

Unit 2:

Homeostasis

Review

Worksheet

Name _____ Date _____

CELL TRANSPORT

Cell transport - Movement of molecules in and out of the cell

Match the definition on the left with the term on the right.

1. _____ Large wastes or cell products are released from inside to outside a cell
2. _____ Diffusion of *water molecules* through a selectively permeable membrane.
3. _____ The transport of particles which requires the use of energy
4. _____ A state reached when particles continue to move but in *equal amounts* in and out of the cell.
5. _____ Large particles are surrounded by the membrane and taken into the cell.
6. _____ Movement of any particles from an area of *higher* concentration to one of *lower* concentration, with the concentration gradient.
7. _____ The transport of particles which does not require energy

- a. Passive transport
- b. Diffusion
- c. Dynamic equilibrium
- d. Exocytosis
- e. Osmosis
- f. Active transport
- g. Endocytosis

Circle the word or phrase that best completes the statement or answers the question.

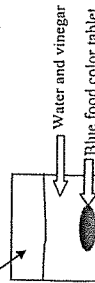
8. The structure most responsible for maintaining cell homeostasis is the cytoplasm
cell wall mitochondria plasma membrane
9. The plasma membrane (cell membrane) is made up of a(n) cholesterol layer
enzyme layer phospholipid bilayer protein layer
10. Which of the following is NOT a form of passive transport?
facilitated diffusion diffusion endocytosis osmosis
11. Diffusion continues until equilibrium is reached
turgor pressure is reached one side has more osmosis
12. If a cell is placed in salt water, water leaves the cell by osmosis
diffusion active transport phagocytosis
13. A cell moves particles from a region of low concentration to a region of high concentration by facilitated diffusion
osmosis passive transport active transport

For each scenario, answer the questions and draw an ARROW to illustrate the movement of molecules.

14. Easter egg coloring:

A blue food coloring tablet is placed in a cup of vinegar and water. After several seconds, the blue tablet will begin to dissolve and will eventually spread evenly throughout the liquid.

beaker



- a. The blue dye is traveling from a _____ to a _____ concentration.
- b. Identify the type of transport illustrated in this scenario:
- c. Does this movement of particles require energy?

15. Following the digestion of food:

- a. Where is the higher concentration of glucose - blood or cell?
- b. Glucose travels through helper proteins in the cell membrane. Identify this specific type of cell transport:



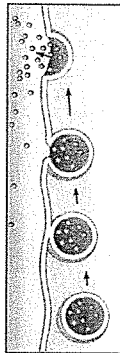
- c. Is this active or passive transport?
- d. Use an arrow to illustrate the movement of glucose molecules.

16. Movement of large particles into the cell:



- a. Identify the specific type of transport being illustrated:
- b. How are the molecules being moved? _____ concentration → _____ concentration
- c. Does this require energy? _____

17. Movement of large particles out of the cell:



- a. Identify the specific type of transport being illustrated:
- b. Is this active or passive transport? _____
- c. What type of substances would be moved in this way? _____

18. For the boxes seen below, do the calculations (each environment must equal 100%), draw an ARROW to illustrate the direction of water movement. State whether the solution is hypertonic, hypotonic, or isotonic.

25% H ₂ O 75% glucose 55% H ₂ O 45% glucose ↑	% H ₂ O 60% salt 30% H ₂ O % salt	% H ₂ O 80% oxygen 80% H ₂ O % oxygen	% H ₂ O 100% Solute 95% H ₂ O % Solute
Water leaves cell. Cell shrinks. Hypertonic solution.			
55% H ₂ O % carbon dioxide 50% H ₂ O % carbon dioxide	100% H ₂ O % Solute 95% H ₂ O 3% Other % Solute	% H ₂ O 88% Solute % H ₂ O 10% Other 30% Solute	89% H ₂ O % Salt 80% H ₂ O 9% Other % Salt

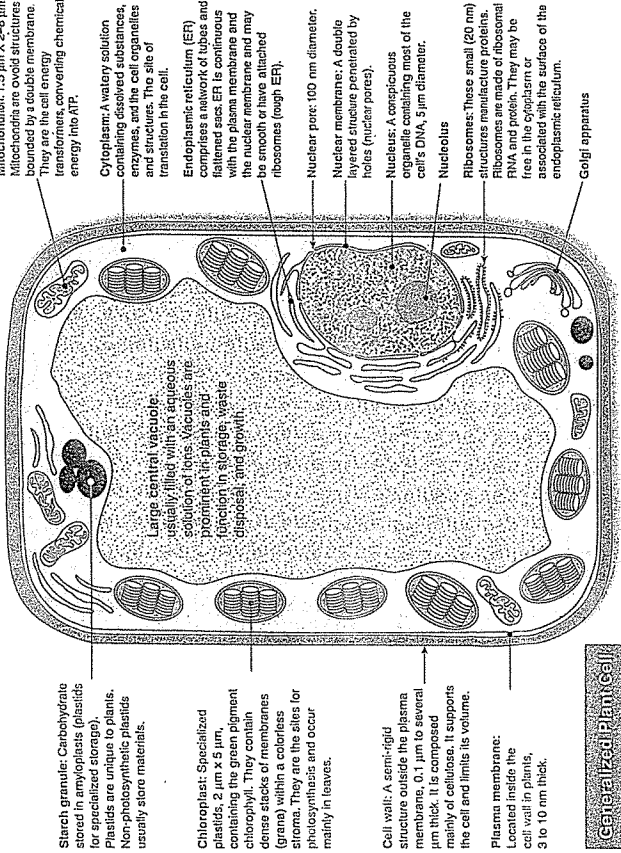
OSMOSIS

LEARNING ABOUT CELL STRUCTURE

Plant Cells

Name: _____
Date: _____
Period: _____
Assignment: _____

Plant cells are enclosed in a cellulose cell wall. The cell wall protects the cell, maintains its shape, and prevents excessive water uptake. It does not interfere with the passage of materials into and out of the cell. The diagram below shows the structure and function of a typical plant cell and its organelles. Also see pages 69-71, where further information is provided on the organelles listed here but not described.



Chloroplast: Specialized structure outside the plasma membrane, 2 μm x 5 μm, containing the green pigment chlorophyll. They contain dense stacks of membranes (grana) within a colorless stroma. They are the sites for photosynthesis and occur mainly in leaves.

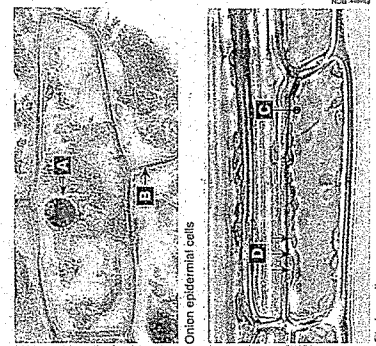
Starch granule: Carbohydrate stored in amyloplasts (specialised storage). Plastids are unique to plants. Non-photosynthetic plastids usually store materials.

Large central vacuole: Usually filled with an aqueous solution in plants and function in storage, waste disposal, and growth.

Cell wall: A semi-rigid structure outside the plasma membrane, 0.1 μm to several μm thick. It is composed mainly of cellulose. It supports the cell and limits its volume.

Plasma membrane: Located inside the cell wall in plants, 3 to 10 nm thick.

Generalized Plant Cell



Onion epidermal cells

Elodea cells

- The two photomicrographs (left) show plant cells as seen by a light microscope. Identify the basic features labelled A-D:
A: _____
B: _____
C: _____
D: _____

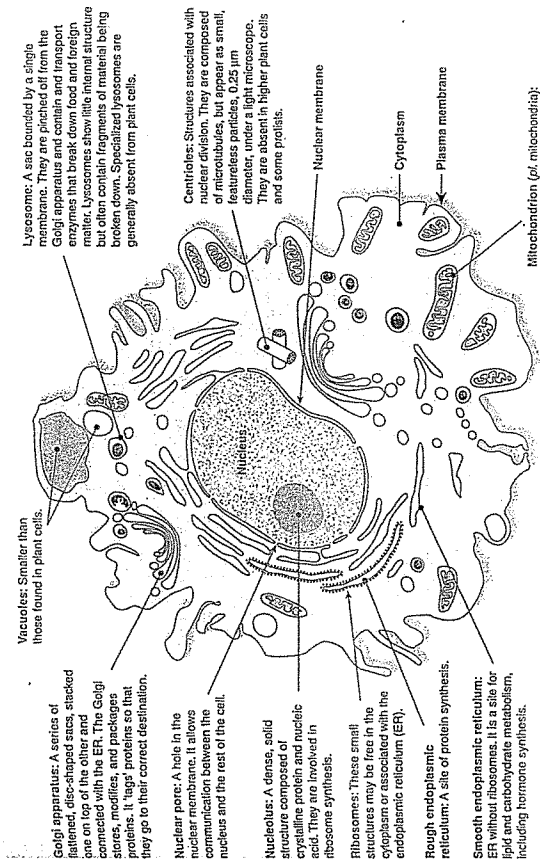
- Cytoplasmic streaming is a feature of eukaryotic cells, often clearly visible with a light microscope in plant (and algal) cells.
(a) Explain what is meant by cytoplasmic streaming:

(b) For the *Elodea* cell (lower, left), draw arrows to indicate cytoplasmic streaming movements.

- Describe three structures/organelles present in generalized plant cells but absent from animal cells (also see page 69):
(a) _____
(b) _____

Animal Cells

Animal cells, unlike plant cells, do not have a regular shape. In fact, some animal cells (such as phagocytes) are able to alter their shape for various purposes (e.g. engulfment of foreign material). The diagram below shows the structure and function of a typical animal cell and its organelles. Note the differences between this cell and the generalized plant cell. Also see pages 68 and 70-71, where further information is provided on the organelles listed here but not described.



Vacuoles: Smaller than those found in plant cells.

Golgi apparatus: A series of flattened, disc-shaped sacs, stacked one on top of the other and connected with the ER. The Golgi stores, modifies, and packages proteins. It 'tags' proteins so that they go to their correct destination.

Nuclear pore: A hole in the nuclear membrane. It allows communication between the nucleus and the rest of the cell.

Nucleolus: A dense, solid structure composed of nucleic acids. They are involved in ribosome synthesis.

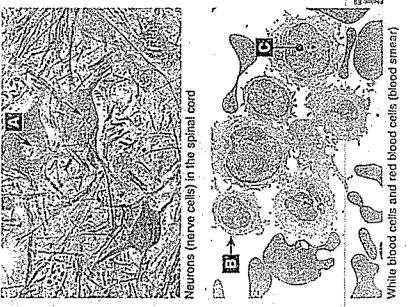
Ribosomes: These small structures may be free in the cytoplasm or associated with the endoplasmic reticulum (ER).

Rough endoplasmic reticulum: A site of protein synthesis.

Smooth endoplasmic reticulum: ER without ribosomes. It is a site for lipid and carbohydrate metabolism, including hormone synthesis.

Generalized Animal Cell

- The two photomicrographs (left) show several types of animal cells. Identify the features indicated by the letters A-C:
A: _____
B: _____
C: _____
- White blood cells are mobile, phagocytic cells, whereas red blood cells are smaller than white blood cells and, in humans, lack a nucleus.
(a) In the photomicrograph (below, left), circle a white blood cell and a red blood cell:
(b) With respect to the features that you can see, explain how you made your decision.



Neurons (nerve cells) in the spinal cord

White blood cells and red blood cells (blood smear)

- Name and describe one structure or organelle present in generalized animal cells but absent from plant cells:

Diffusion vs. Active Transport Worksheet

Directions: Use the reading, your notes, and your knowledge of Living Environment to answer the following questions.

- Define:
 - Passive Transport:
 - Simple Diffusion:
 - Facilitated Diffusion:
 - Active Transport:
 - Osmosis:

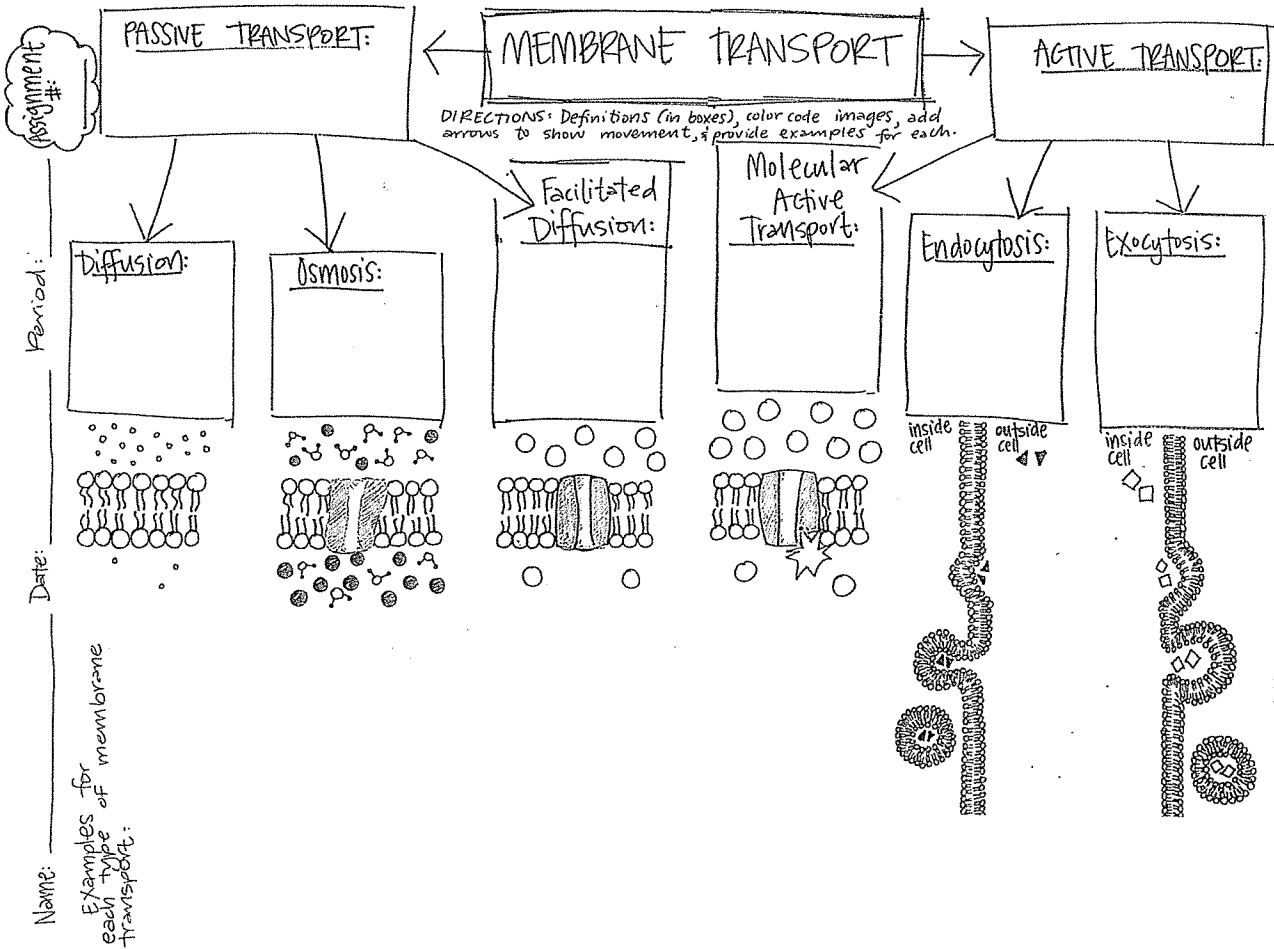
2. Is there a difference between Passive Transport and Diffusion? Explain your reasoning.

3. What is the difference between passive transport and active transport?

4. Why is the plasma membrane described as being "semipermeable"?

5. Identify which type of transport fits best with the following statement:

- Molecules move from a high concentration to a low concentration. _____
- Molecules move from a low concentration to a high concentration. _____
- Molecules move UP a concentration gradient. _____
- Molecules move DOWN a concentration gradient. _____
- Molecules move without the use of energy. _____
- Molecules require energy to move. _____
- Molecules use transport proteins that require energy usage to cross the plasma membrane. _____
- Molecules use transport proteins to cross the plasma membrane, but they do not require ATP to do so. _____



Homeostasis and Negative Feedback Questions

1. Define homeostasis from the readings.
2. List some factors that homeostasis regulates in your body.
3. Define negative feedback. Explain how this relates to the concept of homeostasis?
4. Define positive feedback. Explain how this relates to the concept of homeostasis?
5. Explain how homeostasis is like driving a car.
6. Describe what the cartoon would be like if it was drawn of positive feedback.
7. Create your own cartoon of a negative feedback system of the Respiratory system or the Circulatory system. Include and explain all the components of a negative feedback system (a set point, a control center and an effector).

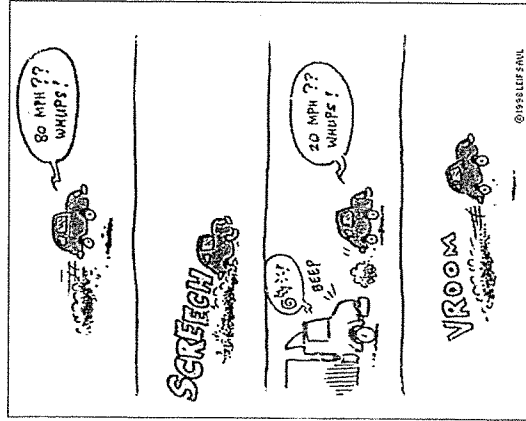
Name: _____ Date: _____ Period: _____

Homeostasis and Negative Feedback

Homeostasis is one of the fundamental characteristics of living things. It refers to the maintenance of the internal environment within tolerable limits. All sorts of factors affect the suitability of our body fluids to sustain life; these include properties like temperature, salinity, acidity, and the concentrations of nutrients and wastes. Because these properties affect the chemical reactions that keep us alive, we have built-in physiological mechanisms to maintain them at desirable levels.

When a change occurs in the body, there are two general ways that the body can respond. In **negative feedback**, the body responds in such a way as to reverse the direction of change. Because this tends to keep things constant, it allows us to maintain homeostasis. On the other hand, **positive feedback** is also possible. This means that if a change occurs in some variable, the response is to change that variable even more in the same direction. This has a de-stabilizing effect, so it does not result in homeostasis. Positive feedback is used in certain situations where rapid change is desirable.

To illustrate the components involved in negative feedback, we can use the example of a driver trying to stay near the speed limit. The desired value of a variable is called the set point. Here, the *set point* is a speed of 55 mph; in controlling body temperature, the set point would be 98.6 degrees. The *control center* is what monitors the variable and compares it with the set point. Here, the control center is the driver; for body temperature, it would be the hypothalamus of the brain. If the variable differs from the set point, the control center uses *effectors* to reverse the change. Here, the effector is the foot on the accelerator pedal; in controlling body temperature, it would include the glands that sweat and the muscles that shiver.



Answer the following questions.

4. What is the function of the plasma membrane?
 - A. molecules are attracted to one another
 - B. molecules constantly move and collide into one another
 - C. cellular energy forces molecules to collide with one another
 - D. cellular energy pumps molecules across the cell membrane
 5. The cell membrane contains channels and pumps which help in transport. What are these materials made of?
 - A. carbohydrate
 - B. lipid
 - C. Protein
 - D. nucleic acid
 6. Explain how each of the following organelles is involved in cell transport:
Vacuoles and vesicles –

Golgi apparatus –

Endoplasmic reticulum –

Cytoskeleton –
 7. Explain the relationship between the endoplasmic reticulum and Golgi apparatus in terms of cell transport.
- Transport Mechanisms:**
1. How do passive and active transport differ?
 2. List and describe the types of passive transport.
 3. Why do some molecules require the use of protein channels, as in facilitated diffusion?
4. Diffusion occurs because:
 - A. molecules are attracted to one another
 - B. molecules constantly move and collide into one another
 - C. cellular energy forces molecules to collide with one another
 - D. cellular energy pumps molecules across the cell membrane
 5. During diffusion, when the concentration of molecules on both sides of the membrane is equal, molecules will:
 - A. move across the membrane to the outside of the cell
 - B. stop moving across the membrane
 - C. continue to move across the membrane in both directions
 - D. move across the membrane to the inside of the cell
 6. Explain equilibrium.
 7. What is the relationship between diffusion and osmosis?
 8. Compare and contrast hypertonic, hypotonic, and isotonic solutions.
 9. Explain, in terms of osmosis, why a raisin placed in a cup of pure water overnight will puff up.
 10. Two solutions are placed on either side of a selectively permeable membrane. The membrane is permeable to solute. There is a higher concentration of solute particles on the left side of the membrane. In which direction will the solute particles move? Why?
 11. List and describe the types of active transport.

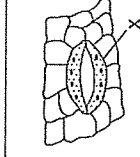
Multiple Choice Section: Choose the response which best completes the statement or answers the question. Place the number corresponding to that response before the number of the question or statement.

- Which life function provides substances that may be used by an organism for its growth and for the repair of its tissue? (1.) nutrition (2.) excretion (3.) regulation (4.) reproduction
- The life process of circulation in an organism directly involves those activities used to (1.) release energy from food (2.) produce cellular waste products (3.) obtain and hydrolyze materials (4.) absorb and distribute materials
- An activity carried on by every living plant and animal is (1.) reproduction (2.) respiration (3.) photosynthesis (4.) transpiration
- Which life process prevents the accumulation of metabolic wastes in a bald eagle? (1.) nutrition (2.) excretion (3.) digestion (4.) ingestion
- As a direct result of which life process does a plant make a variety of complex chemical substances from simpler ones, such as poisons, drugs, and flavorings? (1.) synthesis (2.) digestion (3.) excretion (4.) respiration

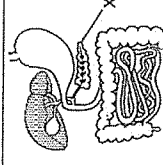
Completion Section:

- The taking in of food is called _____.
- The study of living things is called _____.
- The _____ is an organ which produces a hormone regulating blood glucose.
- The process by which food is utilized to provide energy in the form of ATP the organism can use is called _____.
- The movement (circulation) of materials throughout an organism is called _____.
- The increase in size of a living thing is called _____.
- The removal of wastes from an organism is called _____.
- This is the one life process not necessary for any individual organism. This life process where by organisms make more of their own kind is called _____.

- The tendency of organisms to maintain a stable internal environment or "steady state" is called _____.
- Structures which open and close openings in plants regulating water loss and gas exchange are called _____.
- The hormone produced by the pancreas which lowers blood glucose levels is called _____.
- Disruptions in homeostasis may result in death or _____.



- Identify structure X in the section of the plant leaf on the left. _____
- Explain how structure X helps the plant maintain homeostasis. _____



- Identify structure X in the human diagram on the left. _____
- Explain how structure X helps the plant maintain homeostasis. _____

Given the life processes which follow:

digestion circulation respiration

- Choose two of the life processes above and explain how they relate to assist an organism in the maintenance of homeostasis.

Answer the following questions:

12. Compare and contrast endocytosis and exocytosis.
6. In what way are the characteristics of living things related to homeostasis?
Obtain and use materials:

Obtain and use energy:

Grow and develop:

Reproduce:

Respond to environment:

7. What is a feedback mechanism/feedback inhibition? What is the role of a feedback mechanism in maintaining homeostasis?

8. Briefly explain how animal body systems work together to maintain homeostasis.

13. How do active transport and facilitate diffusion differ?

Homeostasis:

1. Which of the following activities is NOT a way for unicellular organisms to maintain homeostasis?
 - A. reproduction
 - B. growth
 - C. cell specialization
 - D. response to environment

2. Explain the relationship between multicellular organisms, cell specialization, and homeostasis.

3. What do unicellular organisms do to maintain homeostasis?

4. The contractile vacuole is an organelle found in paramecia, a group of single-celled organisms. Contractile vacuoles pump out fresh water that accumulates in the organisms by osmosis. Explain how this is an example of the way paramecia maintain homeostasis.

5. How do buffers help an organism to maintain homeostasis?

Name _____ Date _____ Period _____

5. RESPOND TO THE ENVIRONMENT / MAINTAIN HOMEOSTASIS

Living things live in a constant connection with the environment, which includes the air, water, weather, temperature, any organisms in the area, and many other factors. These external environmental factors act as stimuli and can cause a response from living things. Organisms need to respond to the changes in order to stay alive and healthy. For example, if you go outside on a bright summer day, the sun may cause you to squint. Perhaps the bark of an approaching dog causes you to turn your head quickly. Just as you are constantly sensing and responding to changes in your environment, so are all other organisms. For example, a specialized leaf of the Venus flytrap senses the light footsteps of a soon-to-be-digested green bottle fly. The plant responded to this environmental stimulus by rapidly folding the leaf together.

An organism must respond to changes in the internal environment as well. Internal conditions include the level of water, nutrients, and minerals inside the body. It also refers to body temperature and hormone levels. Adjustments to internal changes help organisms maintain a stable internal environment. The regulation of an organism's internal environment to maintain conditions suitable for life is called homeostasis. Or you can just think of it as keeping everything in BALANCE! For example, you have a "thermostat" in your brain that reacts whenever your body temperature varies slightly from 37°C (about 98.6°F). If this internal thermostat detects a slight rise in your body temperature on a hot day, your brain signals your skin to produce sweat. Sweating helps cool your body.

The ability of mammals and birds to regulate body temperature is just one example of homeostasis. Mechanisms of homeostasis enable organisms to regulate their *internal* environment, despite changes in their *external* environment.

30. What are some environmental factors (stimuli) that organisms respond to?

31. Organisms must also respond to _____ factors in order to stay healthy & survive.

32. What are two internal factors that organisms respond to?

33. Give two examples from the reading of how living things respond to changes in their environment.

23. If light is applied to a human eye, how does it respond?

24. Describe homeostasis.

Identify the feature of life that is illustrated by each of the following statements.
NOTE: You may use terms other than the characteristics of life!

1. _____ "That boy shot up five inches in only one year."
2. _____ "Our cat had a litter of kittens yesterday."
3. _____ "My dog has become much less clumsy now that he is a year old."

Name _____ Date _____ Period _____

4. _____ "Eat a good breakfast and you will be able to run longer."

5. _____ "When that car pulled in the driveway, my cat ran to hide under the porch."

6. _____ "That owl's night vision allows it to see the movement of mice on even the darkest night."

7. _____ "Single-celled organisms live in the pond behind school."

8. _____ Your body normally maintains a temperature of 98.6°F.

9. _____ A giraffe uses its long neck to eat from the high branches of a tree.

10. _____ is another name for "living thing."

11. Which of the following is a stimulus, which is a response?

- a) the recess bell ringing in an elementary school Stimulus or Response
- b) your mouth watering at the sight of food on a plate Stimulus or Response
- c) a sudden drop in air temperature Stimulus or Response
- d) a flu virus entering your body Stimulus or Response
- e) getting "butterflies" in your stomach before giving a speech. Stimulus or Response

12. Determine if each of the following describes a living or nonliving thing.

- a) rust eating a hole in a metal bucket _____
- b) an apple on a tree _____
- c) bacteria _____
- d) lightning _____
- e) a dinosaur fossil _____
- f) a wasp _____

* * * * * * * * * * * * * * * *

Biology is: _____

Living Things are called: _____

List Characteristics of ALL LIVING THINGS

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Answer the following questions:

Part B: Based on structural difference, explain why prokaryotic cells can be much smaller than eukaryotic cells.

Part C: Describe one similarity between prokaryotic cells and eukaryotic cells that is independent of size.

4. Alveoli are microscopic air sacs in the lungs of mammals. Which statement best describes how the structure of the alveoli allows the lungs to function properly?

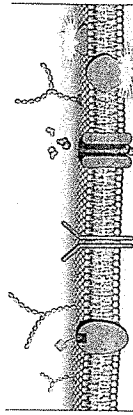
- A. They increase the amount of energy transferred from the lungs to the blood
- B. They increase the flexibility of the lungs as they expand during inhalation.
- C. They increase the volume of the lungs, allowing more oxygen to be inhaled.
- D. They increase the surface area of the lungs, allowing efficient gas exchange.

5. Use the diagram at the right to answer the question. A scientist observes a single-celled organism with several long, whip-like tails. Which function do the whip-like tails most likely perform for the organism?

- a. Defense against predators
 - b. Movement through an environment
 - c. Detection of the location of a light source
 - d. Measurement of atmospheric temperature changes
6. Living organisms can be classified as prokaryotes or eukaryotes. Which two structures are common to both prokaryotic and eukaryotic cells?

- a. Cell wall and nucleus
- b. Cell wall and chloroplast
- c. Plasma membrane and nucleus
- d. Plasma membrane and cytoplasm

Look at the image above: Identify its structure and function.



12. In order for medicine X to produce the effects that the researchers observed, it must have entered into which part of the targeted cells?

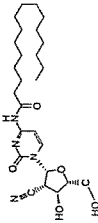
- A. nucleus
- B. ribosomes
- C. Golgi apparatus
- D. rough endoplasmic reticulum

treatment: Some human diseases involve the unregulated growth of cells. Although some patients are not affected by these growths, many are harmed. Cells in harmful growths divide uncontrollably and can eventually invade other cells, tissues and organs of the body. Some patients carry a mutation on one or more growth suppressor genes (GSGs). GSGs help to repair damage to DNA. This mutation decreases an individual's ability to fight these harmful growths. Recently researchers reported on the results of using a combination of two types of medicine

to treat patients with unregulated growths caused by a lack of functioning GSGs. When medicine "X" and "Y" are used together they cause the cell processes in the targeted cell to fail. In order for medicine X to produce the effects that the researchers observed, it must have entered into which part of the targeted cells?

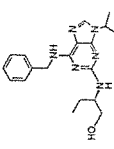
Characteristics of Medicine X

- High molecule
- damage DNA



Characteristics of Medicine Y

- large molecule
- decrease enzyme activity



- a. Nucleus
- b. Endoplasmic reticulum
- c. golgi apparatus
- d. Ribosomes

Use the list below to answer the question.

Cell Structures

- plasma membrane
- endoplasmic reticulum
- Golgi apparatus
- mitochondria
- nucleus
- ribosomes

A scientist identifies several structures in a cell and organizes them in a list.

Part A: Describe how the cell structures in this list can be used to classify the cell as either prokaryotic or eukaryotic. Use examples of the structures that would help identify the cell in your answer.

Part B: Compare how both prokaryotes and eukaryotes use two of the cell structures listed and describe the common functions of these structures.

Structure 1:

Common Function:

Structure 2:

Common Function:

Name _____ Date _____ Period _____

Match each LEVEL to its MEANING.

(Use your textbook)

- ____ 1. Atom/Molecule
- ____ 2. Organ
- ____ 3. Population
- ____ 4. Biome
- ____ 5. Cell
- ____ 6. Organelle
- ____ 7. Community
- ____ 8. Ecosystem
- ____ 9. Tissue
- ____ 10. Organism

- A. All living & nonliving things on earth
- B. Smallest level at which life exists
- C. a group of one kind of organism living in an area
- D. group of similar cells working together
- E. Several populations of organisms living together
- F. a living thing that may be unicellular or multicellular
- G. a group of similar tissues working together like the heart or lungs
- H. all the living and nonliving things living in a similar environment such as a desert
- I. parts of a cell such as the nucleus
- J. smallest part of an element or compound

Name _____ Date _____ Period _____

Modern science has changed the way people understand their world. In the past, the people of many societies thought that mountains, rivers, and forests were "alive." In much the same way that animals and plants are alive. Today, most people recognize a difference between living and non-living things.

Fill out the table below. Explain HOW each shows the feature of life IF it does.

Feature of Life	Dog	Fast-moving stream
made of cells?		
uses energy?		
responds and adjusts to changes?		
reproduces?		
grows and develops?		

LEVELS OF ORGANIZATION

Life is organized into many levels. The simplest level at which life exists is the cell. Life is also organized into nonliving levels (below the cell) and levels above the organism. Arrange the following levels of organization in order from simplest to most complex --- ecosystem, atom, population, organ, molecule, biome, tissue, cell, organelle, system, organism, community

- NONLIVING
- _____
 - _____
 - _____
- LIVING
- _____ ORGANISM
 - _____ CELL
 - _____
 - _____
 - _____

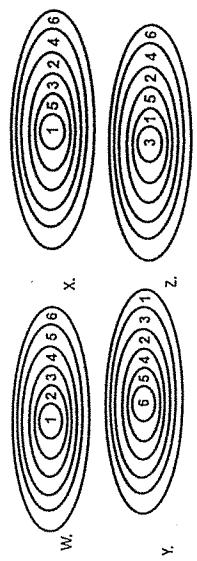
Answer the following questions:

- using camouflage to avoid predators
- feeding at night to regulate body temperature
- moving to deeper water to regulate metabolic wastes
- exchanging gases through its gills to regulate oxygen levels

5. Which statement best describes an effect of the low density of frozen water in a lake?
- When water freezes, it contracts, decreasing the water level in a lake.
 - Water in a lake freezes from the bottom up, killing most aquatic organisms.
 - When water in a lake freezes, it floats, providing insulation for organisms below.
 - Water removes thermal energy from the land around a lake, causing the lake to freeze

6. Which diagram best represents the relationship of the items in the list below?

- Cell
- Organ
- Organelle
- Organ system
- Tissue
- Whole organism



Station 2- Cells and Cellular Organization

Complete the following table by writing the name of the cell part or organelle in the right hand column that matches the structure/function in the left hand column. A cell part may be used more than once.

Structure/Function	Cell Part
Membrane bound structures found in eukaryotic cells which have a specific function	
Stacked, flattened sacs – modifies and packages proteins for exit out of the cell	
The sites of protein synthesis	
Transports proteins within the cell	
The region inside the cell except for the nucleus	
Organelle that manages or controls all the cell functions in a eukaryotic cell. Houses the cell's DNA	
Contains chlorophyll, a green pigment that traps energy from sunlight and gives plants their green color	
Digests excess or worn-out cell parts, food particles and invading viruses or bacteria	
Organelle that produces lipids and detoxifies cell	
Rigid, protective structure that gives the cell its shape in plants, fungi, most bacteria and some protists	
Powerhouse of the cell - Produces a usable form of energy for the cell- ATP	

Stores water, large, found in plant cells	
Site where ribosomes are made	
The membrane surrounding the cell, composed of phospholipid bilayer with proteins embedded in it	
Provides support for the cell,	
DNA in the nucleus of eukaryotic cells, thin and threadlike, seen in a non-dividing cell	
Small hair-like structures used for movement or sensing things	
Condensed and coiled DNA in a dividing cell	
Longer whip-like structures used for movement	

Put a check in the appropriate column(s) to indicate whether the following organelles are found in plant cells, animal cells or both

Organelle	Plant Cells	Animal Cells
Cell Wall		
Vesicle		
Chloroplast		
Chromatin		
Cytoplasm		
Cytoskeleton		
Endoplasmic reticulum		
Golgi apparatus		

Organelle	Plant cells	Animal Cells
Lysosome		
Mitochondria		
Nucleolus		
Nucleus		
Plasma membrane		
Central vacuole		
Ribosome		
Vacuole		

Keystone Released Questions

- Which characteristic is shared by all prokaryotes and eukaryotes?
 - Ability to store hereditary information
 - Use of cellular respiration for energy release
- Living organisms can be classified as prokaryotes or eukaryotes. Which two structures are common to both prokaryotic and eukaryotic cells?
 - Cell wall and nucleus
 - plasma membrane and nucleus
- Prokaryotic cells are generally much smaller than eukaryotic cells.

Part A: Identify a structural difference between prokaryotic cells and eukaryotic cells that is directly related to their difference in size.

 - Use of organelles to control cell processes
 - Ability to move in response to environmental stimuli

Cell Membrane Coloring Worksheet

WORD BANK: BI-LAYER; ENERGY; FATTY ACIDS; GLYCEROL; HEADS; NON-POLAR; PASSIVE TRANSPORT; PLASMA; SIDEWAYS; TAILS; WITH

Composition of the Cell Membrane & Functions

The cell membrane is also called the _____ membrane and is made of a phospholipid _____. The phospholipids have a hydrophilic (water attracting) _____ and two hydrophobic (water repelling) _____. The head of a phospholipid is made of an alcohol and _____ group, while the tails are chains of _____. Phospholipids can move _____ and allow water and other _____ molecules to pass through into or out of the cell. This is known as simple _____ because it does not require _____ and the water or molecules are moving _____ the concentration gradient.

SKETCH AND LABEL a phospholipid coloring the heads red and the tails blue.

PHOSPHOLIPID (Your Sketch in space below ↓)

WORD BANK: CHOLESTEROL; INTEGRAL; PARTS; PERIPHERAL; PROTEINS; PROTEINS

Another type of lipid in the cell membrane is _____ that makes the membrane more fluid. Embedded in the phospholipid bilayer are _____ that also aid in diffusion and in cell recognition. Proteins called _____ proteins go all the way through the bilayer, while _____ proteins are only on one side. Large molecules like _____ or carbohydrates use proteins to help move across cell membranes. Some of the membrane proteins have carbohydrate _____ attached to help cells in recognize each other and certain molecules.

Match the cell membrane structure or its function with the correct letter from the cell membrane diagram.

Letter	Structure/Function	Letter	Structure/Function
_____	Attracts water	_____	Repels water
_____	Helps maintain flexibility of membrane	_____	Make up the bilayer
_____	Involved in cell-to-cell recognition	_____	Help transport certain materials across the cell membrane

Osmosis and Tonicity

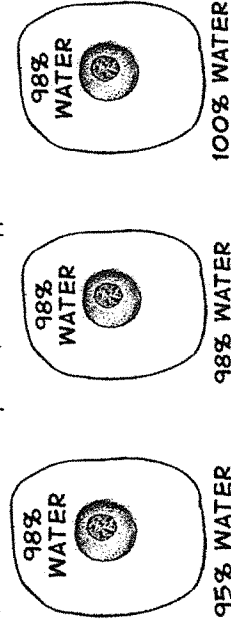
Define osmosis. _____

In which direction does water move across membranes, up or down the concentration gradient? _____

Define these 3 terms:

- isotonic- _____
- hypertonic _____
- hypotonic _____

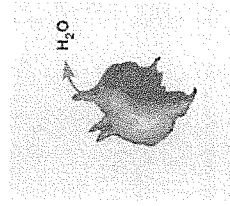
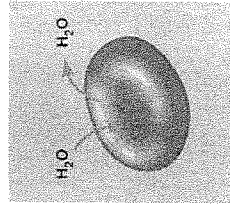
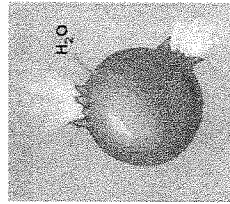
Use arrows to show the direction of water movement into or out of each cell. Color and label the cell in an isotonic environment light blue, the hypotonic environment yellow, and the hypertonic environment light green.

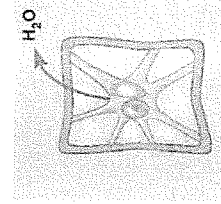
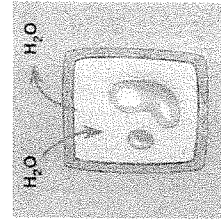
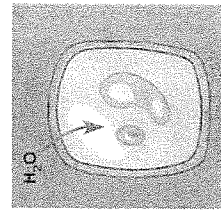


Match the description or picture with the osmotic condition:

- A. *Isotonic* _____ solution with a lower solute concentration
- _____ solution in which the solute concentration is the same
- B. *Hypertonic* _____ condition plant cells require
- _____ condition that animal cells require
- _____ red blood cell bursts (cytolysis)
- C. *Hypotonic* _____ plant cell loses turgor pressure (Plasmolysis)
- _____ solution with a higher solute concentration
- _____ plant cell with good turgor pressure
- _____ solution with a high water concentration

Label the tonicity for each solution (*isotonic, hypotonic, or hypertonic*):





Transport Requiring Energy

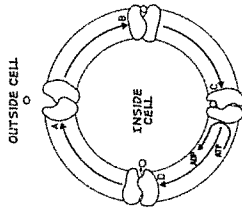
WORD BANK: ACTIVE; AGAINST; ATP

What type of transport is represented by the following picture?

What energy is being used? _____

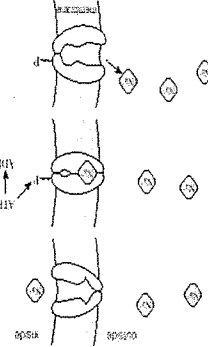
In which direction (concentration gradient), is the movement occurring?

Color the internal environment of the cell yellow. Color and Label the transport proteins red and the substance being moved blue.



WORD BANK: AGAINST; PROTEINS; SHAPE; SODIUM-POTASSIUM; TRANSMEMBRANE (INTEGRAL)

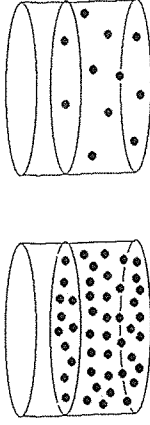
One type of active transport is called the _____ pump which helps muscle cells contract. This pump uses _____ to move ions _____ the concentration gradient. The protein that is used to pump the ions through is called a _____ protein and it changes its _____ to move the ions across the cell membrane. Label and color the carrier proteins red and the ions green.



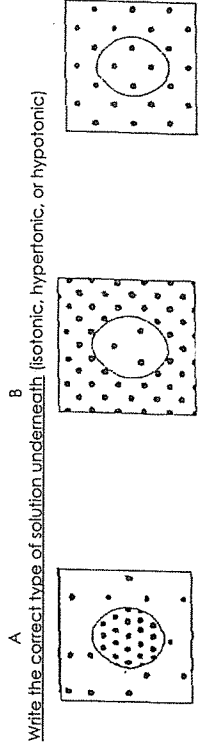
Name: _____
Passive Transport Practice

- The cell membrane is made of a _____ permeable. This means that _____.
- The cell membrane is _____ permeable. This means that _____.
- Diffusion always causes particles to move from a region of _____ concentration to a region of _____ concentration.
- Does a cell use energy when molecules diffuse in or out of the cell? _____
- What are 3 types of Passive Transport? _____

LOOK AT THE DIAGRAMS. The black dots represent solute molecules dissolved in water



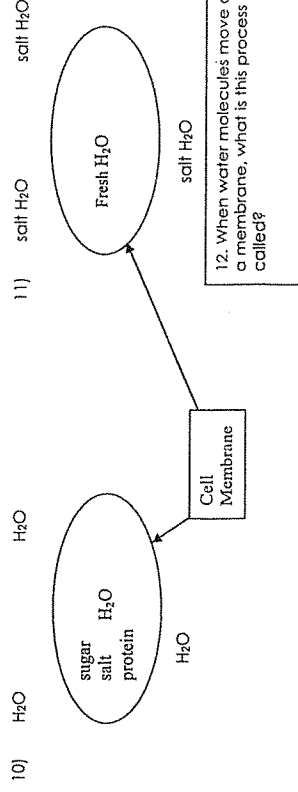
6. In which beaker is the concentration of solute the greatest?
 A or B



Write the correct type of solution underneath (isotonic, hypertonic, or hypotonic)

- _____ tonic means there is a GREATER concentration of solute molecules OUTSIDE the cell than inside.
- _____ tonic means there is a LOWER concentration of solute molecules OUTSIDE the cell than inside.
- _____ tonic means there is the SAME concentration of solute molecules outside the cell as inside.

Show the direction the molecules are moving with arrows _____

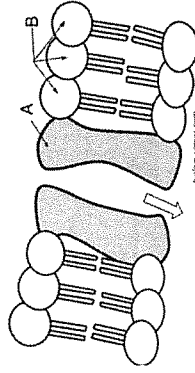


Name: _____ Date: _____

Reinforcement: Cell Transport

Diffusion	Cystic Fibrosis	Semipermeable	Equilibrium
Facilitated Diffusion	Osmosis	Isotonic	Hypertonic
Hypotonic	Homeostasis	Passive Transport	Active Transport
Endocytosis	Exocytosis	Membrane	Contractile Vacuole

- The movement of molecules from an area of high to low concentration: _____
- The movement of water across a membrane: _____
- A solution that has **more** molecules (like salt) outside the cell is a _____ solution.
 *Cells in this solution will gain or lose water? _____
- A solution that has **less** molecules (like salt) outside the cell is a _____ solution.
 * Cells in this solution will gain or lose water? _____
- A solution that has the **same** number of molecules as the cell is a _____ solution.
- This disease is caused by a failure of the cell membrane, which causes mucus to build up in the lungs: _____
- Cell membranes will let some things pass through them, this means they are _____
- Type of transport that does not require energy: _____
- Type of transport that does require energy: _____
- When molecule are even throughout a space, it is called _____
- This organelle pumps out excess water: _____
- The maintaining of a biological balance, or sameness: _____
- The outer boundary of all cells, its job is to move things in and out of the cell: _____
- Type of transport where a cell takes in a large particle, like food: _____
- Type of transport where a cell pushes out large particles, like waste: _____
- Type of transport where proteins channels help move molecules across the membrane: _____



17. Label the Cell Membrane

Phospholipids _____
 Transport Protein _____