Part 2 Cell Transport

Name:

Part 2 Lesson 1Cell Membrane

Due:

Weight of your egg _____grams. Now place in vinegar / with lid for later.
Weight of Potato slices before soaking _____ in grams for Distilled Water.
Weight of Potato slices before soaking _____ in grams for Salt Water.

Cells need to have an optimal _____ to _____ ratio.

-If the volume increases too much the surface area will decrease and the exchange of materials across the membrane will _____.

-Cells tend to _____ and remain small to maintain a high surface area to volume ratio.

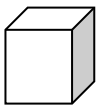
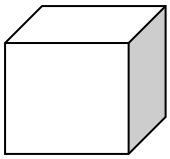
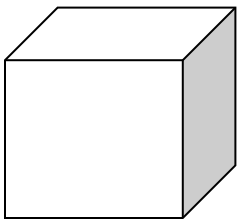
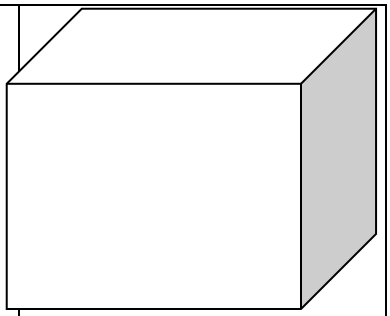
Surface Area refers to the _____ area on an object, e.g. it is the area around the outside of the cell. Unit = cm^2

Diffusion: The net movement of anything from a region of _____ concentration to a region of _____ concentration.

Volume refers to the amount of space _____ of the object, e.g. the space inside the cell. Unit = cm^3

Beet Size at Start	Volume	Surface Area	Surface Area to Volume Ratio. Just divide SA/ by Vol
Small 1cm L x W X H			
Medium 2 cm L X W X H			
Large 4 cm L X W X H			
Extra Large 6 cm			

Draw the beets after 30 minutes of soaking. How much Red/Purple is left? Sketch the remaining purple with a colored pencil. Measure just the purple/red and recalculate the volume, surface area, and surface area to volume ration.

			
Small 1 cm^3	Medium 2 cm^3	Large 4 cm^3	Extra Large 6 cm^3

As the size of an object increases, the volume also increases, when the cube doubles from a length of 1 cm to a length of 2 cm, the surface area increase by a factor of four, going from 6 cm^2 (1 cm x 1 cm x 6 sides) to 24 cm^2 (2 cm x 2 cm x 6 sides).

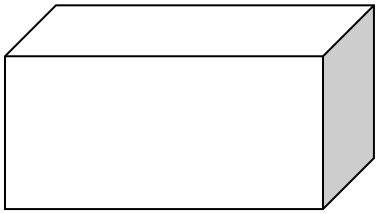
Red Color remaining after 30 min in bleach	Volume	Surface Area	Surface Area to Volume Ratio. Just divide SA/ by Vol
Small 1cm L x W X H			
Medium 2 cm L X W X H			
Large 4 cm L X W X H			
Extra Large 6 cm			

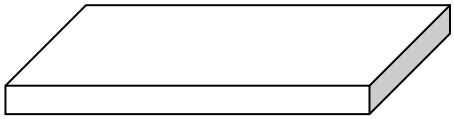
Now just subtract the Beet size start Volume and Surface Area by the final (color left size) below. To determine the volume of this colored inner cube, measure the length of this purple inner cube and multiply it by the width and height. Subtract this from the original volume and original surface area of the cube and you obtain the volume of the cube that has not been dulled by the bleach. By dividing this number by the original volume and multiplying by 100%, you can determine the percentage penetration for each cube.

Beet Size after 30 min in bleach	Change in Volume	% Bleach Penetrated
Small 1cm		
Medium 2 cm		
Large 4 cm		
Extra Large 6 cm		

When a cell grows, its volume (units^3) increases faster than surface area (units^2), leading to a _____ SA:Vol ratio
If metabolic rate exceeds the rate of exchange of critical materials and wastes (low SA:Vol ratio), the cell will eventually _____.
Growing cells tend to _____ and remain _____ in order to maintain a _____ SA:Vol ratio suitable for survival

Circle the shape that best represents a cell? Why? Explain below using the beet lab as a focus. Please use words Surface Area, Volume, Diffusion, Cell Size, Membrane, bleach, Beets



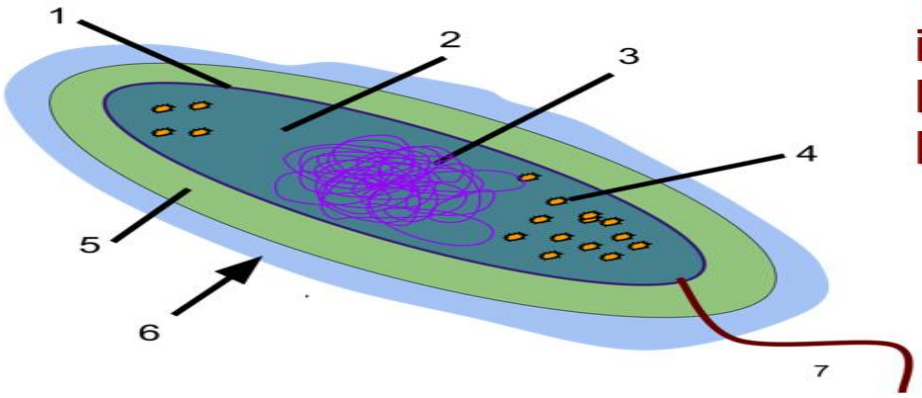


Cytoplasm

-All areas outside of _____. Area outside of organelles is called cytosol.
-Rich _____ fluid that helps breakdown molecules for use.
-Moves materials _____ cell (food and waste)

Capsule: aka (slime layer) A thick layer used for _____ cells together.

-Food reserve
-_____ (Toxin release)



Which number is the slime layer in this bacteria?

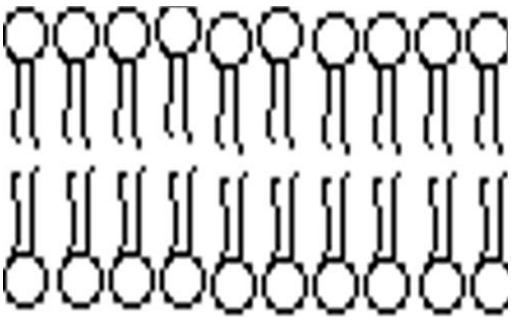
Cell Wall

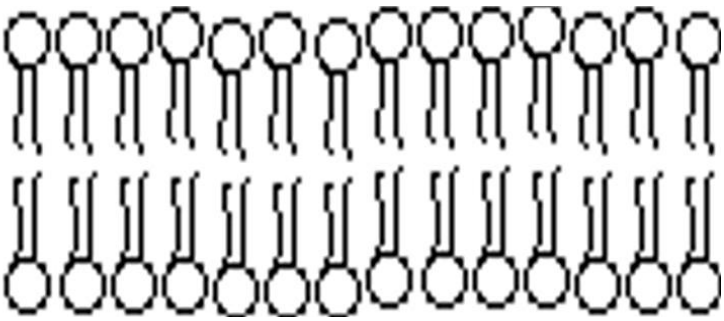
-Bacteria, _____, _____, and some Protista have cell walls.
-Made of _____ (permeable)
-_____ plant
- Difficult to chew and digest (protection).

Part 2 Lesson 2 Osmosis (Likely Two Days)

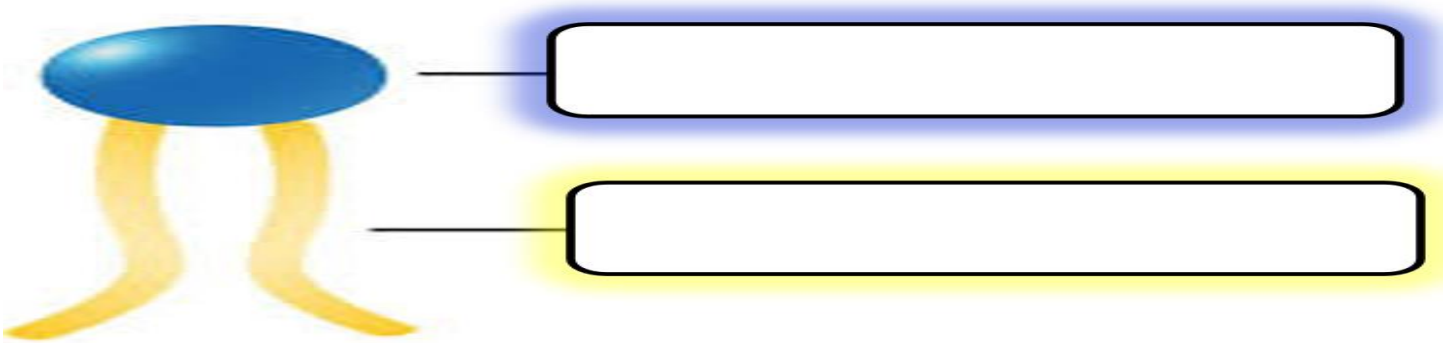
Plasma Membrane

-Made of a _____ bilayer
-Phospholipids have two ends, one of which is hydro_____, or attracted to water, and one of which is hydro_____, or repelled by water.





Which part of the phospholipid below is hydrophilic? And which is hydrophobic?



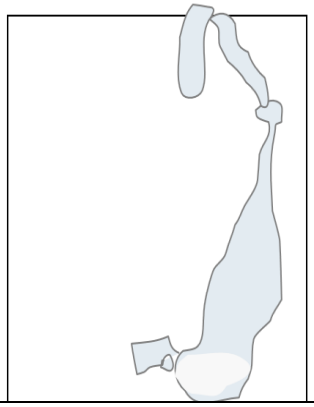
Why is it important that the cell membrane is a lipid? Think Polarity.

The cell membrane is selectively permeable. Some things can enter some can't.

Cell Membrane controls movement (cellular traffic) in and out the cell.

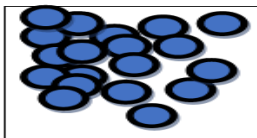
What are some things that a cell might want to let enter and leave?	What are some things that a cell might want to keep out?

Starch, Iodine, Water Diffusion

Please set up the following. -One clear container filled ¾ with water. -One length of dialysis tubing (20 cm) -Wet dialysis tubing and tie-of on one end. -Use finger and thumb to open wet dialysis tubing. -Using pipettes, fill dialysis tubing with starch solution. (cornstarch / amylose) -Tie-off other end of dialysis tubing. -Extension: Weigh baggie before placing it in the water. -Place in container with one end hanging on edge so that the baggy can be removed without touching iodine	Weight of baggie before soaking  Weight of tubing with starch and and water solution _____ grams

Diffusion: Random _____of molecules.
-From _____ to _____concentrations.
-Molecules are trying to reach equilibrium

Please animate diffusion in the boxes below with 20 molecules.

Passive Transport - movement of molecules from a _____ crowded to a _____ crowded area _____ the use of energy.

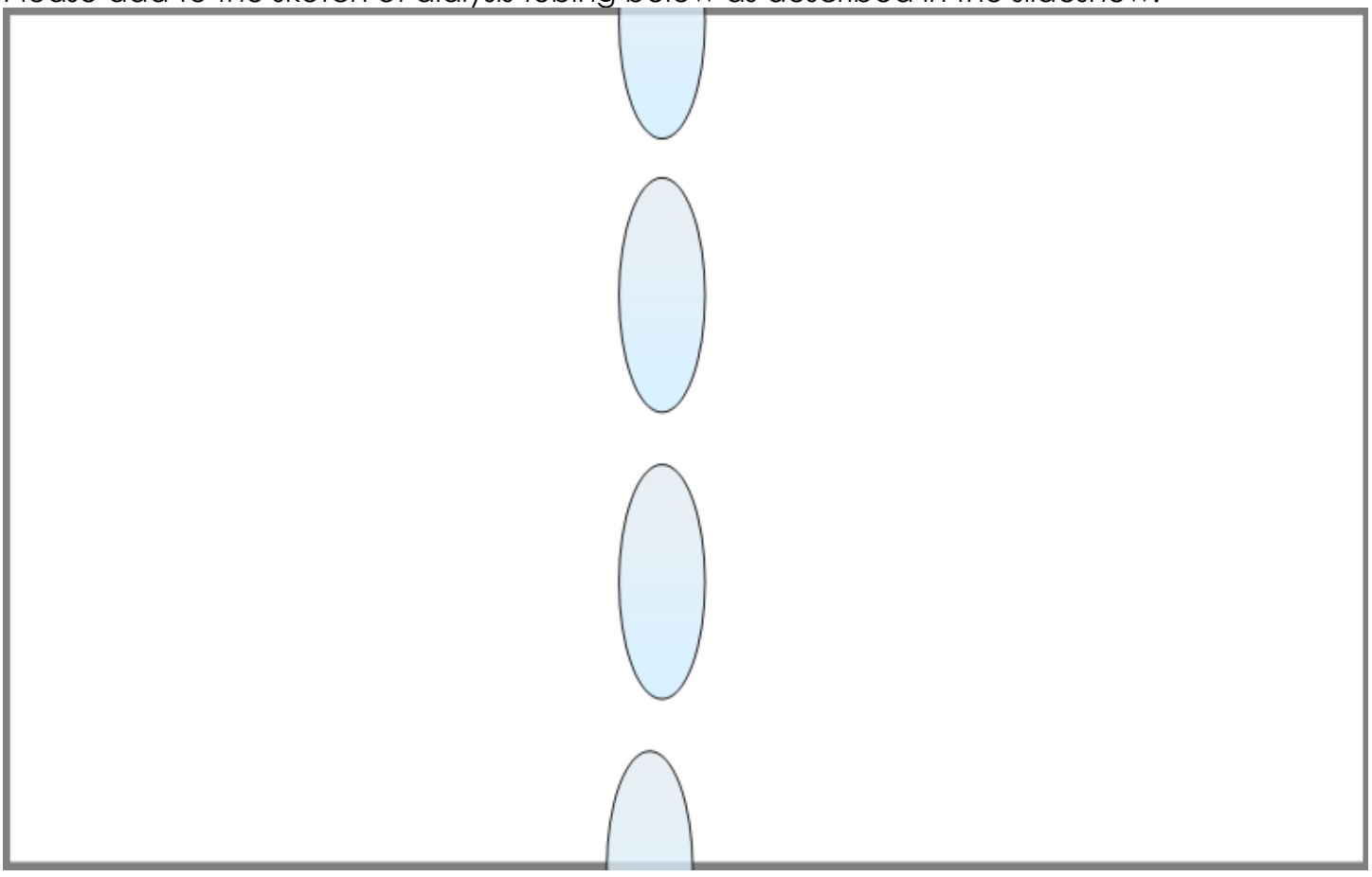
Osmosis: The movement of water through a _____

Facilitated diffusion is the process of _____transport of molecules or ions across a biological membrane via specific transmembrane integral _____.

Permeable: Has large holes in it to let molecules pass through.

- _____-permeable – Some things can enter
- _____permeable – Nothing can enter

Please add to the sketch of dialysis tubing below as described in the slideshow.



Bag with Starch %Change in Mass

(After soaking mass – before soaking mass / before soaking mass x 100

_____ - _____ / _____ = _____ x 100 = _____%

Use the word "Diffusion" in a sentence.

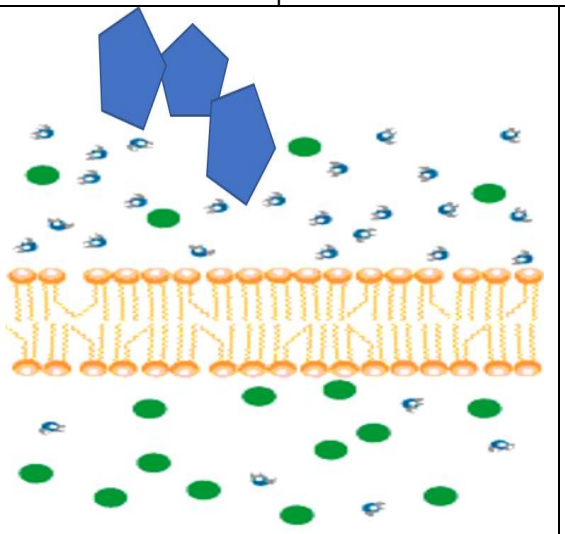
Use the word "Osmosis" in a sentence.

Please describe the diffusion of Iodine through the water:

What moved into and out of the dialysis tubing? How do you know?

What is a larger molecule, Starch or Iodine? Explain?

A cell membrane is selectively permeable. The membrane below is permeable to which molecules and impermeable to which molecules? Explain in the space at the bottom…



Part 2 Lesson 3 Gummy Bear

GUMMY BEAR

Water Height before soaking = Height after soaking=	Saltwater Height before soaking = Height after soaking=
Baking Soda Height before soaking = Height after soaking=	Vinegar Height before soaking = Height after soaking=

Water %Change in height

(After soaking height – before soaking height / before soaking height x 100 = _____%

_____ - _____ / _____ x 100 = _____%

Saltwater %Change in height

(After soaking height – before soaking height / before soaking height x 100 = _____%

_____ - _____ / _____ x 100 = _____%

Baking Soda and Water %Change in height

(After soaking height – before soaking height / before soaking height x 100 = _____%

_____ - _____ / _____ x 100 = _____%

Vinegar %Change in height

(After soaking height – before soaking height / before soaking height x 100 = _____%

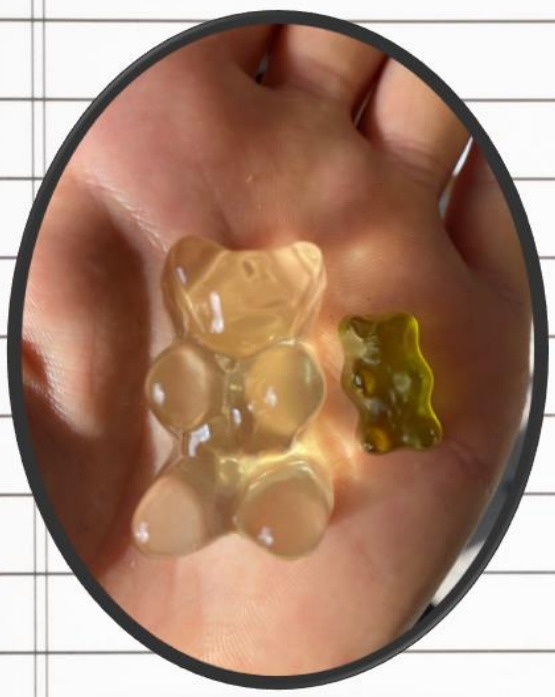
_____ - _____ / _____ x 100 = _____%

Other % Mystery Optional / Maybe Soda

(After soaking height – before soaking height / before soaking height x 100 = _____%

_____ - _____ / _____ x 100 = _____%

What happen to a gummy bear soaked in water?
Answer in one strong paragraph with supportive data (%).
-You must use the words osmosis, high, low, concentration, diffused, juicy, lifeguard, molecules, tragic, and Alfred in your paragraph.



Hypotonic Solution: A solution that contains _____ solute (more water) compared to the cytoplasm of the cell.

-Water moves _____ the cell to equal out concentrations. The cell _____!

Hypertonic Solution: Concentration of the cell is _____ than outside of the cell.

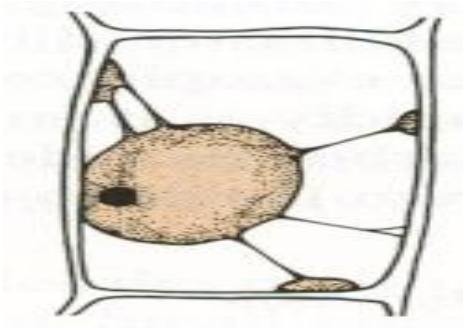
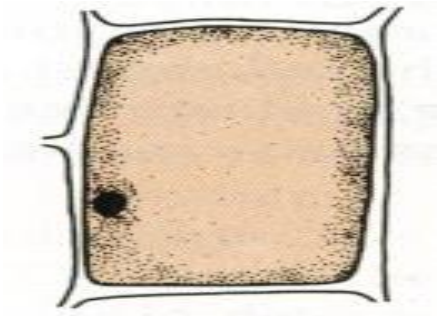
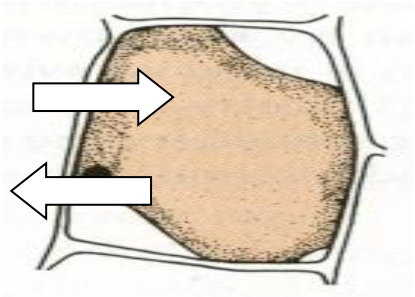
-Water moves _____ of the cell to try to even out the concentration. Cell _____! (Plasmolysis)

Isotonic Solution: The cell has an _____ proportion of concentration with the area surrounding.

-Water continually flows in and out to keep concentration _____.

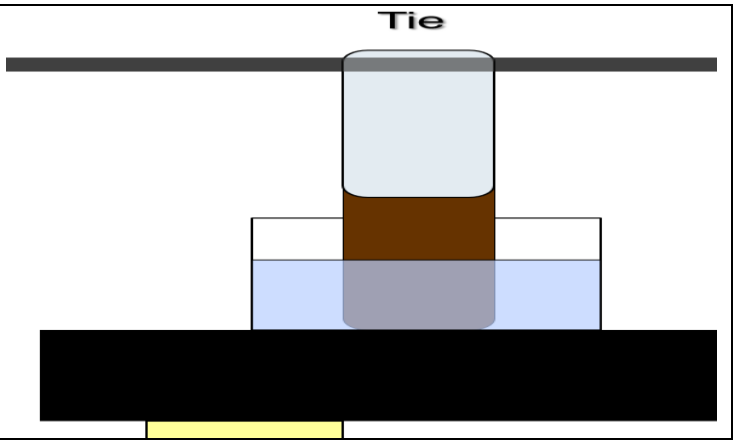
Name the solution that cell has been placed in? Word Bank: Hypertonic Solution, Hypotonic Solution, Isotonic Solution

Please name the following cells and solutions. Word Bank: Hypotonic, Hypertonic, Isotonic. – Can you spot plasmolysis and turgor pressure? Please draw arrows!

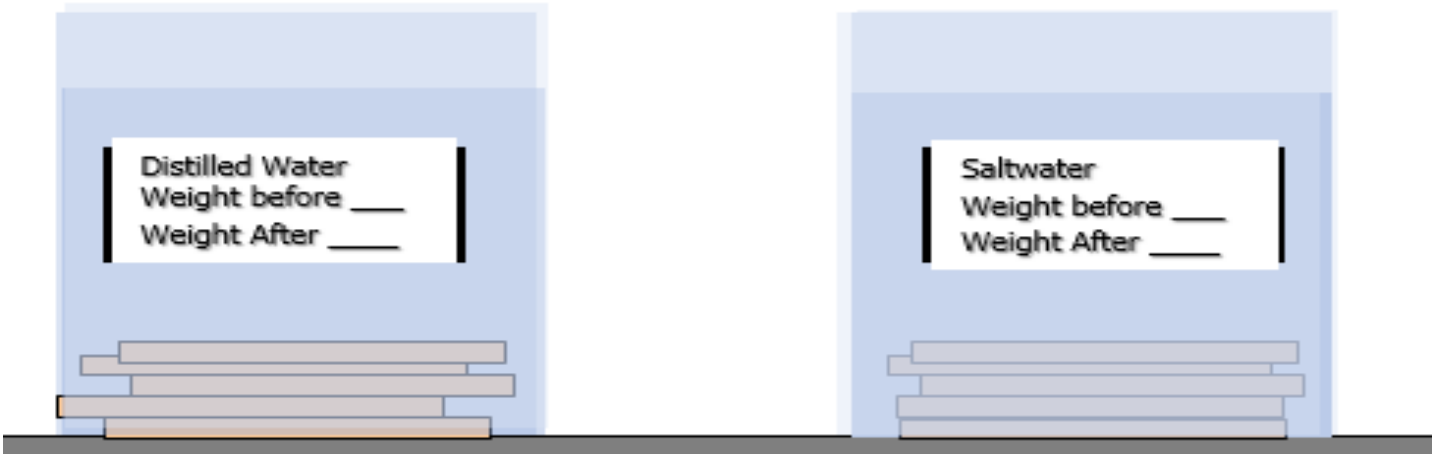
_____Cell _____ Solution	_____ Cell _____ Solution	_____Cell _____Solution
		 Equal Concentrations

How come plant cells don't burst (lysis) if placed in water? Explain below.

Part 2 Lesson 4 Osmosis Extensions

Osmosis and Corn Syrup. The corn syrup was _____ (more solute). Water was _____. The water moved into the dialysis tubing to equal the concentrations (_____). The fluid in the tubing rose. Observations:	

Revisiting the Potato



Feel the potatoes. How are they different?

What was the % change in mass? Show your work! You should be able to do on your own.

Why did the potato slices in freshwater gain mass while the potatoes in saltwater lost mass?

Quiz Wiz 1-10 Is the cell in a Hypotonic, Hypertonic, or Isotonic Solution

1.)	6.)
2.)	7.)
3.)	8.)
4.)	9.)
5.)	10.)
*11.)	Score:

If stuck on a raft in a survival situation, should you drink the saltwater to stay alive? Why?

Revisiting the egg in vinegar.

Original Weigh of the egg from the first page_____grams

Current weight of the egg (pat dry)_____grams?

Did it gain or lose mass? How much in grams?_____

Determine % Change in mass

(After soaking mass – before soaking mass / before soaking mass x 100 = _____%

_____ - _____ / _____ x 100 = _____%

Draw and describe the eggs properties.

How else has it changed?

Part 2 Lesson 5 Active Transport

Active transport –

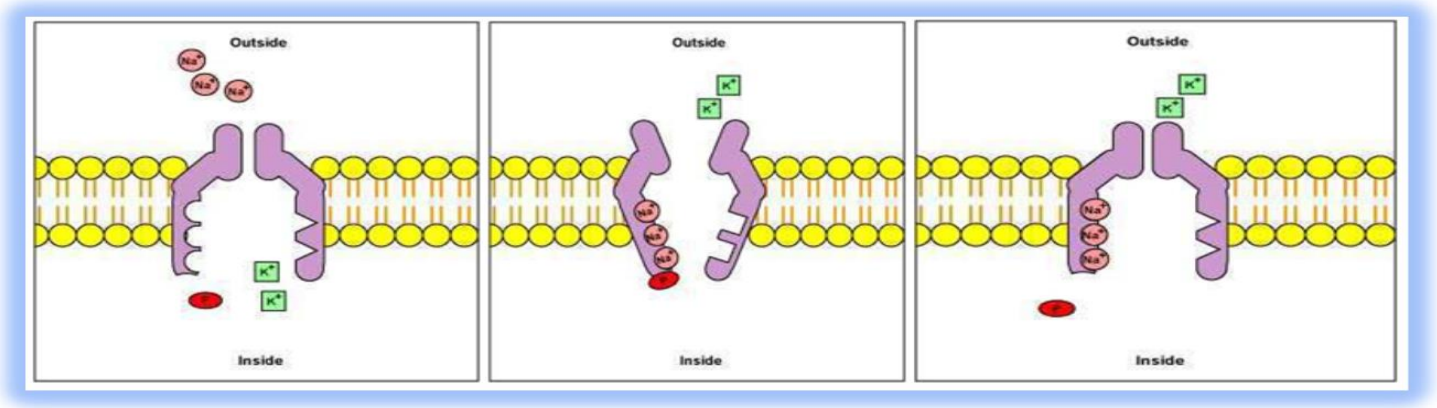
-Movement of molecules from a _____ crowded to a _____ crowded area
-Requires the use of _____
-Proteins can do this
-Also called _____osmosis

The Sodium Potassium Pump: The process of moving _____ sodium and potassium ions across the _____.

It's active transport involving the hydrolysis of ATP to provide the necessary _____.

This process is responsible for maintaining the large excess of Na^+ outside the cell and the large excess of K^+ ions on the inside

Please describe active transport as it related to the sodium potassium pump? Feel free to share extra's about the specifics of this process.



Living organisms constantly receive and interpret signals from their _____.
-Signals can be light, heat, water, odors, and touch.
-Cells also receive signals from other _____ to divide and signals to differentiate.

Endocytosis: (Endo - means to bring in) Energy requiring process where cell _____ a particle.

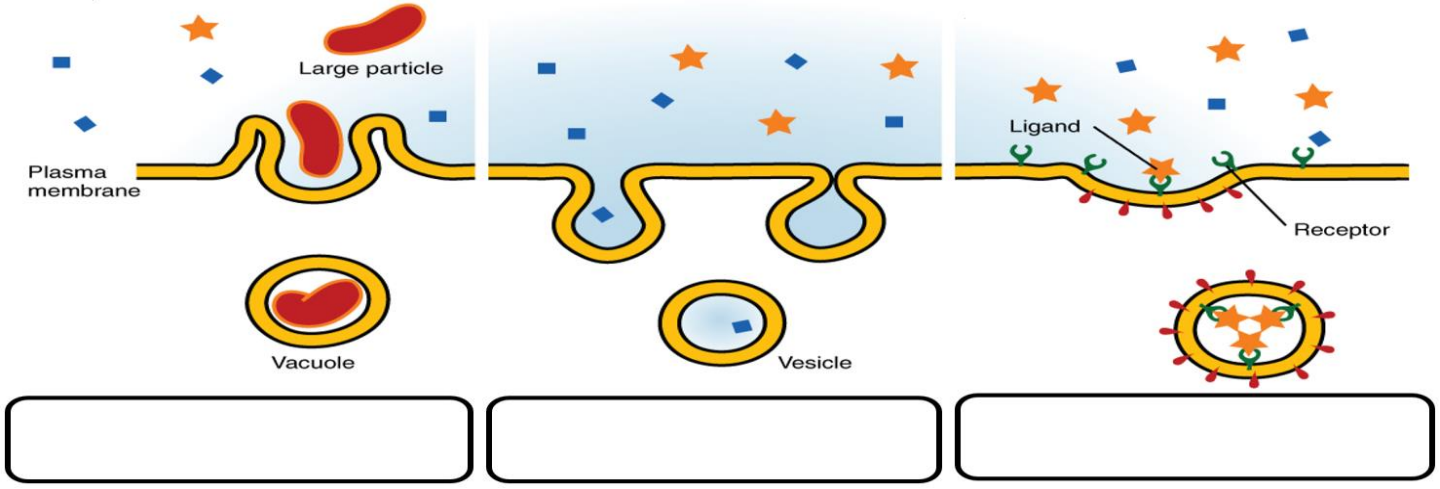
Phagocytosis: Type of endocytosis. Membrane surrounds large particles (_____)
Pinocytosis: Membrane surrounds a _____

Please animate endocytosis in the space below. Is it Pino or Phagocytosis?

Endo				

Transmembrane Protein Receptor Mediated Endocytosis: Proteins receptors facilitate endocytosis.

Please name the correct form of endocytosis below?

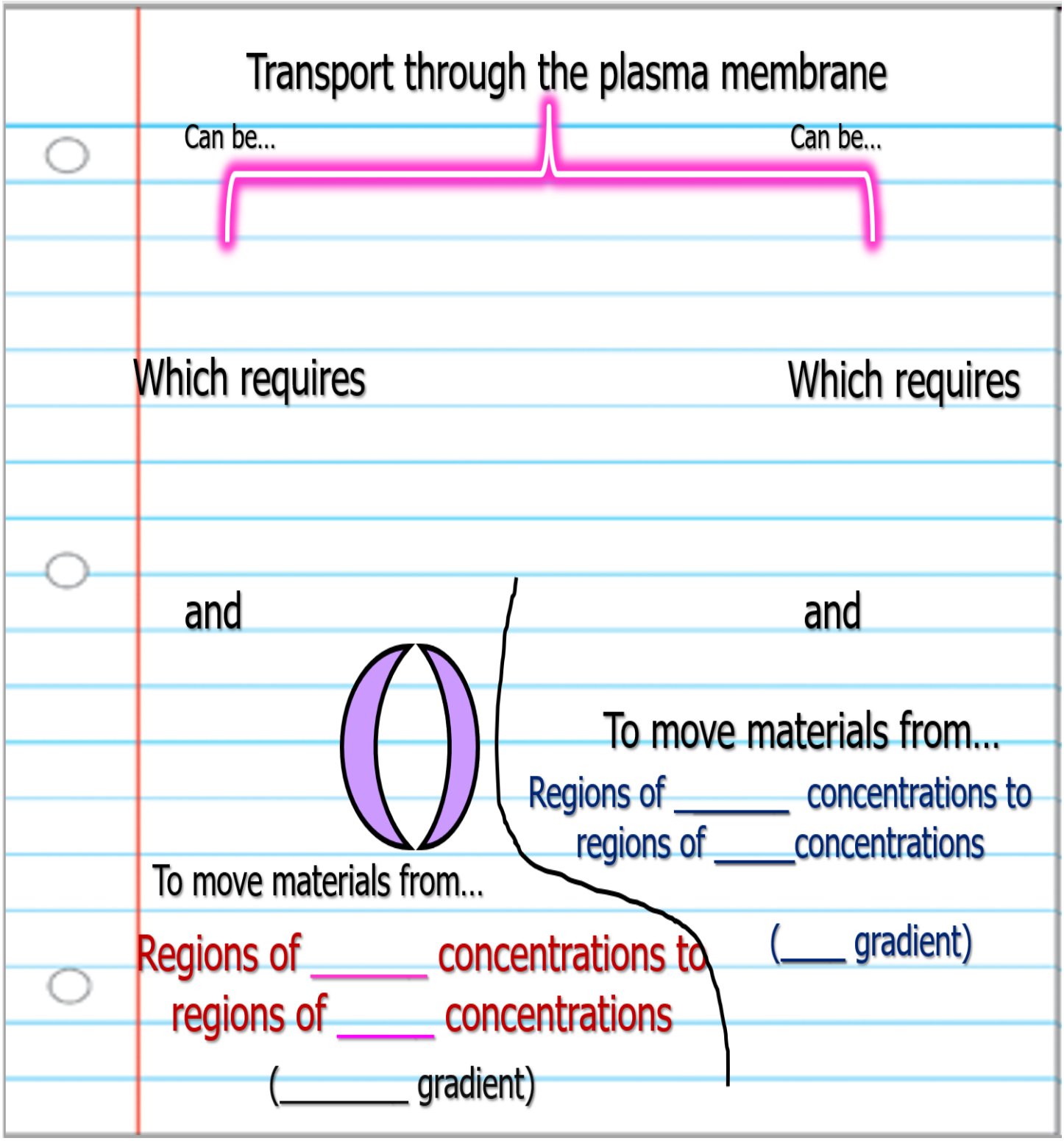


Exocytosis: (Exo - means to take out) Cell _____ particle. Uses _____.

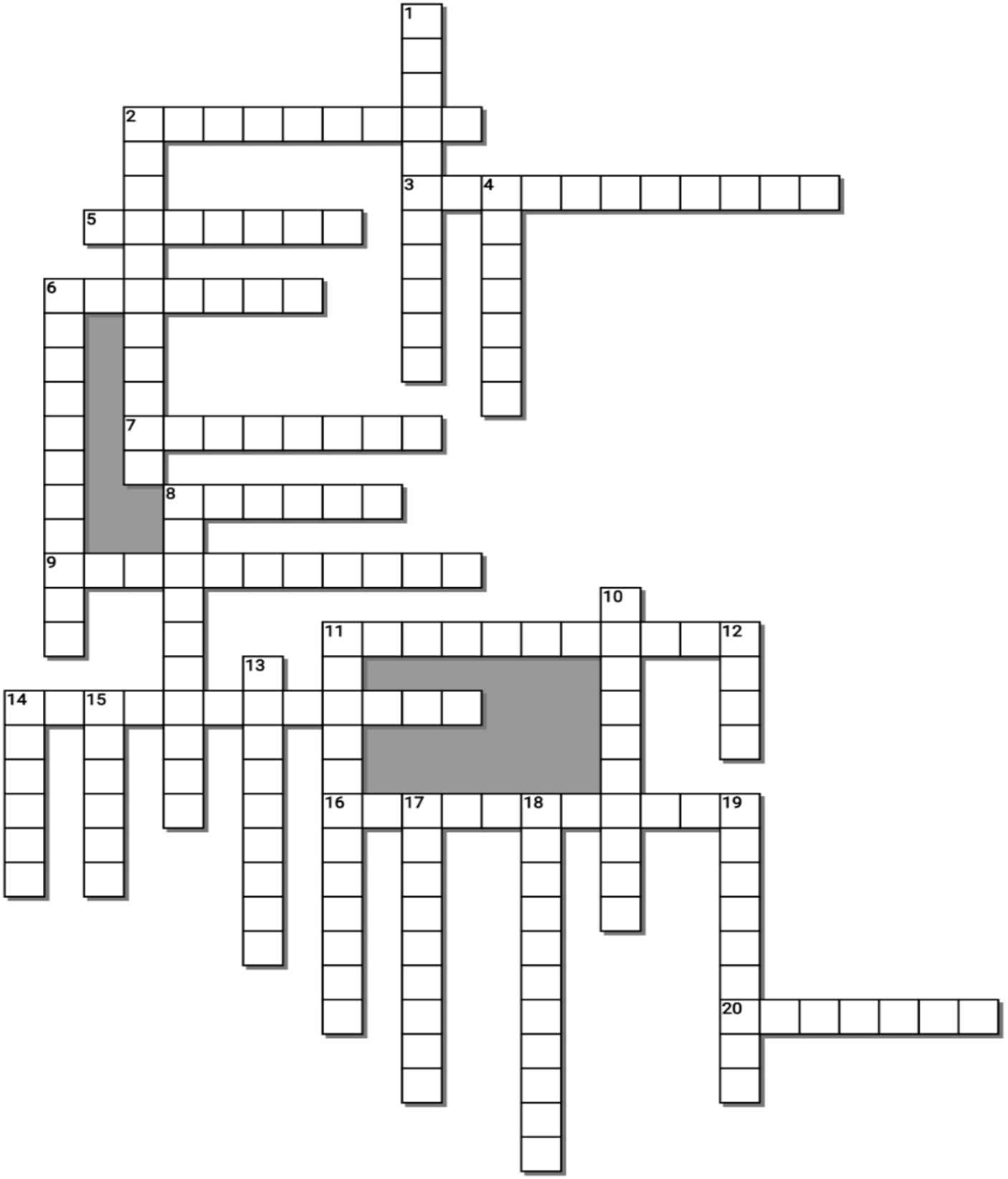
Please animate endocytosis in the space below.

Exocytosis				

Please complete the flow chart below as described in the slideshow.



Which transport uses energy?	
What some examples of passive transport?	
Which one moves materials against the concentration gradient?	
Which one moves materials from high to low concentrations?	
Can you name three types of active transport?	



Possible Answers

ACTIVE, CELLULOSE, CYTOPLASM, DIFFUSION, ENDOCYTOSIS, ENERGY, EXOCYTOSIS, HYPERTONIC, HYPOTONIC, IMPERMEABLE, ISOTONIC, OSMOSIS, PASSIVE, PHAGOCYTOSIS, PHOSPHOLIPID, PLASMA, PLASMOLYSIS, PROTEIN, SELECTIVELY, SEMI, SUPPORT, EQUILIBRIUM, HYDROPHILIC, HYDROPHOBIC, PINOCYTOSIS

Across

2. H_____ Solution: A solution that contains less solute (more water) compared to the cytoplasm of the cell.
3. If nothing can enter a membrane is said to be I_____
5. Transmembrane P_____ Receptor Mediated Endocytosis: Proteins receptors facilitate endocytosis.
6. The cell wall can help S_____ the plant
7. I_____ Solution: The cell has a equal proportion of concentration with the area surrounding.
8. Active Transport requires the use of _____
9. Energy requiring process where cell engulfs particle.
11. When water moves out of the cell to try to even out the concentration. Cell Shrinks (P_____)
14. Type of endocytosis. Membrane surrounds large particles (solids)
16. Phospholipids have two ends, one of which is _____, or repelled by water.
20. The movement of water through a semi-permeable membrane.

Down

1. Molecules are trying to reach E_____.
2. Phospholipids have two ends, one of which is _____, or attracted to water
4. P_____ Transport: The movement of molecules from a more crowded to a less crowded area WITHOUT the use of energy.
6. The cell membrane is _____ permeable. Some things can enter some can't.
8. When the cell releases particle. Uses energy.
10. H_____ Solution: Concentration of the cell is less than outside of the cell.
11. The plasma membrane is made of a _____ bilayer
12. S_____-permeable – Some things can enter
13. All areas outside of nucleus. Rich chemical fluid that helps breakdown molecules for use.
14. _____ Membrane: This is the membrane found in all cells that separates the interior of the cell from the outside environment.
15. _____ Transport: Movement of molecules from a less crowded to a more crowded area
17. Random movement of molecules. From high to low concentrations
18. Type of endocytosis where the membrane surrounds a liquid
19. The cell wall is made of _____ (permeable)

Possible Answers

ACTIVE, CELLULOSE, CYTOPLASM, DIFFUSION, ENDOCYTOSIS, ENERGY, EXOCYTOSIS, HYPERTONIC, HYPOTONIC, IMPERMEABLE, ISOTONIC, OSMOSIS, PASSIVE, PHAGOCYTOSIS, PHOSPHOLIPID, PLASMA, PLASMOLYSIS, PROTEIN, SELECTIVELY, SEMI, SUPPORT, EQUILIBRIUM, HYDROPHILIC, HYDROPHOBIC, PINOCYTOSIS

Part 2 Review Game

Name:

1-10 = 10 pts * = Bonus + 1 pt, Part 2 Lesson 6
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Score ____ / 100

INSIDE AND OUT	INSANE IN THE MEMBRANE	UNCOMMON SOLUTION	BIG-GULP	SOLUTION FLICKS (1pt Bonus)
1)	6)	11)	16)	*21)
2)	7)	12)	17)	*22)
3)	8)	13)	18)	*23)
4)	9)	14)	19)	*24)
5)	10)	15)	20)	*25)

Final Question Wager ___/5 Answer: _____

Part 2 Cell Transport

Name:

Part 2 Lesson 1Cell Membrane

Due:

Weight of your egg 50 grams grams. Now place in vinegar / with lid for later.
Weight of Potato slices before soaking 40 grams for Distilled Water.
Weight of Potato slices before soaking 40 grams in grams for Salt Water.

Cells need to have an optimal surface area (SA) to Volume (V) ratio.

-If the volume increases too much the surface area will decrease and the exchange of materials across the membrane will decrease.

-Cells tend to divide and remain small to maintain a high surface area to volume ratio.

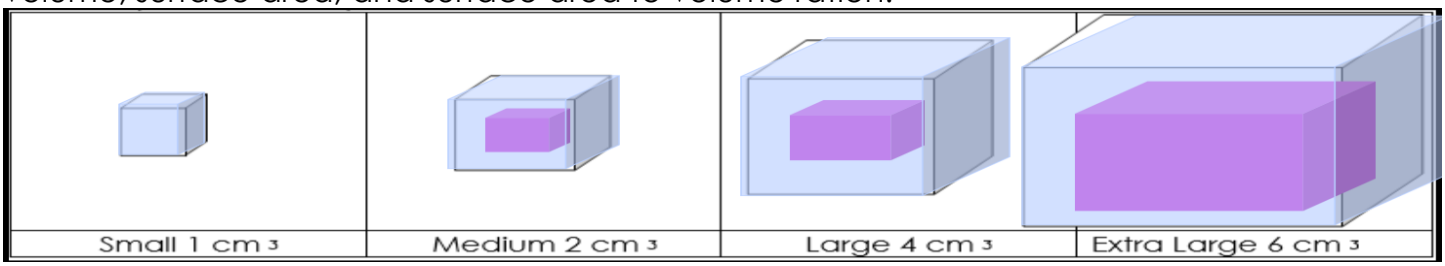
Surface Area refers to the outside area on an object, e.g. it is the area around the outside of the cell. Unit = cm^2

Diffusion: The net movement of anything from a region of higher concentration to a region of lower concentration.

Volume refers to the amount of space inside of the object, e.g. the space inside the cell. Unit = cm^3

Beet Size at Start	Volume	Surface Area	Surface Area to Volume Ratio. Just divide SA/ by Vol
Small 1cm L x W X H	$1x1x1=1cm^3$	$1x1x6=6cm^2$	6 to 1 = 6:1 Ratio
Medium 2 cm L X W X H	$2x2x2=8cm^3$	$2x2x6=24cm^2$	24 to 8 = 3:1 Ratio
Large 4 cm L X W X H	$4x4x4=64cm^3$	$4x4x6=96cm^2$	96 to 64 = 1.5:1 Ratio
Extra Large 6 cm	$6x6x6=216cm^3$	$6x6x6=216cm^2$	216 to 216 = 1:1 Ratio

Draw the beets after 30 minutes of soaking. How much Red/Purple is left? Sketch the remaining purple with a colored pencil. Measure just the purple/red and recalculate the volume, surface area, and surface area to volume ration.



As the size of an object increases, the volume also increases, when the cube doubles from a length of 1 cm to a length of 2 cm, the surface area increase by a factor of four, going from 6 cm^2 (1 cm x 1 cm x 6 sides) to 24 cm^2 (2 cm x 2 cm x 6 sides).

Red Color remaining after 30 min in bleach	Volume	Surface Area	Surface Area to Volume Ratio. Just divide SA/ by Vol
Small 1cm L x W X H	$0x0x0=0cm^3$	$0x0x6=0cm^2$	0 to 0 = 0:0 Ratio
Medium 2 cm L X W X H	$1x1x1=1cm^3$	$1x1x6=6cm^2$	6 to 1 = 6:1 Ratio
Large 4 cm L X W X H	$3x3x3=27cm^3$	$3x3x6=54cm^2$	54 to 27 = 2:1 Ratio
Extra Large 6 cm	$5x5x5=125cm^3$	$5x5x6=150cm^2$	150 to 125 = 1.2:1 Ratio

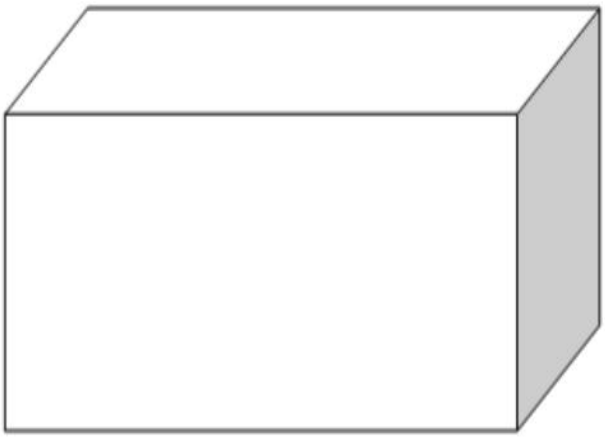
Now just subtract the Beet size start Volume and Surface Area by the final (color left size) below. To determine the volume of this colored inner cube, measure the length of this purple inner cube and multiply it by the width and height. Subtract this from the original volume and original surface area of the cube and you obtain the volume of the cube that has not been dulled by the bleach. By dividing this number by the original volume and multiplying by 100%, you can determine the percentage penetration for each cube.

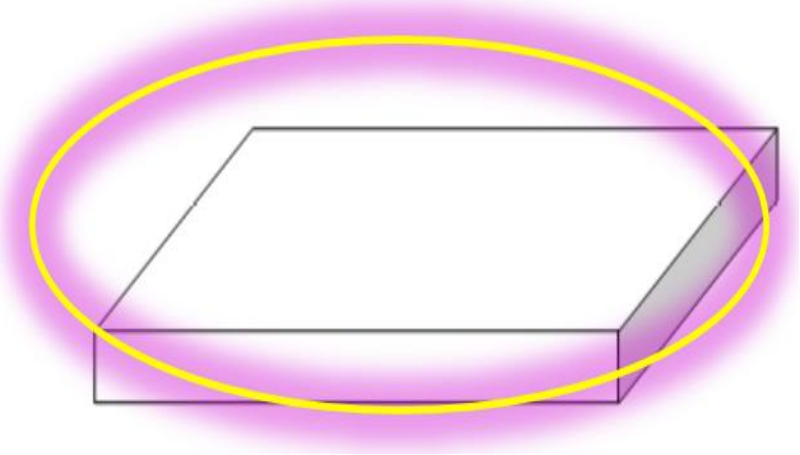
Beet Size after 30 min in bleach	Change in Volume	% Bleach Penetrated
Small 1cm	1/1=1 X 100	100%
Medium 2 cm	7/8 = .875 x100	87.5%
Large 4 cm	37/64 = .578 x100	57.8%
Extra Large 6 cm	91/216 = .421 x100	42.1%

The small cube had the most diffusion of bleach through "cell" The large cell did not ☹

When a cell grows, its volume (units^3) increases faster than surface area (units^2), leading to a decrease SA:Vol ratio
If metabolic rate exceeds the rate of exchange of critical materials and wastes (low SA:Vol ratio), the cell will eventually die.
Growing cells tend to divide and remain small in order to maintain a high SA:Vol ratio suitable for survival

Circle the shape that best represents a cell? Why? Explain below using the beet lab as a focus. Please use words Surface Area, Volume, Diffusion, Cell Size, Membrane, bleach, Beets



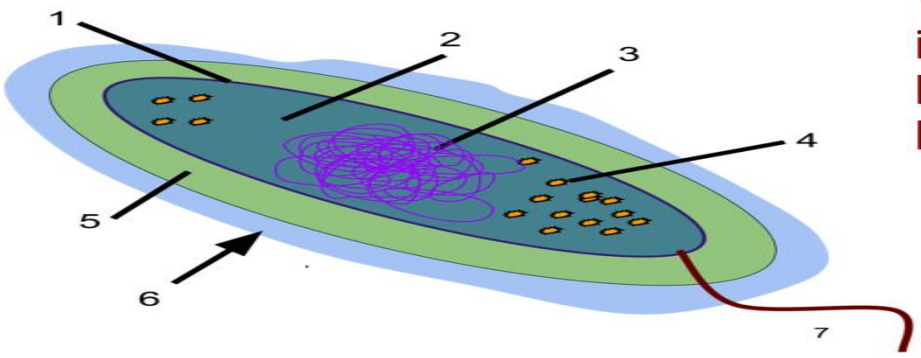


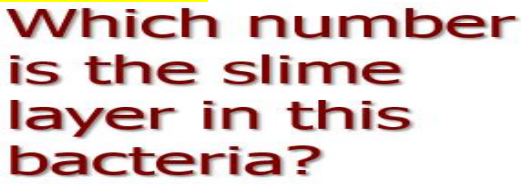
The smaller thinner box circled. Cells need to have an optimal volume to surface area ratio. If the volume increases too much the surface area will decrease and the exchange of materials across the membrane will decrease. Cells tend to divide and remain small to maintain a high surface area to volume ratio.

Cytoplasm

-All areas outside of nucleus. Area outside of organelles is called cytosol.
-Rich chemical fluid that helps breakdown molecules for use.
-Moves materials through cell (food and waste)

Capsule: aka (slime layer) A thick layer used for sticking cells together.
-Food reserve
-Protection (Toxin release) #6 is the Slime Layer, #5 is Cell Wall

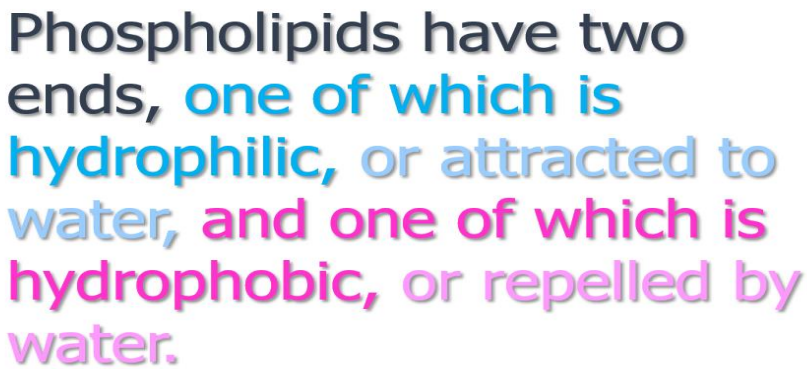


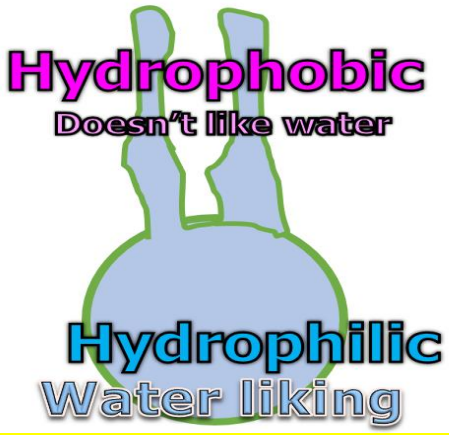


Cell Wall
-Bacteria, plants, fungi, and some Protista have cell walls.
-Made of cellulose (permeable)
-Supports plant
- Difficult to chew and digest (protection).

Part 2 Lesson 2 Osmosis (Likely Two Days)

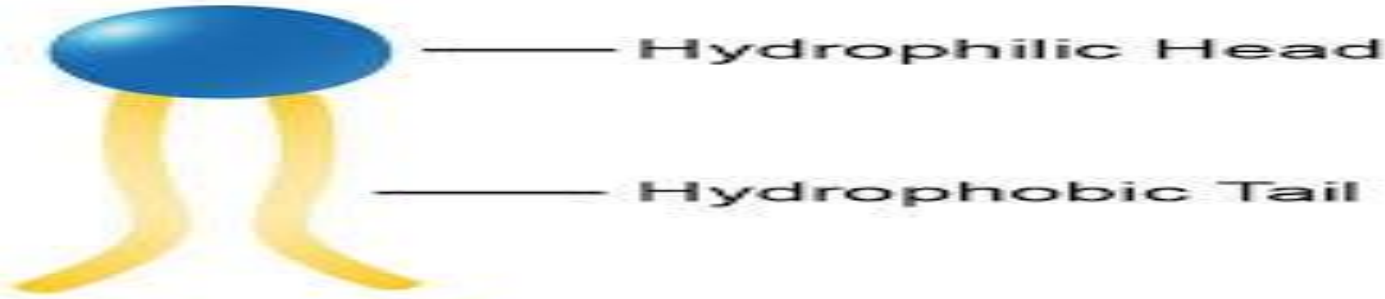
Plasma Membrane
-Made of a phospholipid bilayer
-Phospholipids have two ends, one of which is hydrophilic, or attracted to water, and one of which is hydrophobic, or repelled by water.





The most important property of the lipid bilayer is that it is a highly impermeable structure. It does not allow molecules to freely pass across it. Only water and gases can easily pass through the bilayer. This means that large molecules and small polar molecules cannot cross the bilayer, and thus the cell membrane, without the assistance of other structures.

Which part of the phospholipid below is hydrophilic? And which is hydrophobic?



Why is it important that the cell membrane is a lipid? Think Polarity.

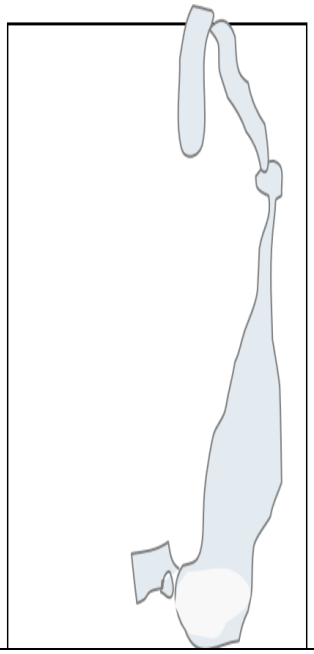
- Answer: Because lipids are nonpolar. They don't mix with water.

The membrane becomes a waterproof barrier between two liquid areas.
The cell membrane is selectively permeable. Some things can enter some can't.

Cell Membrane controls movement (cellular traffic) in and out the cell.

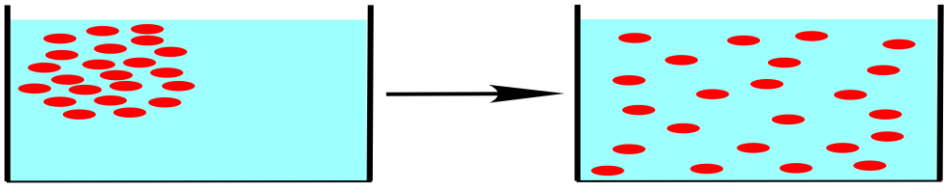
What are some things that a cell might want to let enter and leave?	What are some things that a cell might want to keep out?
Oxygen. Water. Food (Molecules, Glucose) Sodium Ions (Small particles)	Waste. Viruses. Bacteria. Large Particles cannot move freely through membrane

Starch, Iodine, Water Diffusion

Please set up the following. -One clear container filled ¾ with water. -One length of dialysis tubing (20 cm) -Wet dialysis tubing and tie-of on one end. -Use finger and thumb to open wet dialysis tubing. -Using pipettes, fill dialysis tubing with starch solution. (cornstarch / amylose) -Tie-off other end of dialysis tubing. -Extension: Weigh baggie before placing it in the water. -Place in container with one end hanging on edge so that the baggy can be removed without touching iodine	Weight of baggie before soaking  Weight of tubing with starch and and water solution ____ grams

Diffusion: Random movement of molecules.
-From areas of high to areas of low concentrations.
-Molecules are trying to reach equilibrium

Please animate diffusion in the boxes below with 20 molecules.



Passive Transport - movement of molecules from a more crowded to a less crowded area without the use of energy.

Osmosis: The movement of water through a semi permeable membrane

Fa.cilitated diffusion is the process of passive transport of molecules or ions across a biological membrane via specific transmembrane integral proteins.

Permeable: Has large holes in it to let molecules pass through.

- Semi-permeable – Some things can enter
- Impermeable – Nothing can enter

A cell membrane is selectively permeable. The membrane below is permeable to which molecules and impermeable to which molecules? Explain in the space at the bottom…

The large green circles cannot pass through the cell membrane. The smaller water molecules can freely pass through the cell membrane. When water moves through a semipermeable membrane its called osmosis. The green particles might be able to pass through the membrane in facilitated diffusion or active transport to move them though the cell membrane.

Please add to the sketch of dialysis tubing below as described in the slideshow.

.

Use the word "Diffusion" in a sentence.

The iodine diffused through the water as it moved from an area of high concentration to areas of low concentration.

Use the word "Osmosis" in a sentence.

Osmosis occurred when the water passed through the dialysis tubing which was semi-permeable.

Please describe the diffusion of Iodine through the water:

The Iodine diffused through the water from areas of high concentration to areas of low concentration.

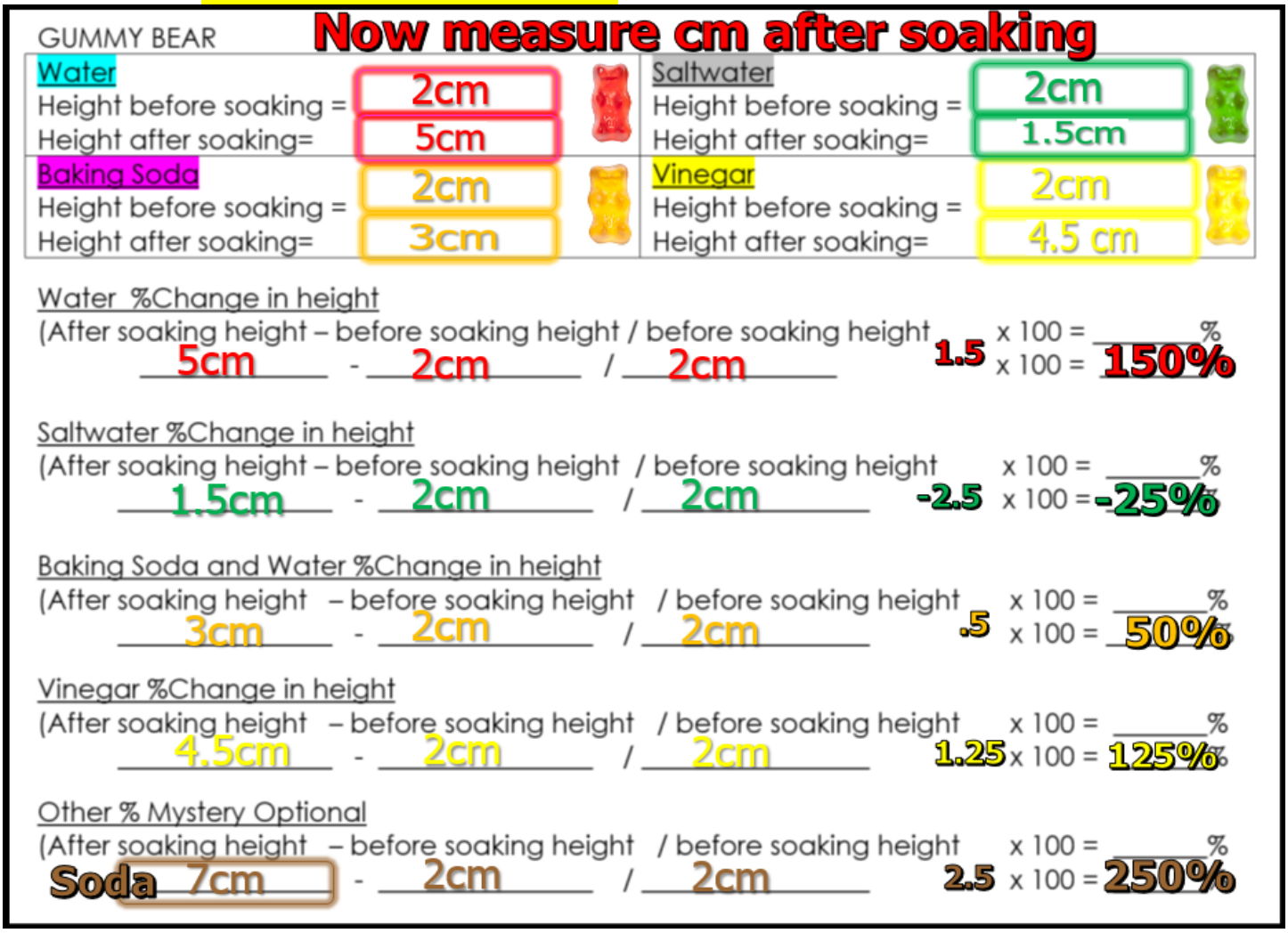
What moved into and out of the dialysis tubing? How do you know?

The water moved both into and out of the dialysis tubing. The Iodine moved into the tubing but the starch was unable to leave the tubing.

What is a larger molecule, Starch or Iodine? Explain?
Starch was larger because it did not turn the solution outside of the tubing dark until the bag was popped.

Part 2 Lesson 3 Gummy Bear

GUMMY BEAR EXAMPLE-ANSWERS WILL VARY



What happen to a gummy bear soaked in water? Water traveled into the gummy bear
Answer in one strong paragraph with supportive data (%).
-You must use the words osmosis, high, low, concentration, diffused, juicy, lifeguard, molecules, tragic, and Alfred in your paragraph.

Alfred the juicy gummy bear drown one day at a pond with no lifeguard. The dive team was dispatched but could not find him. After several days he was found enlarged. The autopsy revealed a 75% increase in width. The large gelatin molecules kept Alfred from dissolving. The coroner described that the high concentration of distilled water diffused through the gelatin of the bear. This was because Alfred had a low concentration of water in him before drowning. Water diffused from high to low concentrations and through a semi-permeable membrane. The final autopsy report revealed a tragic death by osmosis.

Hypotonic Solution: A solution that contains less solute (more water) compared to the cytoplasm of the cell.

-Water moves into the cell to equal out concentrations. The cell swells!

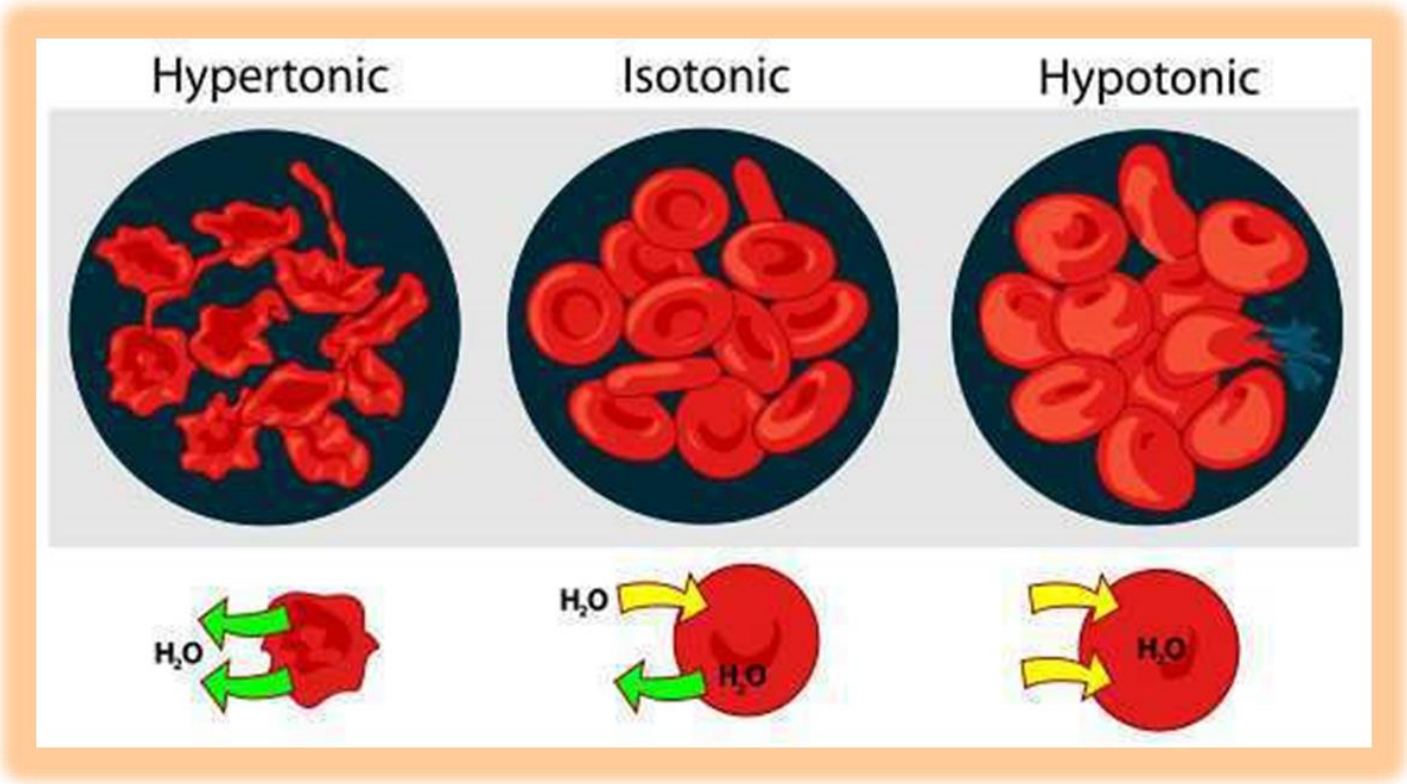
Hypertonic Solution: Concentration of the cell is less than outside of the cell.

-Water moves out of the cell to try to even out the concentration. Cell shrinks! (Plasmolysis)

Isotonic Solution: The cell has an equal proportion of concentration with the area surrounding.

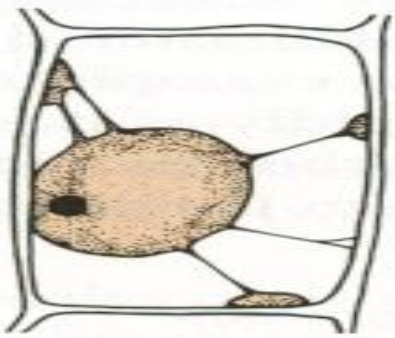
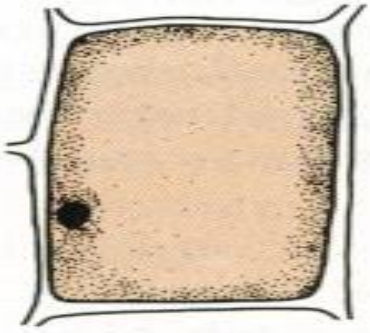
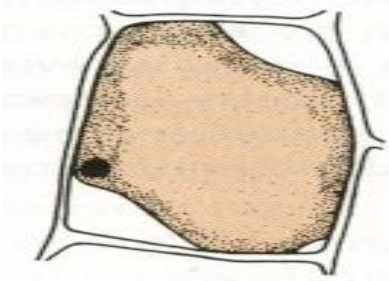
-Water continually flows in and out to keep concentration equal.

Name the solution that cell has been placed in? Word Bank: Hypertonic Solution, Hypotonic Solution, Isotonic Solution

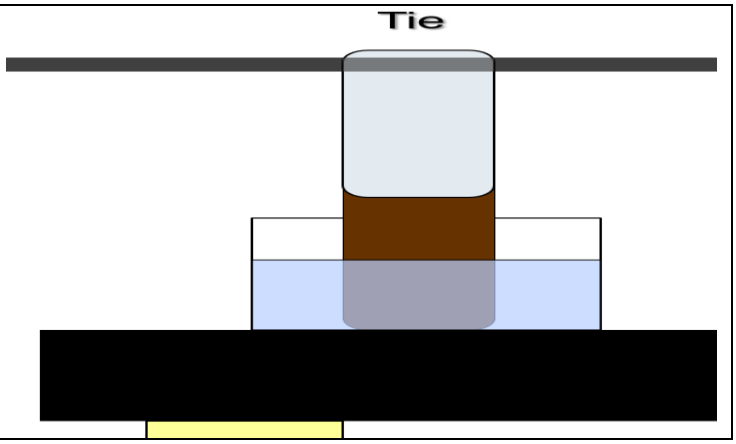


Please name the following cells and solutions. Word Bank: Hypotonic, Hypertonic, Isotonic. – Can you spot plasmolysis and turgor pressure?

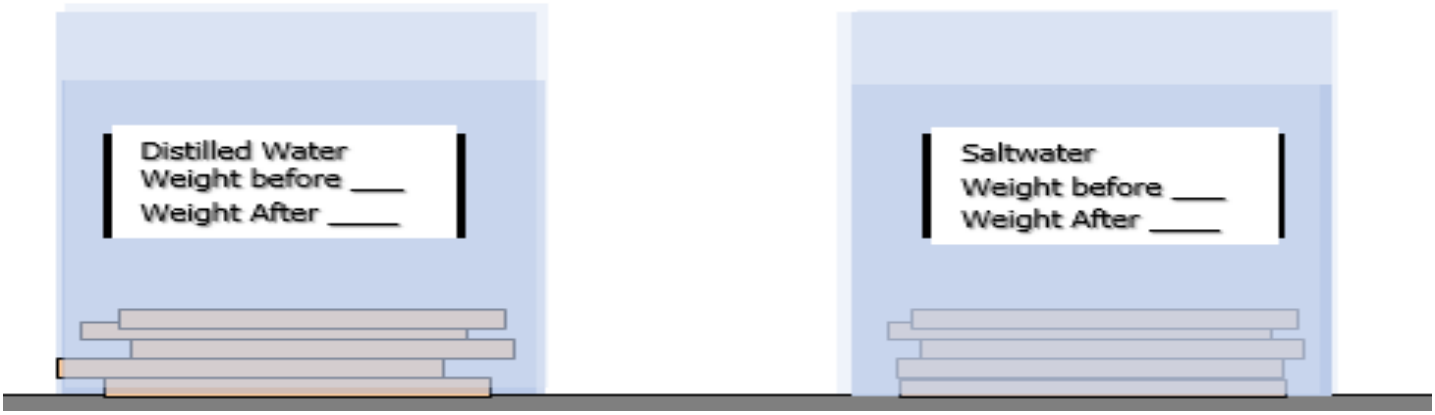
How come plant cells don't burst (lysis) if placed in water? Explain below.

Hypotonic Cell **Hypertonic** Solution plasmolysis 	**Hypertonic** Cell **Hypotonic** Solution Turgor pressure 	**Isotonic** Cell **Isotonic** Solution  Equal Concentrations

Part 2 Lesson 4 Osmosis Extensions

Osmosis and Corn Syrup. The corn syrup was hypertonic (more solute). Water was hypotonic. The water moved into the dialysis tubing to equal the concentrations (isotonic). The fluid in the tubing rose.	

Revisiting the Potato



Feel the potatoes. How are they different?
They're softer and larger.

What was the % change in mass? Show your work! You should be able to do on your own.

% Change in mass
(After soaking mass – before soaking mass / before soaking mass x 100 = _____%
_____ - _____ / _____ x 100 = _____%

Why did the potato slices in freshwater gain mass while the potatoes in saltwater lost mass?
Freshwater: There was more solutes and other dissolved chemicals within the potato then in the surrounding water. This means that the water will move into the potato. It gained mass as a result.
Saltwater: There was less solutes and other dissolved chemicals within the potato then in the surrounding water. This means that the water will move out of the potato. It lost mass as a result.

Quiz Wiz 1-10 Is the cell in a Hypotonic, Hypertonic, or Isotonic Solution

1.) Hypotonic Solution	6.) Isotonic Solution
2.) Hypotonic Solution	7.) Hypertonic Solution
3.) Hypertonic Solution	8.) Isotonic Solution

4.) Isotonic Solution	9.) Hypotonic Solution
5.) Hypertonic Solution	10.) Isotonic Solution
*11.) The Cheshire Cat	Score:

If stuck on a raft in a survival situation, should you drink the saltwater to stay alive? Why? Humans can't drink salt water because the kidneys can only make urine that is less salty than salt water. Therefore, to get rid of all the excess salt taken in by drinking salt water, you have to urinate more water than you drank, so you die of dehydration.

Revisiting the egg in vinegar.

Original Weigh of the egg from the first page_____grams
Current weight of the egg (pat dry)_____grams?
Did it gain or lose mass? How much in grams?_____

- Determine % Change in mass

(After soaking mass – before soaking mass / before soaking mass x 100 = _____%
_____ - _____ / _____ x 100 = _____%

Draw and describe the eggs properties.

How else has it changed?
The acid wore away the shell.
Egg increased in size and mass.
Water in the vinegar passed through the eggs membrane.
- From high concentration in vinegar to low concentration in egg.

Denaturation of proteins causes egg to become rubbery.

Part 2 Lesson 5 Active Transport

Active transport –

-Movement of molecules from a less crowded to a more crowded area
-Requires the use of energy
-Proteins can do this
-Also called reverse osmosis

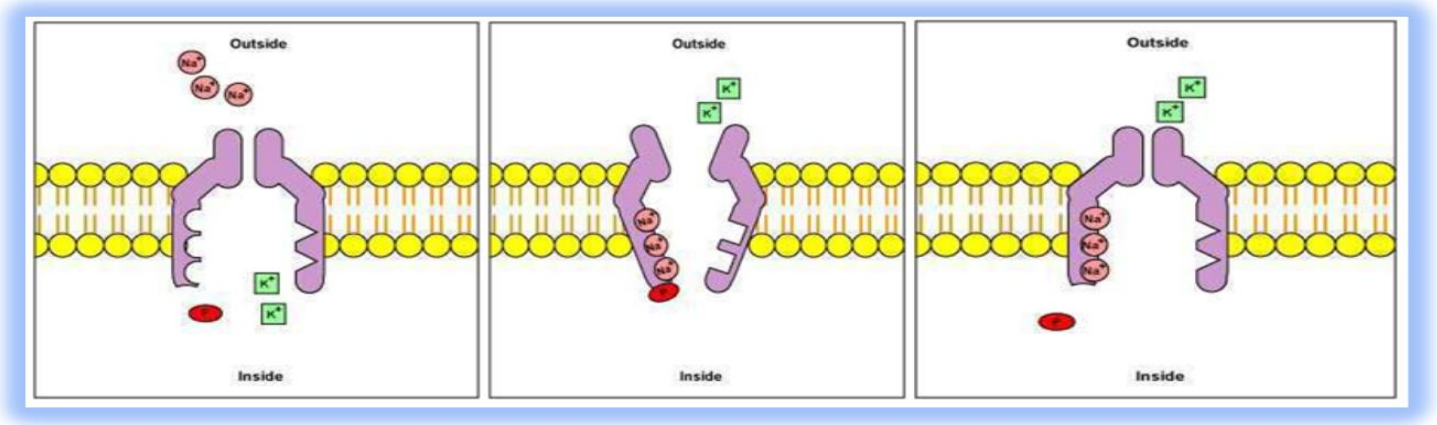
What is your role for the sodium potassium pump simulation? Roles will vary but study the slide in the slideshow with animation and the teacher will assign you a role.

The Sodium Potassium Pump: The process of moving excess sodium and potassium ions across the cell membrane.

It's active transport involving the hydrolysis of ATP to provide the necessary energy.

This process is responsible for maintaining the large excess of Na^+ outside the cell and the large excess of K^+ ions on the inside

Please describe active transport as it related to the sodium potassium pump? Feel free to share extra's about the specifics of this process.



The sodium-potassium pump system moves sodium and potassium ions against large concentration gradients. It moves two potassium ions into the cell where potassium levels are high, and pumps three sodium ions out of the cell and into the extracellular fluid. ... In doing so, it pumps the three sodium ions out of the cell. The process involves the hydrolysis of ATP to provide the necessary energy (Active Transport)

Living organisms constantly receive and interpret signals from their environment.

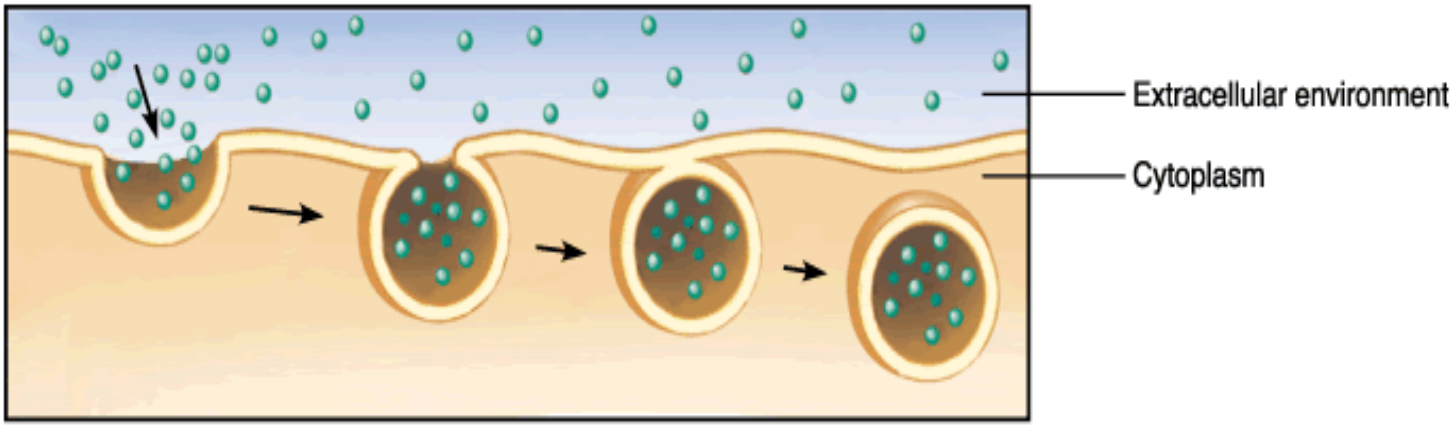
-Signals can be light, heat, water, odors, and touch.

-Cells also receive signals from other cells to divide and signals to differentiate.

Endocytosis: (Endo - means to bring in) Energy requiring process where cell engulfs a particle.

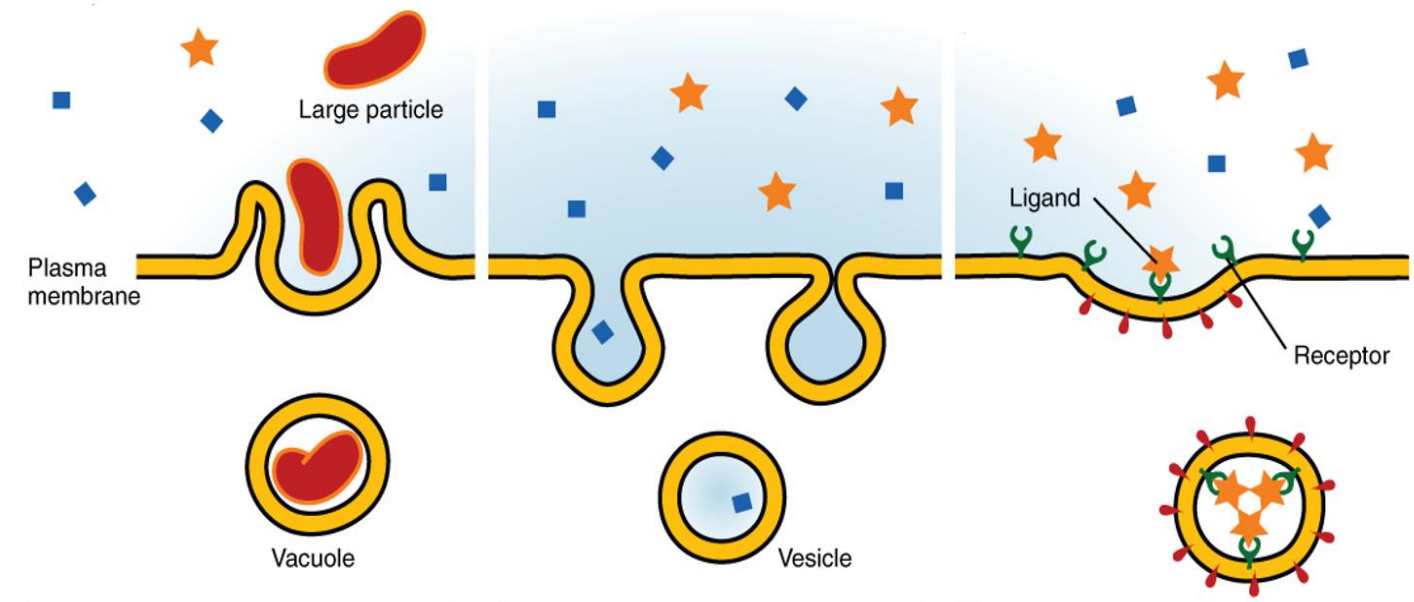
Phagocytosis: Type of endocytosis. Membrane surrounds large particles (Solid Particle)
Pinocytosis: Membrane surrounds a liquid particle

Please animate endocytosis in the space below. Is it Pino or Phagocytosis?



Transmembrane Protein Receptor Mediated Endocytosis: Proteins receptors facilitate endocytosis.

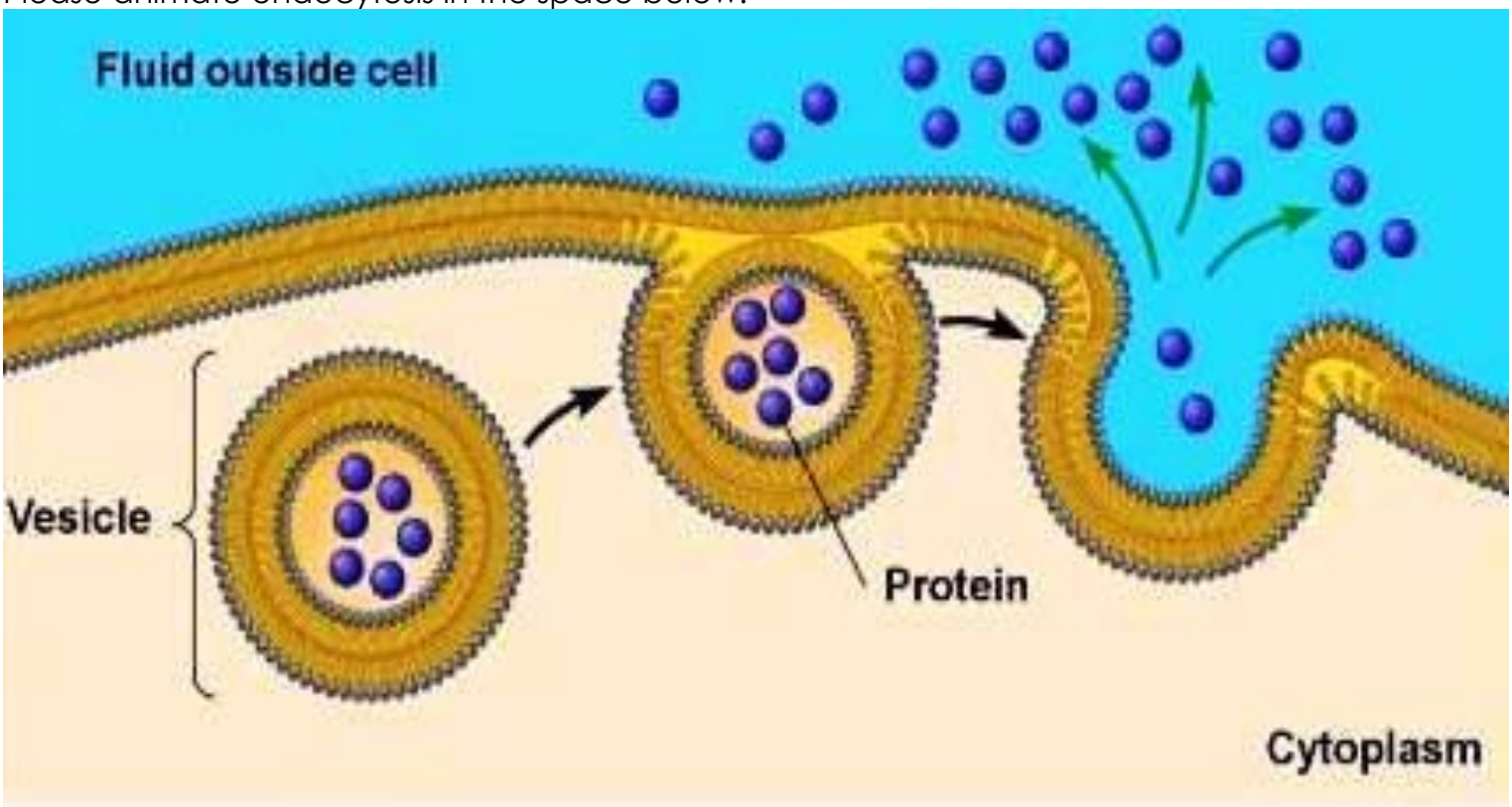
Please name the correct form of endocytosis below?



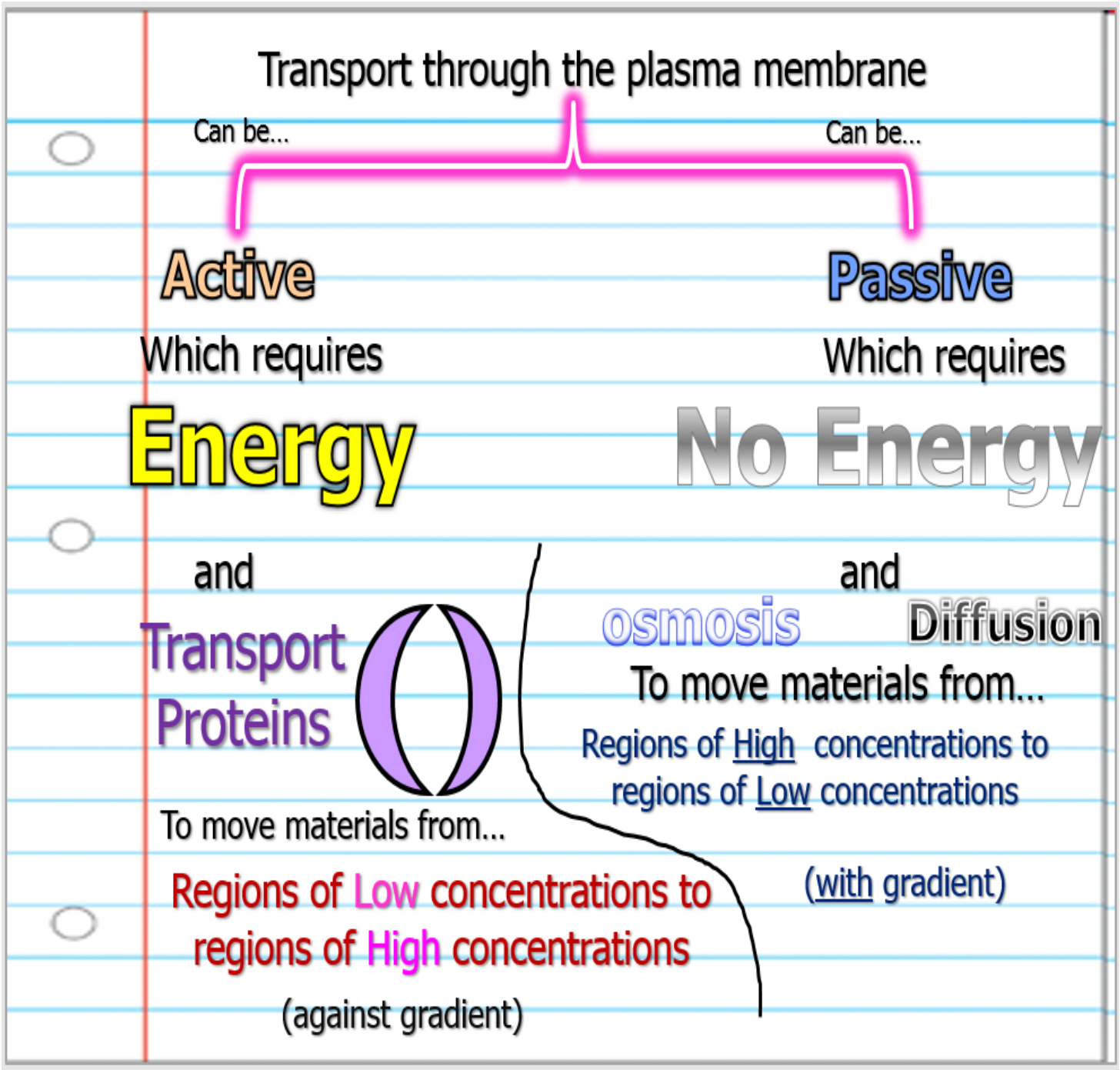
Phagocytosis (Endocytosis)	Pinocytosis (Endocytosis)	Transmembrane Protein Receptor Mediated Endocytosis

Exocytosis: (Exo - means to take out) Cell releases particle. Uses energy.

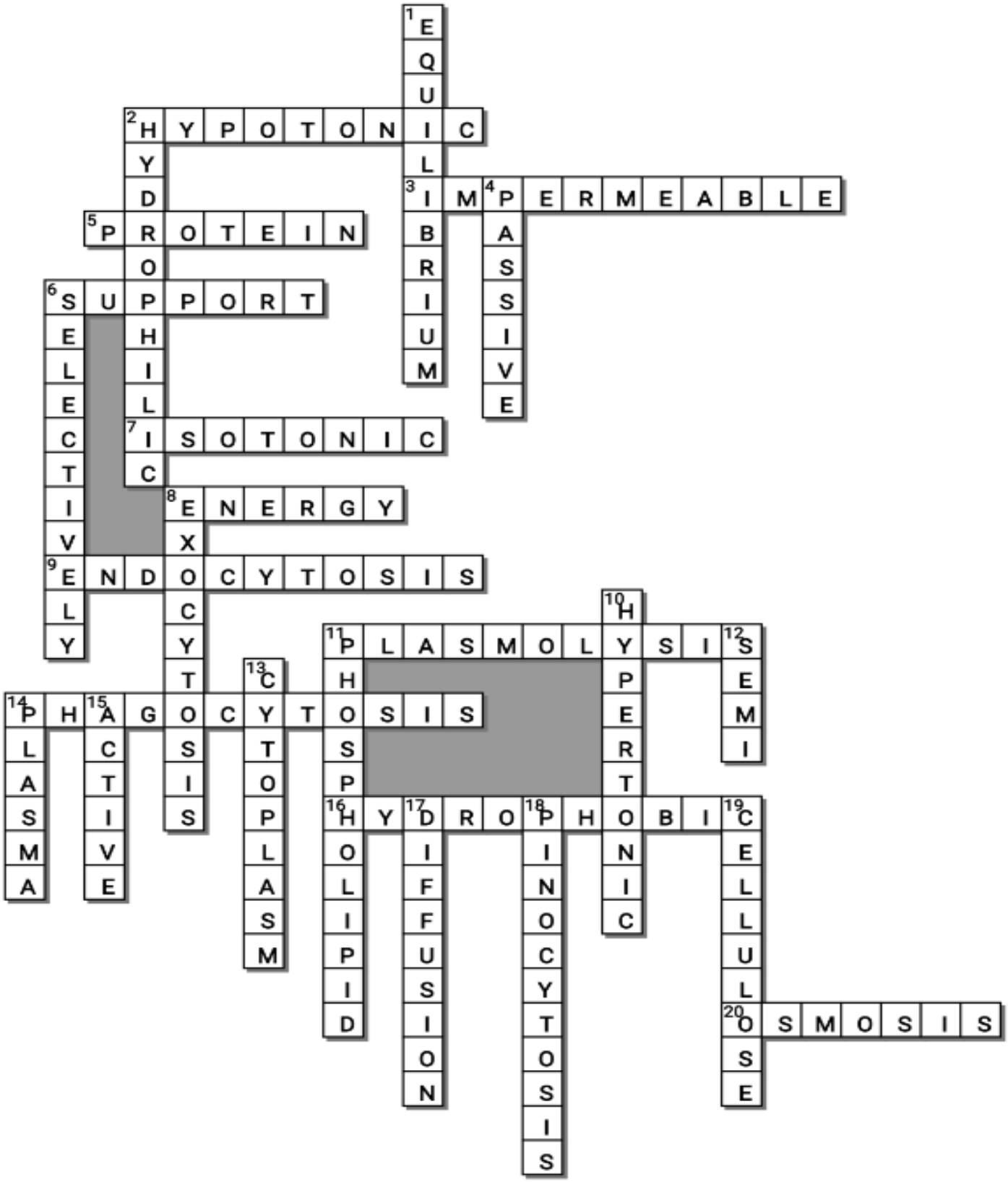
Please animate endocytosis in the space below.



Please complete the flow chart below as described in the slideshow.



Which transport uses energy?	Active Transport
What some examples of passive transport?	Osmosis Diffusion, Facilitated Diffusion
Which one moves materials against the concentration gradient?	Active Transport - Endocytosis
Which one moves materials from high to low concentrations?	Passive Transport
Can you name three types of active transport?	The Sodium-Potassium pump, Exocytosis, and Endocytosis.



Possible Answers

ACTIVE, CELLULOSE, CYTOPLASM, DIFFUSION, ENDOCYTOSIS, ENERGY, EXOCYTOSIS, HYPERTONIC, HYPOTONIC, IMPERMEABLE, ISOTONIC, OSMOSIS, PASSIVE, PHAGOCYTOSIS, PHOSPHOLIPID, PLASMA, PLASMOLYSIS, PROTEIN, SELECTIVELY, SEMI, SUPPORT, EQUILIBRIUM, HYDROPHILIC, HYDROPHOBIC, PINOCYTOSIS

Across

2. H_____ Solution: A solution that contains less solute (more water) compared to the cytoplasm of the cell.
3. If nothing can enter a membrane is said to be I_____
5. Transmembrane P_____ Receptor Mediated Endocytosis: Proteins receptors facilitate endocytosis.
6. The cell wall can help S_____ the plant
7. I_____ Solution: The cell has a equal proportion of concentration with the area surrounding.
8. Active Transport requires the use of _____
9. Energy requiring process where cell engulfs particle.
11. When water moves out of the cell to try to even out the concentration. Cell Shrinks (P_____)
14. Type of endocytosis. Membrane surrounds large particles (solids)
16. Phospholipids have two ends, one of which is _____, or repelled by water.
20. The movement of water through a semi-permeable membrane.

Down

1. Molecules are trying to reach E_____.
2. Phospholipids have two ends, one of which is _____, or attracted to water
4. P_____ Transport: The movement of molecules from a more crowded to a less crowded area WITHOUT the use of energy.
6. The cell membrane is _____ permeable. Some things can enter some can't.
8. When the cell releases particle. Uses energy.
10. H_____ Solution: Concentration of the cell is less than outside of the cell.
11. The plasma membrane is made of a _____ bilayer
12. S_____-permeable – Some things can enter
13. All areas outside of nucleus. Rich chemical fluid that helps breakdown molecules for use.
14. _____ Membrane: This is the membrane found in all cells that separates the interior of the cell from the outside environment.
15. _____ Transport: Movement of molecules from a less crowded to a more crowded area
17. Random movement of molecules. From high to low concentrations
18. Type of endocytosis where the membrane surrounds a liquid
19. The cell wall is made of _____ (permeable)

Possible Answers

ACTIVE, CELLULOSE, CYTOPLASM, DIFFUSION, ENDOCYTOSIS, ENERGY, EXOCYTOSIS, HYPERTONIC, HYPOTONIC, IMPERMEABLE, ISOTONIC, OSMOSIS, PASSIVE, PHAGOCYTOSIS, PHOSPHOLIPID, PLASMA, PLASMOLYSIS, PROTEIN, SELECTIVELY, SEMI, SUPPORT, EQUILIBRIUM, HYDROPHILIC, HYDROPHOBIC, PINOCYTOSIS

Part 2 Review Game

Name:

1-10 = 10 pts * = Bonus + 1 pt, Part 2 Lesson 6
(Secretly write owl in correct space +1 pt)
Final Question = 5 pt wager

Score ____ / 100

INSIDE AND OUT	INSANE IN THE MEMBRANE	UNCOMMON SOLUTION	BIG-GULP	SOLUTION FLICKS (1pt Bonus)
1) Letter D	6) HYDROPHILIC HYDROPHOBIC	11) OSMOSIS	16) ENDOCYTOSIS	*21) BACK TO THE FUTURE
2) Cytoplasm	7) Oxygen. Water. Food. Molecules Protein. Minerals Vitamins	12) HYPERTONIC	17) PHAGOCYTOSIS	*22) HONEY I SHRUNK THE KIDS
3) Cell Wall	8) Waste. Viruses. Bacteria. Large Particles	13) HYPOTONIC	18) PINOCYTOSIS	*23) OSMOSIS JONES
4) Plants, Bacteria Cellulose Supports Protects	9) LETTER B	14) ISOTONIC	19) TRANS MEMBRANE PROTEIN RECEPTOR MEDIATED ENDOCYTOSIS	*24) GHOSTBUSTERS
5) Phospholipid Bilayer Membrane Protein	10) High to Low Concentration	15) ACTIVE TRANSPORT	20) CELL WALLS	*25) BILLY MADISON

Final Question Wager ___ /5 Answer: HYPERTONIC, HYPOTONIC, ISOTONIC