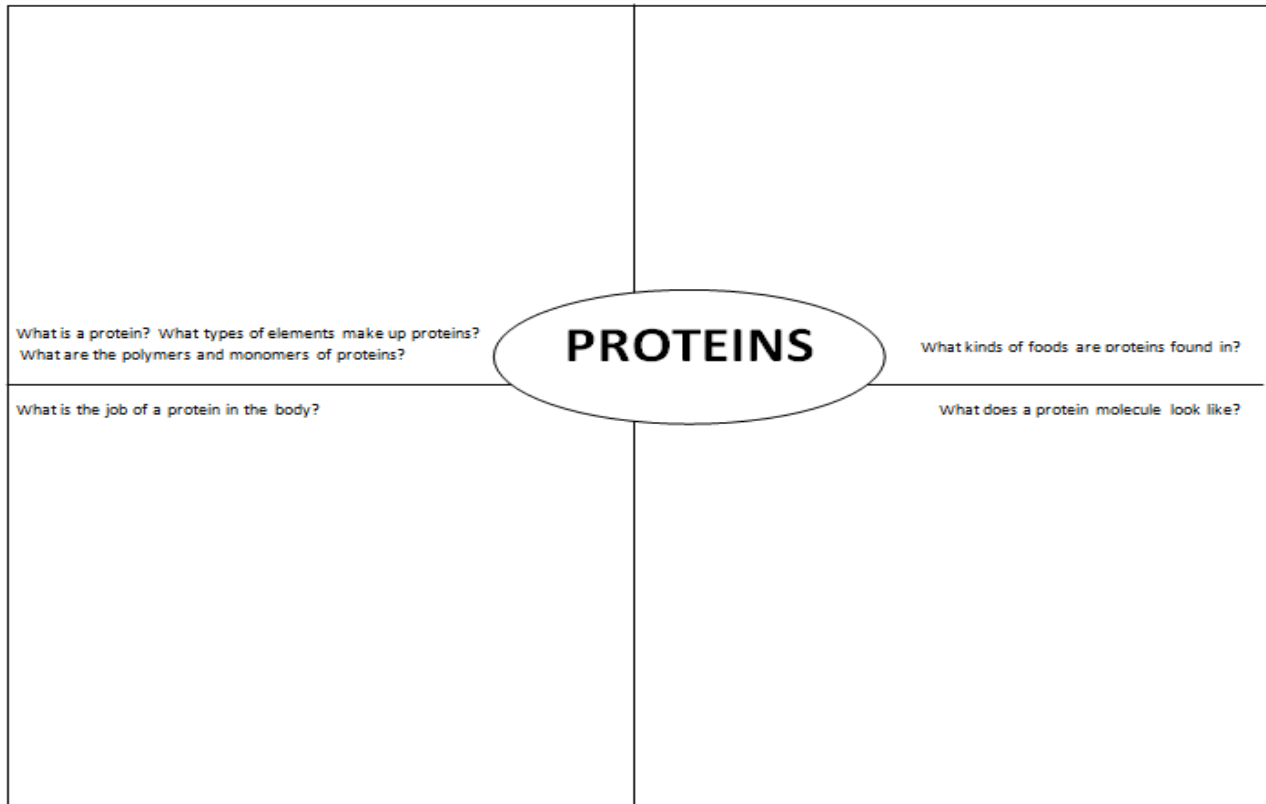
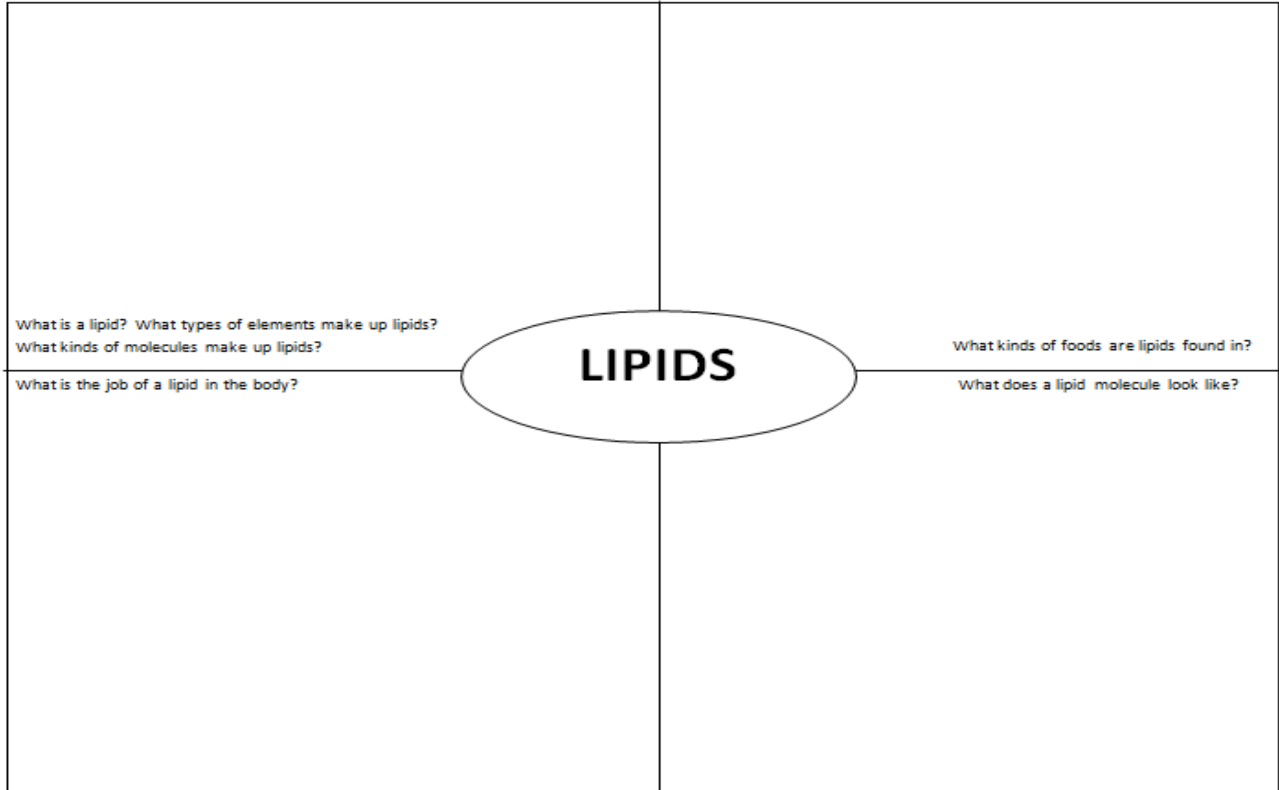


REPORTING CATEGORY 1: CELL STRUCTURE AND PROCESSES

1. For the four types of biomolecules, fill in the chart that describes each type.



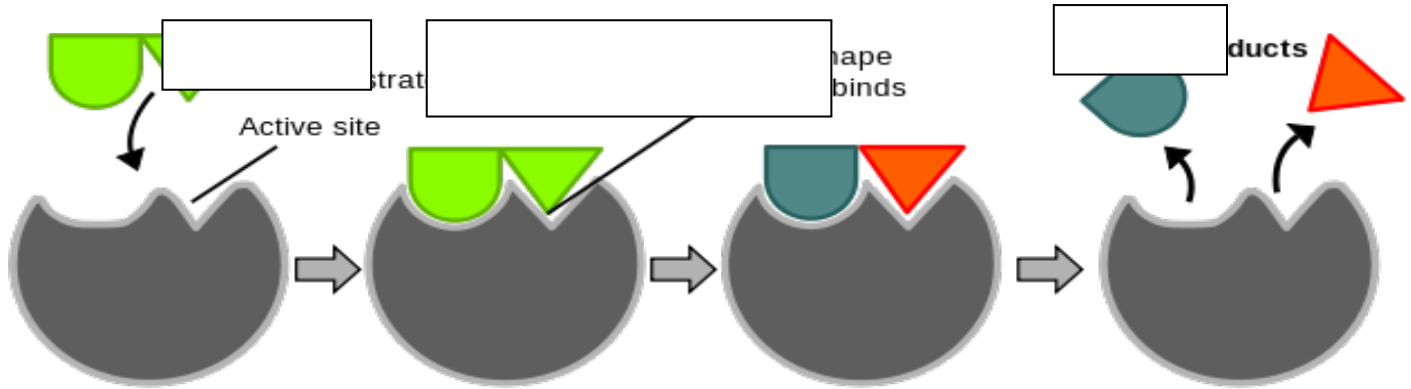
BIOLOGY EOC PRACTICE WORKSHEETS

What is a carbohydrate? What types of elements make up carbohydrates? What are the monomers and polymers?	CARBOHYDRATES	What kinds of foods are carbohydrates found in?
What is the job of a carbohydrate in an organism?		What does a carbohydrate molecule look like?

What is a nucleic acid? What types of elements make up nucleic acids? What are the monomers and polymers?	Nucleic Acids	What are the two types of nucleic acids?
What is the job of a nucleic acid in the body?		What does a nucleic acid molecule look like?

BIOLOGY EOC PRACTICE WORKSHEETS

2. Enzymes are a type of protein that acts like a catalyst, which speeds up chemical reactions. In the diagram below, please label the parts of an enzyme reaction and describe what is occurring in each step.



Step 1:

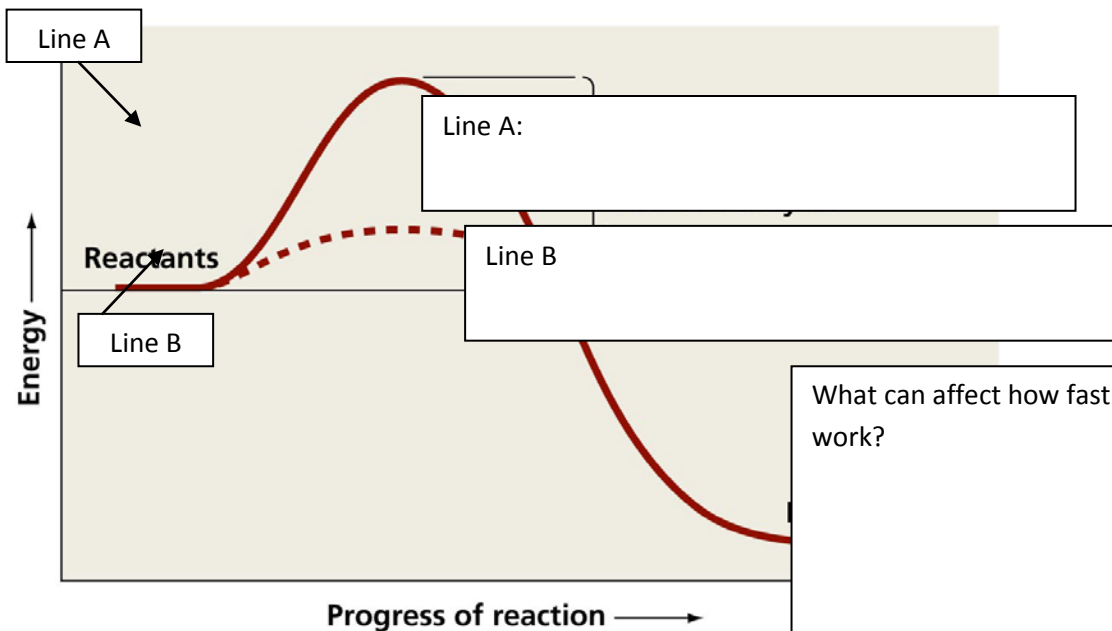
Step 2:

Step 3:

Step 4:

3. Enzymes are specific. Amylase breaks down _____; Protease breaks down _____; and Lipase breaks down _____.

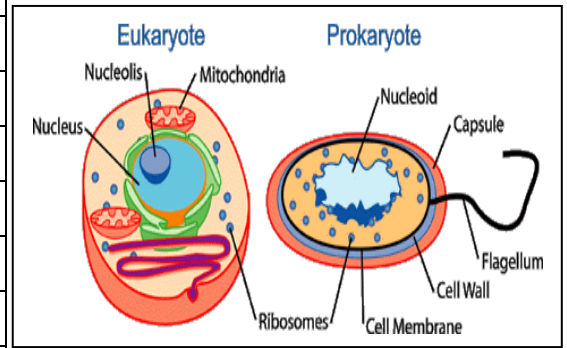
4. Enzymes work by reducing the amount of _____ needed to complete a reaction. In the diagram below, label which line uses an enzyme and which line does not use an enzyme.



What can affect how fast enzymes work?

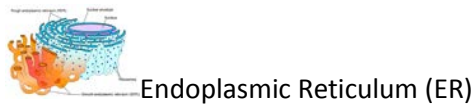
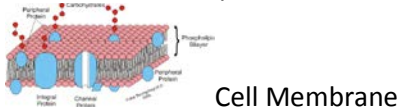
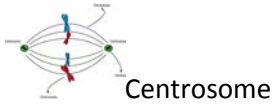
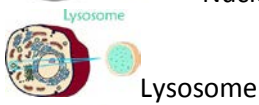
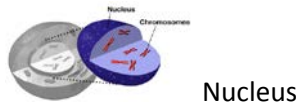
5. Fill out the chart about cells with a "Yes" or a "No."

	Prokaryotic	Eukaryotic
Cell membrane		
Cytoplasm		
Genetic Material		
Ribosome		
Nucleus		
Organelles		
Type of Cell	Simple	Complex



6. Which organelles are found ONLY in the plant cell and not animal cells? (Note: Some prokaryotic bacteria cells may have these organelles.)

7. Match the cell organelle to its function.



Protein Synthesis

Has a role in Mitosis to separate chromosomes

Contains DNA

Transport nutrients within the cell

Packages proteins made; Exocytosis

Breaks down nutrients and wastes

Storage

Breaks down glucose into ATP energy

Photosynthesis

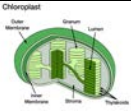
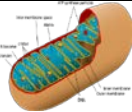
A flexible membrane around eukaryotic cells

A rigid membrane found in plants and some bacteria

8. Specialized cells are determined by DNA and they are specialized to do a specific job. What is the special job of--

Type of Specialized Cells	Specialized Job
 Red Blood Cells	
 White Blood Cells	
 Muscle	
 Nerve	
 Bone	

9. Fill out the chart below about Cell Energy.

	Photosynthesis	Cellular Respiration
Occurs in what type of cells?		
Takes place in the _____ organelle.		
Reactants (uses)		
Produces (creates)		
Full Equation		

10. Compare and contrast the two types of cell transport.

Active Transport	Passive Transport

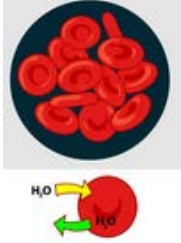
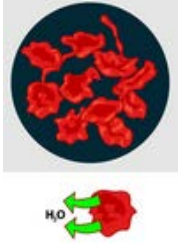
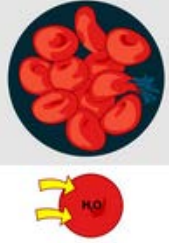
11. Describe how the following types of Active Transport works.

	Active Transport	Endocytosis	Exocytosis
How does it work?			
What does it use to move things across the cell membrane?			
What type of things does it move across the cell membrane?			
Draw a picture of it.			

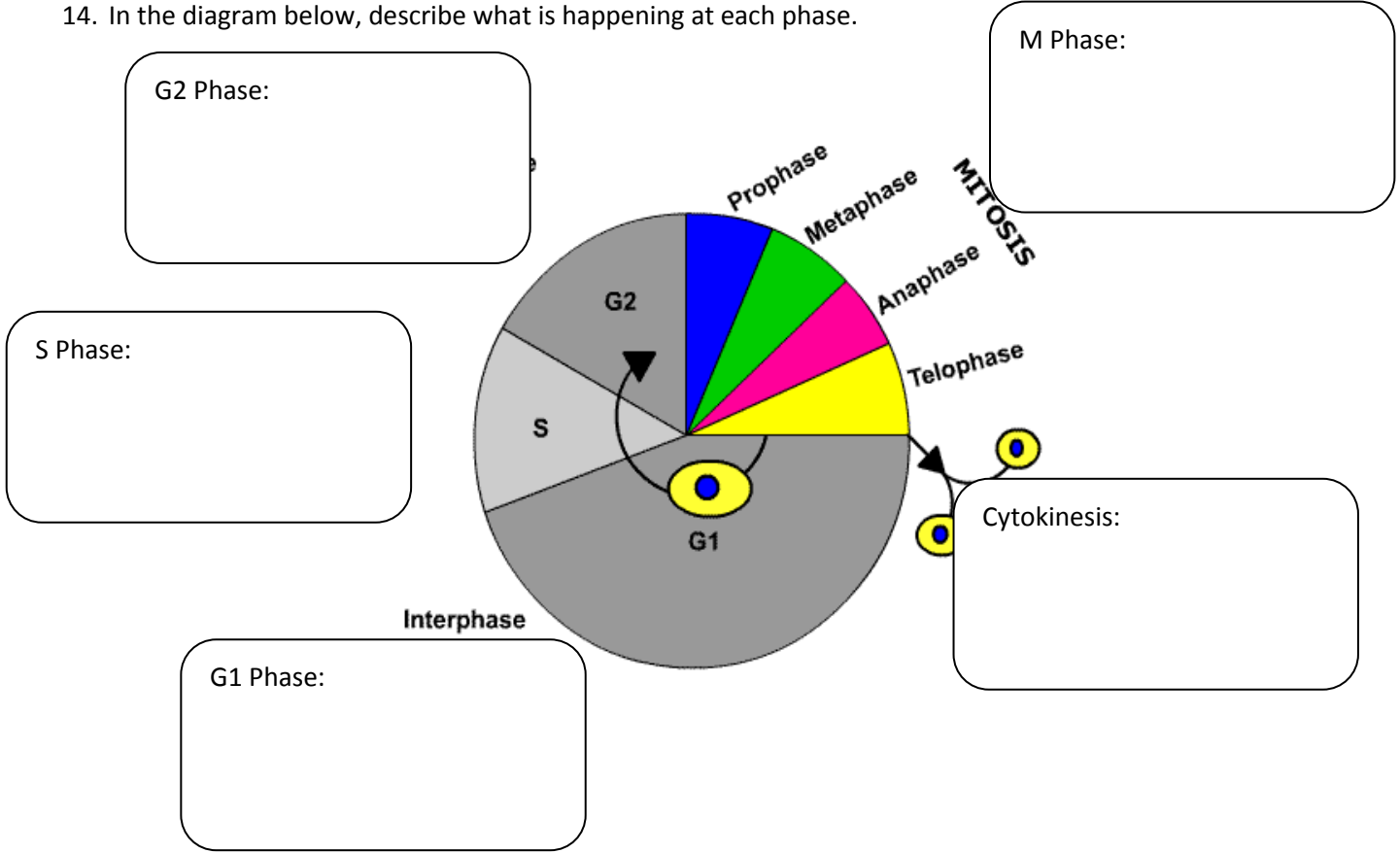
12. Describe how the following types of Passive Transport works.

	Diffusion	Facilitated Diffusion	Osmosis
How does it work?			
What does it use to move things across the cell membrane?			
What type of things does it move across the cell membrane?			
Draw a picture of it.			

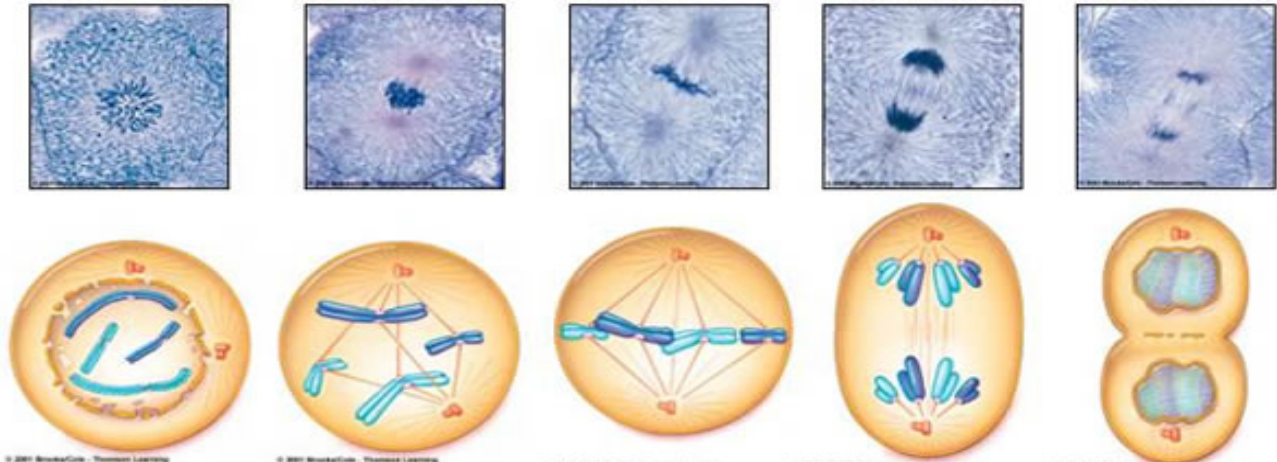
13. In the diagram below, identify the type of passive transport- osmosis that is occurring.

			
Type of Osmosis			
What happens to the cell?			

14. In the diagram below, describe what is happening at each phase.



15. Describe what occurs in each step of Mitosis. Use terms: chromosome, spindle fiber, nuclear envelope, nucleus, centrosome.



<p>Prophase:</p>	<p>Metaphase:</p>	<p>Anaphase:</p>	<p>Telophase:</p>
------------------	-------------------	------------------	-------------------

16. What divides in Mitosis? What divides in Cytokinesis?

17. What happens when a cell can't stop dividing and continues to divide uncontrollably?

18. How is Mitosis different from Meiosis?

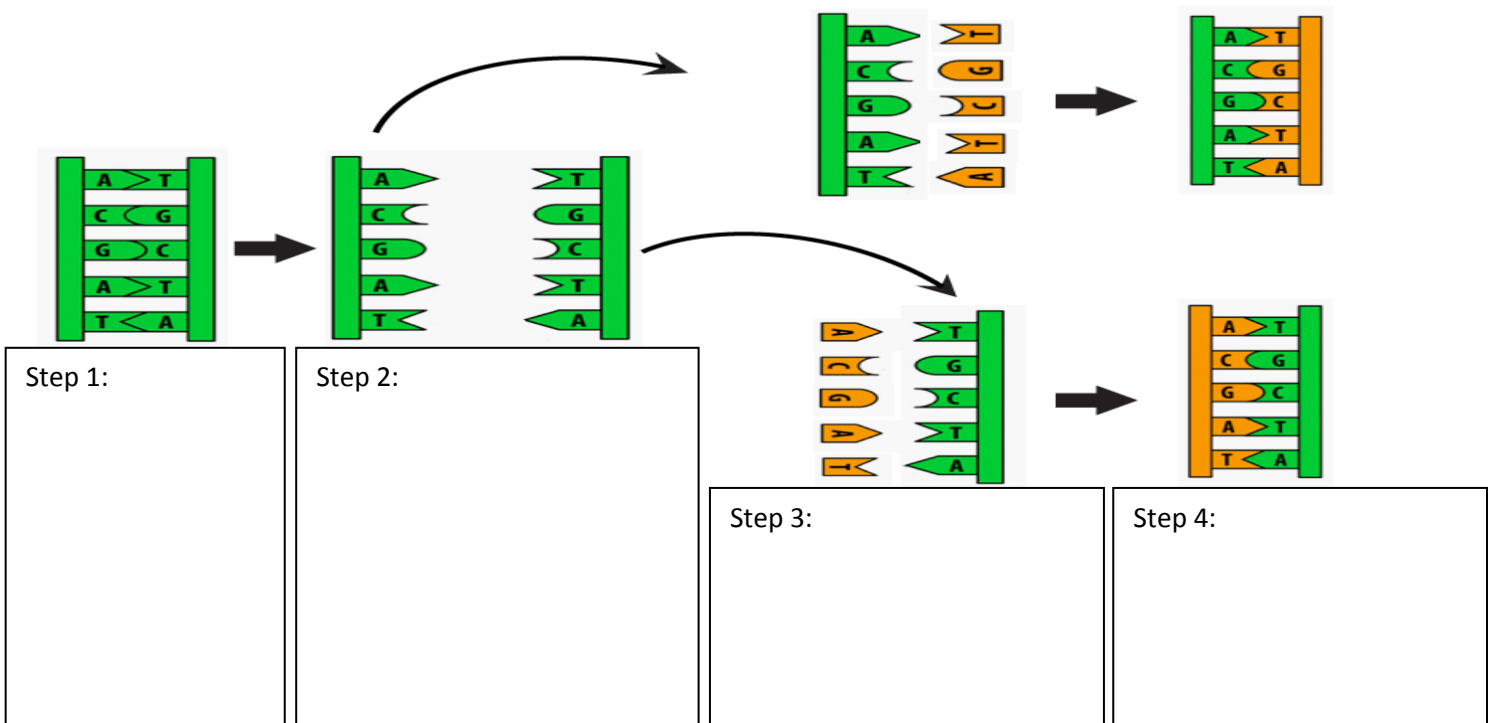
	Mitosis	Meiosis
# of divisions		
# daughter cells		
Genetic Make up		
Type of cell created		
Type of reproduction		
Examples		

19. Even though you and your siblings get your DNA from the same parents, why is it you are not identical to each other? Explain how the processes below help increase genetic diversity.

Crossing Over	
Segregation	
Independent Assortment	

20. When does DNA replication occur in the cell cycle?

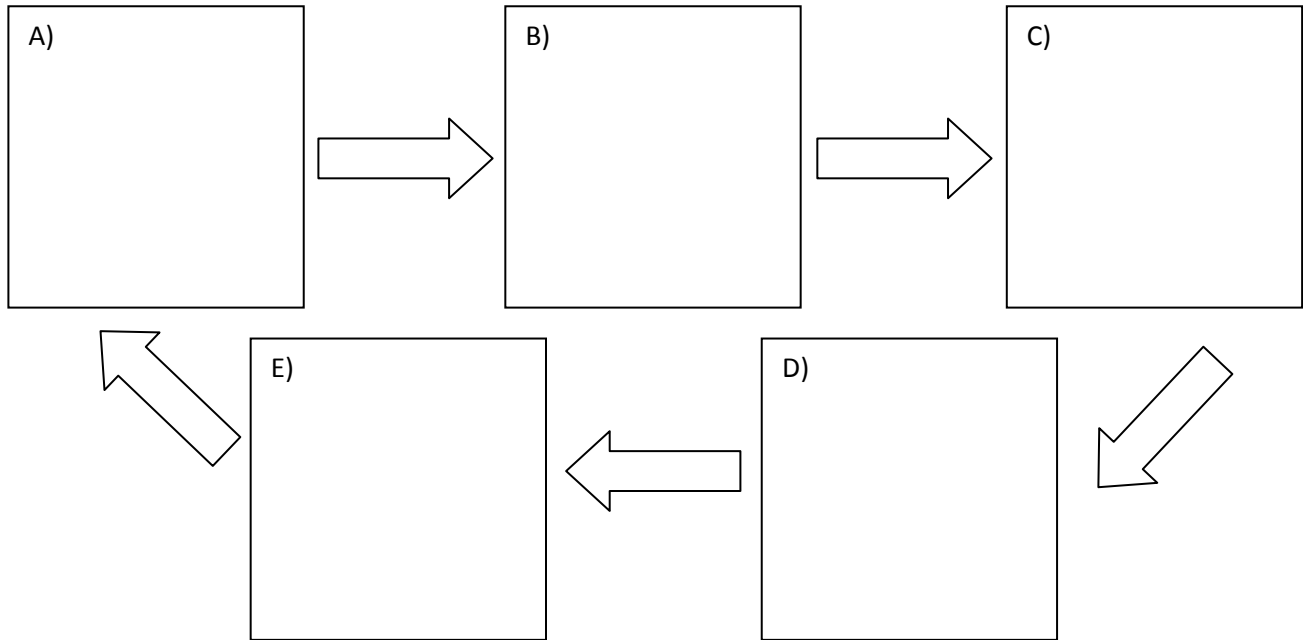
21. The diagram below shows DNA replication. Describe what is happening at each step.



22. Use the following to write about key differences between bacteria and viruses.

Viruses _____, but bacteria _____ .
 Viruses _____, but bacteria _____ .
 Viruses _____, but bacteria _____ .
 Viruses _____, but bacteria _____ .

23. Draw pictures and descriptions of the five stages of the viral lytic cycle.



24. How do the lytic and lysogenic cycles differ? _____

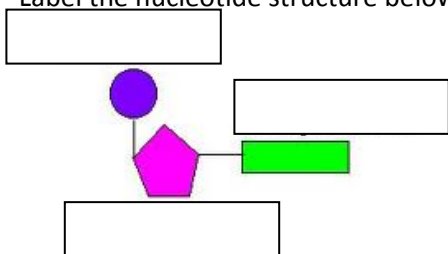
25. What does influenza attack? Which cycle is it in? _____

26. What does HIV attack? Which cycle is it in? Why is HIV so dangerous? _____

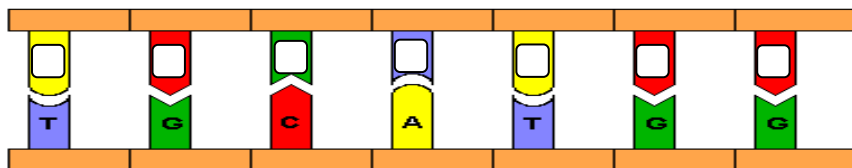
REPORTING CATEGORY 2: MECHANISMS OF GENETICS

1. What is DNA? What does it carry?
2. What are the monomers of DNA? Polymers?

3. Label the nucleotide structure below.



4. What makes up the backbone/sides of DNA?
5. What makes up the steps/rungs of DNA?
6. In the unwound DNA form below, fill in the complementary base pairs.



7. Where do you get your DNA from?
8. Describe the types of DNA Gene Mutations.

Definition	Example
Point Substitution:	
Frameshift Deletion:	
Frameshift Addition:	

Monohybrid: In the following examples, the trait of black colored fur on a rat is studied. Black fur (B) is dominant over brown fur (b). For each example, predict the distribution of phenotype and genotype in the offspring for the parents described.

×		

In this example, a homozygous dominant male (BB) is crossed with a homozygous recessive female (bb).

9. What is the distribution of genotypes in the offspring? _____

10. What is the distribution of phenotypes in the offspring? _____

×		

In this example, both parents are heterozygous (Bb).

11. What is the distribution of genotypes in the offspring? _____

12. What is the distribution of phenotypes in the offspring? _____

×		

In this example, a heterozygous male (Bb) is crossed with a homozygous recessive female (bb).

13. What is the distribution of genotypes in the offspring? _____

14. What is the distribution of phenotypes in the offspring? _____

15. If one of the parents is homozygous dominant (BB), what can always be said about the offspring? _____

Dihybrid: In this example, we're going to see what happens when two traits are examined at the same time. We'll examine the color of fur again (Black = B and brown = b), but we'll also examine another trait, the tail. A long tail (T) is dominant over a short tail (t).

×				

In this example, both parents are heterozygous for both traits (BbTt).

16. What percentage of offspring have black fur?

17. What percentage of offspring have brown fur?

18. How does this compare to the monohybrid cross of heterozygous parents in the monohybrid cross above?

19. What is the distribution for the four genotypes in the Punnett square?

Co-Dominance: In this example, we're going to examine blood type, which results from a co-dominant trait. Type A blood results from having a Type A allele (I^A), Type B blood results from a different allele (I^B), Type AB blood results from both of these alleles ($I^A I^B$), and Type O blood results from being homozygous recessive (ii).

x		

In this example, a father is heterozygous for Type A blood ($I^A i$) and a mother is heterozygous for Type B blood ($I^B i$).

20. What genotypes are seen for the off spring? _____

21. What phenotypes do these genotypes correspond to? _____

22. What are the only ways to produce offspring who have Type O blood? _____

23. What is the only way to have offspring with Type AB blood? _____

Incomplete Dominance: In this example, we'll examine a species of flower that produces blue and yellow flowers. The blue trait (BB) and the yellow trait (YY) exhibit incomplete dominance and produce green flowers when heterozygous (BY).

x		

In this example, blue (BB) flowers are crossed with green (BY) flowers .

24. What is the distribution of genotypes in the offspring? _____

What is the distribution of phenotypes in the offspring? _____

25. If you wanted to produce yellow flowers, what genotypes would the parents have to have?

Sex-Linked Traits: Hemophilia is a disease which results from the blood's inability to clot normally. It is an X-linked recessive disease, so a normal X chromosome (X) is dominant over a carrier X chromosome (X^h). The gene would be expressed if it were paired with a Y chromosome.

x		

In this example, a mother who carries the hemophilia trait (XX^h) has children with an unaffected father (XY).

26. What is the distribution of genotypes in the offspring? _____

What is the distribution of phenotypes in the offspring? _____

27. What is the percentage of male offspring who express hemophilia disease? _____

28. What is the percentage of female offspring who express the hemophilia disease? _____

29. If a hemophiliac son were to have children, what percentage of his sons would have hemophilia? _____

30. Complete the boxes and charts below about mitosis and meiosis.

In this box, list characteristics that mitosis and meiosis have in common.

--

List some key differences between mitosis and meiosis.

Meiosis ...

but mitosis ...

--	--

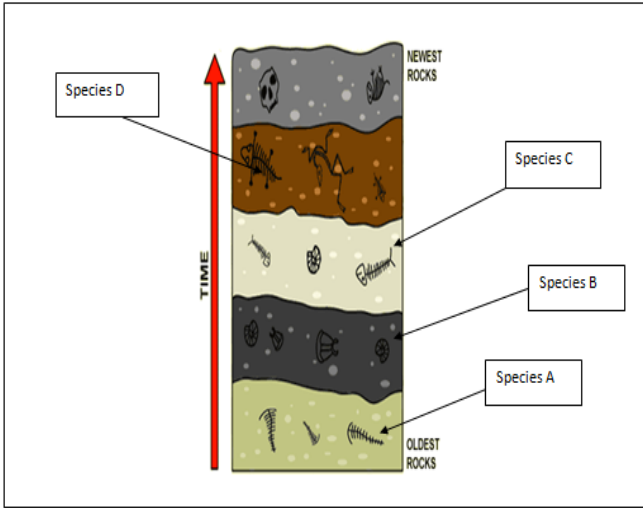
31. Describe each of the following possibilities of what can happen to chromosomes during meiosis. Explain the impact on the genes. Draw pictures to illustrate.

	Description and Drawing
Nondisjunction	
Crossing over	
Insertion	
Deletion	
Inversion	

32. For each of the following gene technology applications, describe what it is and why it is important.

Karyotype	
Pedigree	
Genetically Modified Organisms	
Gene Therapy	
DNA Fingerprinting	
Cloning	
Transgenic Animals and Recombinant DNA	

REPORTING CATEGORY 3: EVOLUTION AND CLASSIFICATION

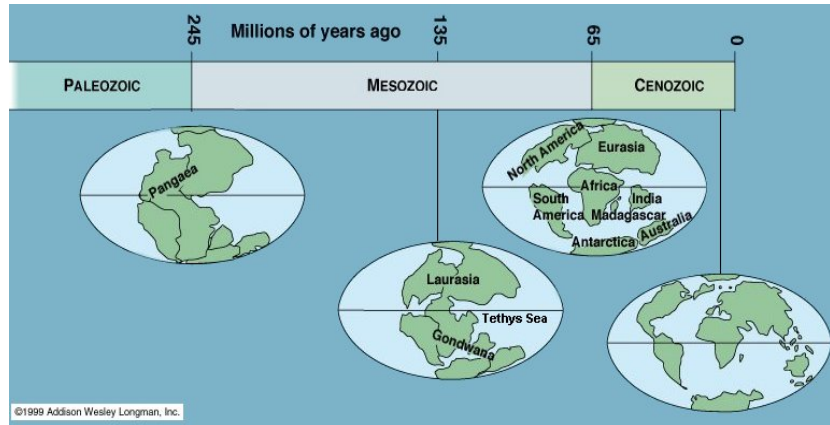


1. How can evidence of evolution be determined from a fossil record?

2. Where in the fossil record would you expect to see older common ancestors?

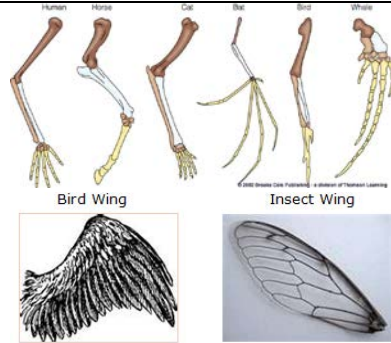
3. How would gradualism present in the fossil record?

4. How would punctuated equilibrium show in the fossil record?



5. Even though they are now separated by the Atlantic Ocean, the northeastern coast of North America and the Scandinavian coast of Europe were once connected as part of the original supercontinent Pangaea. What would biogeography predict about fossils that might be excavated in both of these locations?

6. What do homologous and analogous structures have in common?



7. How are homologous and analogous structures different?

8. Which of these two structures supports theories of common ancestry? Why? _____

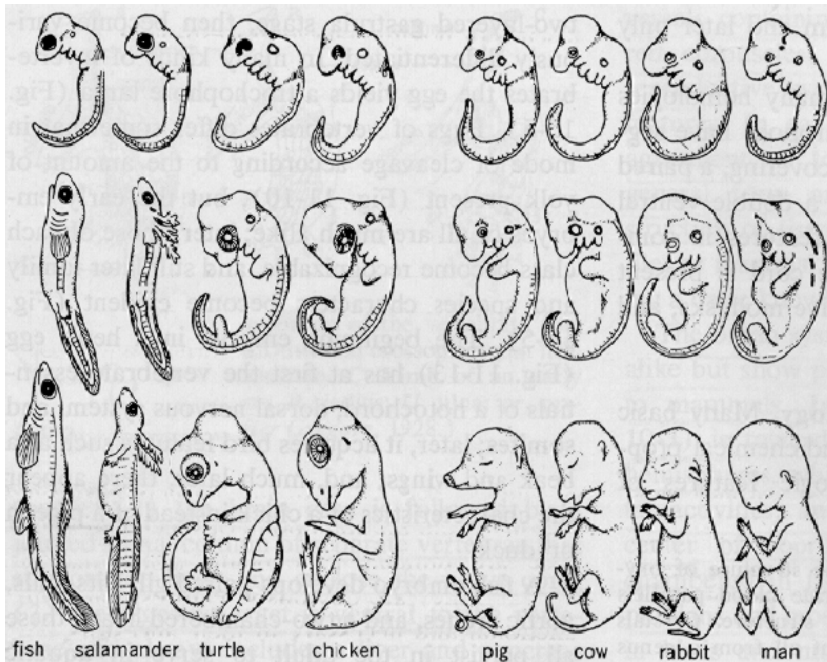
Species	Sequence of Amino Acids in the Same Part of the Hemoglobin Molecules
Human	Lys-Glu-His-Iso
Horse	Arg-Lys-His-Lys
Gorilla	Lys-Glu-His-Lys
Chimpanzee	Lys-Glu-His-Iso
Zebra	Arg-Lys-His-Arg

Some of the strongest evidence of common ancestry is contained in our genetic code. Look at the table above which lists sequences of amino acids in the protein hemoglobin. Hemoglobin is used in all organisms to deliver oxygen to the tissues, but there are slight differences among the species.

9. Which two species would to share the closest common ancestor? Why? _____

10. What are additional species that might share close common ancestors? What do you know about these pairs of animals that might make it seem true that they are closely related? _____

11. Which pair of animals do you think would least likely to share a common ancestor? Why? _____

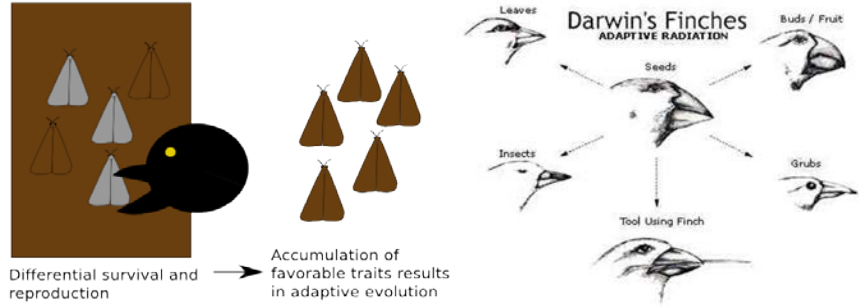


Embryology also allows us to see evidence of common ancestry. As you can see in the top of the diagram, early stages of embryonic development show many similarities. As the embryos develop, differences among the species become more apparent.

12. Which pairs of embryos indicate species that are likely to share closer common ancestors? Why?

13. Which pairs of species are probably have only distant common ancestors? Why? _____

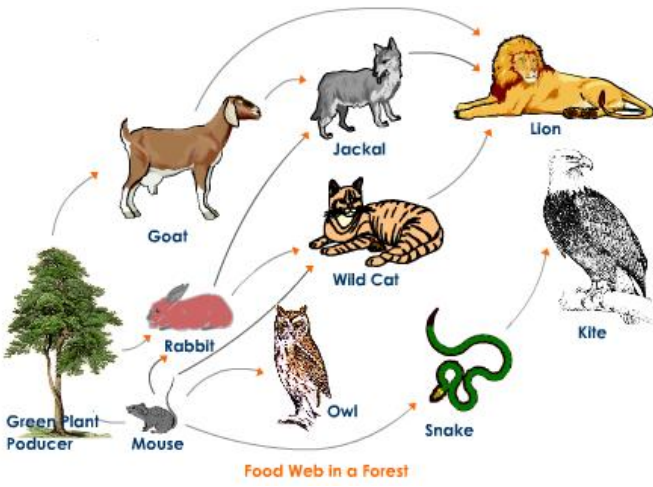
BIOLOGY EOC PRACTICE WORKSHEETS



The diagrams above represent a possible mechanism and some possible outcomes of natural selection.

14. Describe how natural selection causes changes in a population. _____

15. An observer makes detailed observations about a bird and its song for over two years. One day, she notes that the birdsong has changed. She postulates that natural selection caused this change. Why is she wrong?



Consider this food web. Suppose that some of the mice in the food web had a mutation that caused their fur to become darker, thus camouflaging their appearance from their predators.

16. According to natural selection, what would happen to the population of mice over time? Why?

17. The ability of a mouse to burrow underground is one of its defenses. Suppose that the climate of the forest became drier over time and that only snakes which have a mutation that allows them to dig in dry earth would be able to prey upon those mice. How would the snake population be affected, according to natural selection?

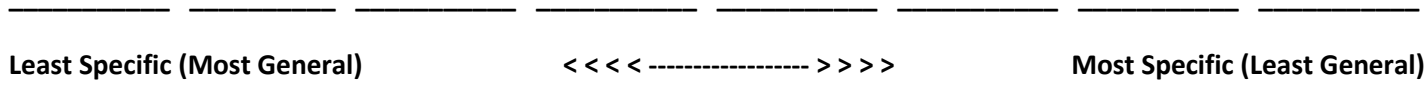
18. The eggs that snakes lay for reproduction fare better in wetter soils than what the forest develops. How will the reproductive success be affected? What does this mean for the population of snakes? Which snakes will survive?

19. The following table lists mechanisms by which populations can change. For each of the following, complete the table with descriptions, what happens to the population, and an example of each.

Type of Change	Description	What change happens in the population?	Example
Genetic Drift: Bottleneck Effect			
Genetic Drift: Founder's Effect			
Gene Flow: Migration			
Mutation			

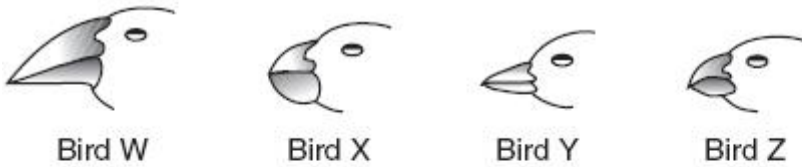
20. Rank the 8 Taxonomic classification categories from least specific to most specific.

Class Domain Family Genus Kingdom Order Phylum Species



21. Which two parts of the taxonomy system are used to refer to specific organisms in the two-part naming system?
Why are these names the ones used?

22. Use the dichotomous key to identify the organisms.



Bird W _____

Bird X _____

Bird Y _____

Bird Z _____

Dichotomous Key to Representative Birds	
1. a.	The beak is relatively long and slender..... <i>Certhidea</i>
b.	The beak is relatively stout and heavy.....go to 2
2. a.	The bottom surface of the lower beak is flat and straight <i>Geospiza</i>
b.	The bottom surface of the lower beak is curved.....go to 3
3. a.	The lower edge of the upper beak has a distinct bend <i>Camarhynchus</i>
b.	The lower edge of the upper beak is mostly flat <i>Platyspiza</i>

23. Complete the following table with descriptions about the six different taxonomic classification kingdoms.

	Archaeobacteria	Eubacteria	Protista	Fungi	Plantae	Animalia
Cell Type						
Cell Structure						
Number of Cells						
Modes of Nutrition						
Examples						
Describe in Your Own Words						

REPORTING CATEGORY 4: BIOLOGICAL SYSTEMS AND PROCESSES

1. Why must body systems work together?

2. What is the main function of the...

a. Respiratory System

b. Digestive System

c. Reproductive System

d. Circulatory System

e. Nervous System

f. Muscular System

g. Endocrine System

h. Excretory System

3. Identify if the following is an example of negative feedback response or positive feedback response.

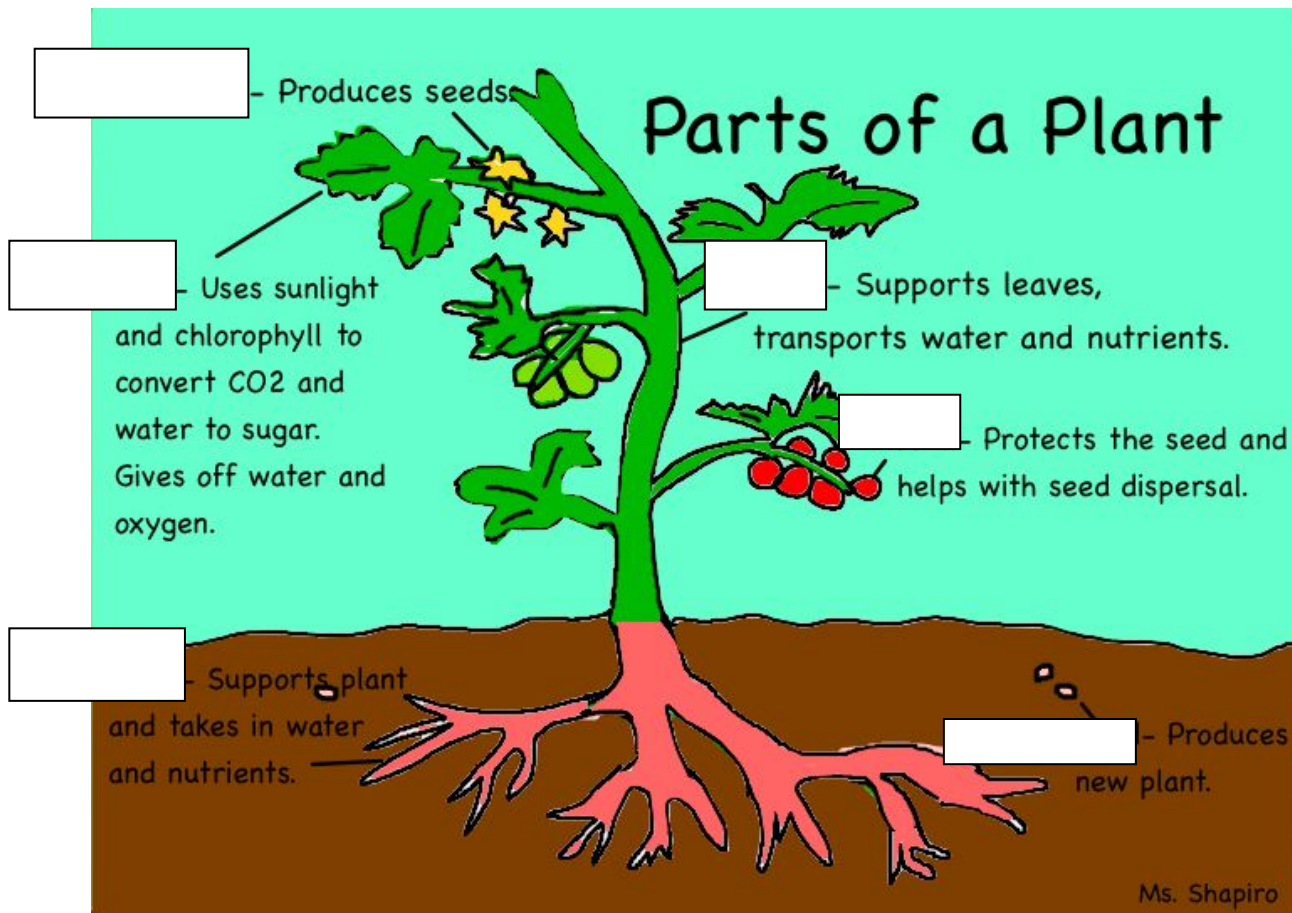
Scenario	Negative Feedback or Positive Feedback
You catch the flu virus and are feeling horrible. In an effort to get better, your body increases body temperature causing a fever.	
It's bright and sunny outside so you decide to go ride your bike. As you are riding, you begin to sweat in order to cool your body temperature down.	
You want to try out for the soccer team so you start exercising everyday. As you exercise, you notice that your heart rate and breathing rate increases so you can get enough oxygen to your muscles.	
Your mother is going through child labor to give birth to your new baby sibling! As time goes on, her muscle contractions are increasing!	

4. Give an example of how the body regulates, absorbs nutrients, reproduce, and defend itself against illness or injury. Explain which and how body systems work together to perform these functions.

	Which systems	How do they work together?
Regulation		
Nutrient Absorption		
Reproduction		
Defense from injury or illness		

PLANT SYSTEMS Practice Worksheet

5. Label the parts of the plant in the diagram below.



6. Match the function of the plant organ parts to its function.





Fibrous Roots	Tube in the stem that carries water
Tap Roots	Pores in the leaf for gas exchange and transpiration
Xylem	Thick roots ideal for anchoring plants to the ground and absorbing water
Phloem	Tube in the stem that carries nutrients and food (glucose)
Stem/Trunk	Capture sunlight for photosynthesis
Leaf	Cells around a pore in the leaf that controls when the pores open/close
Stomata	Helps support leaves and transports water and nutrients
Guard Cells	Brightly colored to attract pollinators for pollination and plant reproduction
Flowers	Thin roots that spread out and absorbs water

7. How does a plant transport food and water throughout itself?

8. What is the difference between asexual and sexual reproduction in plants?

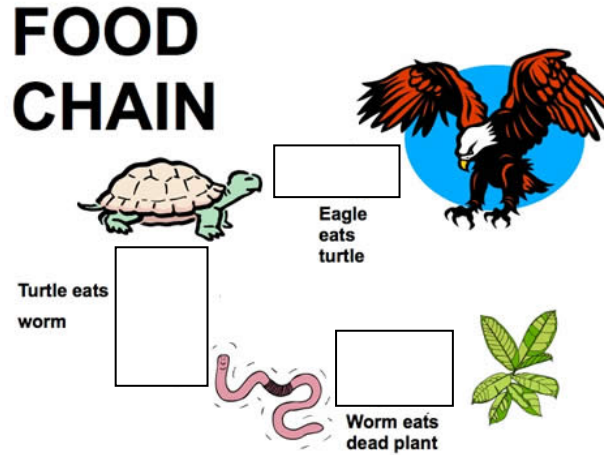
9. What is the purpose of a flower?

10. Identify the types of tropisms below.

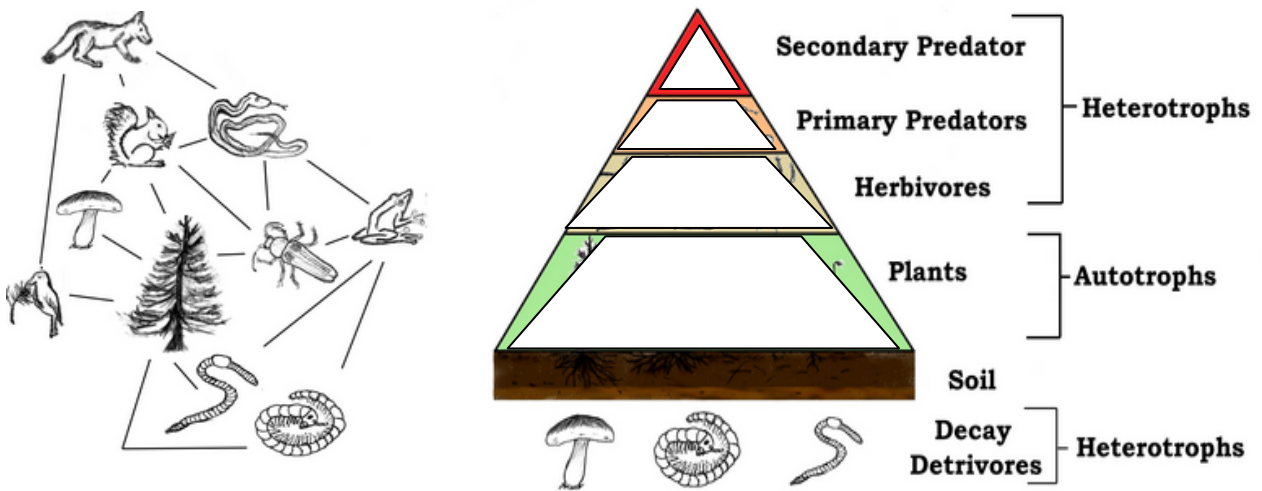
Tropisms			
Tropisms occur when plants respond to external stimuli. Tropisms are movements caused by a change in a plant's growth pattern. Tropisms can be negative or positive. If the plant moves toward the stimulus, the tropism is defined as positive. If the plant moves away from the stimulus, the tropism is considered negative.			
<div style="border: 1px solid black; width: 100px; height: 20px; margin: 0 auto;"></div> <p>Gravity causes a response in a plants growth.</p>  <p>In the above image, what part of the plant exhibits positive tropism, and which part (s) of the plant exhibits negative tropism?</p>	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 0 auto;"></div> <p>The way a plant grows or bends in response to water.</p>  <p>Why would it be important for some parts of a plant to be pulled toward water?</p>	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 0 auto;"></div> <p>Plants bend or grow because of touch. An example would be when vines wrap around an arbor frame.</p>  <p>What are some other ways a plant can be "touched"?</p>	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 0 auto;"></div> <p>The way a plant grows or bends in response to light.</p>  <p>Why do you think sunflowers were given their name?</p>

REPORTING CATEGORY 5: INTERDEPENDENCE WITHIN ENVIRONMENTAL SYSTEMS

- Where does the first type of energy come from? (Hint: Plants use it to make its own food)
- Draw arrows to indicate flow of energy in the food chain below



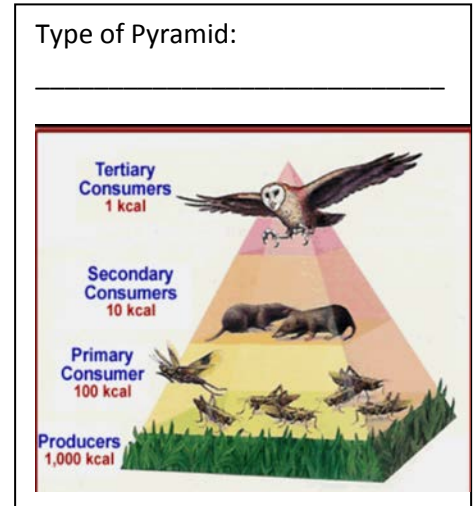
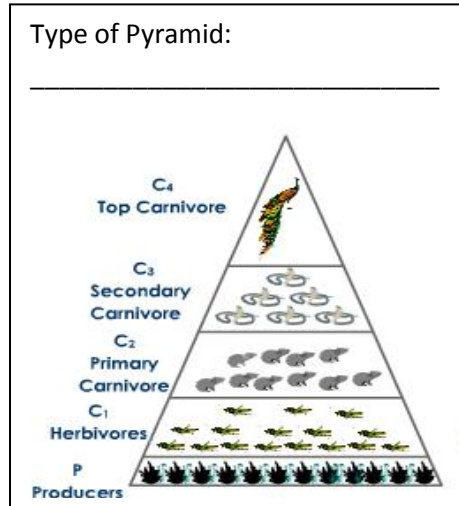
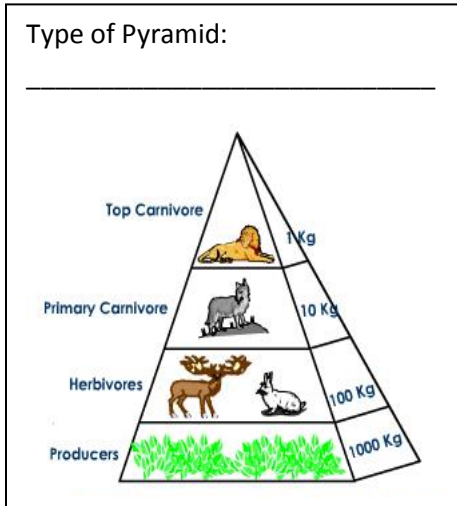
- Using the food web to the right, place the animals in the correct tropic level pyramid on the left.



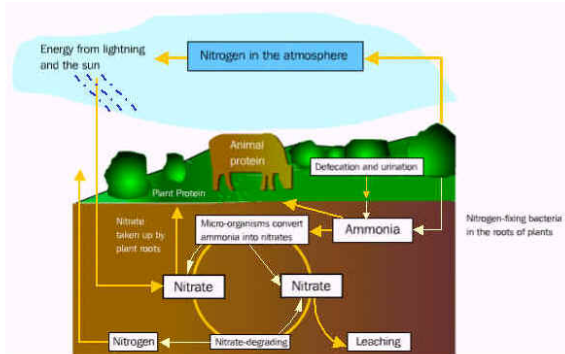
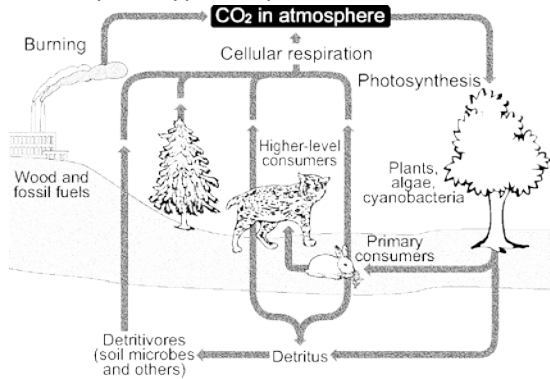
- Identify the type of relationship in the scenarios below. Relationships could be predation, competition, parasitism, commensalism, or mutualism

Scenario	Type of Relationship
A fox eats a rabbit	
Two male deer stags fight over a female doe deer	
A mosquito feeds off the blood of other mammals like humans, harming them by taking their blood and making them itchy	
A bird lives near large cattle. As cattle move, they rustle up bugs that bird can eats.	
A sea anemone has stinging tentacles that protects the clownfish that lives in it. The clownfish eats any undigested food the sea anemone doesn't eat.	

- If only 10% of energy is passed on when an organism is eaten, what happens to the other 90%?
- Why does an ecosystem have a carrying capacity?
- Identify the type of ecological pyramid below.



- Identify the type of cycle below:



Type of Cycle: _____

Type of Cycle: _____

- In the carbon cycle, what releases carbon? In the carbon cycle, what absorbs carbon?
- In the nitrogen cycle, what needs to happen in order to turn the nitrogen into a usable form?
- What is the difference between primary and secondary succession?