease in the number of species
- b. secondary succession because the type of species changed twice d. secondary succession because the first organisms to grow were grasses

4. A student is demonstrating how water moves across cell membranes to maintain homeostasis. The student uses dialysis bags, which are semipermeable and model cell membranes. The student fills each of the three bags with 100 mL of a 10% salt solution and ties the end of each bag. In Beaker 1, the student places 200 mL of a 5% salt solution. In Beaker 2, the student places 200 mL of a 10% salt solution. In Beaker 3, the student places 200 mL of a 20% salt solution. What kind of environments are in Beakers 1, 2, and 3?



- a. Beaker 1: hypertonic, Beaker 2: hypotonic, Beaker 3: isotonic
- b. Beaker 1: hypertonic, Beaker 2: isotonic, Beaker 3: hypotonic
- c. Beaker 1: isotonic, Beaker 2: hypertonic, Beaker 3: hypotonic
- d. Beaker 1: hypotonic, Beaker 2: isotonic, Beaker 3: hypertonic

5. The diagram shows a plant's responses to stimuli. Which table presents explanations for the plant's responses?



a. A.

Response	Explanation
1	In response to light, a plant hormone causes the shoot to lengthen more on one side, and the stem bends toward the light.
2	In response to gravity, a plant hormone accumulates in certain areas, and the roots grow downward.

b. B.

Response	Explanation
1	In response to light, the chloroplasts begin to photosynthesize, and the shoot leans toward the light.
2	In response to water, the vacuoles on one side of the roots swell, and the roots grow downward.

c. C.

Response	Explanation
1	In response to the heat, sensors in the shoot are activated, and the shoot bends toward the Sun.
2	In response to touching the soil, sensors in the root are activated, and the roots grow downward.

d. D.

Response	Explanation
1	In response to gravity, a plant hormone causes cell replication, and the shoot grows upward.
2	In response to light, a plant hormone causes cells to move away from the Sun, and the roots grow downward.

6. Scientists noted that each of several anole lizard species in the Caribbean islands has a body type that seems to be well suited for its own habitat. For example, the anole species that live mainly on tree trunks have stocky bodies and long legs. Anoles that live in grassy areas are slender and have very long legs. Scientists also noted that distinct anole species with the same body types can be found on several different islands. These findings are consistent with the mechanism of natural selection, which favors adaptations that allow a species to survive in its environment.

The scientists developed a few hypotheses for the finding that the twig-dwelling anole species found on several of the islands have thin bodies, large toe pads, and short legs and tails. They then performed DNA analysis on each of these twig-dwelling species. This analysis revealed that the twig-dwelling species on different islands did not share a recent common ancestor.

Which of these hypotheses is supported by the findings?

- | | |
|---|---|
| a. A species of twig-dwelling anoles developed on one island, and then descendants spread out to other islands. | c. Each twig-dwelling species came from distant ancestors but evolved in similar ways despite separated habitats. |
| b. The twig-dwelling anoles are much better adapted to living in the Caribbean islands than the trunk-dwelling and grass-dwelling anoles. | d. Twig-dwelling anoles, trunk-dwelling anoles, and grass-dwelling anoles all evolved from the same ancestor. |

7. The Tarsier is a primate with big eyes to help see at night when he is most active. Which of the following adaptations best describes this primate's ability to maintain homeostasis?

- | | |
|---------------------|----------------|
| a. thick fur | c. speed |
| b. nocturnal habits | d. sharp claws |

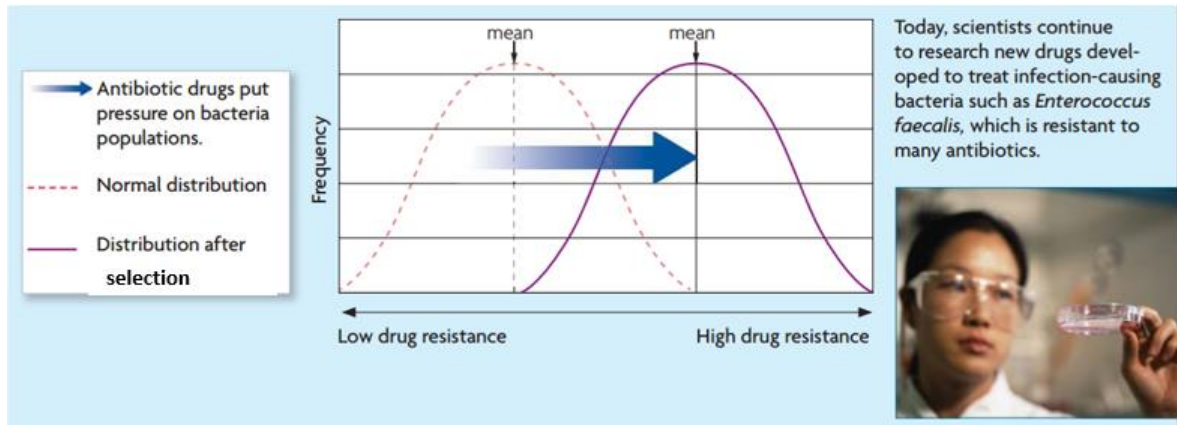
8. Which of the following represents the correct order of the stages of primary succession in the picture below?



Retrieved from *Georgia Biology* by McDougal & Littell

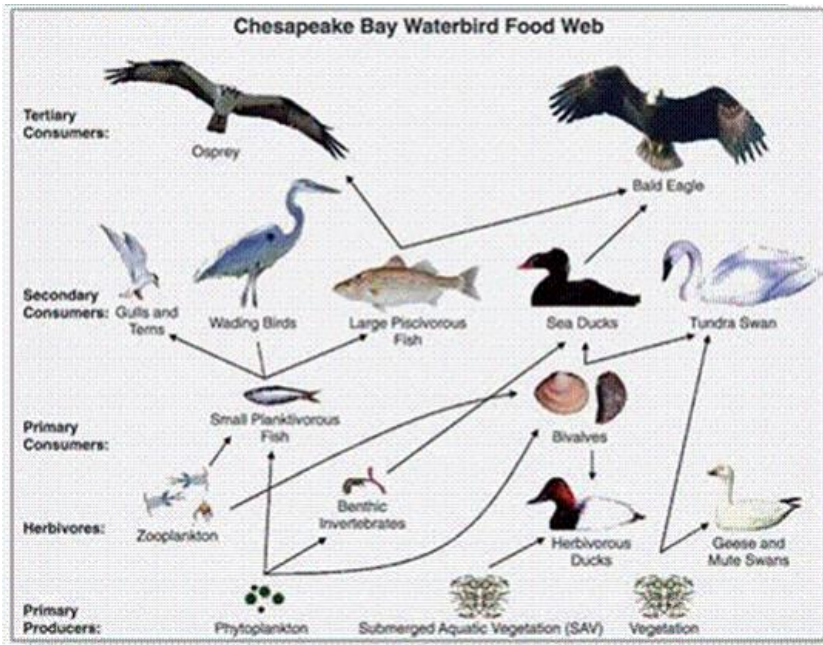
- | | |
|--|--|
| a. pioneer species (mosses and lichens) →
small flowers and hardy shrubs →
pine/spruce forest → oak/hickory forest
(climax community) | c. climax community (pine/spruce forest)
→ pioneer species (lichens and mosses)
→ small flowers and hardy shrubs
→ oak/hickory forest |
| b. climax community (oak/hickory forest)
→ pioneer species (lichens and mosses)
→ small flowers and hardy shrubs
→ pine/spruce forest | d. pioneer species (mosses and lichens) →
small flowers and hardy shrubs →
oak/hickory forest → pine/spruce forest
(climax community) |

___ 9. Identify which type of selection is taking place in the picture below.



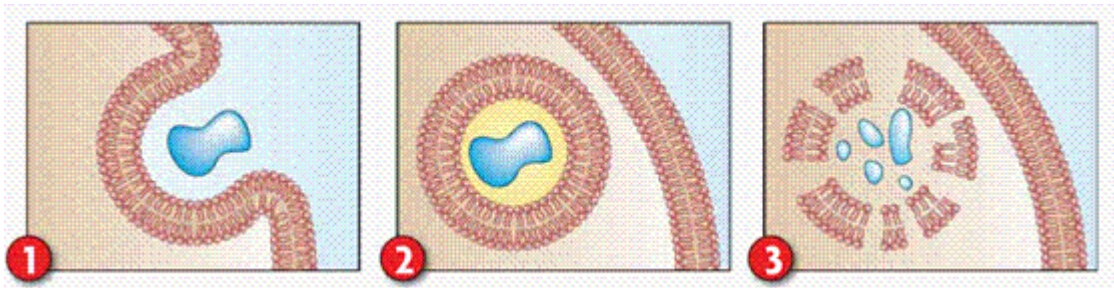
Retrieved from *Georgia Biology* by McDougal and Littell

- a. stabilizing selection
 - b. directional selection
 - c. disruptive selection
 - d. artificial selection
- ___ 10. The condition in which there are barriers to interbreeding between individuals of the same species such as those separated by a river is referred to as
- a. geographic isolation
 - b. temporal isolation
 - c. behavioral isolation
 - d. natural isolation
- ___ 11. No matter where they are located in the world, the shark and dolphin seem to share many morphological and physiological characteristics. Which of the following terms best describes these similarities among the two unrelated species?
- a. coevolution
 - b. convergent evolution
 - c. divergent evolution
 - d. adaptive radiation



12. Several decades ago DDT was sprayed into this pond to kill mosquitoes. The DDT settled into the sediments and can still be found in organisms that feed in this pond. Which organism would you expect to have the highest concentration of DDT in its system?
- zooplankton
 - bivalves
 - large fish
 - osprey
13. Due to intense competition for light, phototropism is most beneficial in which of the following biomes?
- tundra
 - grassland
 - deciduous forest
 - tropical rainforest
14. The nonnative kudzu plant was brought to the United States in 1876 to plant as an ornament in gardens and as food for livestock. In the 1930s, it was used in the South to control erosion, but by the 1950s, it had colonized many Southern forested areas. Which scenario is most likely true regarding the introduction of this species?
- Native plants naturally repel kudzu.
 - The higher biodiversity leads to healthier forests.
 - They compete with native plants for food and other resources.
 - Native plant populations are growing rapidly.
15. How is facilitated diffusion different from active transport?
- facilitated diffusion requires ATP; active transport does not.
 - active transport requires ATP; facilitated diffusion does not.
 - active transport can only be used by plant cells.
 - active transport is a type of passive transport; facilitated diffusion is not.

___ 16. The diagram below shows which of the following types of transport?



Georgia Biology by McDougal and Littell

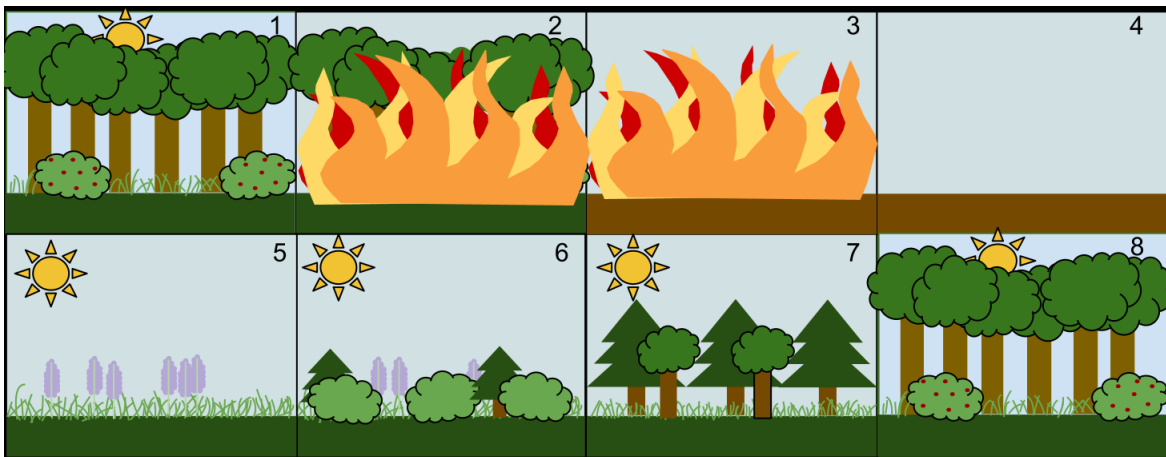
Retrieved from

- a. diffusion
- b. osmosis
- c. endocytosis
- d. exocytosis

___ 17. Mr. Taylor has had a serious accident and lost a lot of blood. In an attempt to replenish his body fluids, a large amount of distilled water was transferred directly into one of his veins. Distilled water is a solution in which the majority of solutes have been removed, leaving only the pure water in solution. What will be the most probable result of this transfusion?

- a. Mr. Taylor may die because there will be too much fluid for his heart to pump
- b. Mr. Taylor may die because red blood cells will be hypotonic to the body fluids and the cells will shrivel
- c. Mr. Taylor may die because red blood cells will be hypertonic to the body fluids and the cells will burst
- d. Mr. Taylor will live because the red blood cells will be isotonic to the body fluids and the cells will remain stable.

___ 18. In the comic below, the climax community was disrupted by a fire which destroyed everything except the soil. The area was set back to an earlier stage of succession where new plants began to grow. Which type of succession is shown below?



- a. primary
- b. secondary
- c. tertiary
- d. Quaternary

- _____ 19. Farmer John has been using pesticides for years to keep bugs off of his crops. After several years, he notices that the pesticide is not working as well as it did in the beginning. What is happening?
- a. The insects are becoming immune to the pesticide after years of ingesting it.
 - b. The insects are developing resistance to the pesticide out of need.
 - c. The insects with inherited resistance survive the pesticide naturally and therefore pass this resistance onto their offspring.
 - d. The pesticide is causing the insects to be captured by their predators at a higher rate.
- _____ 20. Which of the following best describes the difference between ozone depletion and climate change?
- a. climate change allows dangerous UV to penetrate the atmosphere and cause skin and eye damage, whereas ozone depletion is caused by the increased greenhouse effect that causes the atmosphere to warm
 - b. ozone depletion allows dangerous UV to penetrate the atmosphere and cause skin and eye damage, whereas climate change is caused by the increased greenhouse effect that causes the atmosphere to warm
 - c. the hole in the ozone layer allows more heat in, therefore causing an increase in global warming
 - d. ozone depletion and climate change are the same concept and are both caused by humans

**Biology Milestone: Unit 4 Topics (Equilibrium)
Answer Section**

MULTIPLE CHOICE

- | | |
|------------|--------|
| 1. ANS: A | PTS: 1 |
| 2. ANS: C | PTS: 1 |
| 3. ANS: D | PTS: 1 |
| 4. ANS: D | PTS: 1 |
| 5. ANS: A | PTS: 1 |
| 6. ANS: C | PTS: 1 |
| 7. ANS: B | PTS: 1 |
| 8. ANS: A | PTS: 1 |
| 9. ANS: B | PTS: 1 |
| 10. ANS: A | PTS: 1 |
| 11. ANS: B | PTS: 1 |
| 12. ANS: D | PTS: 1 |
| 13. ANS: D | PTS: 1 |
| 14. ANS: C | PTS: 1 |
| 15. ANS: B | PTS: 1 |
| 16. ANS: C | PTS: 1 |
| 17. ANS: C | PTS: 1 |
| 18. ANS: B | PTS: 1 |
| 19. ANS: C | PTS: 1 |
| 20. ANS: B | PTS: 1 |