

# Middle School Science STAAR Review

## Reporting Category 4: Organisms & Environment

8.11.A describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems

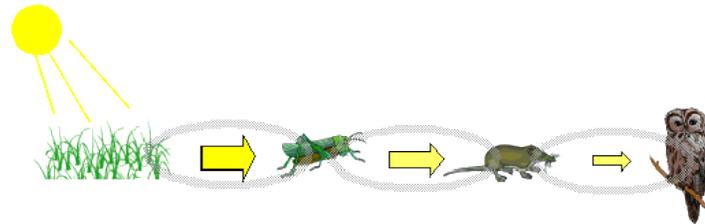
### ECOSYSTEM

An **ecosystem** includes the **biotic** (living) and **abiotic** (non-living) parts of the environment.

### Food Chain

The path of food energy from the sun to the producer then transferred to a series of consumers

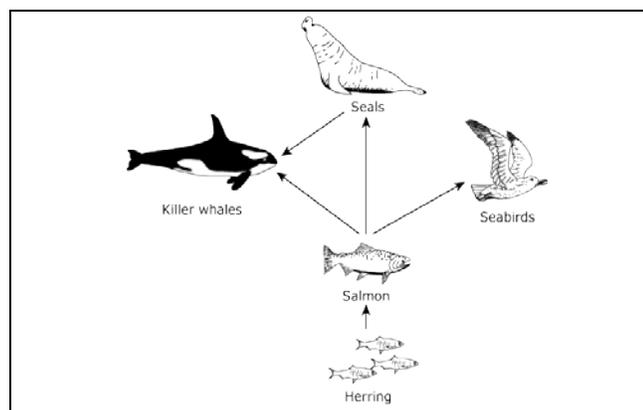
Arrows show the flow of **energy**.



**Note:** The sun provides energy to plants to produce food in the process called **Photosynthesis**.

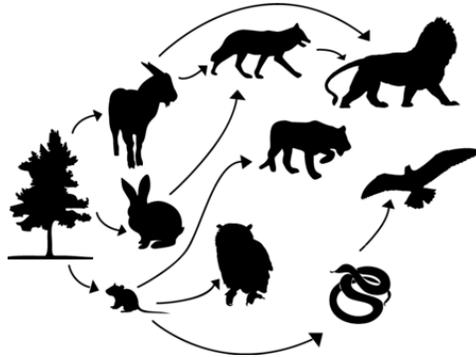
### Food Web

A model that shows all the possible feeding relationships between organisms living in an ecosystem.



Energy flows through various food chains as animals eat plants and **predators** consume **prey**, creating a **food web**. The energy that flows through food chains and food webs comes from the Sun.

Trophic levels of organisms in a food web range from primary producers (autotrophs), and different levels of heterotrophs, including primary consumers (herbivores), secondary consumers (carnivores that eat herbivores), and tertiary consumers (carnivores that eat carnivores).



Label the food web using all the underline words in the paragraph above.

## AQUATIC ECOSYSTEMS



Aquatic ecosystems include freshwater and marine biomes and constitute the largest part of the biosphere. In marine ecosystems, phytoplankton are autotrophic producers and are consumed by zooplankton and small invertebrates, which are consumed secondarily by fish and larger marine life.

**Question: What is the main difference between freshwater and marine ecosystems?**

---

---



Give an example of a producer/consumer in these ecosystems.

## TERRESTRIAL ECOSYSTEMS



A **terrestrial ecosystem** is an ecosystem that is found on land.

In terrestrial ecosystems, the primary producers are plants, which are consumed by insects, arthropods, and grazing animals. Secondary consumers include spiders, frogs, and carnivorous animals.

### Question:

**Give an example of a predator/prey in this ecosystem. Share your answer with your partner.**

### DEFINITIONS you must know to answer questions.

A **producer** is an organism that is able to produce its own food, usually by using energy from sunlight to make sugars (**photosynthesis**).



Ex: plants

A **consumer** is an organism that eats other organisms for energy.

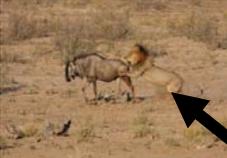


Ex: herbivores, carnivores, omnivores, and scavengers

A **decomposer** is an organism that gets energy by breaking down the remains of dead organisms or organic wastes and consuming or absorbing nutrients (recycle nutrients) .

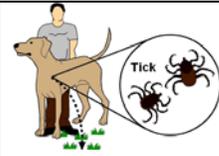


Ex: fungi and bacteria

	<p>A <b>herbivore</b> is an organism that consumes only plants</p>	 Ex: Giraffe, rabbits, cows
	<p>A <b>carnivore</b> is an organism that consumes other animals</p>	 Ex: hawks, tigers
	<p>An <b>omnivore</b> is an organism that consumes both plants and animals</p>	 Ex. Humans, bears
	<p>A <b>parasite</b> is an organism that survives on a host organism and causes harm to the host.</p>	 Ex. Insects that eat tomatoes
	<p>A <b>host</b> is an organism that is used by another for nutrients, shelter, or transport; it is harmed by the relationship</p>	 Ex. Humans are host for mosquitoes
	<p>A <b>prey</b> is an organism that is hunted by other organisms for food</p>	 Prey
	<p>A <b>predator</b> is an organism that hunts for its food</p>	 Predator

## Symbiosis

**Parasitism** is an interaction between two organisms, in one organism benefits (the parasite) and the other organism is harmed (host).



**Mutualism** is an interaction between two organisms, in which there is benefit to both.



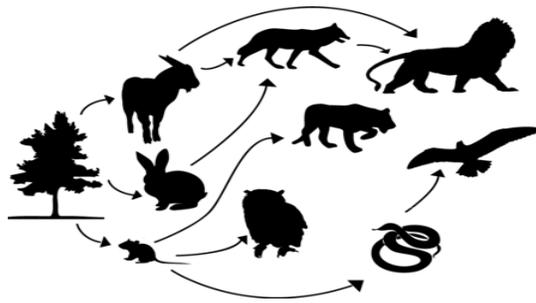
**Commensalism** is an interaction between two organisms, in which one benefits and the other is not affected.



## QUESTIONS:

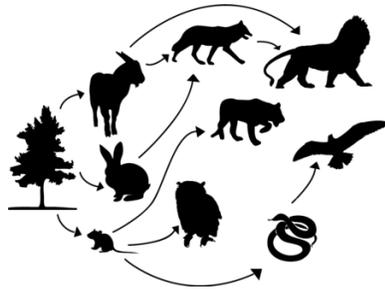
Refer to the diagram below to answer the question.

1. The primary consumers found within the food web are the –



- A. plants
- B. wolf, snake, and hawk
- C. frog, dragonfly, and bird
- D. mouse, grasshopper, butterfly

2. If the wolf population decreased within the food web below, the result would be



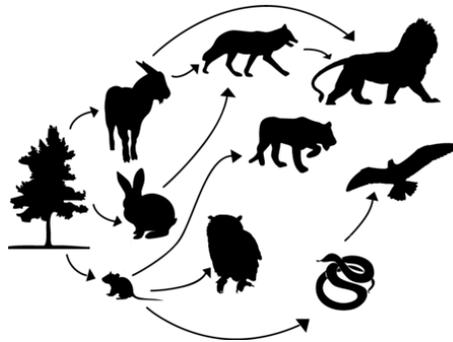
- A. the mouse population decreasing
- B. the hawk population decreasing
- C. the snake population decreasing
- D. the producer population decreasing

Explain your answer:

---

---

3. An example of a predator-prey relationship existing between two of the organisms in the food web below are between the –



- A. toad and snake
- B. wolf and hawk
- C. plant and butterfly
- D. grasshopper and fly

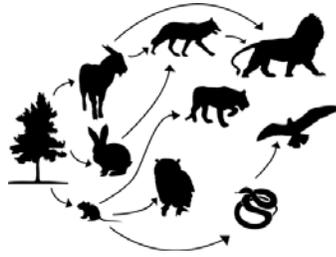
Explain your answer:

---

---

4. The mouse is an example of a(n) –

Refer to the diagram below to answer the question.



- A. Autotroph
- B. Consumer
- C. Predator
- D. Producer

5. A clown fish's home is in a sea anemone. Clown fish scare away other fish that eat the sea anemone. The clown fish and sea anemone exhibit which type of relationship?



- A. Commensalism
- B. Mutualism
- C. Parasitism
- D. Predator-Prey

Explain your answer:

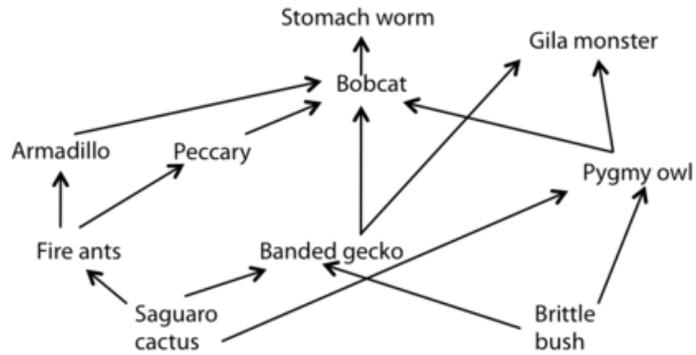
---

---

6. A student goes home one day to find his dad chopping down a tree in their backyard. The pine beetle had attacked the tree for some time, feeding on the tree's bark to the point of killing the tree. The pine beetle is a –

- A. Herbivore
- B. Host
- C. Parasite
- D. Producer

7. In the diagram below, a desert food web is shown. Write an essay identifying and describing one producer-consumer relationship, one predator-prey relationship, and one parasite-host relationship within the desert food web.



ESSAY:

8.11.B investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors such as quantity of light, water, range of temperatures, or soil composition

## Biotic & Abiotic



Term	Definition	Examples
<b>Biotic factors</b>	are the living parts of an ecosystem	Animals (ex. Horses, dogs) Plants (ex. Trees, grass) Fungi (ex. mushroom) Microorganism (ex. bacteria)
<b>Abiotic Factors</b>	are the non living parts of an ecosystem	Sunlight Air Temperature Water Soil Wind Clouds

## Competition for Biotic & Abiotic

Biotic Competition	Abiotic Competition
Competing for food	Competing for sunlight

Resources for an organism's habitat, including space, food, shelter, and water, may be limited or depleted by competition. Two species cannot operate in the same niche in the same environment.

**DEFINITIONS** you must know to answer questions.

A **population** is a group of living organisms of the same kind living in the same place.

Ex. Group of polar bears



A **niche** is an organism's "job" or role in an ecosystem.



Examples:  
A ladybug eating aphids

A **community** is ALL species or populations living in the same area.



**Competition** occurs when more than one individual, or populations in an ecosystem relies upon the same limited resources.

Examples of **limited resources**:  
food, water, territory

Two types of competition:

a. **Intraspecies competition**: occurs when members of the same species compete for same resources in an ecosystem



b. **Interspecies competition**: occurs when individuals of two separate species share a limiting resource in same area.



**Invasive species vs. native species**



An "**invasive species**" is defined as a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

## QUESTIONS:

1. Describe an owl's niche in the ecosystem. On what abiotic and biotic factors do individual owls and owl populations depend?

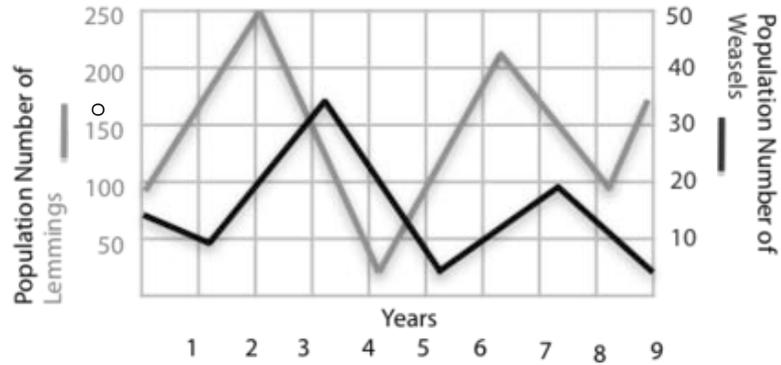


2. Intraspecies competition happens when individual organisms within the same species compete for resources. Interspecies competition happens when different populations of species compete for resources. Describe the similarities and differences between these two types of competition. Use specific examples to support your answer.

3. Competition for resources within an elk herd living in a national park can become severe. What conditions can increase resource competition between individuals within a population?

- A. Large habitat
- B. High population density
- C. Elevated rate of disease
- D. Increased predation

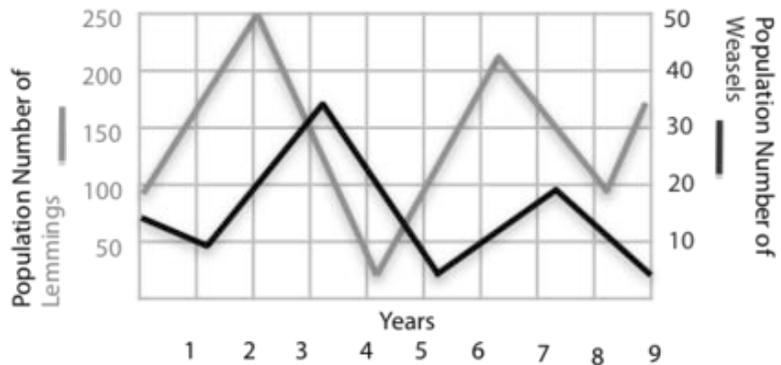
4. Use the graph below to answer the question below.  
How many more lemmings are there than weasels during the peak of the lemmings population? Record answer on a griddable.



Griddable:

0	0	0	0	.	0	0
1	1	1	1		1	1
2	2	2	2		2	2
3	3	3	3		3	3
4	4	4	4		4	4
5	5	5	5		5	5
6	6	6	6		6	6
7	7	7	7		7	7
8	8	8	8		8	8
9	9	9	9		9	9

5. Use the graph below to answer the question below.  
In the study area, weasels prey primarily on lemmings. Using this information and the graphed data, what can you infer?



- A. Weasels compete with lemmings for resources.
- B. Weasel population numbers remain constant over time.
- C. Weasels are an invasive species.
- D. The weasel population declines when individuals compete for reduced food sources

6. What often happens when two species operate in the same niche with limited resources?



- A. They will share resources without affecting either population.
- B. They will contribute to an increase in resources over time.
- C. Both populations will grow without limit.
- D. They will compete for available resources, causing a decline in one population and in the shared resource.

7. In a forest, two trees are growing next to each other. One is growing strong and tall. The other appears weak and small. Which of the following describes natural resources that both trees compete for here?

- A. Quantity of light and nutrients
- B. Root length and strength
- C. Genetic diversity
- D. Presence of bird nests and roosting areas

8. How do invasive species compete with native species?



- A. Invasive species often occupy the same niche as native species and invasive species may be more successful at obtaining resources.
- B. Invasive species are always larger than native species.
- C. The population number of invasive species is always lower than native species.
- D. Invasive species have different resource requirements from the native species.

9. Organisms and populations compete for abiotic and biotic resources. How does competition affect these resources? Explain your choice.

- A. Competition can limit or deplete resources.
- B. Competition can increase biotic resources.
- C. Competition can provide abiotic resources for other organisms.
- D. Competition only affects biotic resources.

10. How could a scientist demonstrate competition between organisms in a Petri dish? Explain your choice.



- A. The scientist could give the organisms a limited amount of food every day.
- B. The scientist could give the organisms a limited amount of food every day.
- C. The scientist could move some of the organisms out of the Petri dish when it gets crowded.
- D. The scientist could feed one of the organisms, but not the others.

8.11.C explore how short-and long-term environmental changes affect organisms and traits in subsequent populations

## Short-Term and Long-Term Environmental Change Effects

**Adaptations** are traits that make an animal suited to its environment.

**Two Types:**

**Structural Adaptations** are inherited physical features of an organism. (Ex. White fur on a polar bear)

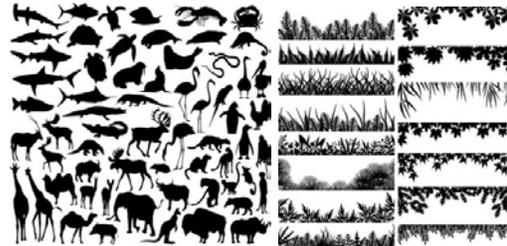


www.fishbase.org

**Behavioral Adaptations** are things organisms do to survive. (Ex. Migration & hibernation)



**Biodiversity**-The number of different species of plants and animals in an area



## Short-Term and Long-Term Environmental Changes

Short-Term	Long-Term
<ul style="list-style-type: none"> <li>- Drought</li> <li>- Smog</li> <li>- Flooding</li> <li>- Volcanic Eruption</li> <li>- Blizzard</li> <li>- Pollution</li> </ul>	<ul style="list-style-type: none"> <li>- Ice Age</li> <li>- Deforestation</li> <li>- Urbanization</li> <li>- Global Warming</li> <li>- Extinction of Species</li> <li>- Radioactive Waste/Pollution</li> </ul>

Changes in environmental conditions can affect the survival of individual organisms and entire species.

Long-term environmental changes, like climate change, can permanently alter an ecosystem, but over time the change may cause some genetic variations to become more favorable or less favorable in the new environment. If adaptations to the new environment are not present or do not develop, populations can become **extinct**.

Short-term environmental changes, like "floods, don't give populations time to adapt to change and force them to move or become **extinct**.

**Human activity** affects natural systems through agriculture, resource consumption, and pollution from waste disposal and energy production.



### QUESTIONS:

1. How are populations affected by long-term environmental change?
  - A. They may adapt to the new environment, or they can become extinct
  - B. They are not affected by long-term changes.
  - C. They always become extinct or move from the area.
  - D. They can only change their niche.
  
2. How can a researcher determine if a population has adapted to a long-term environmental change?
  - A. The population has a lower number of breeding individuals.
  - B. The population immediately behaved differently to obtain resources after the change.
  - C. The population has migrated to a new location and occupies similar niche.
  - D. The population has changed behaviorally to become successful in the new environment over several generations.

EXPLAIN YOUR CHOICE for #2 BELOW:

---

---

3. How are populations affected by short-term environmental changes?
  - A. They increase in number and diversity.
  - B. They do not have time to adapt and are forced to move or become extinct.
  - C. Over generations they develop new behaviors which help them live in the changed environment.
  - D. The changes will only affect individuals and not populations.

4. What type of data could be used to determine if an environmental change was a short-term change?
- A. Genetic adaptations in populations to the changed environment
  - B. Temperature changes in the area collected over five years
  - C. Organisms and population numbers before and right after the event which caused the changes
  - D. Organism niche use 10 years after the event

EXPLAIN YOUR CHOICE for #4 BELOW:

---

---

5. How will clear-cut logging, a short-term environmental change, affect organisms living in the area?



ANSWER: \_\_\_\_\_

6. Farming by humans negatively affects a natural environment the LEAST when –



- A. high concentrations of nitrogen-rich fertilizer are used
  - B. toxic pesticides are applied annually
  - C. practices adhere to organic standards and long-term sustainability of the soil composition
  - D. a large proportion of water flow from local streams is drawn out and used for irrigation
7. How do human activities most directly affect natural systems?
- A. Through agriculture, resource consumption, and pollution from waste disposal and energy production
  - B. By domesticating animals
  - C. By causing only short-term environmental changes
  - D. Through the production of literature and art

8. A researcher notices a decline in organism and population numbers over several years in a stream environment. What human activity may have affected organisms and populations in this way?

ANSWER: \_\_\_\_\_

9. A scientist must assess an environment to determine the affect of changes in environmental conditions on living species. What type of data will the scientist collect, and how will this measure the impact of the environmental change? (Hint: use words like diversity, abundance, species, etc. in your explanation)

8.11.D recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems

### Dependence on Ocean Systems

Humans depend on the ocean for:

Weather, Food, Transportation and Recreation

### Humans modify by:

**Overfishing**

personal sport, commercial harvesting



**Artificial Reefs**

man made underwater structure to promote marine life such as a sunken ship



**Run Off**

chemicals and trash flow to the ocean from rivers and streams



Human activity such as runoff pollution can originate from small or large sources on land and water, including motorized vehicles, oil spills, agricultural chemicals, and recreation. Runoff pollution negatively affects beaches and ocean habitats.

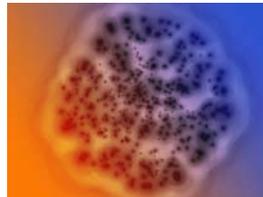
Overharvesting food from the ocean creates an imbalance in existing ocean food webs. **(What does overharvesting mean and how would this cause an imbalance?)**

**Other examples of the effects of human activity on oceans** include climate change, spread of disease, and introduction of exotic species.

Climate Change



Disease



Exotic species/Invasive



## QUESTIONS:

1. Fish farming in large netted cages in the ocean have become big business. What affect do these human activities have on ocean systems?



- A. Siltation
- B. Coral bleaching
- C. Islands of garbage
- D. Increase in disease

2. What ocean feature regulates Earth's climate and weather?



- A. Ocean acidity
- B. Marine biodiversity
- C. Ocean temperature
- D. Wind patterns

3. Introduction of exotic species can –



- A. increase atmospheric carbon dioxide
- B. outcompete native species, thereby reducing marine biodiversity
- C. help prevent collapsed fisheries and increase fish catch
- D. affect oxygen production

4. What measurement in a lab experiment would indicate photosynthesis activity in marine algae?

- A. Changes in water level over time
- B. Volume of water compared to the mass of the algae
- C. Oxygen concentration in the water
- D. Changes in water temperature over time

5. What are some examples of ocean pollution from runoff?

- A. Smog and particulates
- B. Reforestation of disturbed areas
- C. Extracting and burning fossil fuels
- D. Chemicals used in agriculture and oil leaking from motorized vehicles

6. How can commercial fishing modify ocean systems?
- A. Fish can be overharvested, creating an imbalance in ocean food webs.
  - B. Fishing can affect ocean currents and shipping routes.
  - C. Ocean pH can become acidic, causing coral bleaching
  - D. Commercially harvested fish can dramatically increase in numbers and diversity.
7. What factors could be included in a model showing the affect of climate change on ocean systems?
- A. Areas where overfishing has depleted fisheries
  - B. Temperature and pH of the water
  - C. Amounts of nitrogen and phosphorus
  - D. Numbers of introduced exotic species
8. Sewer drains along city streets are a common sight. Especially when it rains, the flow of water to the drains carry trash and toxins with it. What does this demonstrate about how human activities can affect ocean systems?



- A. Excess atmospheric carbon dioxide can lead to ocean acidification.
  - B. Organic farms help curb agricultural runoff.
  - C. Urban runoff can damage beaches and ocean habitats.
  - D. Introduced species cause a decline in ocean biodiversity.
9. Which part of an ocean system would a researcher study to learn about oxygen production and carbon dioxide consumption?
- A. Marine algae
  - B. Ocean currents and circulation of energy
  - C. Seasonal climate variations
  - D. Tide

10. Satellite images are common on the news to help forecast storms and sunny days. How do these images also show one way that humans are dependent on ocean systems?



- A. They show marine biodiversity.
- B. They show cycling of matter by algae.
- C. They show storage of gases.
- D. They show how weather patterns are regulated by ocean temperatures.

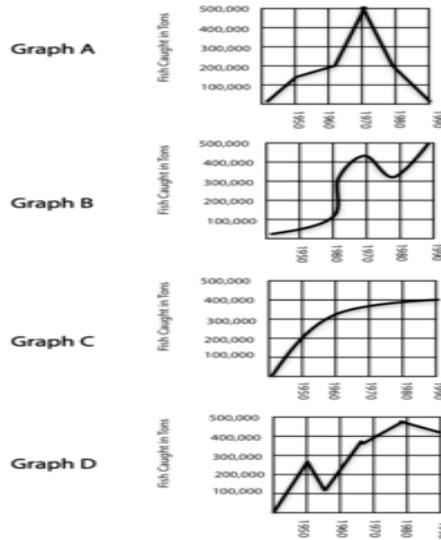
11. A student has been collecting nitrogen level data in a marine bay every week. If conditions remain the same and this trend continues, what will be the nitrogen concentration on the eighth week of study? Record answer as number of grams of nitrogen per cubic meter in griddable .

Week	Nitrogen grams per cubic meter
1	.01
2	.04
3	.07
4	.1
5	.13

Griddable:

				.		
0	0	0	0		0	0
1	1	1	1		1	1
2	2	2	2		2	2
3	3	3	3		3	3
4	4	4	4		4	4
5	5	5	5		5	5
6	6	6	6		6	6
7	7	7	7		7	7
8	8	8	8		8	8
9	9	9	9		9	9

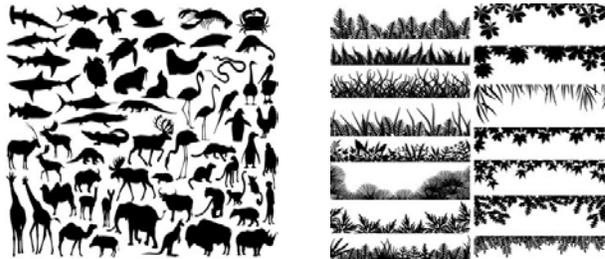
12. Which graph below best demonstrates the effects of overfishing?



- A. Graph A
- B. Graph B
- C. Graph C
- D. Graph D

7.10.B describe how biodiversity contributes to the sustainability of an ecosystem

## BIODIVERSITY



The number of different species of plants and animals in an area



Biodiversity, or biological diversity, is the variety of life and the intricate interactions that support and link organisms together in a geographical region.

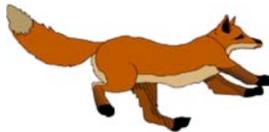
Biodiversity includes a variety of genes, species, and ecosystems. The **higher** the biodiversity of an ecosystem, the **better** that ecosystem can withstand environmental stress. Hence, if biodiversity is lost, that ecosystem has less ability to withstand the same environmental stress.

### QUESTIONS:

1. A population of daisies lives in an area. They are part of what larger ecological grouping?



- A. A field
  - B. A community
  - C. A floodplain
  - D. A state
2. A fox species living in an area eats mostly mice. What would you predict would happen if the mouse population died from a quick-spreading virus?



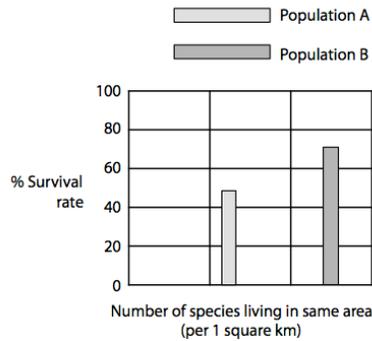
- A. Foxes would turn to eating grass species to survive.
  - B. Some foxes would roam outside of their usual home range to find more mice.
  - C. Some foxes may starve
  - D. Both B and C
3. An ecosystem, like the one below, depends on which of the following in order to be healthy?



- A. Yearly check-ups
- B. A balanced water table
- C. Interdependent relationships between a variety of organisms
- D. Annual pruning of shrubs and trees by human caretakers

4. Which of the following is the most vulnerable to disease and demonstrates the lowest biodiversity?
- A. A cultivated rice field
  - B. A managed tree farm
  - C. A natural short-grass prairie
  - D. Both A and C
5. Temperature, water amounts, soil type, and other organisms control the biodiversity of a habitat. Which term includes the items that control biodiversity?
- A. Limiting factors
  - B. Niches
  - C. Disturbances
  - D. Environmental stresses
6. A bluegill perch is a sunfish that has a blue tab on its gill cover. They have a yellow abdomen with dark blue vertical stripes on the sides of their bodies. They live in freshwater and spawn between May – August. Their diet consists of insect larva, protists, small crustaceans, and small fish. Based upon the description of bluegill perch, what is a limiting factor for the perch?
- A. The blue tab on its gill cover
  - B. Its yellow abdomen
  - C. The vertical stripes on its body
  - D. The salinity (saltiness) of the water
7. A forest is composed of Douglas Fir trees, Noble Fir trees, Red Cedar Trees, White Pine trees, Big Leaf Maple trees, Hemlock trees and Vine Maple trees. If a disease attacks the Douglas Fir trees, what happens to the forest?
- A. All the trees will die and the forest will be destroyed
  - B. Only the Douglas Fir trees may be destroyed, but the rest of the trees will be maintained in the forest
  - C. All the trees will survive, but the shrubbery on the forest floor will die
  - D. The animals in the forest will get sick from the disease and they will pass it to the people who walk through the forest

8. Two populations of chimpanzees live in two different areas of a jungle region. The jungle area that Population B is located within has higher biodiversity than the jungle area that Population A is located. Referring to the graph below, what can you infer?



- A. Chimpanzees in Population A have a lower survival rate because the biodiversity is less.
- B. Chimpanzee survival is not dependent on tree diversity in any part of the jungle.
- C. Chimpanzee in Population B live in a jungle area that have higher biodiversity and have a higher survival rate.
- D. Both A and C

9. Researchers are studying a bird species that feeds solely on flying insects. Their study area is home to three different species of flying insects. One insect species mysteriously disappears suddenly, yet the bird population barely drops. What is an explanation for this?

7.10.C observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds

## Ecological Succession

The gradual replacement of one plant community by another through natural processes over time

**Primary** – Begins in a place without soil (Side of a Volcano)

Starts with **Pioneer Species** (like Lichen that doesn't need soil). They die /decompose and leave behind organic matter on bare rock to make soil.

Then simple plants, grass, shrubs, trees grow and die to provides home to insects, birds and small mammals.

**Secondary** - Begins in a place that already has soil and was once the home of living organisms. Example..... After forest fires.



Following a major disturbance, such as natural disaster, a progression of re-building occurs. Weeds, small insects, and other pioneers will move into the disturbed area first. This literally lays the foundation for other species to move into the area, and the progress continues. This is referred to as ecological succession.

**Vocabulary you need to know:**

<p><b>Habitat</b></p>	<p>A place where an organism naturally lives and grows</p> 
<p><b>Microhabitat</b></p>	<p>A very small specialized habitat, such as the space under a rock</p>  <p>...small pond or in a schoolyard tree.</p>
<p><b>Succession (Ecological Succession)</b></p>	<p>Transition of species present in a community in an area virtually barren of life, or after a disturbance</p> 

**QUESTIONS:**

1. A very hot wildfire burns up an acre of prairie. Organisms above and below ground get wiped out, and even the abundance of soil nutrients suffers. What will happen first in the area's recovery?
  - A. Organisms will return to the soil
  - B. Weeds will return.
  - C. Humans will plant saplings
  - D. Rain will bring nutrients

2. Which statement is false following a catastrophic wildfire?



- A. Plants and animals will return to the area over time.
  - B. The area will remain charred and devastated.
  - C. Weeds will grow in the area before trees do.
  - D. The area will experience changes in species composition over time.
3. A hot wildfire whipped through a large, flat, forested area, burning down every tree and leaving the ground bare. An angry resident thinks the local emergency crews should have done more, and he states that “Now, nothing will ever live here again!” Defend or criticize his statement, explaining your position.
4. The table below charts the different types of organisms that are living within the Basket Fern and when they started living in the fern. The Basket Fern started growing on the tree 80 years ago. What has occurred over the last 80 years to the Basket Fern?

Time (years ago)	Type of Organism	Number of Organisms
78	Ants	279
35	Orchids	5
7	Frogs	37
4	Laughing Kookaburra Birds	4

- A. It has developed into a static environment
  - B. It has changed biomes
  - C. It has gone through succession and created new niches
  - D. It has lost its biodiversity
5. Heavy spring rains flood a large area, severely eroding banks and taking chunks of vegetation and animal burrows downriver. What prediction can you make?
- A. Weeds and annual plants will take root in the area first.
  - B. Burrowing animals will return.
  - C. Nothing will ever grow here again.
  - D. Both A and B

6. You are out in a desert area with a crew of anthropologists digging for fossils. The area only gets about three inches of annual rainfall. A couple of different species of sagebrush and grass grow here, used by a few different small rodent species. During your crew's dig, you uncover fossils of ancient fish and snail species. Based on your observations, describe how the area shifted from one supporting aquatic species to one supporting terrestrial species.



7.11.A examine organisms or their structures such as insects or leaves and use dichotomous keys for identification

## Dichotomous Key

**Dichotomous Key** - a tool that allows the user to determine the identity of items by their characteristics, such as insects, leaves, trees, mammals, reptiles and others.

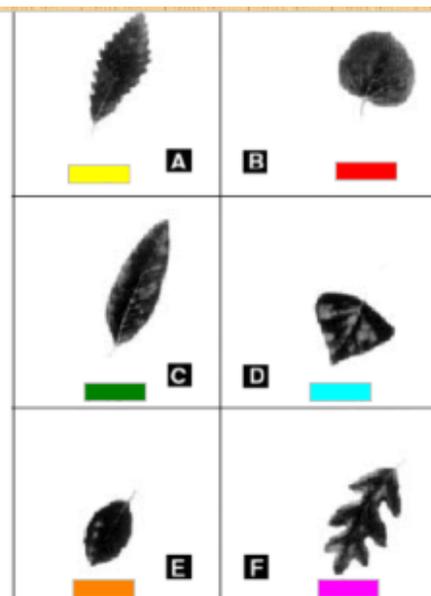
Follow the clues in a **dichotomous key** to identify the organism!



## Dichotomous Key for Leaves

### Key to Common Leaves

- 1a. If the edge of the leaf has no teeth, waves, or lobes, go to 2. ■ ■ ■
- 1b. If the edge of the leaf has teeth, waves, or lobes, go to 3. ■ ■ ■
- 2a. If the leaf has a single bristle at its tip, it is a shingle oak. ■
- 2b. If the leaf has no single bristle at its tip, go to 4. ■ ■
- 3a. If the leaf edge is toothed, it is a lombardy poplar. ■
- 3b. If the leaf edge has waves or lobes, go to 5. ■ ■
- 4a. If the leaf is a heart-shaped leaf with veins branching from the base, it is a redbud. ■
- 4b. If the leaf is not heart shaped, it is a live oak. ■
- 5a. If the leaf edge has lobes, it is an English oak. ■
- 5b. If the leaf edge has waves, it is a chestnut oak. ■



## QUESTIONS:

1. Four different species of bats have been identified – *Myotis lucifugus*, *Macotus californicus*, *Myotis yumaensis*, and *Mormoops megalophylla*. Which two species are the most closely related?

- A. *Myotis lucifugus* and *Macotus californicus*
- B. *Macotus californicus* and *Mormoops megalophylla*
- C. *Myotis yumaensis* and *Myotis lucifugus*
- D. Not enough information provided to draw a conclusion

Explain your answer choice here:

2. Two plants have the same type of leaves and are the same color. What might be another differentiating characteristic to examine?

- A. Number of petals
- B. Number of stamen
- C. Position of ovary
- D. All of the above

3. Examining two kinds of insects, which observable characteristic would likely be included on a dichotomous key?



- A. Creepy-looking eyes or nice-looking eyes
- B. Feet tickle when crawling on arm or feet hurt when crawling on arm
- C. Wings or no wings
- D. Both A and C

4. You have spotted a certain butterfly species in large groups, but only in the spring season. Which of the following characteristic is the most helpful in identifying the butterfly with a dichotomous key?



- A. Migrates north every spring
- B. Hangs on branches to rest
- C. Flutters wings more quickly on hot days
- D. Hindwing has a tail

5. Based on the observation data and key below, what is the correct identification for the three arachnids?

Arachnid Observations			
#	Body	Tail	Legs
1	Segmented	Present with no stinger	Shorter than body
2	Not segmented	Not Present	Longer than body
3	Segmented	Present with stinger	Shorter than body

- 1. a) Abdomen segmented.....go to 2
- b) Abdomen not segmented ....go to 4
- 2. a) Abdomen with tail.....go to 3
- b) Abdomen without tail.....go to 5
- 3. a) Tail with stinger.....Scorpion
- b) Tail without stinger..... Whipscorpion
- 4. a) Legs longer than body.....Daddy long legs
- b) Legs not longer than body...Wind scorpion
- 5. a) Covered with spines .....Mite
- b) Few spines.....Tick

Arachnid #1's identity: \_\_\_\_\_

Arachnid #2's identity: \_\_\_\_\_

Arachnid #3's identity: \_\_\_\_\_

7.11.C identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals

## Changes in Genetic Traits

### Natural Selection

**Natural Selection** - the basic concept by Charles Darwin is that environmental conditions (or "nature") determine (or "select") how well certain traits of organisms can survive and be passed on; organisms missing these traits might die before reproducing. As long as environmental conditions remain the same, the traits that help them survive will become more common within the population.

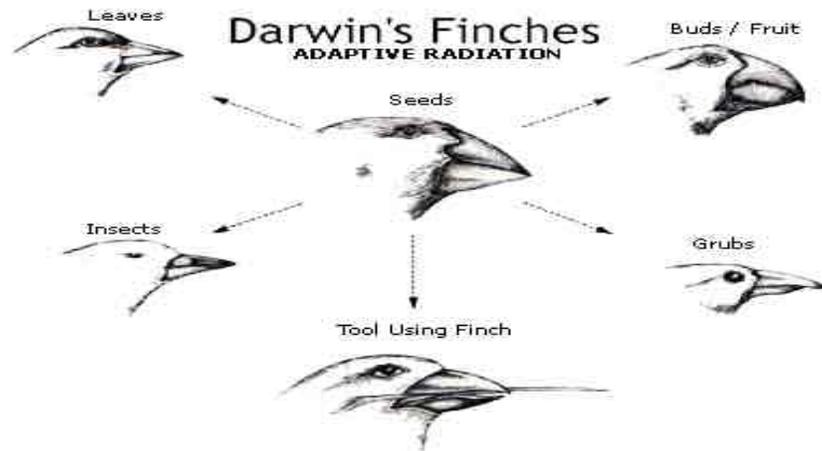
<p><b>Natural Selection</b></p> <p>There is a <i>variation in traits</i>. For example, some beetles are green and some are brown.</p>	
<p>There is a <i>degree of difference</i> in reproduction. Since the environment can't support unlimited population growth, not all individuals get to reproduce to their full potential. In this example, green beetles tend to get eaten by birds and survive to reproduce less often than brown beetles do.</p>	
<p>There is <i>heredity</i>. The surviving brown beetles have brown baby beetles because this trait has a genetic basis. End result: brown colored beetle have more offspring, becomes more common in the population.</p>	

### Selective Breeding

**Selective Breeding** - is the process of breeding plants and animals for particular genetic traits. Such as the beaks of Darwin's Galapagos Finch.

Darwin's finches are an excellent example of the way in which species' gene pools have adapted in order for long term survival through their offspring.

The Darwin's Finches diagram shows the way the finch has adapted their beaks to take advantage of feeding on different foods in different ecological niche.



### Adaptation

A process by which a population becomes better suited to its habitat; a genetic variation that provides an advantage to survive and reproduce, generally spreads through the population



### QUESTIONS:

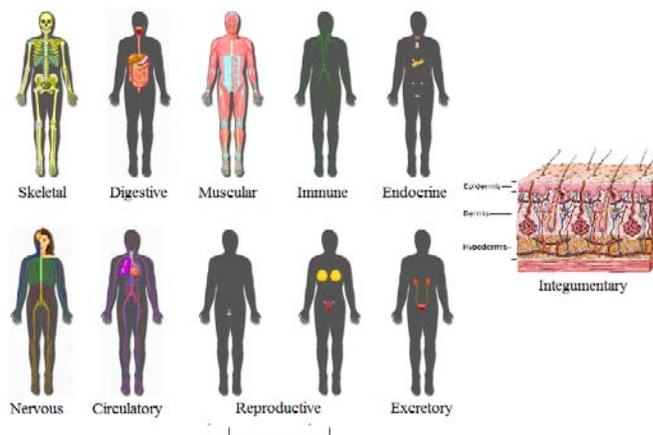
1. An example of selective breeding is –
  - A. A pet dog at someone's house
  - B. A duck swimming at the local pond
  - C. Rice in a cultivated field
  - D. Both A and C
  
2. Which of the following statements is false?
  - A. An adaptation can involve just a single individual.
  - B. An adaptation must be common among a population.
  - C. An adaptation happens over time.
  - D. An adaptation can either physical or behavioral
  
3. Which of the following examples best reflects selective breeding?
  - A. The mating of two particular sheep to produce thicker wool
  - B. A genetic mutation in an individual snake that improves its sense of smell compared to others in its population
  - C. A few individuals of an extinct species live in zoos
  - D. Two wolf packs live in geographically separate regions

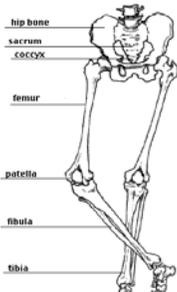
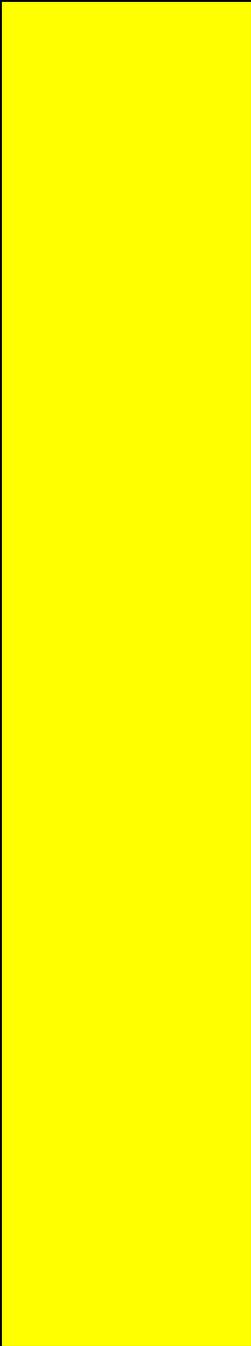
4. If a population of rabbit species lives in a wet, temperate habitat and the environment goes through a 10-year drought with 10 degree Fahrenheit temperatures above normal, which of the following responses might occur?
- A. The population may migrate to seek a wetter area.
  - B. The population may die out.
  - C. If a mutation occurs to better handle the hot, dry conditions- such as larger ears to radiate heat-then the population may be able to continue living in this area.
  - D. All the above.
5. Fifty years ago, an isolated wetland area consisted mostly of open water. Today, it is mostly a swamp with thick vegetation. The same predator species have remained in the area. Scientists have noticed a shift in a local duck species from wide webbed feet to a population that has feet with little webbing and more robust claws. Genetically, today's species and the species from 50 years ago are nearly identical. Explain what happened to your partner.



7.12.B identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems

## Human Body Systems





### Circulatory System

**Function:**

Transport blood throughout the body via the **heart, veins** (blood flows to the heart) and **arteries** (blood flows away from the heart).

**Includes:**

- Heart
- Arteries
- Veins
- Blood

### Respiratory System

**Function:**

Supplies blood with oxygen in the lungs and removes carbon dioxide.

**Includes:**

Airways, such as the trachea, as well as lungs, and alveoli

### Skeletal System

**Function:**

Support the body  
Protects internal organs  
Makes red blood cells

**Includes:**

Bones and joints



### Muscular System

**Function:**

- Provides movement to the body
- Contract (become shorter)
- Relax (become longer)
- Provides strength, balance, and warmth

**Includes:**

Muscles, ligaments and tendons

There are three types of muscles: skeletal, smooth, and cardiac

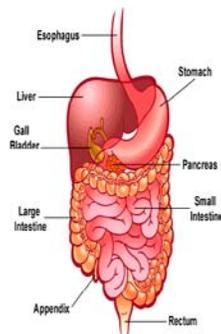
### Digestive System

**Function:**

- Breaks down food
- Absorbs nutrients

**Includes:**

Mouth, esophagus, stomach, small and large intestines, and anus



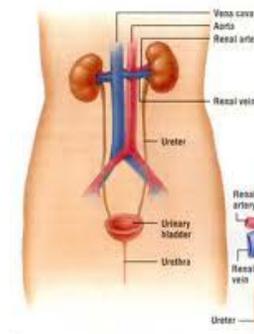
### Excretory system

**Function:**

- Filters the blood (**kidney**)
- Removes waste in the form of fluids (urine).

**Includes:**

Kidneys and bladder



## Reproductive System

### Function:

- Male-to produce and deliver sperm
- Female-to produce ova and prepares the female's body to nourish a developing embryo

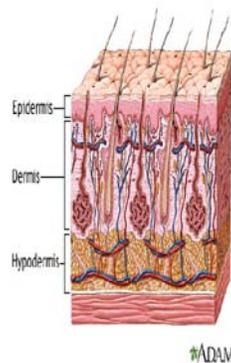
## Integumentary System

### Function:

- Helps regulates temperature
- Protects the body from the outside world

### Includes:

Skin, hair, nails and sweat glands.



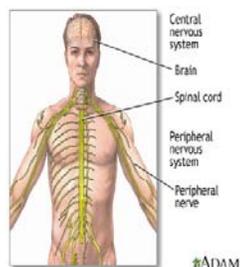
## Nervous System

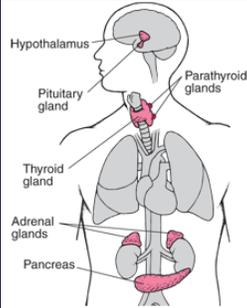
### Function:

- Network that relays messages back and forth from the brain to different parts of the body
- Functions as the control center, coordinating all actions and reactions

### Includes:

Brain, spinal cord, and nerves





## Endocrine System

### Function:

- Regulates body by secreting hormones into the bloodstream, such as insulin
- Helps body maintain **homeostasis**
- Also controls growth, reproduction and metabolism

### Includes:

Glands and hormones

## QUESTIONS:

1. A student touches a hot stove and immediately withdraws her hand from it. Sensory receptors within her hand felt pain from the hot stove. Which body system includes the three layers of skin that function to protect deeper tissue?  
**A** Endocrine system  
**B** Integumentary system  
**C** Nervous system  
**D** Skeletal system
2. A student touches a hot stove and immediately withdraws her hand from it. The student experienced an adrenaline rush when she felt the heat from the stove. Chemicals rushed through her body, giving her a little scare. The body system that produces such chemicals that affect other parts of the body is the -  
**A.** endocrine system                      **C.** nervous system  
**B.** integumentary system                **D.** skeletal system
3. A student touches a hot stove and immediately withdraws her hand from it. Signals from her hand to her brain "red, instructing her body to quickly remove her hand from the hot stove. Which body system initiated this response?  
**A** Endocrine system  
**B** Integumentary system  
**C** Nervous system  
**D** Skeletal system

4. The digestive system's main function is to -
- A** circulate blood and oxygen throughout the entire body
  - B** provide protection and support for other organs within the body
  - C** store nutrients until it finally disappears into the bones
  - D** digest food into smaller parts to be absorbed in the bloodstream

5. Which data table correctly identifies the body systems to their corresponding function and organs?

1			3		
Body System	Function of Body System	Organs of Body System	Body System	Function of Body System	Organs of Body System
Excretory	provides movement and posture	muscles, ligaments, tendons	Respiratory	provides movement and posture	muscles, ligaments, tendons
Respiratory	supplies oxygen to the blood	larynx, trachea, lungs	Muscular	supplies oxygen to the blood	larynx, trachea, lungs
Muscular	filters excess fluids and wastes	kidneys, bladder	Circulatory	filters excess fluids and wastes	kidneys, bladder
Circulatory	delivers oxygen through blood	heart, arteries, veins	Excretory	delivers oxygen through blood	heart, arteries, veins

2			4		
Body System	Function of Body System	Organs of Body System	Body System	Function of Body System	Organs of Body System
Muscular	provides movement and posture	muscles, ligaments, tendons	Circulatory	provides movement and posture	muscles, ligaments, tendons
Respiratory	supplies oxygen to the blood	larynx, trachea, lungs	Respiratory	supplies oxygen to the blood	larynx, trachea, lungs
Excretory	filters excess fluids and wastes	kidneys, bladder	Excretory	filters excess fluids and wastes	kidneys, bladder
Circulatory	delivers oxygen through blood	heart, arteries, veins	Muscular	delivers oxygen through blood	heart, arteries, veins

- A** Table 1
- B** Table 2
- C** Table 3
- D** Table 4

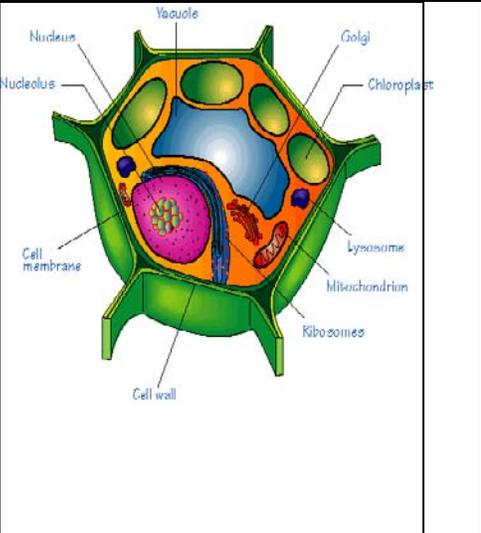
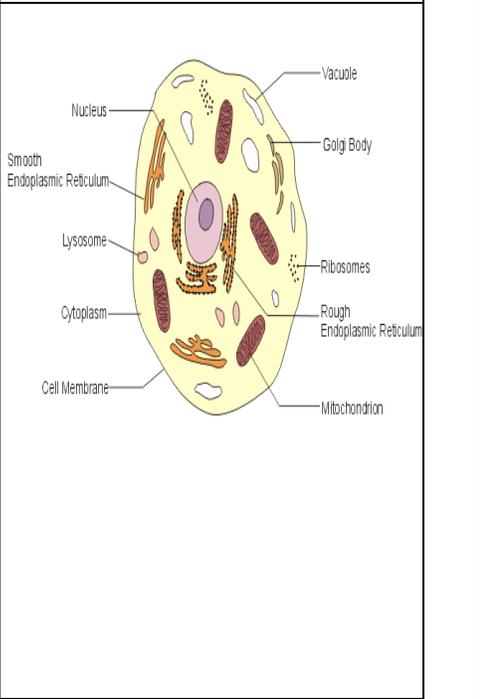
6. A student walks home one day and encounters a mean, barking dog. The student becomes scared and runs away from the dog. This fight or flight response is induced by the -

- A** nervous system
- B** excretory system
- C** circulatory system
- D** endocrine system

7. A student begins to run a fever and is feeling sick. Which body system responds by fighting of sickness through production of white blood cells?

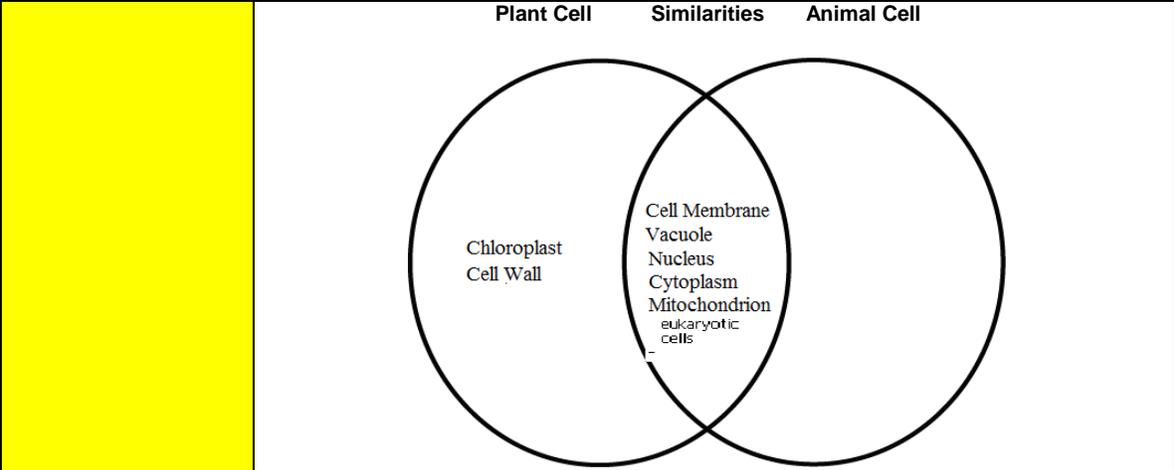
- A** Circulatory system
- B** Respiratory system
- C** Immune system
- D** Endocrine system

	<p>8. Which of the following is not part of the integumentary system?</p> <ul style="list-style-type: none"><li>A Hair</li><li>B Nails</li><li>C Skin</li><li>D Cartilage</li></ul> <p>9. Be able to identify the <u>function</u> of all ten body systems and the organs associated with each body system.</p>
<p>7.12.D differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole</p>	<p style="text-align: center;"><b>Differentiate: Structure and Function Plant &amp; Animal Cells</b></p>

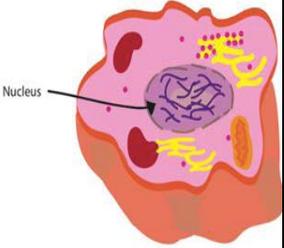
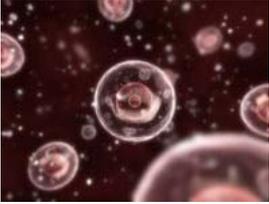
	<p><b>Plant Cell</b></p>	
	<p><b>Animal Cell</b></p>	

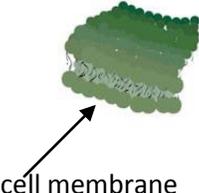
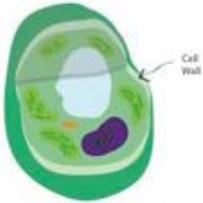
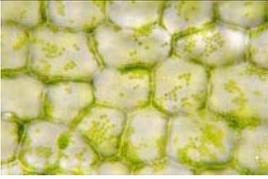
What is the main difference between **eukaryotic cells** and **prokaryotic** cells? Which kind of cells do plants and animals have?

**Plant Cells have a chloroplast and a cell wall.  
Animal cells do not.**



STRUCTURE & FUNCTION of Plant and Animal Cell Organelles

Organelles	Function	In plant, animal, or both?
Nucleus	Controls the cell & contains genetic material	In both 
Cytoplasm	The jellylike material that makes up much of a cell inside the cell membrane, and, in eukaryotic cells, surrounds the nucleus. Supports and protects organelles	In both 
Mitochondrion	Provides <b>energy</b> for the cell	In both

			
	Vacuole	Stores water and food/waste	In both 
	Cell Membrane	Controls movement of materials in & out of cell and a barrier between cell and its environment	In both 
	Cell Wall	Supports and protects the cell	 Only in PLANT cells!
	Chloroplast	The green organelle in plant cells that converts light energy into chemical energy. Uses energy from the sun to make food (photosynthesis)	 Only in PLANT cells!
<b>QUESTIONS:</b>			

1. Which one of the following statements about plant and animal cells is correct?

- A. Both plant and animal cells contain a cell membrane , cell wall, and a nucleus.
- B. Both plant and animal cells contain a cell membrane, cytoplasm, and a nucleus.
- C. Both plant and animal cells contain mitochondria, cell membrane, and a cell wall.
- D. Both plant and animal cells contain mitochondria, a cell wall and cytoplasm.

2. Which organelle helps to create energy within the cell?

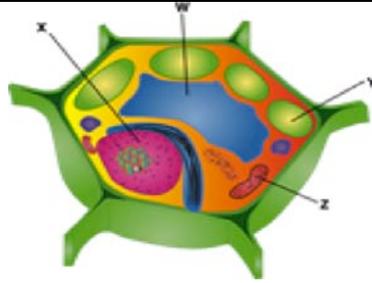
- A. Mitochondria
- B. Nucleus
- C. Vacuole
- D. Ribosomes

3. A group of students conduct a lab experiment to determine the differences between plant and animal cell features. The teacher did not specify which slides were plant cells and which were animal cells. What knowledge can the students recall for them to determine these differences?



- A. The students know that eukaryotic cells perform tasks for the growth of the cell.
- B. The students know that plant cells have a cell wall, chloroplasts, and a large vacuole whereas animal cells do not.
- C. Students can recall that all cells are the building blocks of life.
- D. The students know that animal cells have a cell wall, chloroplasts, and a large vacuole whereas plant cells do not.

4. Examine the eukaryotic cell pictured. The primary function of structure Y is to -



- A. produce energy for the cell.
- B. control the activities of the cell.
- C. transport materials between parts of the cell.
- D. store water, waste and nutrients for the cell.

7.12.F recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life

### Cell Theory

The **most basic unit** of living system and **all living things** are made up of **cells**

Cells are the structural and functional units common to all living organisms.

A **cell** is the **smallest unit of life** that is classified as a **living** thing. Some organisms are **unicellular**, meaning they consist of only a single cell. Most bacteria are unicellular.

Other organisms, including humans, are **multicellular**, consisting of many cells. For example, humans have about 100 trillion cells.

All cells need **genetic** and **environmental** information in order to function. The cell theory states that new cells come from old survive.

Cells use a series of chemical reactions to break down nutrients in food to create energy and produce waste through a process called metabolism.

**Cells** use energy from food to carry on life.

Cellular respiration (heterotrophs)

The process of using oxygen to break down nutrients to release energy for the cell



Photosynthesis (autotrophs)

Process by which plant cells make food using water, carbon dioxide, and light from the Sun



To carry out their day to day functions, cells require **energy**. The ultimate **source of this energy** is the sun.

**Some organisms** can **trap energy directly** from the sun, storing it away to used for energy. These organisms are called **autotrophs**. Autotrophs can make their own food. This process is called **photosynthesis**.

**Organisms** which are **not capable** of photosynthesis are called **heterotrophs**, and must get their energy through their diet instead.

**Cellular respiration** is the process of breaking down carbohydrates, fats and proteins (obtain from diet) to release energy that can be delivered to each cell for use.

To convert the energy stored into a form that is usable, both autotrophs and heterotrophs must take large molecules and break them down into smaller, easier to use molecules.

### QUESTIONS:

1. Which statement about photosynthesis and respiration is true?
  - A. Respiration stores energy while photosynthesis releases energy.
  - B. Photosynthesis stores energy while respiration releases energy.
  - C. Respiration and photosynthesis are the same process.
  - D. Respiration and photosynthesis have nothing to do with each other.
2. The chemical process in which energy is released in living things is called
  - A. cellular respiration
  - B. photosynthesis
  - C. death.
  - D. a chemical change.
3. Which statement is not accurate about the cell theory?
  - A. New cells form from pre-existing cells
  - B. All cells carry out their own life activities
  - C. All organisms are made up of more than one cell.
  - D. Cells vary in size and shape.

4. Cellular respiration is the process by which energy is produced in a cell. Which of the following organelles contain the function for cellular respiration?

- A. Chloroplast
- B. Mitochondria
- C. Vacuole
- D. Cell membrane

5. A small plant was submersed inside a test tube of water and placed in the sunlight for 6 hours. Based on what you know about photosynthesis, what is the function of the chloroplast of the leaves?



- A. Chloroplasts are stimulated in the leaves. Photosynthesis can occur, which produces oxygen.
- B. Since the plant is inside the test tube, it will not receive aid from the sun and it will die.
- C. Chloroplast are motivated by the sun to go through a physical change, therefore altering the plant.
- D. None of these are correct

6. The picture below is a mitochondria found in the cell. Which of the following is the purpose of the mitochondria in a plant cell?



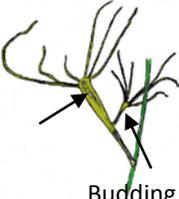
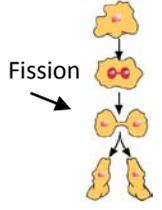
- A. The mitochondria contains the DNA which controls the cell's activities.
- B. The mitochondria produces proteins that are necessary for plant growth.
- C. The mitochondria stores the metabolic wastes from the plant.
- D. The mitochondria breaks down food to release energy for the

cell and the organism.

7. Which of the following statements is not true about the cell theory.
- A. All living organisms are composed of one or more cells.
  - B. Cells originate from pre-existing cells.
  - C. Cells are the basic unit of structure and organization of all living organisms.
  - D. Unicellular organisms can live on their own.

7.14.B compare the results of uniform or diverse offspring from sexual reproduction or asexual reproduction

### Asexual & Sexual Examples Uniform or Diverse offspring?

<p><b>Asexual Reproduction</b></p> <ul style="list-style-type: none"> <li>• Only 1 parent</li> <li>• Offspring <b>exactly like</b> parent genetically (<b>uniform</b>)</li> </ul>	 <p style="text-align: center;">Budding</p>	 <p style="text-align: center;">Fission</p> <p style="text-align: right;">uniform</p>
<p><b>Sexual Reproduction</b></p> <ul style="list-style-type: none"> <li>• Requires 2 parents</li> <li>• Offspring is <b>different</b> from each parent (<b>diverse</b>)</li> </ul>	 <p style="text-align: right;">diverse</p>	

In **asexual reproduction** of **prokaryotic cells**, DNA is replicated from the parent resulting in **uniform offspring**. These cells divide by **binary fission**. Organisms composed of **eukaryotic cells** can also reproduce asexually by forming **spores, by budding, or by vegetative propagation**.

In **sexual reproduction** of **eukaryotic organisms**, DNA is combined and unique combination of **dominant and recessive traits** from two parents create **diverse offspring**.

**QUESTIONS:**

1. What characteristic can be found in the offspring of asexual reproduction?
  - A Genetic information from more than one parent
  - B Uniform genetic information
  - C Diverse appearance
  - D Alleles from more than one parent
  
2. What can be used to best compare the results of offspring from asexual or sexual reproduction?
  - A Cell walls
  - B Mitochondria
  - C Organelles
  - D DNA
  
3. Which organism reproduces only sexually?
  - A Strawberry plant
  - B Bacteria
  - C Human
  - D Mushroom
  
4. What creates diverse offspring?
  - A Fragmentation
  - B Sexual reproduction
  - C Large populations
  - D Biodiversity
  
5. How could a scientist determine if offspring are the result of asexual or sexual reproduction?
  - A Analyze their DNA
  - B Measure their growth rate
  - C Weigh their mass
  - D Map their habitat
  
6. If two different breeds of dogs reproduced sexually, combining DNA, then their offspring would demonstrate -





- A. identical appearance to only one parent.
- B. uniform genotype.
- C. a unique combination of recessive and dominant traits.
- D. prokaryotic cells.

SHARE your thoughts about the questions below with your partner:

What are some reproductive differences between prokaryotic and eukaryotic cells?

How do offspring from asexual reproduction compare to offspring from sexual reproduction?

Are the offspring of asexual reproduction uniform or diverse?

Are the offspring of sexual reproduction uniform or diverse?

7.14.C recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus

## Genetic Material

**Gene** - a unit of instructions for traits, found in the DNA of an organism.

Genes play an important role in determining physical traits (how we look).

DNA is located in chromosomes in the nucleus

Humans have 23 pairs of chromosomes

**Traits** - characteristics that distinguish an organism.

**Inherited Traits** - traits that are inherited in the genes and passed down from parent to offspring (generation to generation)

Type of Inherited Trait	Genes are located in the Chromosomes in the Nucleus
-------------------------	---



Attached Ear Lobe



Hanging Ear Lobe

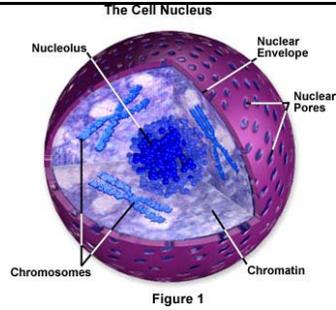


Figure 1

Genetic information is inherited from both parents in sexual reproduction. Inherited traits include expressed external characteristics such as eye color and hair color and internal characteristics such as blood type. Inherited traits are not affected by the organism's surroundings.

**VOCABULARY YOU NEED TO KNOW TO ANSWER QUESTIONS:**

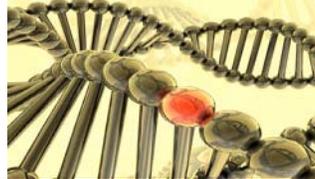
**Heredity:**

Process of characteristics transmitted from parent to offspring.



**Genes:**

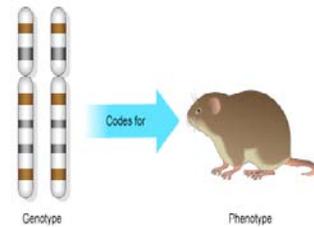
The basic physical and functional unit of heredity made up of DNA.



**Genotype:**

A genetic makeup of an organism

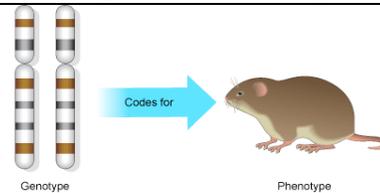
Example: Bb (brown hair dominant)



**Phenotype:**

The physical appearance of an organism

Example: long body, brown hair, etc.

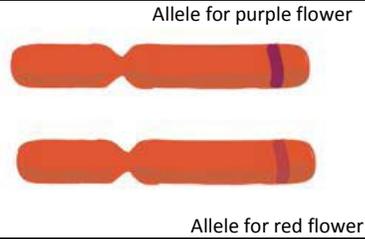


**Trait:**  
A characteristic of an organism controlled by genetics.



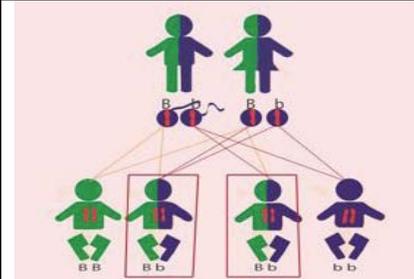
Example: color

**Alleles:**  
Variations of a gene relating to the same trait.



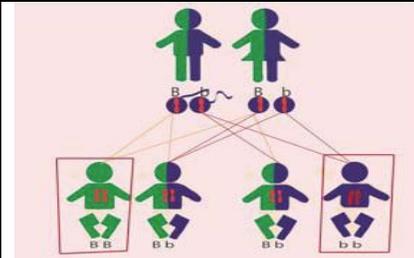
**Heterozygous:**  
Having two different alleles for a trait.

Example: Bb in picture to your right.



**Homozygous:**  
Having two of the same alleles for a trait.

Example: BB or bb in picture to your right.



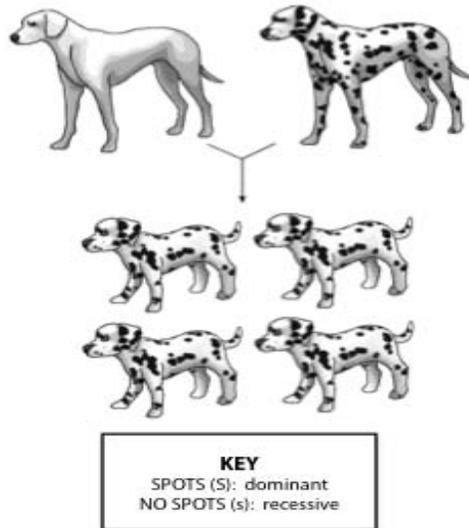
### QUESTIONS:

1. The allele pair below is for the height trait. If R represents a dominant trait (tall) and r represents a recessive trait (short), which will the organism?

**Rr**

- A. Tall and short
  - B. Short
  - C. Medium
  - D. Tall
2. Which of the following is not an example of an inherited trait?
- A. Eye color
  - B. Blood type
  - C. Hairstyle
  - D. Hair color

3. Which gene combination for the parents shown in the diagram?



- A.  $SS \times SS$
- B.  $ss \times ss$
- C.  $Ss \times Ss$
- D. None of these

4. In offspring when a dominant allele (F) and a recessive allele (f) are present, which of the following statements is true?

- A. The recessive form of the trait will be observed.
- B. The recessive allele will blend with the dominant allele.
- C. The recessive form will not be observed but will still be present in the DNA.
- D. The recessive form will not be observed and cannot be passed on to future offspring.

5. The boy in this picture has brown hair and green eyes, what can you conclude?



- A. Both of his parents have brown hair.
- B. Green eye color is the recessive form of the eye color trait
- C. Brown hair and green eyes are phenotypes.
- D. Both A and B

6. Which statement best describes a domesticated chicken?

- A. It was bred to inherit traits for tasty meat quality.
- B. It was bred by selecting parents with desirable genes.
- C. It was bred for its vulnerability to disease.
- D. Both A and B

7. Which of the following traits is most influenced by environment rather

than heredity?

- A. Hitchhiker's thumb
- B. A fondness for grapefruit
- C. Dimples in cheeks
- D. Right or left handed

8. A female brown mouse mates with a male white mouse and produces 11 offspring. Six of the offspring are brown and five of the offspring are white. If brown color is dominant to white, why aren't all the offspring brown?

- A. The female mouse was fed marshmallows which caused some of the offspring to be white.
- B. The white mouse also contains a dominant allele for brown fur.
- C. Pollution in the air and water caused some of the offspring to turn white.
- D. The brown mouse contains a recessive allele for the white fur.

9. A man and woman have dark-colored hair, the expression of hair color's dominant form (H). They have four children, two of which have light-colored hair, the trait's recessive form (h). Which of the diagrams below demonstrate the genotypes of the parents (shaded gray)?

parents	H	H
H	HH	HH
h	Hh	Hh

**F**

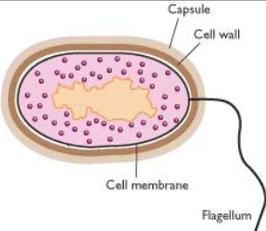
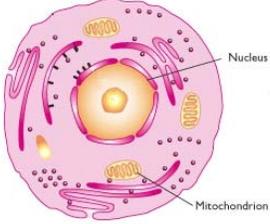
parents	H	h
H	HH	Hh
h	Hh	hh

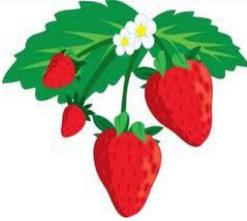
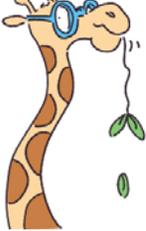
**G**

- A. F
- B. G
- C. Either F or G
- D. Neither F nor G

6.12.D identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms

## Characteristics of Organisms

Prokaryotic	Eukaryotic
Does not have an organized nucleus. Their DNA is floating around the cell.	Has a nucleus.
	

Autotrophic	Heterotrophic
Organisms that make their own organic food	Organisms that consume food that is already present in the environment
	

Three domains are used to classify or group organisms.

DOMAIN	Description	Examples
Archae	Primitive unicellular prokaryotes; some autotrophs and some heterotrophs; some live in harsh conditions	Halophilic archae live in very salty water
Bacteria	Unicellular prokaryotes; most are heterotrophs; "typical" bacteria	Staphylococcus bacteria, <i>E. coli</i>
Eukarya	Unicellular and multicellular	Fish, tree, algae

eukaryotes

The eukarya domain can be divided into four distinct **kingdoms**.

KINGDOM	Description	Examples
Protist	Typically unicellular eukaryotes; some autotrophs and some heterotrophs	Amoeba, algae, euglena
Fungi	Typically multicellular eukaryotes; heterotrophs; many are decomposer	Mushroom, mold, yeast, <i>Penicillium</i>
Plant	Multicellular eukaryotes; autotrophs	Tree, grass, corn
Animal	Multicellular eukaryotes; heterotrophs	Snail, dog, human

### QUESTIONS:

1. Of the characteristic comparisons in the list below, which is the best choice for classifying an organism into a taxonomic Kingdom?
  - A. Fur vs. no fur
  - B. Legs vs. no legs
  - C. Multicellular vs. unicellular
  - D. Brown-colored vs. green-colored
2. Organisms classified in the Animal Kingdom most commonly reproduce
  - A. sexually
  - B. asexually
  - C. by vegetative propagation
  - D. none of the above

3. This fungus is an example of an organism that -



- A. makes its own food using photosynthesis
  - B. consumes other organisms for food
  - C. can either make its own food or consume other organisms
  - D. does not need food
4. A classification guide notes that a type of fungus is a member of the plant Kingdom. Why is this classification incorrect?



- A. Fungi make their own food.
- B. Fungi rely on other organisms as food sources
- C. Fungi are multicellular
- D. Fungi are eukaryotes.

5. Which of the following statements is correct regarding flowering plants?

- A. The asexual reproductive structure is a clone.
- B. Fertilization is the sexual reproductive process that involves pollination.
- C. Flowering plants reproduce by binary fission.
- D. Sexual reproduction in flowering plants only requires the female part of the flower.

6. Which of the following processes explains the type of reproduction that occurs when starfish regenerate from being cut in half?



- A. Asexual reproduction
- B. Sexual reproduction
- C. Both asexual and sexual reproduction
- D. Neither asexual and sexual reproduction