

Biology EOC Prep 2015

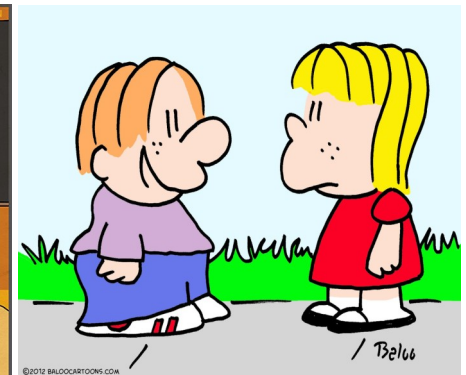
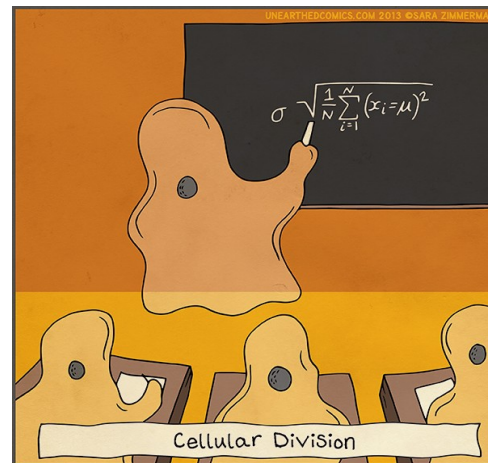
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NAME:



PERIOD:

"I spent the afternoon digesting my lunch, pumping several quarts of blood through miles of tissue, filtering toxins in my liver, and replacing millions of skin cells. I didn't have time for anything else."



"I don't need to learn evolution in school — I watch the Flintstones on TV."

This booklet was produced by the following boss, brainy, brilliant, and brave Biology Teachers at Glacier Peak High School...

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GENE THERAPY



Deoxyribonucleic Acid Rain

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9. In some species of moths, large wings are dominant over small wings, and yellow wings are dominant over white wings. What percent of the offspring of two moths with small white wings will also have small white wings?

A. 0% B. 25% C. 75% D. 100%

10. How do tussock moths obtain energy in cellular respiration?

A. By taking in water
B. By releasing oxygen
C. By breaking down glucose
D. By inhaling carbon dioxide

11. Which is a role of the tussock moth larvae in the forest ecosystem carbon cycle?

A. The larvae eat food and release oxygen
B. The larvae eat food and release carbon dioxide
C. The larvae breathe oxygen and produce glucose
D. The larvae breathe in carbon dioxide and produce water

12. Students used a greenhouse as a model of a forest ecosystem to predict the effects of air temperature changes on tussock moths in a forest ecosystem.

Describe two ways the greenhouse model may lead to unreliable predictions about the effects of air temperature changes on a moth population in a forest ecosystem.

In your description, be sure to:

- Describe two differences that make a forest ecosystem more complex than the greenhouse.
- Describe how each of the differences could cause the students' predictions about a moth population in a forest ecosystem to be unreliable.

One way:

Another way:

Another unintended consequence:

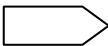

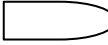

DNA

The nucleus is a small spherical, dense body in a cell. It is often called the "control center" because it controls all the activities of the cell including cell reproduction, and heredity. Chromosomes are microscopic, threadlike strands composed of the chemical DNA (short for deoxyribonucleic acid). In simple terms, DNA controls the production of proteins within the cell. These proteins in turn, form the structural units of cells and control all chemical processes within the cell. Think of proteins as the building blocks for an organism, proteins make up your skin, your hair, parts of individual cells. How you look is largely determined by the proteins that are made. The proteins that are made is determined by the sequence of DNA in the nucleus.

Chromosomes are composed of genes, which is a segment of DNA that codes for a particular protein which in turn codes for a trait. Hence you hear it commonly referred to as the gene for baldness or the gene for blue eyes. Meanwhile, DNA is the chemical that genes and chromosomes are made of. DNA is called a nucleic acid because it was first found in the nucleus. We now know that DNA is also found in organelles, the mitochondria and chloroplasts, though it is the DNA in the nucleus that actually controls the cell's workings.

In 1953, James Watson and Francis Crick established the structure of DNA. The shape of DNA is a double helix which is like a twisted ladder. The sides of the ladder are made of alternating sugar and phosphate molecules. The sugar is deoxyribose. **Color all the phosphates red (one is labeled with a "p"). Color all the deoxyriboses light blue (one is labeled with a "D"). Note, the nitrogenous bases attach to the sugar = "D".**

The rungs of the ladder are pairs of 4 types of nitrogen bases. The bases are known by their coded letters A, G, T, C. These bases always bond in a certain way. Adenine will only bond to thymine. Guanine will only bond with cytosine. This is known as the "Base-Pair Rule". The bases can occur in any order along a strand of DNA.

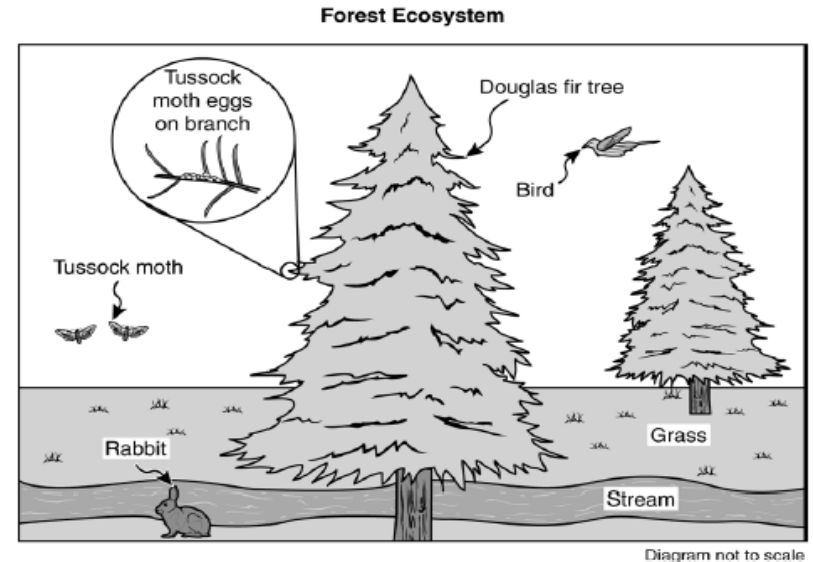
Color Thymines (T) orange 
 Color Adenines (A) green 
 Color Cytosines (C) yellow 
 Color Guanines (G) purple 

A Bit of a Scenario for ya

The Moths and the Trees

Directions: Use the following information to answer questions 5 through 12.

The Forest Ecosystem diagram shows part of a forest ecosystem. Tussock moths are native to the forest ecosystem. In the fall, tussock moths lay eggs on Douglas fir trees. In the spring, tussock moth larvae eat the needles of the Douglas fir trees.



5. The traits of populations in the forest ecosystem have changed over time. What caused the traits to change?
 - A. Natural selection
 - B. Lack of mutations
 - C. Unlimited resources
 - D. Asexual reproduction
6. Which change to the forest ecosystem could limit the growth of the tussock moth population?
 - A. Decrease in competition
 - B. Reduction in disease
 - C. Fewer predators
 - D. Loss of habitat
7. Students asked the following question: "What is the effect of the size of a moth population on the growth of trees in an ecosystem?" Which reason describes why this question is scientifically testable?
 - A. All moths require trees for food
 - B. Many different ecosystems include trees
 - C. Annual data can be collected because trees grow slowly
 - D. Both tree height and moth population size can be measured

Be sure your procedure includes:

- logical steps to do the experiment
- two controlled (kept the same) variables
- one manipulated (independent) variable
- one responding (dependent) variable
- how often measurements

What is the effect of the temperature of potato juice on the time for bubbling to stop after hydrogen peroxide is added?

Procedure:

[illegible]

DNA Vocabulary Review

1. _____ DNA
2. _____ Hydrogen bond
3. _____ Adenine, Guanine, Cytosine, Thymine
4. _____ Central dogma
5. _____ Replication
6. _____ Codon
7. _____ Nucleotide
8. _____ Helicase
9. _____ DNA Polymerase
10. _____ Backbone of DNA
11. _____ Purines
12. _____ Pyrimidines

- A. Adenine, Guanine
- B. Process of making a copy of DNA; 2 identical new complementary strands
- C. Brings in individual nucleotides during replication
- D. Nitrogenous bases of DNA
- E. Monomer of DNA; phosphate, 5 carbon sugar, and nitrogenous base
- F. Type of bond that holds DNA's double helix together
- G. Nucleic acid: storage of genetic information; codes for proteins
- H. DNA → RNA → Amino Acid → Protein → Trait
- I. Unzips and unwinds DNA
- J. Phosphate & sugar
- K. Thymine, Cytosine
- L. Nitrogenous bases arranged in sets of 3

Write a conclusion for this controlled experiment.

In your conclusion, be sure to:

- Answer the experimental question.
- Include **supporting** data from the Acidity of Potato Juice vs. Volume of Foam table.
- Explain how these data **support** your conclusion.
- Provide a **scientific** explanation for the trend in the data.

Question:

What is the effect of the acidity of potato juice on the volume of foam produced when hydrogen peroxide is added to potato juice?

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Procedure:

1. Label four graduated cylinders, one for each acidity.
2. Put 10 milliliters of potato juice at pH 6 in the appropriately labeled cylinder.
3. Do the same for each of the other cylinders.
4. Monitor the room temperature to make sure the temperature remains the same throughout the investigation.
5. Add 5 milliliters of hydrogen peroxide to each graduated cylinder, stir for two seconds. Wait three minutes.
6. Measure and record the volume of foam in each graduated cylinder as Trial 1.
7. Clean all graduated cylinders and stirring rods.
8. Repeat steps 1 through 7 two times for Trials 2 and 3.
9. Calculate and record the average volume of foam for each acidity of potato juice.

Data:

Acidity of Potatoe Juice (pH)	Volume of Foam (milliliters)			
	Trial 1	Trial 2	Trial 3	Trial 4
6	22	25	25	24
7	32	38	36	35
8	41	42	42	42
9	32	29	30	30

How could Mike and Kelsey be more certain the results of their experiment are **reliable**?

- o **A.** Test the reaction with other acidities of potato juice.
- o **B.** Repeat the experiment the same way.
- o **C.** Increase the volume of potato juice.
- o **D.** Use a different type of plant juice.

What did Mike & Kelsey do to make the results of their experiment **valid**?

- o **A.** Recorded the volume of foam in milliliters.
- o **B.** Calculated the average volume of foam for each acidity.
- o **C.** Measured the volume of foam at each acidity three times.
- o **D.** Waited three minutes before measuring the volume of foam.

Messenger RNA

So, now, we know the nucleus controls the cell's activities through the chemical DNA, but how? It is the sequence of bases that determine which protein is to be made and determines which proteins are made and the proteins determine which activities will be performed. And that is how the nucleus is the control center of the cell. The only problem is that the DNA is too big to go through the nuclear pores. So a chemical is used to read the DNA in the nucleus. That chemical is messenger RNA. The messenger RNA (mRNA) is small enough to go through the nuclear pores. It takes the "message" of the DNA to the ribosomes and "tells them" what proteins are to be made. Recall that proteins are the body's building blocks. Imagine that the code taken to the ribosomes is telling the ribosome what is needed - like a recipe.

Messenger RNA is similar to DNA, except that it is a single strand, and it has no thymine. Instead of thymine, mRNA contains the base Uracil. In addition to that difference, mRNA has the sugar ribose instead of deoxyribose. RNA stands for **Ribonucleic Acid**. Color the ribose ('R') a DARKER BLUE, and:

Color Cytosines (C) yellow



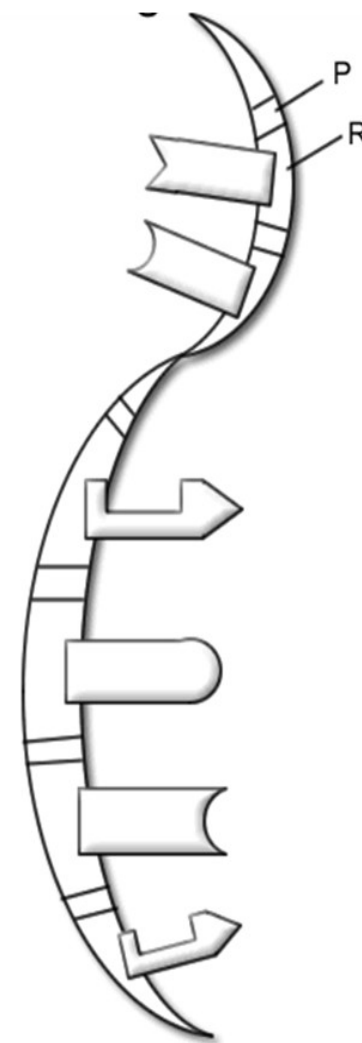
Color Adenines (A) green



Color Guanines (G) purple



Color Uracil (U) brown



Protein Synthesis:

Complete the matching section below. Then, use the terms to fill in the boxes on the following page.

1. _____ mRNA
2. _____ tRNA
3. _____ rRNA
4. _____ Transcription
5. _____ Translation
6. _____ Ribosome
7. _____ Amino acid
8. _____ DNA
9. _____ Protein

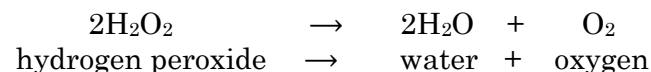
- A. Carried in by tRNA; building blocks / combine to form proteins
- B. Nucleic acid: storage of genetic information; codes for proteins
- C. The PROCESS in which the ribosome reads the mRNA and translates it into the amino acid sequence; occurs in the cytoplasm
- D. Part of cell membranes; enzymes; give us our unique traits
- E. Type of RNA that takes the "message" of the DNA to the ribosomes
- F. The PROCESS in which mRNA is made using DNA; occurs in the nucleus
- G. Type of RNA associated with the ribosome
- H. Type of RNA that carries the amino acids to the site of protein synthesis on the ribosome; has the anti-codon which matches the codon on mRNA
- I. Makes proteins

EOC Short Answer Writing Prompt (whew!)

Foaming Spuds

Directions: Use the following information to answer the following questions.

Mike and Kelsey were studying how hydrogen peroxide (H₂O₂) in cells breaks down to form water and oxygen. When this reaction happens, bubbles of oxygen gas are released, producing foam. This reaction is described as follows:



A protein named *catalase*, found in all cells including potatoes, increases the rate of this reaction. Mike and Kelsey used potato juice as the source of *catalase* to do the following controlled experiment.

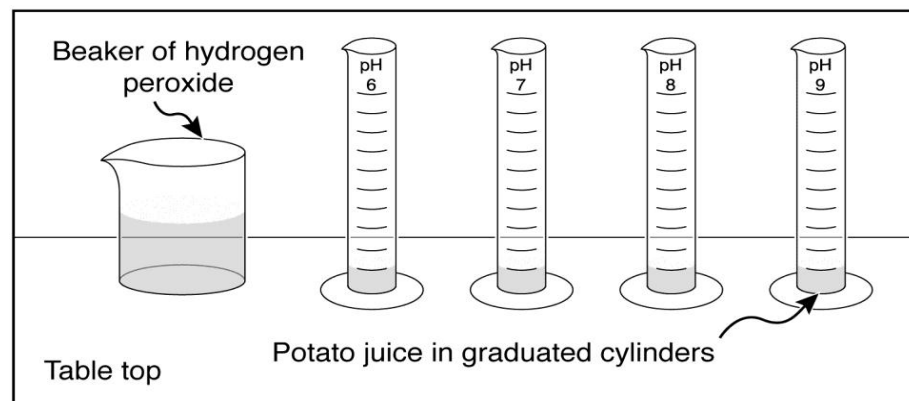
Question: What is the effect of the acidity of potato juice on the volume of foam produced when hydrogen peroxide is added to potato juice?

Prediction: As the acidity of potato juice decreases (higher pH), the volume of foam will increase.

Materials:

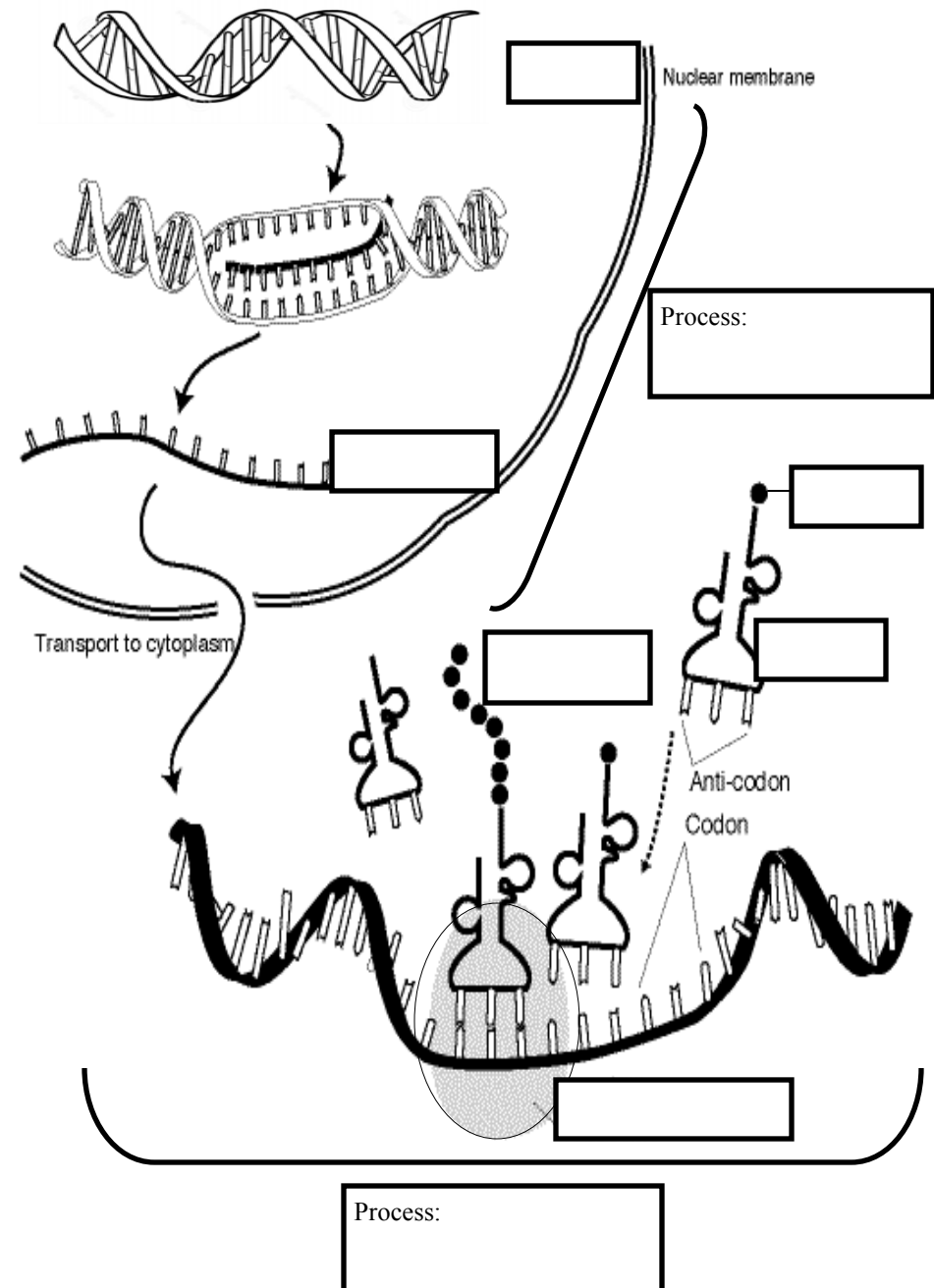
- graduated cylinders labeled pH 6, pH 7, pH 8, and pH 9
- potato juice from the same potato, divided and adjusted to four acidities: pH 6, pH 7, pH 8, and pH 9
- hydrogen peroxide (H₂O₂)
- beaker, stopwatch, stirring rods, thermometer

Investigation Setup

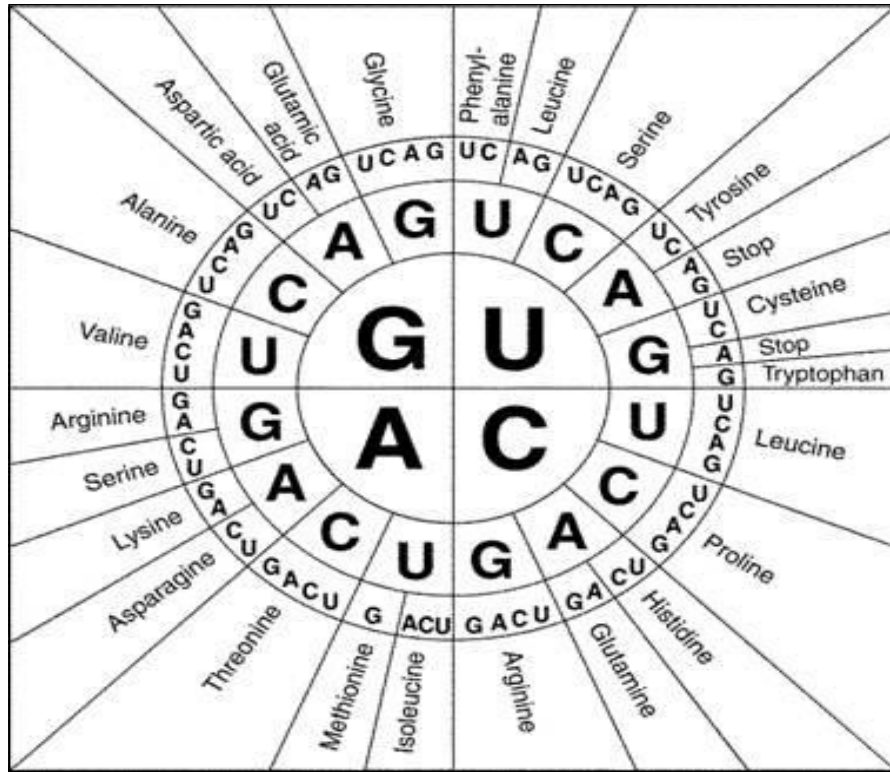


Peppered Moth Graph Questions:

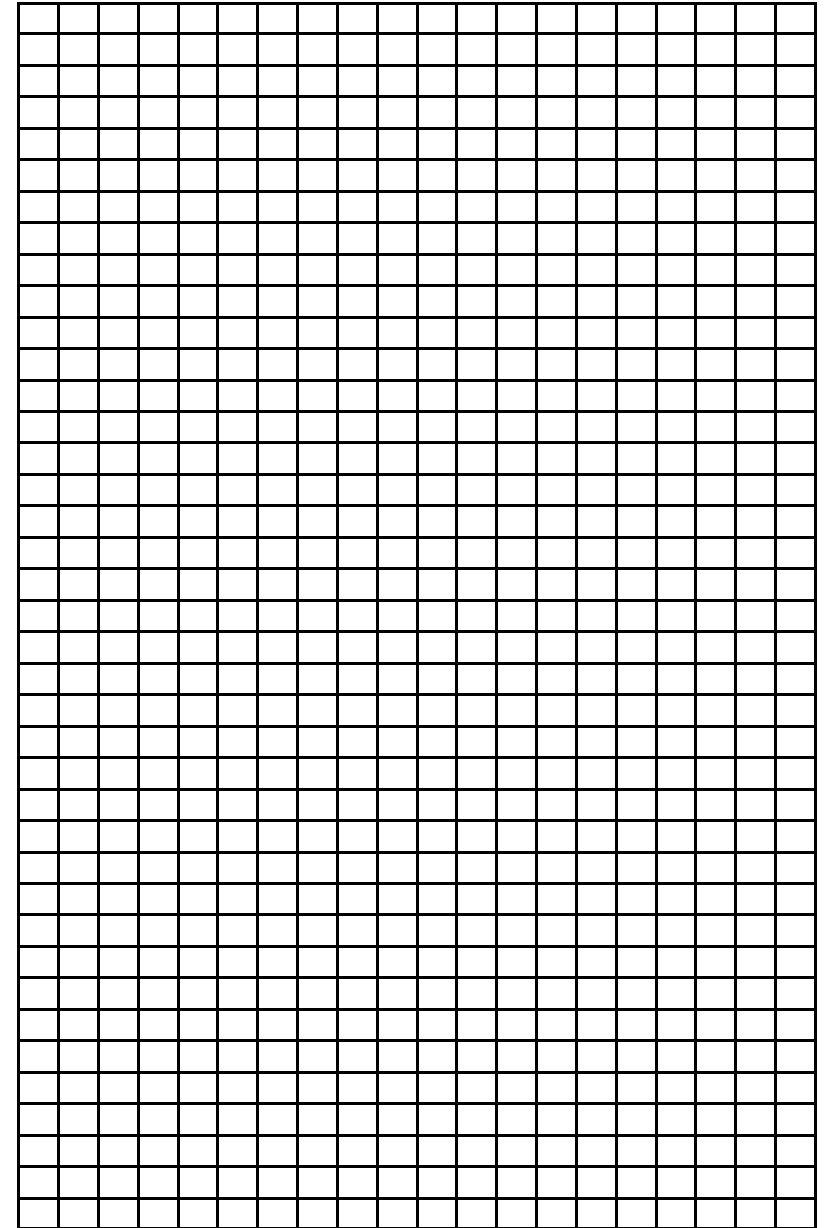
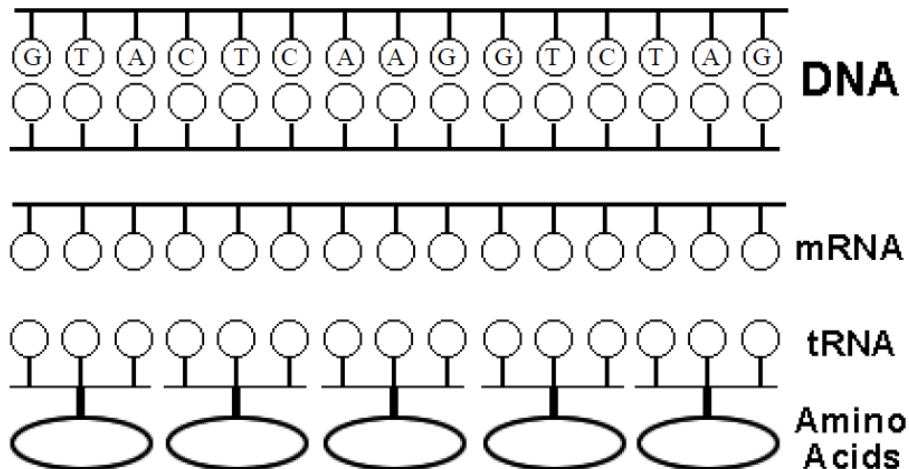
1. What changes occurred in both forms of the moth over these ten years?
2. Why do you think these changes occurred? (your explanation needs to include the FOUR parts natural selection from your notes, using these moths as an example for each part)
3. England has recently cleaned up their factories and now produces much less pollution. As a result, the trees are slowly becoming lighter. What might happen to the populations of each form of the moth in the next 10 years? Why?
4. How does the environment play part in natural selection?



Protein Synthesis



Fill in the complimentary DNA strand, transcribe the DNA to obtain the correct mRNA bases, fill in the correct tRNA bases, translate the tRNA codons to find the correct amino acids.



EVOLUTION

Peppered Moth Background:

Natural selection is the reproductive success of organisms that are best suited for an environment. It is the driving force of evolution. Natural selection occurs within populations, which are interbreeding groups of individuals of the same species. Genetic variation is one factor that influences natural selection. Genetic variation occurs when a population has multiple versions of a trait. For example, some organisms in a population of moths are dark colored, while some are light colored. Natural selection over time results in adaptations, where certain traits are favored due to their influence on survival. Adaptations over many generations can lead to evolution. Peppered moths have lived in the forests around Manchester, England for hundreds of years. There are two genetic variations for color in peppered moths- the moths can be dark with light spots OR light with dark spots.

Before the 1800s (figure 14.11a), the trees were light colored and the light colored moths were well camouflaged. After the 1800s, when England went through the Industrial Revolution, the pollution from factories made the trees darken (figure 14.11b). Now, the trees were dark colored and the dark colored moths were well camouflaged. Various birds eat both kinds of moths IF they are able to be seen.

Data: The table below displays the Number of peppered moths of each color found over a ten year period. Graph the data below to show how the peppered moth populations changed in the 1800s. You should make a line graph with two lines. Years should be on the x axis and number of moths on the y axis. Assume year one was the start of the industrial revolution.

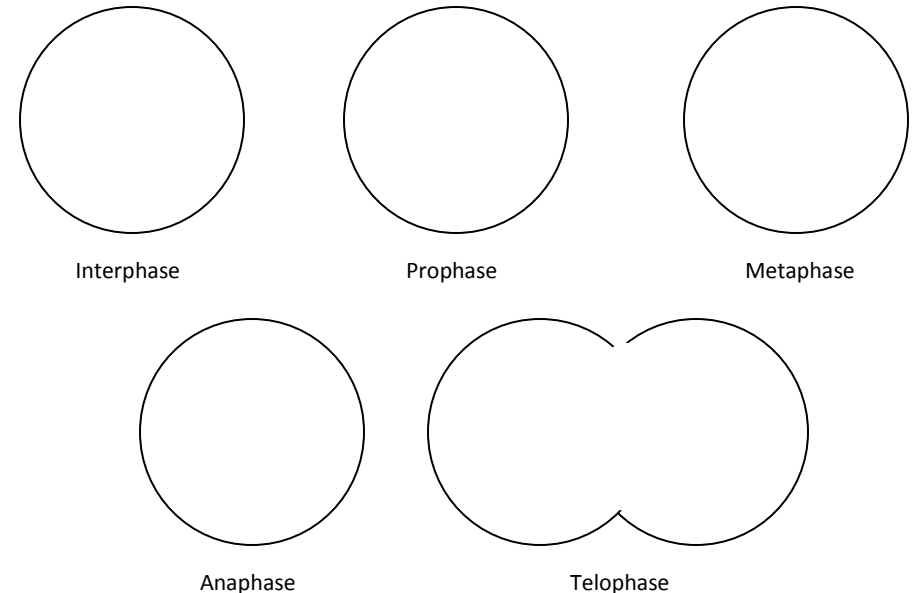
Peppered Moth Populations		
Year	Light Colored Population	Dark Colored Population
1	537	112
2	484	198
3	392	210
4	246	281
5	225	357
6	193	412
7	147	503
8	84	594
9	53	638
10	38	673

Mitosis & Meiosis

Cell Cycle: are the processes, stages and duration for which cells replicate and grow. Match the stages with their description.

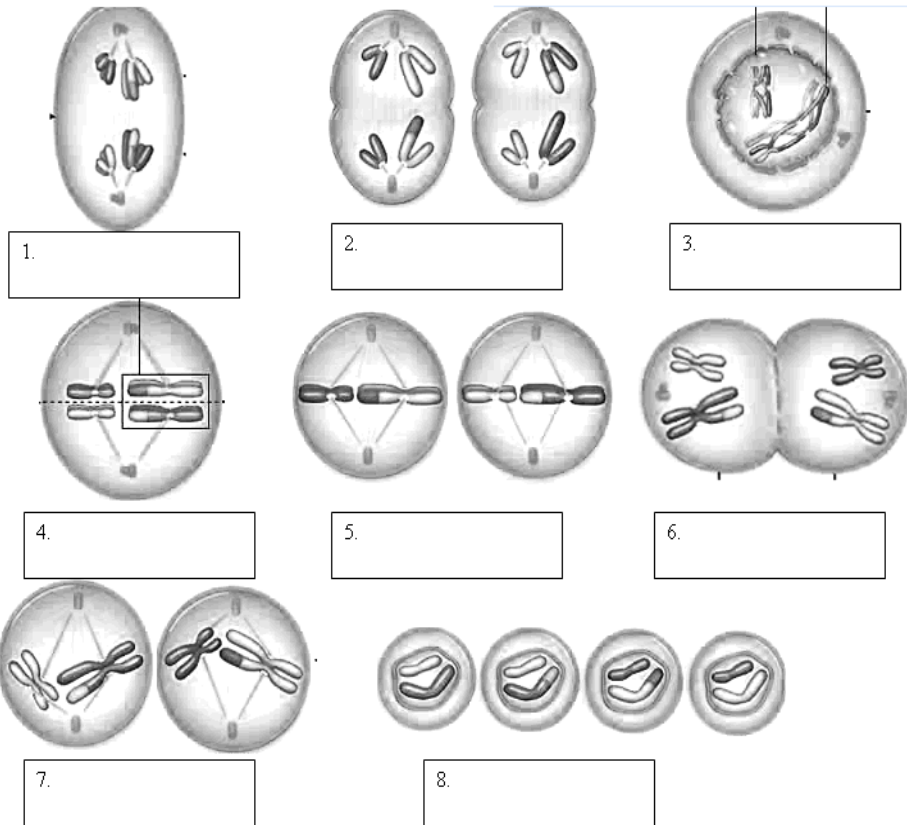
- | | |
|-------------------|---|
| _____ Interphase | a. Chromosomes are pulled to opposite poles |
| _____ Prophase | b. Nuclear membrane forms around chromosomes at each pole |
| _____ Metaphase | c. Chromosomes duplicate and spindle fibers occur and centrioles move to opposite poles |
| _____ Anaphase | d. Cytoplasm and other organelles are separated (not considered a part of mitosis) |
| _____ Telophase | e. Growth phase for cell. Majority of cells life is in this cycle. (not considered a part of mitosis) |
| _____ Cytokinesis | f. Duplicated chromosomes are lined up in the middle of the cell |

Interphase and Mitosis: please use 3 homologous chromosomes and draw the phases of the cell cycle below:



The end product of Mitosis is the formation of two new identical daughter cells for the body (also known as somatic cells). Each cell has the same number of chromosomes and is diploid (2n).

Meiosis: is the process of cell division for sexual reproduction / formation of sperm and egg cells. It is also called reduction division. Cells go from being diploid ($2n$) to haploid (n). The end result is 4 haploid gametes (also known as sex cells) The pictures below are NOT in order. Label the pictures below with the correct phase of meiosis. Be sure to specify whether it is I or II (i.e. Prophase I or Prophase II).



Compare Mitosis & Meiosis by filling in the following chart:		
End Product	Mitosis	Meiosis
1n or 2n		
Genetically identical?		
Number of cells		
Crossing over occur?		
Creates sex cells?		
Creates somatic cells?		

Nitrogen, Farms, Fish, Bears, and Salmon

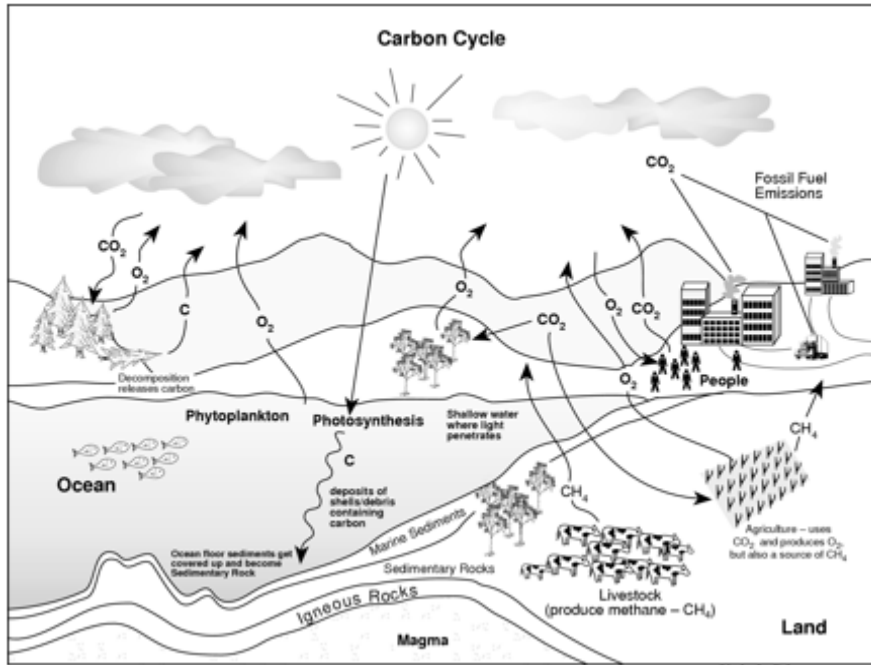
Farmer A has a large farm on which he grows corn. Through his farm flows a small creek which empties into a lake. This farmer sprays nitrogen fertilizer on his crops several times a year. Due to the weather patterns where he lives it often rains within several days of the application of the fertilizer. The lake near him has been a major recreation area with clear water and good fishing. Recently, clear water has become brownish green with mats of algae floating on the surface by late summer, resulting in fish kills. In the fall and winter there are many dead fish floating on the surface of the lake and drifting to shore. Recreation at the lake is coming to a halt because of the murky water and the dead fish.

Farmer B has a similar large farm in which he grows corn one year and soybeans the next. Through his farm also flows a small creek, which empties into a similar lake. This farmer does not spray any nitrogen fertilizer on his crops. He knows that soybeans have bacteria on their roots which take the atmospheric oxygen and convert it into a form of nitrogen that the plants can use. The rainfall is similar to Farmer A's area. The lake near him is and remains a major recreation area. The water is clear and there is good fishing. There is no algae floating in the late summer and there are no fish kills.

Answer the following questions based on the nitrogen story above; **CIRCLE YOUR ANSWER** (for #1-4).

- What is the most probable cause of the algae growing in the lake near farmer A's farm?
 - Corn
 - Nitrogen Fertilizer
 - All the rain
 - Warm weather
- Why does Farmer A use a nitrogen fertilizer?
 - It's a limiting factor for plant growth
 - Plants need Nitrogen to make certain amino acids
 - It kills all the bugs that infect corn
 - It produces a smaller crop
 - A & C
 - A & B
 - C & D
- Why would increased nitrogen cause the algae to grow?
 - Nitrogen runoff stirs up the nutrients on the lake bottom
 - It's a limiting factor for algae growth
 - It provides excess nutrients for algae
- What would cause the fish to die?
 - They eat the algae, which kills them.
 - Lower levels of oxygen due to algae bloom
 - Nitrogen is EXTREMELY toxic to fish (kills them instantly)

Look at the Carbon Cycle below and answer the questions-USE THE PICTURE!



What are the biological processes that are part of the carbon cycle?

Where in the cycle does CO₂ gets released into the atmosphere?

Name at least two sites on Earth that are reservoirs of carbon.

Atmospheric carbon dioxide might produce a “greenhouse effect” by trapping heat near the Earth’s surface. What human activities might tend to increase the greenhouse effect?

Mitosis / Meiosis / Genetics Vocabulary

_____ Dominant	_____ Gamete
_____ Recessive	_____ Somatic
_____ Allele	_____ Crossing over
_____ Gene	_____ Diploid
_____ Homozygous	_____ Haploid
_____ Heterozygous	_____ Homologous Chromosome
_____ Genotype	_____ Sister chromatids
_____ Phenotype	

- A. Egg and sperm; 23 chromosomes
- B. Physical characteristics seen; ‘what you see’
- C. 2 different traits for the same allele; Tt
- D. Non-sex cell; 46 chromosomes
- E. Pair of the same chromosomes; 1 from mom, 1 from dad
- F. 2n; 2 copies of each chromosome (somatic cells); 1 from mom, 1 from dad
- G. Trait that shows up; uses capital letters; Tall = T
- H. Basic unit of heredity; determines traits
- I. 2 identical copies of a single chromosome; connected by centromere
- J. Genes present; uses letters (TT, Tt, tt)
- K. 2 identical alleles for a particular trait; TT or tt
- L. Different form of a gene such as eye color
- M. Exchange of genetic material between homologous chromosomes in meiosis; increases genetic variation
- N. 1n; 1 copy of each chromosome; gametes
- O. Trait that does not show up unless homozygous for that trait; tt = short

Monohybrid Cross:

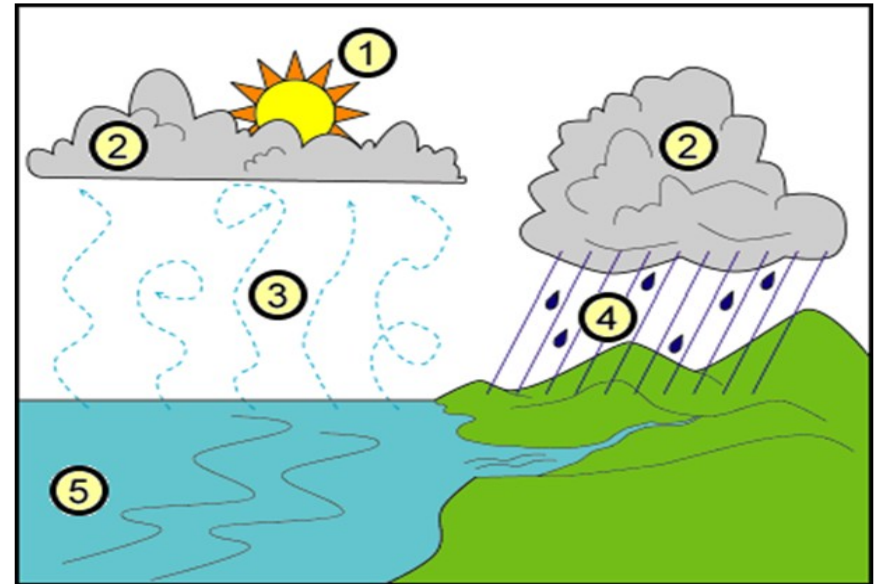
Hornless (H) in cattle is dominant over horned (h). A homozygous hornless bull is mated with a homozygous horned cow. What will be the genotype and phenotype of the first generation?

Genotype: _____ Phenotype: _____

Dihybrid Cross:

In horses, the coat color black is dominant (B) over chestnut (b). The trotting gait is dominant (T) over the pacing gait (t). If a homozygous black pacer is mated to a homozygous chestnut, heterozygous trotter, what will be the ratios for genotype and phenotype?

LABEL THE WATER CYCLE BELOW



WORD BANK

Condensation
Evaporation
Precipitation
Original source of Energy
Groundwater/Runoff/Water table

1. _____
2. _____
3. _____
4. _____
5. _____

What is the difference between evaporation and transpiration?

What is the difference between runoff and seepage?

What cellular processes are part of the water cycle?

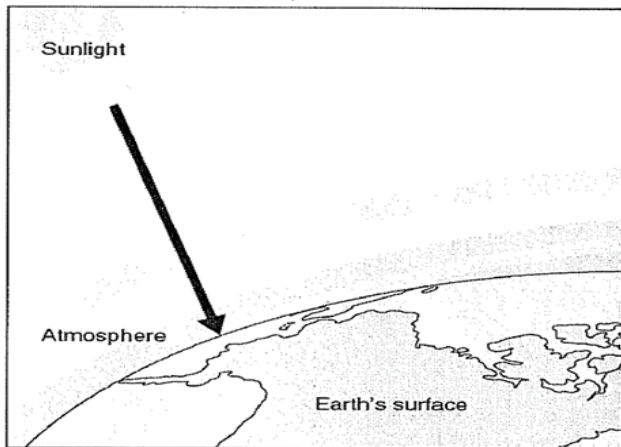
Greenhouse Effect

What are the major / important greenhouse gases?

Why is the greenhouse effect a 'good thing'?

What events in history caused the CO₂ levels to change dramatically?

Complete the illustration of the greenhouse effect by showing in ARROWS AND WORDS what happens to the sunlight that hit's Earth's surface



Review Ecology Part IV: CYCLES

_____ Biogeochemical cycles

- A. Pass the same molecule around again and again
- B. Cycle matter through the biosphere
- C. Do not use up matter, they recycle it
- D. Include the Law of Conservation of Matter
- E. All of the above

Feedback Loops

Definitions:

Positive Feedback:

In a positive feedback loop, the output drives the system further toward one extreme.

Negative Feedback:

Negative feedback sends a signal to decrease the effect of the process. In general, negative feedback loops promote stability in systems.

Ice reflects sunlight energy, and ocean water absorbs sunlight energy. As the average temperature of the planet increases, more ice melts. This increases the amount of solar energy absorbed by the planet, which increases the average surface temperature further.

- Graph the behavior of this system, showing change over time.
- Determine if this system is exhibiting a positive feedback loop, a negative feedback loop, or no feedback loop. Why?



The ocean absorbs CO₂ from the atmosphere via diffusion. As concentrations of CO₂ in the atmosphere rise, the rate at which CO₂ diffuses in to the ocean increases, removing CO₂ from the atmosphere at a faster rate.

- Graph the behavior of this system, showing change over time.
- Determine if this system is exhibiting a positive feedback loop, a negative feedback loop, or no feedback loop. Why?



An increase in predators results in a decrease in prey, the decrease in prey then causes a decrease in predators, the decrease in predators then causes an increase in prey, etc.

- Graph the behavior of this system, showing change over time.
- Determine if this system is exhibiting a positive feedback loop, a negative feedback loop, or no feedback loop. Why?

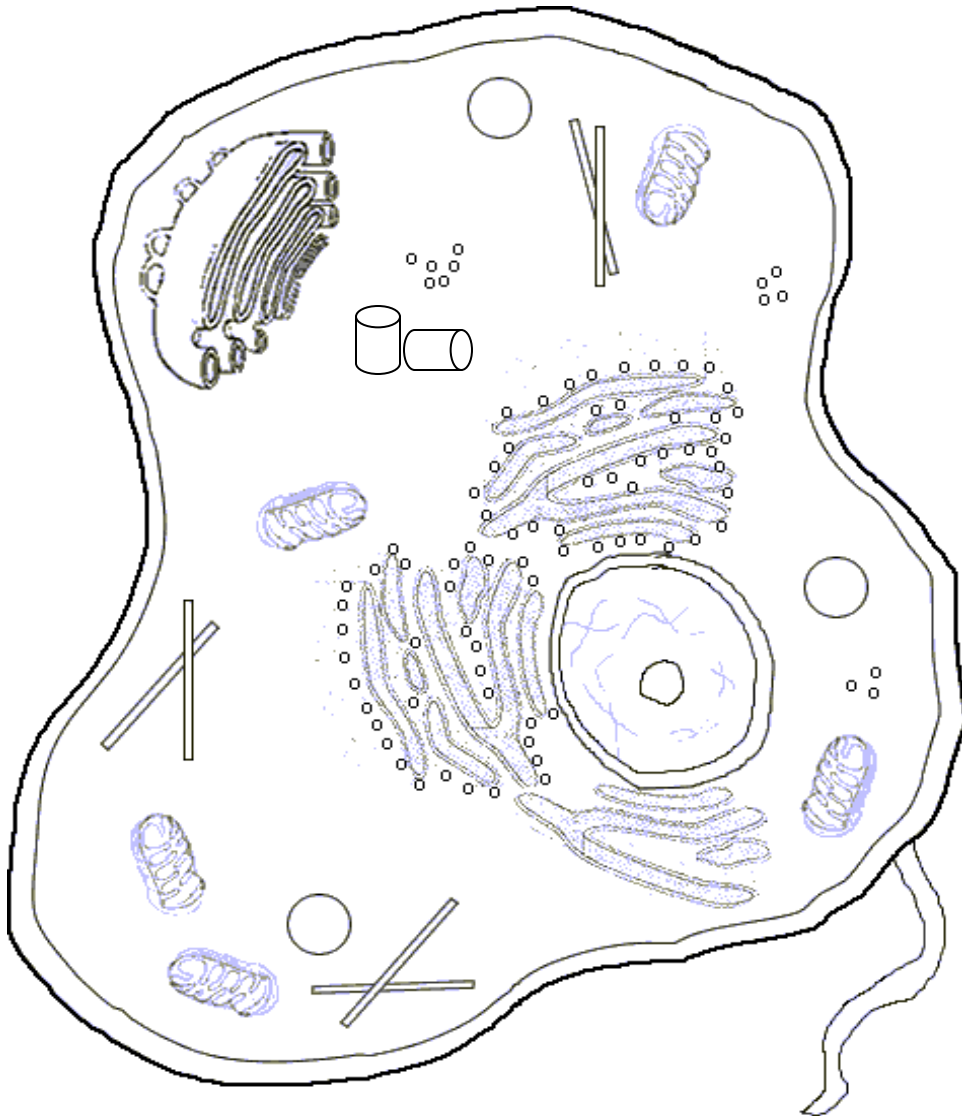


Animal Cell

Color each part of the cell its designated color:

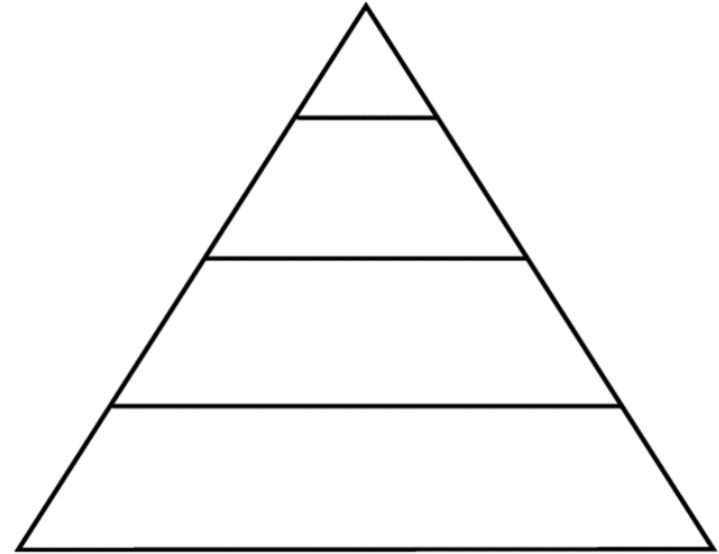
Cell membrane – light brown
Nuclear membrane – dark brown
Golgi apparatus – light blue
Rough endoplasmic reticulum – dark blue
Smooth endoplasmic reticulum – orange
Flagella – dark green polka-dots
Microtubules – dark green

Centrioles – black polka-dots
Nucleolus – black striped
Ribosome – red
Mitochondria – yellow
Lysosome – purple striped
Cytoplasm – white
Chromosomes - multi colored



What is an invasive species? What would happen to this food web if an invasive species invaded the grass?

Place the above items from the food web into the trophic levels below. Label the trophic levels too.



Circle the correct answer:

Energy (increases, decreases, stays the same) as you move through a food chain.

A (Food web, Food Chain, Food Pyramid) shows one possible pathway for energy.

Producers are organisms that (makes their own food, obtain energy from non-living matter, or obtain food from other organisms).

Consumers are organisms that (makes their own food, obtain energy from non-living matter, or obtain food from other organisms).

Decomposers are organisms that (makes their own food, obtain energy from non-living matter, or obtain food from other organisms)

Review Ecology Part III: Recycling Matter & Energy

- _____ A food web is best described as a diagram of
- feeding relationships in an ecosystem.
 - energy flow among producers.
 - Calories available to primary consumers.
- _____ The broadest level of an energy pyramid consists of
- producers.
 - decomposers.
 - scavengers.
 - saprotrophs
- _____ Which trophic level of an ecosystem has the least biomass?
- tertiary consumers
 - secondary consumers
 - primary consumers
 - producers

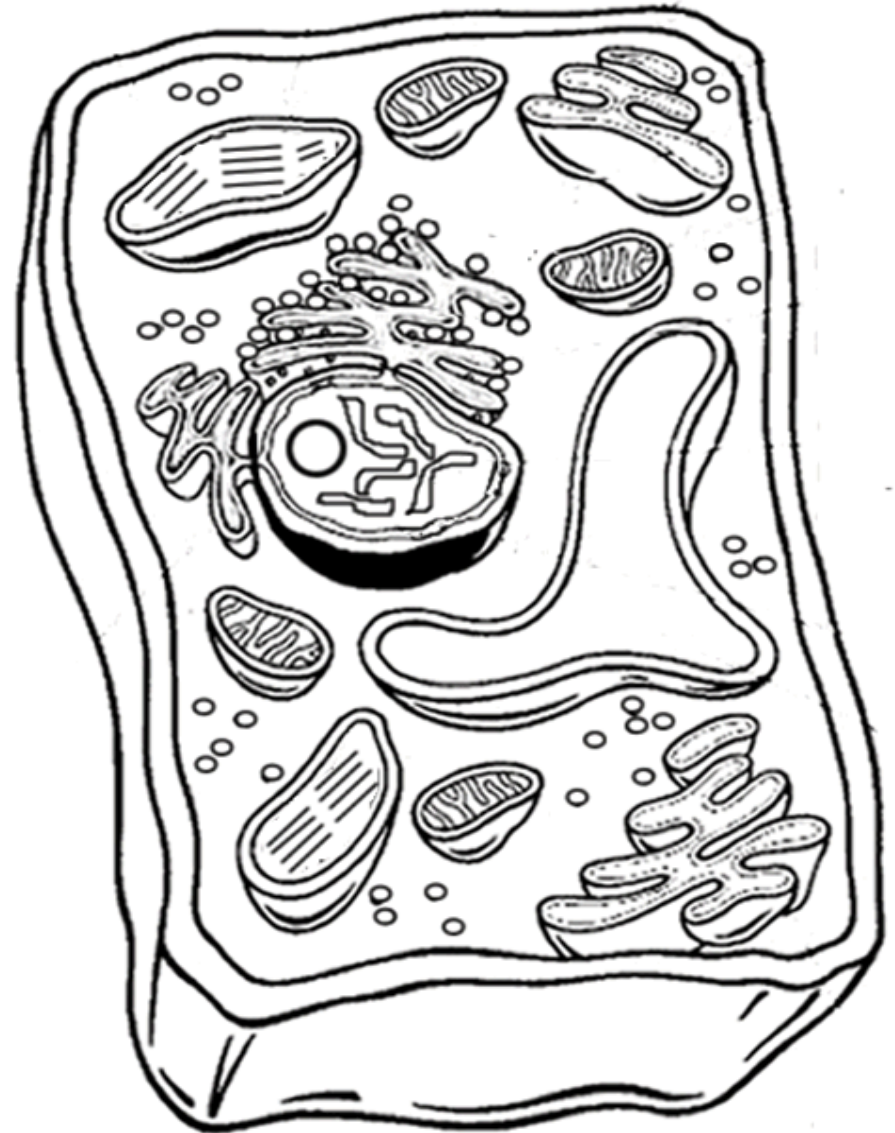
Draw a *food web* that includes the domestic plants corn, wheat, grass and the domestic animals cows, chicken and pigs. Be sure to include a human and a few pests that eat the plants too.

Plant Cell:

Use the same colors as you did for the animal cell color and add:

Cell wall — purple
Vacuole — black

Chloroplasts — dark green



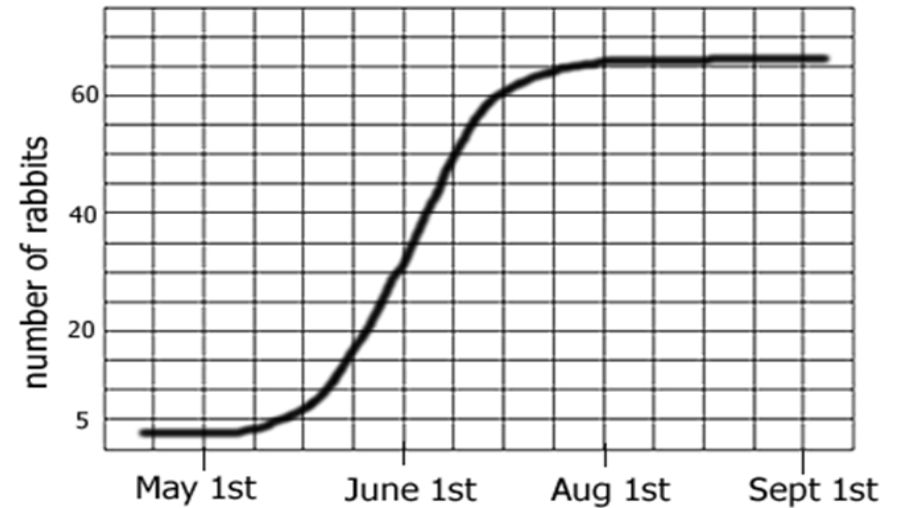
Use Pgs 170-184 to complete the matching:

- 1) _____ Cell membrane
- 2) _____ Nuclear membrane / envelope
- 3) _____ Golgi apparatus
- 4) _____ Rough endoplasmic reticulum
- 5) _____ Smooth endoplasmic reticulum
- 6) _____ Flagella
- 7) _____ Cytoskeleton
- 8) _____ Centrioles
- 9) _____ Ribosome
- 10) _____ Mitochondria
- 11) _____ Lysosome
- 12) _____ Cytoplasm
- 13) _____ Chromosomes
- 14) _____ Cell Wall
- 15) _____ Vacuole
- 16) _____ Chloroplast

- A. Use the energy from sunlight to make energy rich foods molecules in plants
- B. Whip-like structure used for movement
- C. Attach carbohydrates and proteins to lipids
- D. Solution that suspends the organelles of the cell
- E. Double layered membrane with pores; surrounds *nucleus*
- F. Contain spindle fibers which guide chromosomes during division
- G. Ribosomes stud its surface; proteins are chemically modified
- H. Filled with enzymes; takes out the trash
- I. Store water, salts, proteins and carbohydrates
- K. Thin flexible barrier around the cell; phospholipid bilayer
- L. Helps the cell maintain its shape; microtubules, microfilaments
- M. Contains a collection of enzymes; synthesis of lipids
- N. Make proteins
- O. Supports and protects the cell; not found in animal cells
- P. Threadlike structures that contain genetic material
- Q. Use energy from food to make high energy compounds

Review Ecology Part II: Interpreting Ecological Graphs & Data

Graph 1: Rabbits Over Time



_____ The graph shows a ??? growth curve.

- A. Exponential B. Linear C. Logistic

_____ The carrying capacity for rabbits is?

- A. 5 B. 20 C. 40 D. 60

_____ During which month were the rabbits in exponential growth?

- A. May to June
B. May to August
C. August to September
D. May to September

What would be some *population density independent limiting factors* that affect the population growth?

What would be some *population density dependent limiting factors* that affect the population growth?

Review Ecology Part I: The Science of Ecology

Using your awesome knowledge and the reading above complete the matching using the word list .

WORD LIST	WORD LIST
A. Abiotic components	H. Ecosystem
B. Biosphere	I. Habitat
C. Biotic components	J. Niche
D. Community	K. Population density
E. Ecology	L. Population
F. Primary succession	M. Sun
G. Secondary succession	

- _____ Living organisms in the environment are called what?
- _____ Occurs on bare land where there is no soil; pioneer species
- _____ The ORIGINAL source of energy in an ecosystem is
- _____ Physical environment to which an organism has become adapted
- _____ Populations of different species that live in the same area and interact with one another
- _____ Scientific study of the interactions among organisms and between organisms and their environment
- _____ Full range of physical and biological conditions in which an organism lives and the way in which the organism uses those conditions
- _____ Part of Earth in which life exists including land, water, air, atmosphere
- _____ # individuals / unit area
- _____ Collection of all the organisms that live in a particular place, together with their nonliving environment
- _____ Nonliving physical aspects of the environment
- _____ A group of organisms of the same species that live in the same area and interact and interbreed with one another
- _____ Occurs following events such as a wildfire

Multiple Choice:

- _____ What happens to matter in ecosystems?
 - A. It gets used up
 - B. It gets used up and more matter is created
 - C. It gets recycled (matter cannot be created nor destroyed)
 - D. It changes form
 - E. B & C

Cell Processes: Osmosis & Diffusion

Define the following:

Diffusion:

Osmosis:

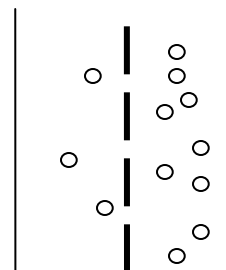
Facilitated Diffusion:

Active Transport:

Fill in the chart below:

Mechanism	Energy Required? or No Energy Required?
Diffusion	
Facilitated diffusion	
Osmosis	
Active transport	

Consider the solution in the drawing below with the two sides divided by a semi-permeable membrane. In the blank drawing on the right, show how the solution would look like once it reached equilibrium:



Cell Processes: Photosynthesis & Cellular Respiration

Vocab: Match the term with the correct definition

- | | |
|--|--------------------------------|
| 1. _____ Aerobic | 9. _____ Mitochondria |
| 2. _____ Anaerobic | 10. _____ Krebs Cycle |
| 3. _____ ATP | 11. _____ Photosynthesis |
| 4. _____ ADP | 12. _____ Energy |
| 5. _____ Chloroplast | 13. _____ Glucose |
| 6. _____ Chlorophyll | 14. _____ Glycolysis |
| 7. _____ Electron transport chain | 15. _____ Light energy |
| 8. _____ Carbon dioxide (CO ₂) | 16. _____ Cellular respiration |

- A. The process in which the energy of sunlight is used to convert water and carbon dioxide into oxygen and high energy sugars
- B. With oxygen
- C. Found in the cytoplasm of most cells ; powerhouse of the cell
- D. Without oxygen
- E. Green pigment in plants that aid in photosynthesis
- F. A molecule composed of carbon and 2 oxygens; a product of respiration and a reactant in photosynthesis
- G. A 6 carbon monosaccharide produced in plants by photosynthesis; formula C₆H₁₂O₆
- H. 1st step in cellular respiration; sugar splitting
- I. Chemical energy used by organisms; adenosine triphosphate
- J. Organelle used in the process of photosynthesis
- K. 2nd step in cellular respiration; occurs in matrix of mitochondria
- L. Process by which glucose is broken down into the energy needed for cell processes
- M. Light, heat, electricity; ability or power to do work
- N. 3rd step in cellular respiration; electrons are passed along chain of Carrier proteins in membrane
- O. Plants and other types of organisms use this type of energy from the sun to produce food
- P. Energy is released when ATP is broken down; Adenosine diphosphate

19. Write the equation for cellular respiration, including the formula and name (i.e. C₆H₁₂O₆ = glucose), and label the products, reactants, inputs, outputs.

Draw and label a picture of the organelle that is part of cellular respiration.

20. Write the equation for photosynthesis, including the formula and name (i.e. C₆H₁₂O₆ – glucose), and label the products, reactants, inputs, outputs.

Draw and label a picture of the organelle that is part of photosynthesis.

21. What is the difference between ATP and ADP (i.e. energy stored or released).