MONDAY, FEBRUARY 19th

DO NOW

- In your notebooks, to be checked, solve this problem…

Know/Given: There are 1000 milliliters in 1 liter, Density equals Mass divided by Volume, and a bottle has a Density of 4 grams per milliliter. These are equations of Density!

$$1000mL = 1L \qquad D = \frac{m}{V}$$

$$D_{bottle} = 4\frac{g}{mL}$$

Asked: What is the Mass of this bottle in grams if it has a Volume of 5 liters?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
   - Today's **QP** = Solutes are "substances that dissolve" in a "solvent" to make a "solution". LIST and SKETCH as many examples of solutes as you can think of!
2. Open books, WORK on today's **AO!**
3. ***HW** = Finish Lab UP Experiment HW Problems & Questions!

TODAY'S ACADEMIC OBJECTIVE

Today you will INVESTIGATE methods of how cells transport materials by EXPERIMENTING with Passive Transport!

DO NOW – Equations of Density

- **Know/Given:** There are 1000 milliliters in 1 liter, Density equals Mass divided by Volume, and a bottle has a Density of 4 grams per milliliter. These are equations of Density!

$$1000mL = 1L \qquad D = \frac{m}{V}$$

$$D_{bottle} = 4\frac{g}{mL}$$

- **Asked:** What is the Mass of this bottle in grams if it has a Volume of 5 liters?

What is KA^2 format? This is an example of a "1-pointer" on a DO NOW!

- **Know:**

$$1000mL = 1L, \quad D = \frac{m}{V}, \quad D_{bottle} = 4\frac{g}{mL}$$

$\frac{1000mL}{1L} = 1$ $\frac{1L}{1000mL} = 1$ $DV = m$ $V = \frac{m}{D}$ $D_{bottle} * mL = 4g$ $ml = \frac{4g}{D_{bottle}}$

- **Asked:** What is the Mass of this bottle in grams if it has a volume of 5 liters?
- **Answer:** $\mathbf{5\cancel{L} * \frac{1000mL}{1\cancel{L}} = 5000\cancel{mL} * 4\frac{g}{\cancel{mL}} = 20,000g}$

DO NOW – Never Forget to Listen to Akila!

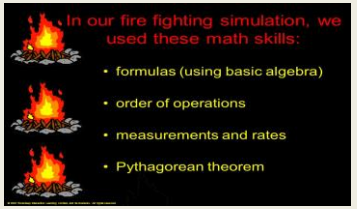
OH NO! Where in the World is Akila?!

- Students! LISTEN UP! Akila, the one-and-only mentor and friend of Mr. Floyd, has gone MISSING!!!
- Has he been kidnapped?! Or is this modest man simply on-the-run from his overbearing fame!?

OH NO! Where in the World is Akila?!

- All we do know is that the only CLUES we have to help us solve this mystery are these SCIENTIFIC RIDDLES!
- **CHIEF** Floyardee thus needs the help of his student scientist's SCIENTIFIC MINDS to CRACK THIS CODE!
- The first SCIENTIFIC RIDDLE we thus have to solve is…→

DO NOW – Translating and Concluding Our Answer!



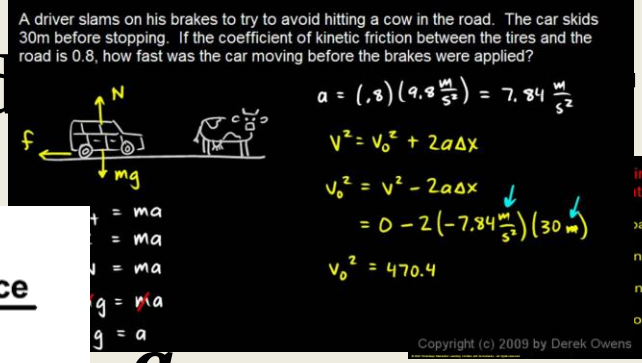
- **Answer:**

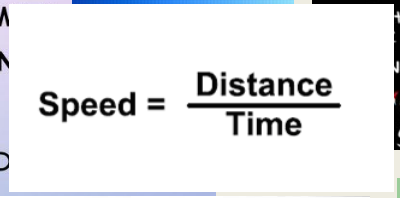
$$5\cancel{L} * \frac{10000mL}{1\cancel{L}} = 5000\cancel{mL} * 4\frac{g}{\cancel{mL}} = 20,000g$$

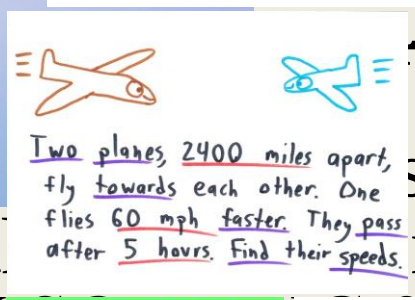
- **Translate and Conclude:** Students, WOAH! Take a step back and realize that your scientific math skills are on fire; WE'RE NOW SOLVING 3 (Triple!) EQUATION SCIENTIFIC PROBLEMS!!!
- **$ci Fact →** We're now using full-fledged formulas (D=m/V)! If we know all but ONE variable in any of our famous scientific FORMULAS aka EQUATIONS, we can always use scientific math to SOLVE for the missing parameter!

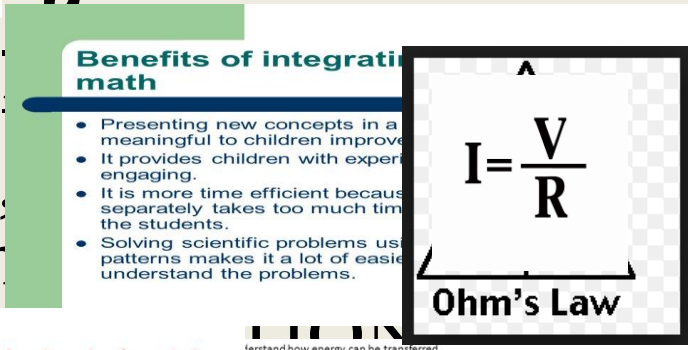
WHAT ARE SOME MATH SKILLS USED IN SCIENCE?

- **SOME MATH SKILLS USED IN SCIENCE WHEN WORKING W… DATA INCLUDE ESTIMATION, ACCURACY AND PRECISION… SIGNIFICANT FIGURES.**
- AN ESTIMATE IS AN APPROXIMATION OF A NUMBER BASED… REASONABLE ASSUMPTIONS.
- AN ESTIMATE IS NOT A GUESS.
- IT IS ALWAYS BASED ON KNOWN INFORMATION.

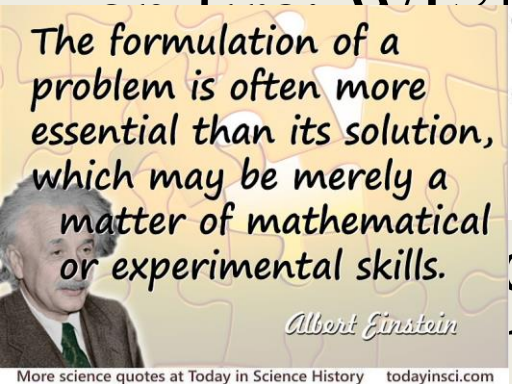


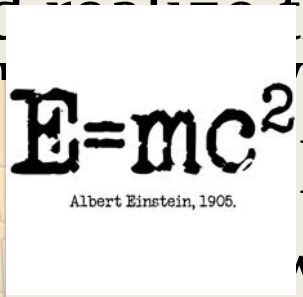


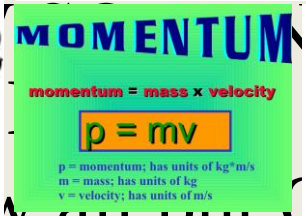


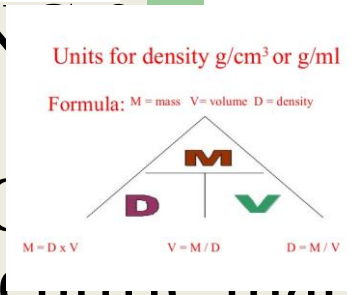


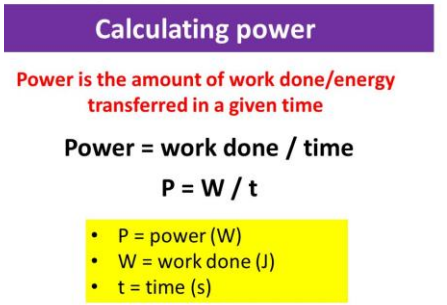
step back and … can always use scientific … ng parameter!







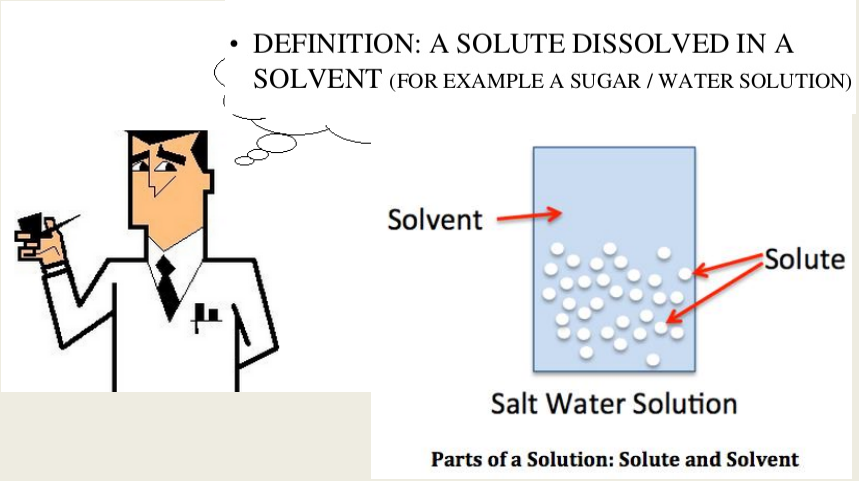


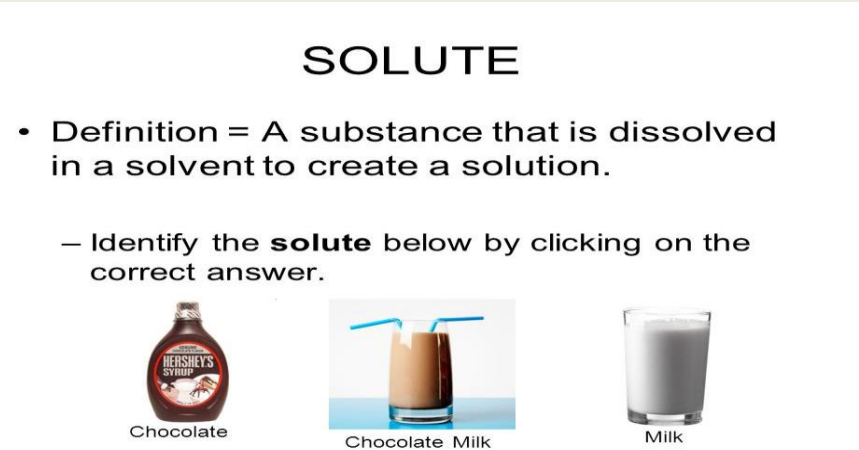


Today's Qualitative Prompt

Solutes are "substances that dissolve" in a "solvent" to make a "solution". LIST and SKETCH as many examples of solutes as you can think of!

- Students, recall that a SOLUTION is a special kind of mixture in which a dissolved substance (the SOLUTE, the dissolvee!) is evenly distributed throughout the substance that does the dissolving (the SOLVENT, the dissolver)!

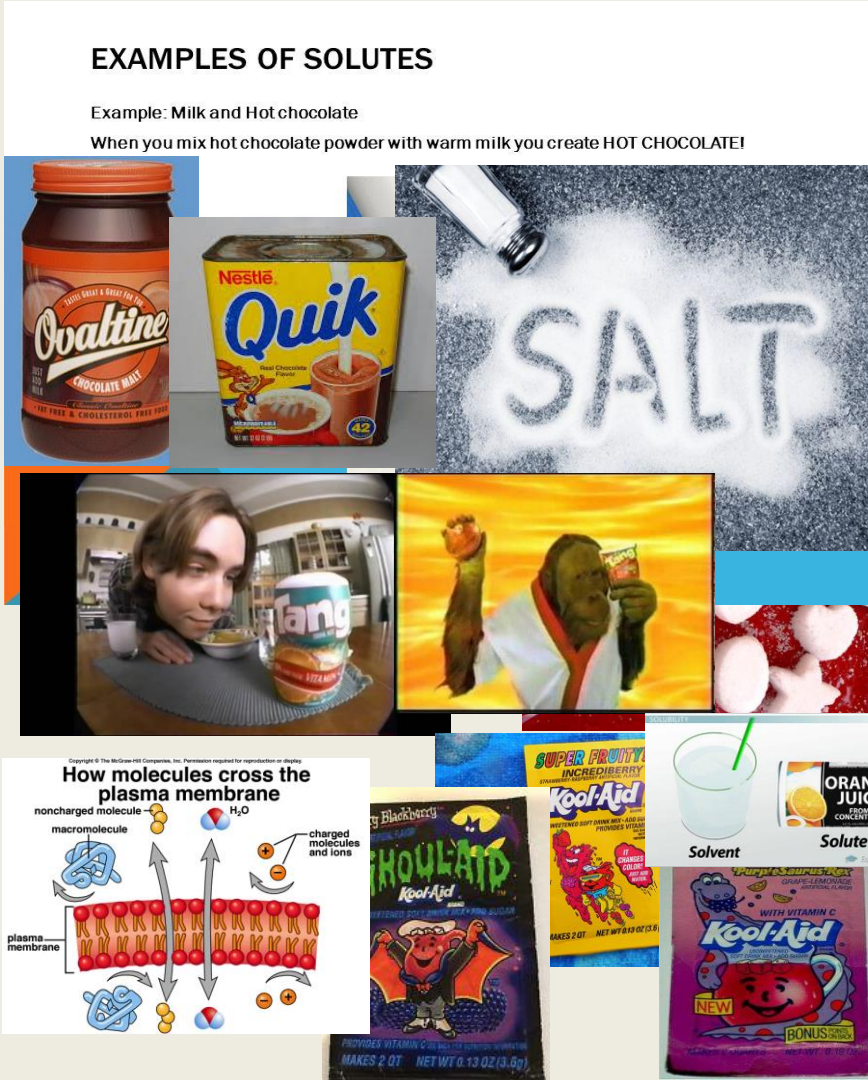




Today's Qualitative Prompt

Solutes are "substances that dissolve" in a "solvent" to make a "solution". LIST and SKETCH as many examples of solutes as you can think of!

- Anything that can be dissolved can be considered a solute, and in biology there can be MANY substances dissolved in the "liquid environment" in which most cells exist!



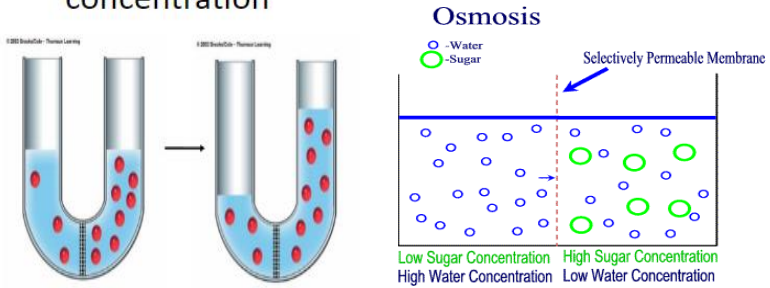
Today's Qualitative Prompt

Solutes are "substances that dissolve" in a "solvent" to make a "solution". LIST and SKETCH as many examples of solutes as you can think of!

- However, the relative amount of solute particles INSIDE and OUTSIDE of a cell is crucial to determining how much water is in it AKA how far from HOMEOSTASIS the cell is!

OSMOSIS

- Osmosis
  - Diffusion of water molecules through cell membrane
  - Direction of osmosis is determined by the SOLUTE concentration



DIRECTION OF OSMOSIS

Depends on the concentrations of solutes & water

THE WATER MOVES WHERE THERE IS MORE SOLUTE!

Today's Qualitative Prompt

Solutes are "substances that dissolve" in a "solvent" to make a "solution". LIST and SKETCH as many examples of solutes as you can think of!

- However, the relative amount of solute particles INSIDE and OUTSIDE of a cell is crucial to determining how much water is in it AKA how far from HOMEOSTASIS the cell is!

Hypertonic Solution

- HIGH concentration of SOLUTE OUTSIDE the cell,
- LOW concentration of SOLUTE INSIDE the cell
- **RESULT:** *WATER MOVES OUT OF THE CELL.*

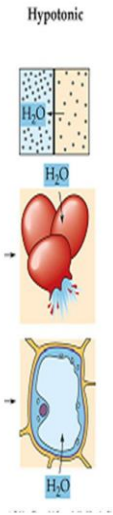
HYPOTONIC

LOW concentration of SOLUTE OUTSIDE the cell

HIGH concentration of SOLUTE INSIDE the cell,

RESULT:

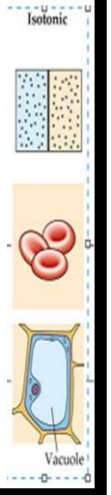
– *WATER MOVES INTO THE CELL.*



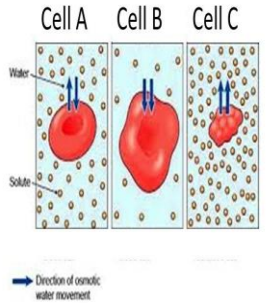
ISOTONIC

- inside and outside concentrations are equal.
- equal concentrations of solute & water outside and inside the cell

RESULT: water diffuses in and out at constant rate, no net movement

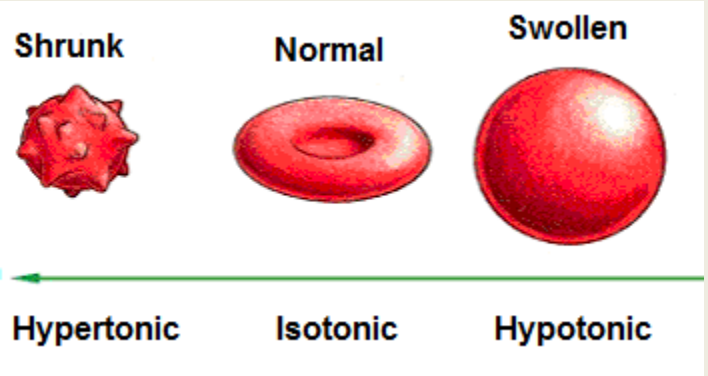


23. Describe the type of solution that each cell is resting in below. **Hint: hyper, hypo, iso**



Today's Qualitative Prompt – Today's Big Scientific ?

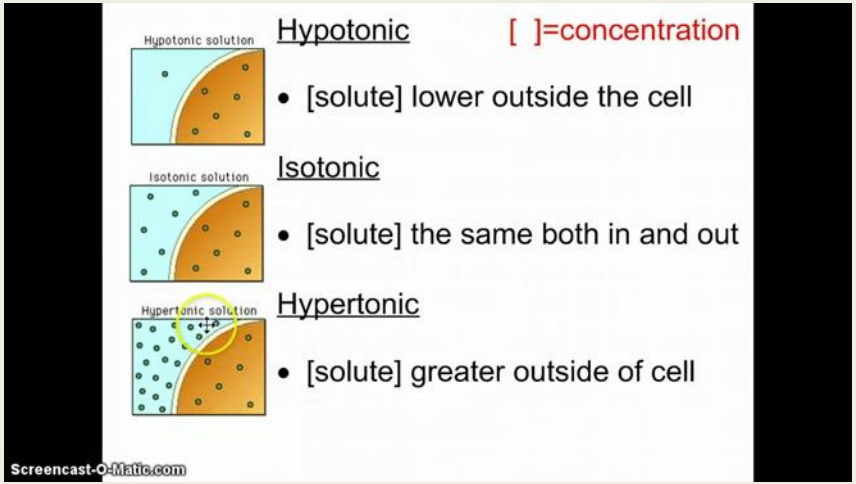
- So! We want to know!
- How can we PREDICT what will happen to cells as their ENVIRONMENT changes!!!



8.1 Cellular Transport

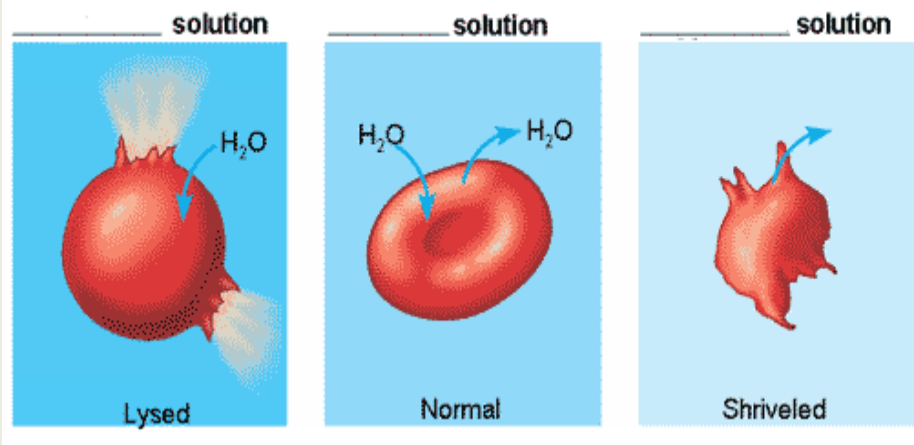
Section Objective:

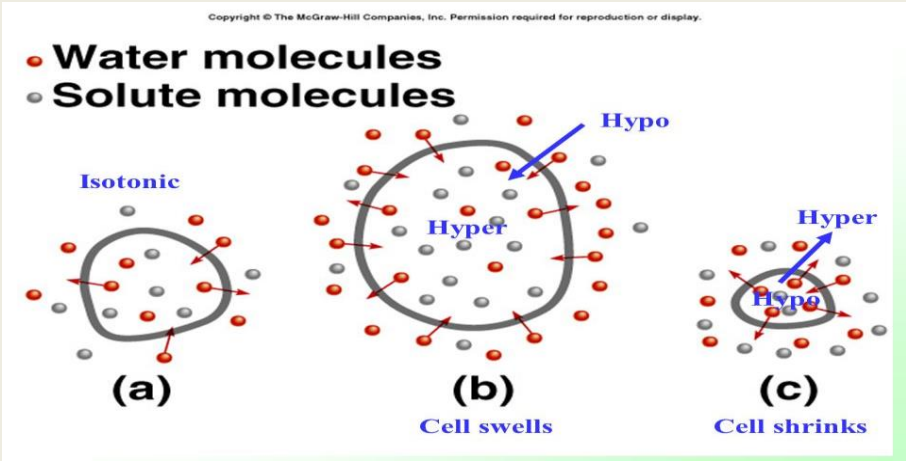
- Predict the effect of a hypotonic, hypertonic, or isotonic solution on a cell.



Today's Qualitative Prompt – Today's Big Scientific ?

- Today our big scientific problem to solve is THUS going to be how we as student scientists can FIGURE OUT how and why cells CHANGE when the amount of SOLUTE around them varies!
- **GET EXCITED!**



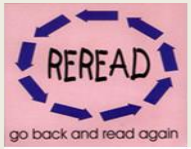


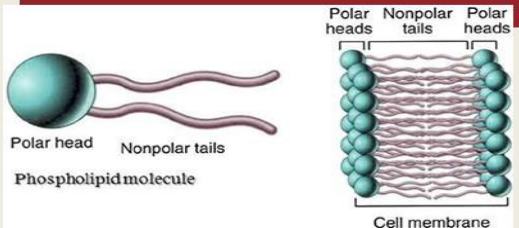
Today's Academic Objective and Standards

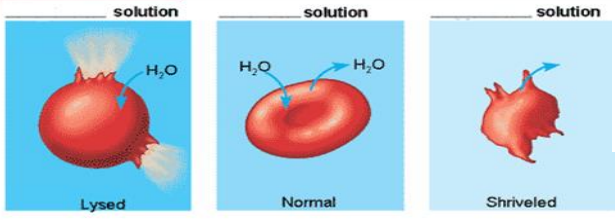
- Today you will INVESTIGATE methods of how cells transport materials by EXPERIMENTING with Passive Transport!
- Standards Met: 3.1.B.A9, 3.1.B.A1, 3.2.7.A6, 3.1.7.A1, 3.4.7.C2, 3.4.7.D2, CC.2.1.7.E.1, CC.2.2.7.B.3, **NGSS** Standard - MS-LS1-1.

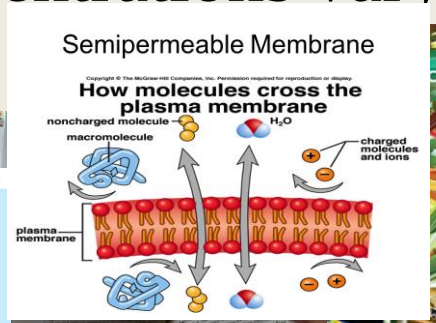
Yesterday's Homework Review

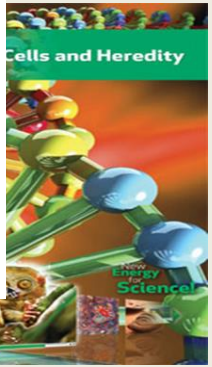
- ***HW** = RE-READ Pg. 20-21!
  - I want to see PR00F! Notes, annotations, and highlights!
  - SO! What are cell membranes made of AND what happens to cells when solute concentrations vary!





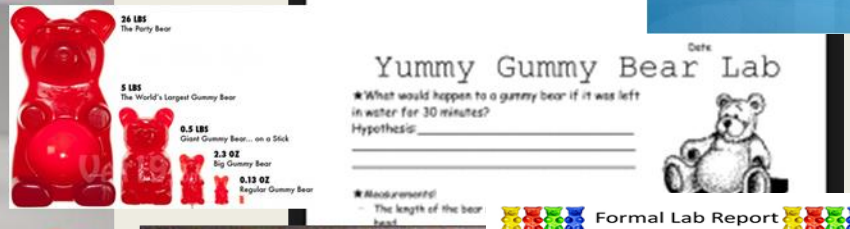


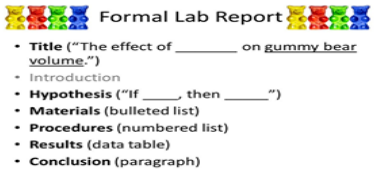




Yesterday's Homework Review

- ***HW** = Bring-In's LAB REPORT **(DUE THE DAY OF OUR QUIZ)!!!**
  - So! What gummy conclusions did you make?!





Bring-In's Lab – Formal Lab Report Write Up

- Students, Listen UP UP UP! You will be required to WRITE a formal, 1-page Lab Report for our Bring-In's Lab!
- This will be submitted along with your QUIZ, and the REQUIREMENTS can be viewed below!

Formal Lab Report

- **Title** ("The effect of _____ on gummy bear _____")
- Introduction
- **Hypothesis** ("If ____, then _____")
- **Materials** (bulleted list)
- **Procedures** (numbered list)
- **Results** (data table)
- **Conclusion** (paragraph)

Conclusion:

*Should refer back to hypothesis
Was it right or wrong?
*Use data to explain how you know if it is right or wrong
*How can this lab be related to everyday life?
Why would scientists do this lab?
*Experimental errors
No one is perfect!
Explain what went wrong even if it didn't affect the outcome of the experiment

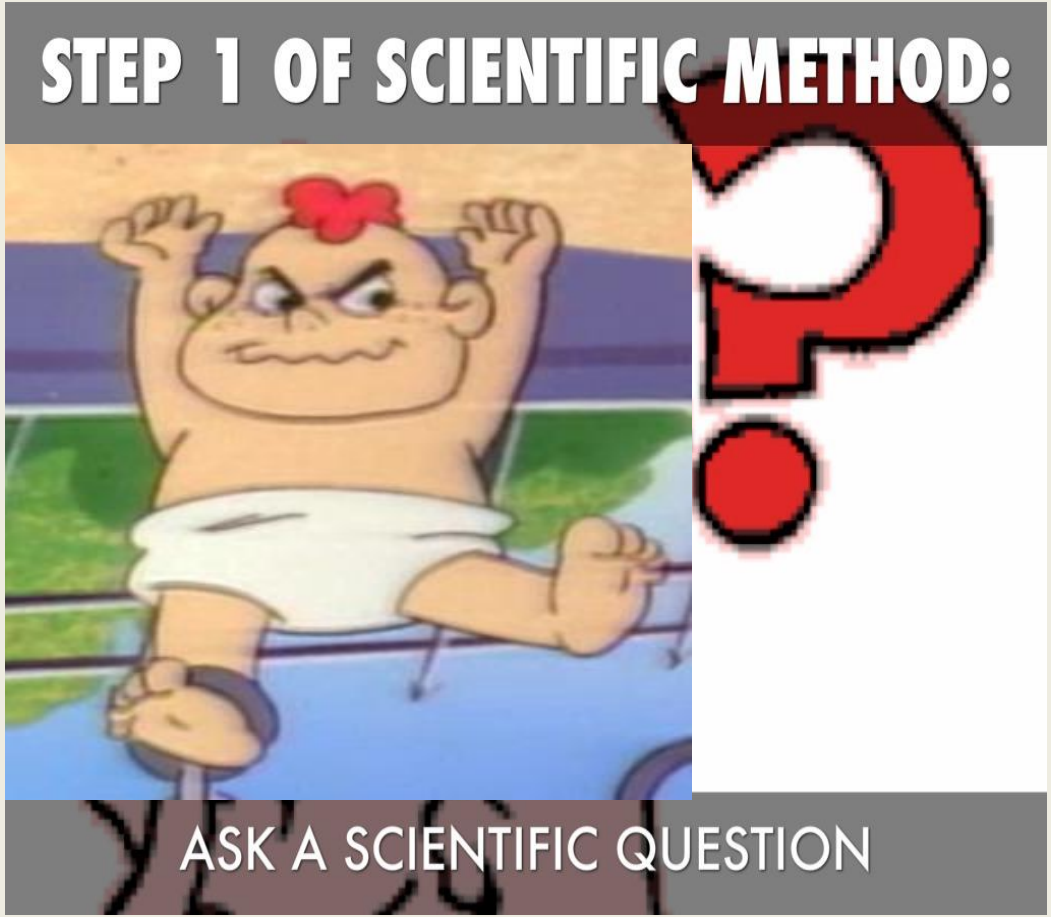
THE SGS - STUDY GUIDE SLIDE – CELL PROCESSES QUIZ

- **Students must KNOW:**
  1. What is Homeostasis, and what conditions have to be met for a Cell to be in this state?
  2. What are the two main types of Cell Transport?
  3. What is the difference between a Hypotonic, Isotonic, and Hypertonic Solution AND Cell?
  4. Which organelle is mainly responsible for Endocytosis and Exocytosis, and what structure does it use to perform these transport processes?
  5. How does the rate of diffusion change with temperature?

- **Students must be able to DO:**
  1. List and define 2 examples of Passive Transport.
  2. List and define 2 examples of Active Transport.
  3. List 3 real world examples of Diffusion.
  4. Describe what the human body does to maintain Homeostasis.
  5. Draw environments with varying solute concentration and show/describe what happens to a cell placed in this environment.
  6. Understand how the concept of a “Semi-permeable membrane” was on display during “The Osmosis and Diffusion Lab”.

Today's Big Scientific ?

- Today's Big Scientific Question =
- How can we PREDICT what will happen to cells as their ENVIRONMENT changes!!!



Learning About Cell Transport: Let's Get <u>Active</u>!

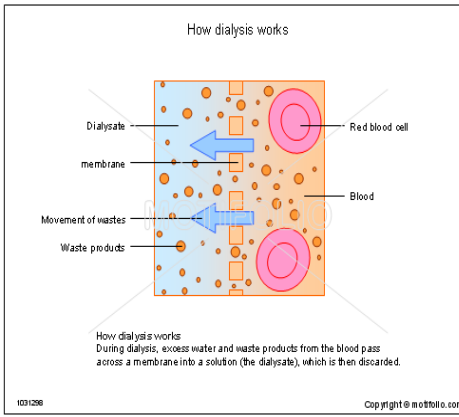
- So! Before we learn more about how our CELLS use each type of Cell Transport to get what they need we need to EXPERIMENT with why and HOW Passive Transport just "naturally" OCCURS!!!
- It's thus time to…**LAB EX-PERI-MENT UP UP UP UP!!@!**

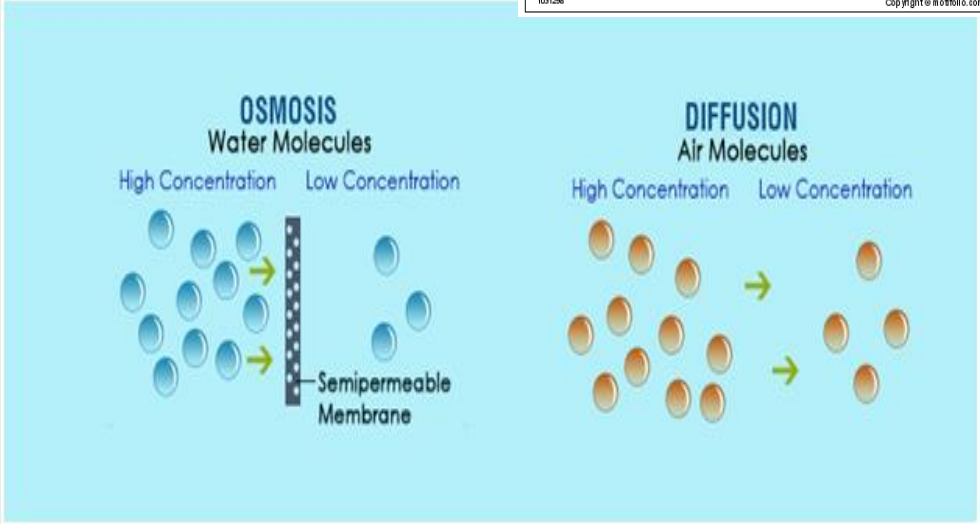
Accomplishing Today's AO = Lab Experiment UP

- In order to accomplish today's Academic Objective we are going to "**LAB EX-PERI-MENT UP UP UP UP…!**"
- We will thus be doing another **FULL-SCALE, MULTI-DAY Lab EXPERIMENT** to help us learn more how and why PASSIVE TRANSPORT processes occur!
- **GET EXCITED!**

Lab UP Experiment – The Osmosis & Diffusion Lab

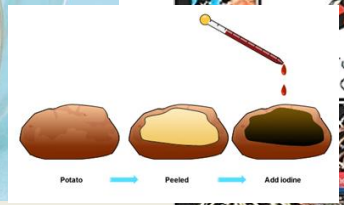
- Today's **Lab UP Experiment** is entitled "The Osmosis & Diffusion Lab" and in it we are going to demonstrate the conditions under which BOTH types of Passive Transport occur by doing a full-scale, multi-day **SCIENCE EXPERIMENT** using explicit instruction in order to better **ANALYZE** these cell transport processes!

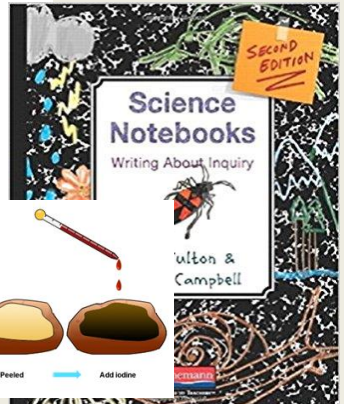


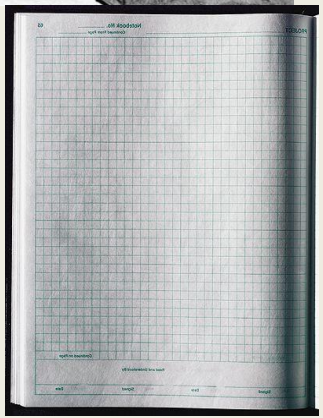


Lab UP Experiment Setup – The Osmosis & Diffusion Lab

- For this Lab UP Experiment all we need is our Science Notebooks, a pencil, our ears & scientific minds, some Experiment Sheets, AND **MATERIALS**!
- So, let's get EXPERIMENTAL and head on over to the LABORATORY!!!!!

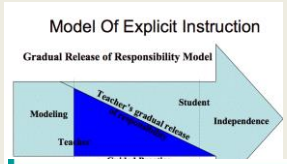


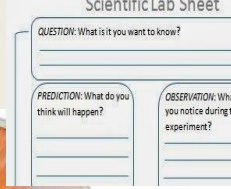


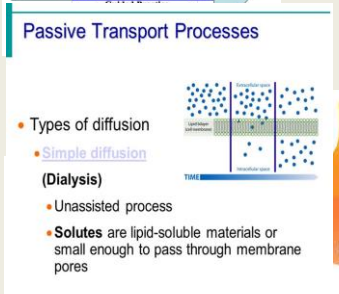


Lab UP Experiment Steps – The Osmosis & Diffusion Lab

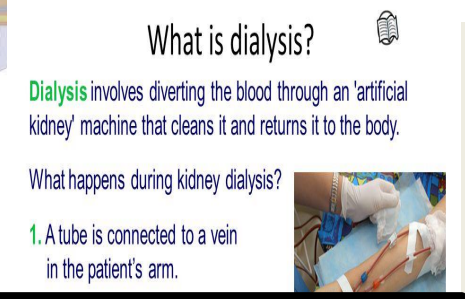
1. First, let us REVIEW **LAB SAFETY** by taking and READING an Experiment Sheet with your ASSIGNED group at your table!
2. Next, LISTEN UP to a brief explanation of what "Semi-permeable Membranes" and "Dialysis" are!
3. Then, ensure that all of the following **MATERIALS** have been provided to your group:
   - 1 Cup
   - 4 Glucose Testing Strips
   - 1 One-foot section of Dialysis Tubing
   - 1 Pipet
   - 1 Graduated Cylinder
4. Finally, to ensure that we stay **ON TASK** and to avoid confusion we will be performing this experiment as a "Guided Lab" in which I will **MODEL** and instruct you on how to do a step, we will do that step together, and you will then do the aforementioned step by yourselves!
   - You are thus RESPONSIBLE for filling out the Experiment Sheets with any and all recorded data as we go ALONG while also completing the LAB EXPERIMENT **HOMEWORK** on the last few pages!

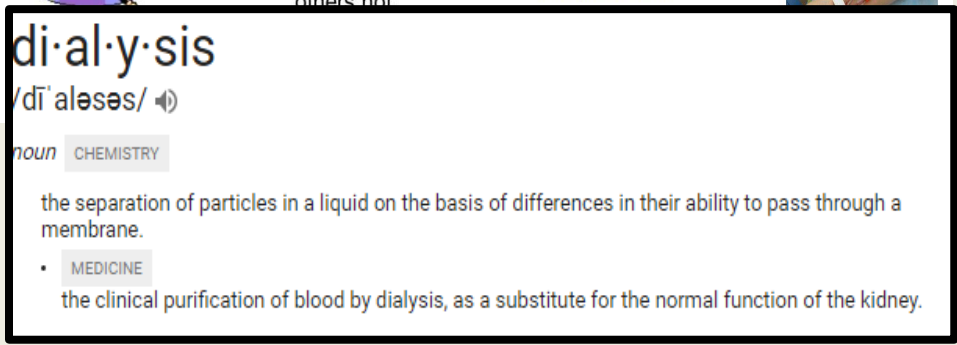






- Dialysis Tubing is ***selectively permeable***
- The tubing will allow some molecules to pass through, and others not





Lab UP Experiment Data Table – The Osmosis & Diffusion Lab

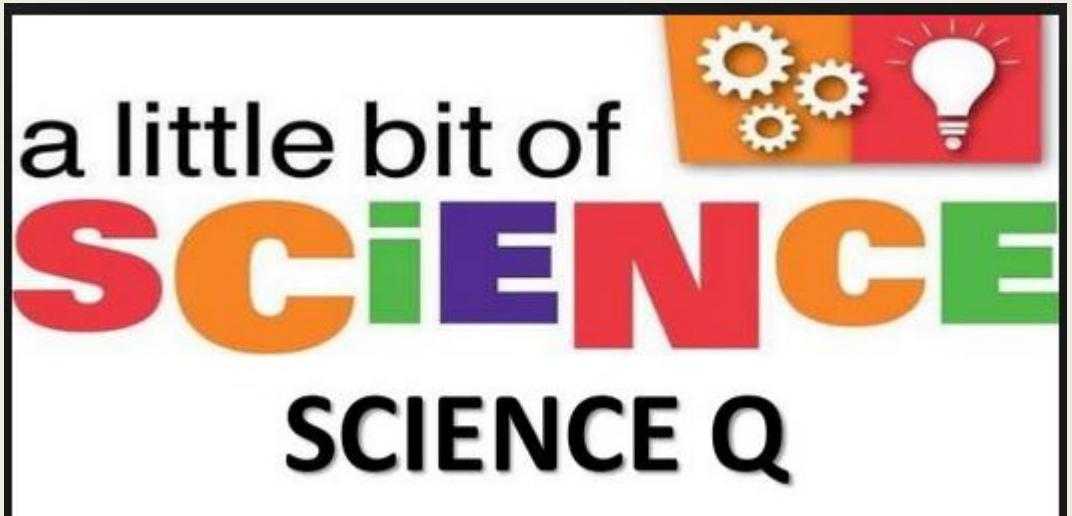
	Food Sample #1	Food Sample #2	Food Sample #3	Food Sample #4	Food Sample #5	Food Sample #6
Name of Food	Cheese Balls	Cheez-Its	Fritos	Popcorn	Marsh-Mallows	Student's Choice
Mass Before (g)	1.1g					
Mass After (g)	.8g					
Temp. Before (°C)	20°C					
Temp. After (°C)	28°C					

Lab UP Experiment – HW Problems and Questions

1. The Homework Problems and Questions are on the SECOND PAGE of the “Experiment Sheet”! ☺

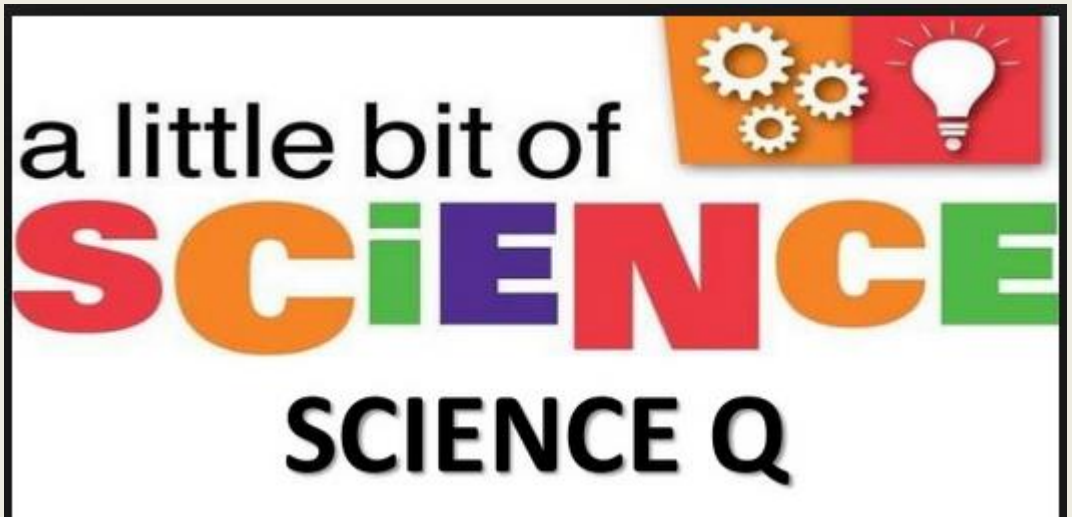
Bell 2 Bell

- We work what in this class?!?!?!
  - **BELL 2 BELL**
- Every single precious SECOND of academic instructional time is thus utilized in this classroom!
- You students will thus be vocally quizzed EVERY DAY until I DISMISS you at the end of class (with a positive greeting and a thank-you of course!).



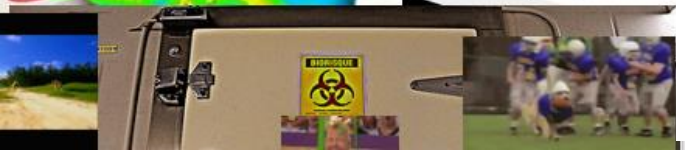
Bell 2 Bell

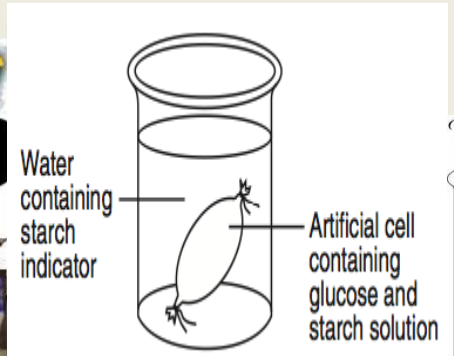
- We work **BELL 2 BELL** in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!

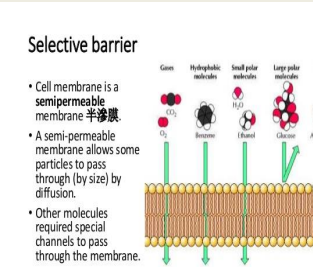


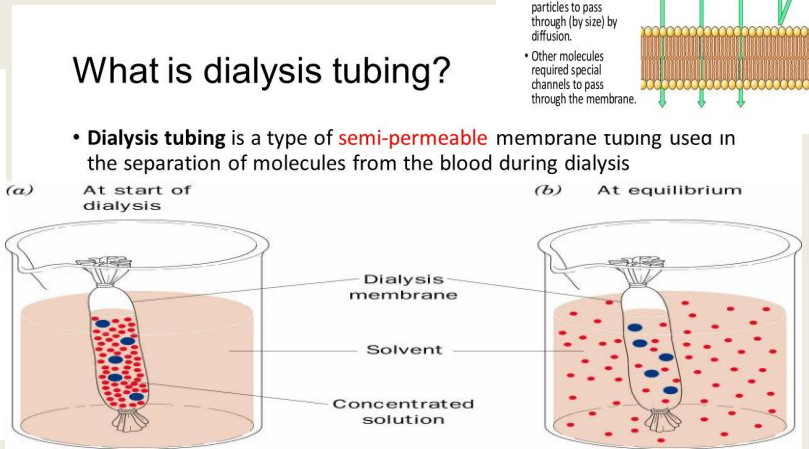
Tomorrow's Academic Objective and Plan

- Tomorrow you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!
- *HW = Finish Lab UP Experiment HW Problems & Questions!









TUESDAY, FEBRUARY 20th

DO NOW

- In your notebooks, to be checked, solve this problem…

Know/Given: There are 1000 grams in 1 kilogram, Density equals Mass divided by Volume, and a rock has a Density of 2 kilograms per milliliter. These are equations of Density!

$$1000g = 1kg \qquad D = \frac{m}{V}$$

$$D_{rock} = 2\frac{kg}{mL}$$

Asked: What is the Volume in milliliters of a 5500 gram rock?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
   - Today's **QP** = DRAW an egg without a shell floating in extremely sugary water and SHOW with arrows which way (in or out) you think the water will move!
2. Open books, WORK on today's **AO!**
3. ***HW** = Read & DO Pg. 60-61 ± AO Accomplisher Questions!

TODAY'S ACADEMIC OBJECTIVE

Today you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!

DO NOW – Equations of Density

- **Know/Given:** There are 1000 grams in 1 kilogram, Density equals Mass divided by Volume, and a rock has a Density of 2 kilograms per milliliter. These are equations of Density!

$$1000g = 1kg \qquad D = \frac{m}{V}$$

$$D_{rock} = 2\frac{kg}{mL}$$

- **Asked:** What is the Volume in milliliters of a 5500 gram rock?

What is KA^2 format? This is an example of a "1-pointer" on a DO NOW!

- **Know:**

$$1000g = 1kg, \quad D = \frac{m}{V}, \quad D_{rock} = 2\frac{kg}{mL}$$

$$\frac{1000g}{1kg} = 1 \quad \frac{1kg}{1000g} = 1 \quad DV = m \quad V = \frac{m}{D} \quad D_{rock} * mL = 2kg \quad mL = \frac{2kg}{D_{rock}}$$

- **Asked:** What is the Volume of a 5500 gram rock with a Density of 2 kilograms per milliliter?
- **Answer:** $\mathbf{5500\cancel{g} * \frac{1kg}{1000\cancel{g}} = 5.5kg = m = DV = 5.5\cancel{kg} * \frac{mL}{2\cancel{kg}} = 2.75mL}$

DO NOW – Never Forget to Listen to Akila!

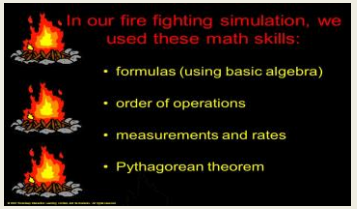
OH NO! Where in the World is Akila?!

- Students! LISTEN UP! Akila, the one-and-only mentor and friend of Mr. Floyd, has gone MISSING!!!
- Has he been kidnapped?! Or is this modest man simply on-the-run from his overbearing fame!?

OH NO! Where in the World is Akila?!

- All we do know is that the only CLUES we have to help us solve this mystery are these SCIENTIFIC RIDDLES!
- **CHIEF** Floyardee thus needs the help of his student scientist's SCIENTIFIC MINDS to CRACK THIS CODE!
- The first SCIENTIFIC RIDDLE we thus have to solve is…→

DO NOW – Translating and Concluding Our Answer!



- **Answer:**

$$\mathbf{5500\cancel{g} * \frac{1kg}{1000\cancel{g}} = 5.5kg = m = DV = 5.5\cancel{kg} * \frac{mL}{2\cancel{kg}} = 2.75mL}$$

- **Translate and Conclude:** Yet again students, WOAH! Take a step back and realize that your scientific math skills are on fire; WE'RE NOW SOLVING 3 EQUATION SCIENTIFIC PROBLEMS!!!
- **$ci Fact** → Density is an "Intrinsic Property" of matter, meaning that it is ALWAYS the SAME for any given amount of a specific SUBSTANCE!

Physical Properties

- **Intensive** (also called intrinsic)
  - INdependent of sample size
  - Examples: color, state of matter, luster, texture, boiling point, melting point, solubility, density

OR

- **Extensive** (also called extrinsic)
  - dependent on sample size
  - Examples: mass, volume, length

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$$D = \frac{\heartsuit}{}$$

$$D = \frac{m}{V}$$

Density

- Density is an intensive property
  - It does not change, no matter the size of a sample
    - 1 kg of gold has the same density as 1 g, or 1 lb, or 1000 kg, etc.

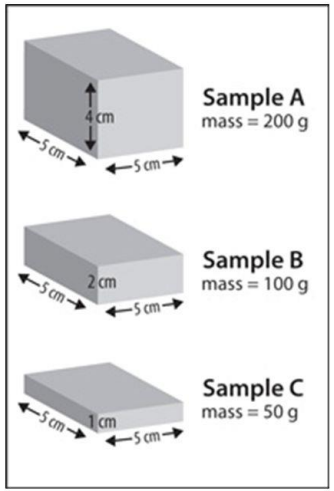
Density

- Density is the mass per unit volume of a substance.
- Density is a physical property
- D= m/V
- Density is an intrinsic property of matter

Density of Coke

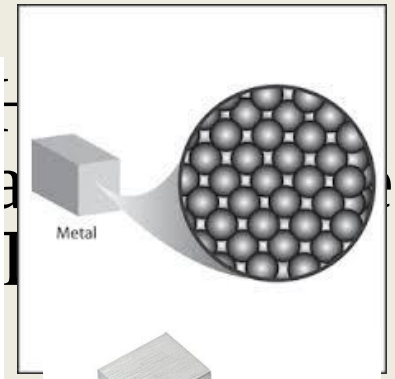
C. Ophardt, c. 2003

What is the difference?
Both cans are in water.



A. What is the density of each sample?

A. Would each sample float or sink in pure water?



2

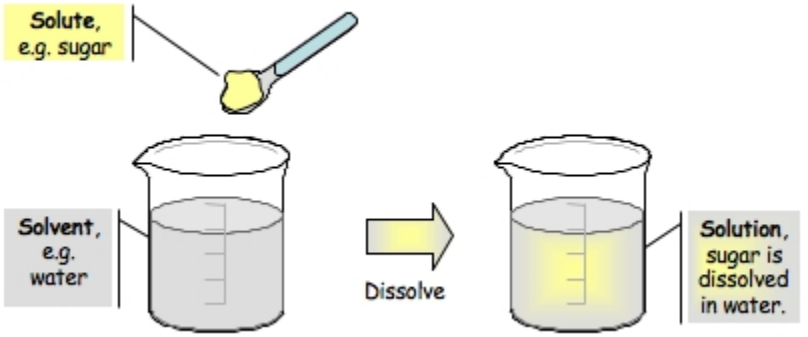
Today's Qualitative Prompt

DRAW an egg without a shell floating in extremely sugary water and SHOW with arrows which way (in or out) you think the water will move!

- Students, recall that sugar in water is a type of SOLUTION, and any cell in a solution can experience OSMOSIS!

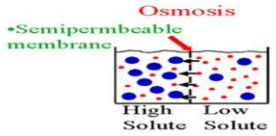
WHAT IS A SOLUTION ?

- DEFINITION: A SOLUTE DISSOLVED IN A SOLVENT (FOR EXAMPLE A SUGAR / WATER SOLUTION)
- SOLUTE IS THE DISSOLVED SUBSTANCE (THE SUGAR)
- SOLVENT IS THE DISSOLVING MEDIUM IN WHICH THE SOLUTE IS DISSOLVED (THE WATER)



Osmosis

- *Definition:* Diffusion of water across a **Semi-permeable** membrane
- Osmosis is a special example of **diffusion**



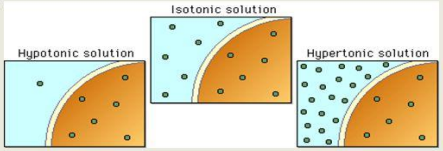
Today's Qualitative Prompt

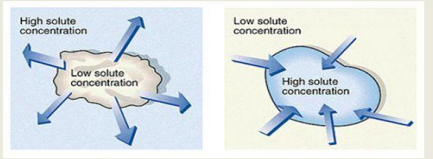
DRAW an egg without a shell floating in extremely sugary water and SHOW with arrows which way (in or out) you think the water will move!

- The direction in which the water in the solution and cell flows will DEPEND on the relative SOLUTE concentrations!

Osmosis: Movement of Water

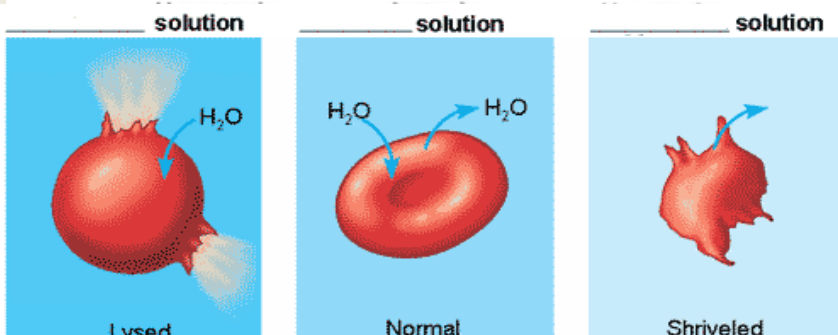
- *Hypotonic Solution*: low solute concentration
- *Isotonic Solution*: equal concentration inside and outside the cell
- *Hypertonic Solution*: high solute concentration
- Water moves in the direction of higher concentration of solute





- Hyper = *above*
- Iso = *same*
- Hypo = *below*

tonic *refers to the* solute concentration



Today's Qualitative Prompt

DRAW an egg without a shell floating in extremely sugary water and SHOW with arrows which way (in or out) you think the water will move!

- Thus, since there is more SOLUTE aka SUGAR outside of the egg, it is in a HYPERTONIC Environment and the egg will shrivel as the water rushes out!

Isotonic, Hypertonic, Hypotonic

- **Hypertonic** – a solution is hypertonic to a cell if it has a higher concentration of dissolved particles than inside the cell.
  - **Example**: if there is a higher concentration of dissolved particles in the solution outside the cell than inside the cell, water will move out of the cell into the solution.

Think of our egg in corn syrup (the corn syrup was hypertonic to the cell. Water from in the cell flowed out of the cell into the corn syrup.

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Today's Qualitative Prompt

DRAW an egg without a shell floating in extremely sugary water and SHOW with arrows which way (in or out) you think the water will move!

- However, if the egg were to be placed back in WATER there would be more SOLUTE inside of the egg, so it would be in a HYPOTONIC Environment and the egg will expand as the water rushes in!

Isotonic, Hypertonic, Hypotonic

- **Hypotonic** – the solution outside the cell has a lower concentration of dissolved particles than that inside the cell.
  - **Example:** water molecules will diffuse into the cell when the inside of the cell has a higher concentration of dissolved particles and a lower concentration of water molecules than outside of the cell.

Water flowed from the vinegar, where there was a lower concentration of dissolved particles, through the cell membrane to the interior of the egg (where there was a higher concentration of dissolved particles).

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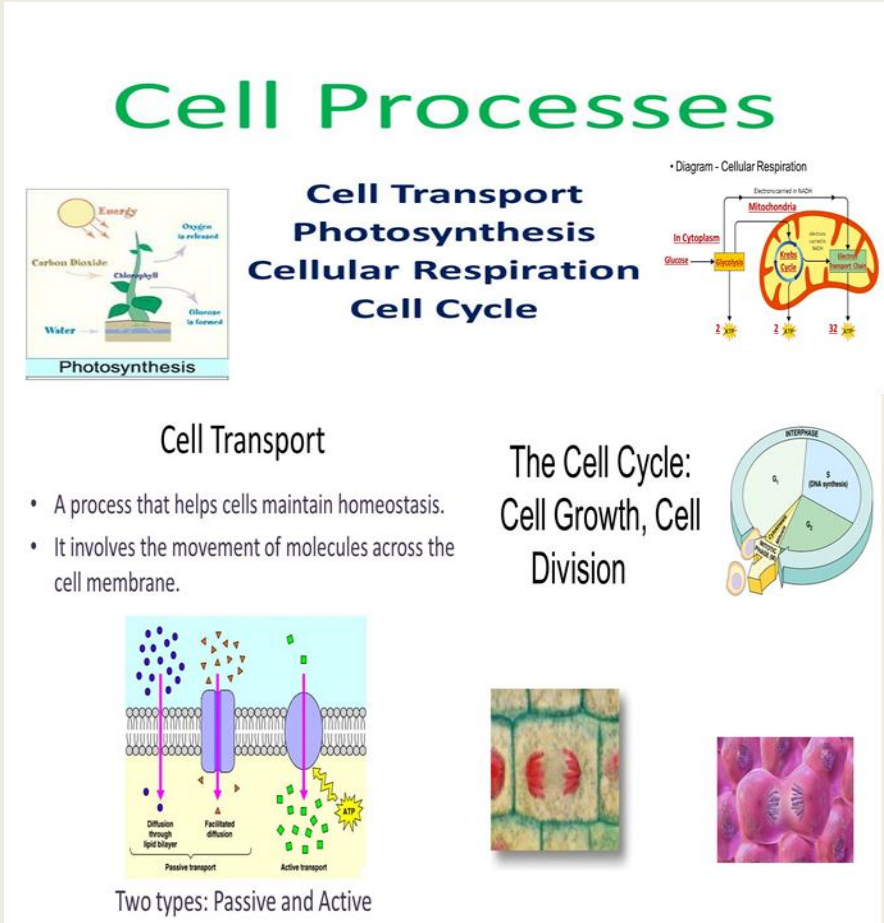
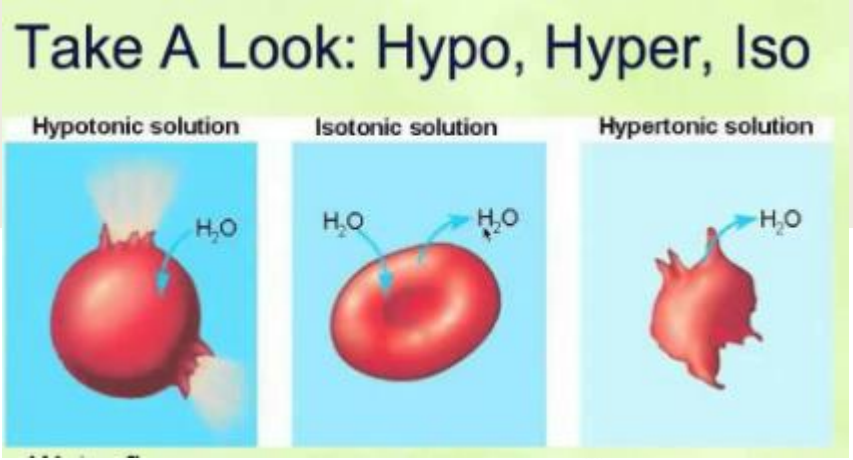
Today's Qualitative Prompt – Today's Big Scientific ?

- So! We want to know!
- How can we REINFORCE our knowledge of cell processes in order to DESCRIBE what happens to cells as their environment changes!!!

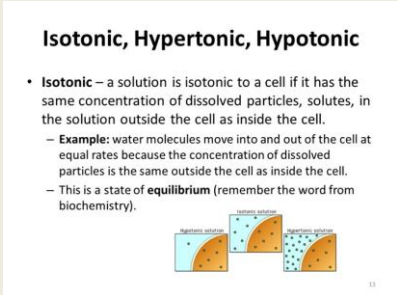


Today's Qualitative Prompt – Today's Big Scientific ?

- Today our big scientific problem to solve is THUS going to be how we as student scientists can FIGURE OUT how to PREDICT how cells change as their surroundings vary!
- **GET EXCITED!**



- Type of solution: Hypertonic, Hypotonic, Isotonic
- Direction of water movement

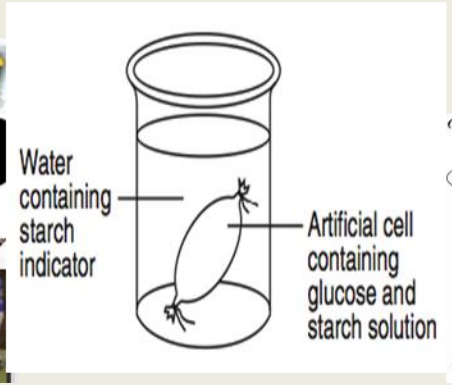


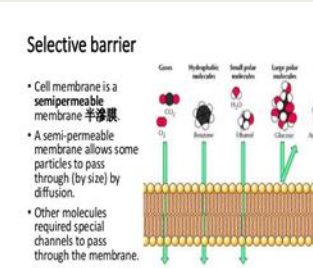
Today's Academic Objective and Standards

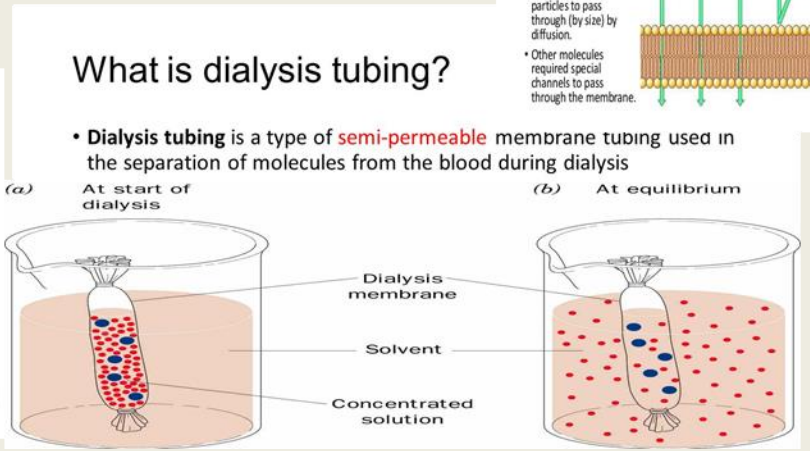
- Today you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!
- Standards Met: 3.1.B.A9, 3.1.B.A1, 3.2.7.A6, 3.1.7.A1, 3.4.7.C2, 3.4.7.D2, CC.2.1.7.E.1, CC.2.2.7.B.3, **NGSS** Standard - MS-LS1-1.

Yesterday's Homework Review

- ***HW** = Finish Lab UP Experiment HW Problems & Questions!
  - SO! What substance moved where, and how do we KNOW?!

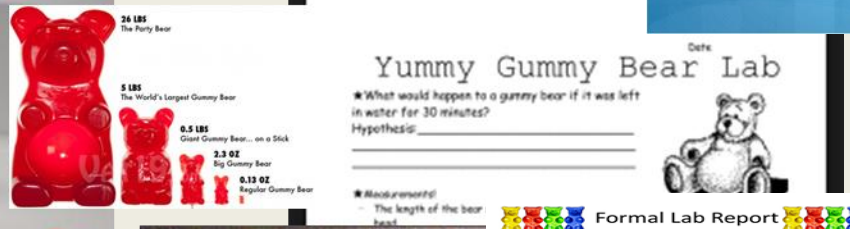


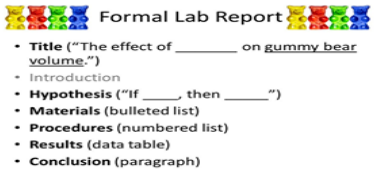




Yesterday's Homework Review

- ***HW** = Bring-In's LAB REPORT **(DUE THE DAY OF OUR QUIZ)!!!**
  - So! What gummy conclusions did you make?!





Bring-In's Lab – Formal Lab Report Write Up

- Students, Listen UP UP UP! You will be required to WRITE a formal, 1-page Lab Report for our Bring-In's Lab!
- This will be submitted along with your QUIZ, and the REQUIREMENTS can be viewed below!

Formal Lab Report

- **Title** ("The effect of _____ on gummy bear _____")
- Introduction
- **Hypothesis** ("If ____, then _____")
- **Materials** (bulleted list)
- **Procedures** (numbered list)
- **Results** (data table)
- **Conclusion** (paragraph)

Conclusion:

*Should refer back to hypothesis
Was it right or wrong?
*Use data to explain how you know if it is right or wrong
*How can this lab be related to everyday life?
Why would scientists do this lab?
*Experimental errors
No one is perfect!
Explain what went wrong even if it didn't affect the outcome of the experiment

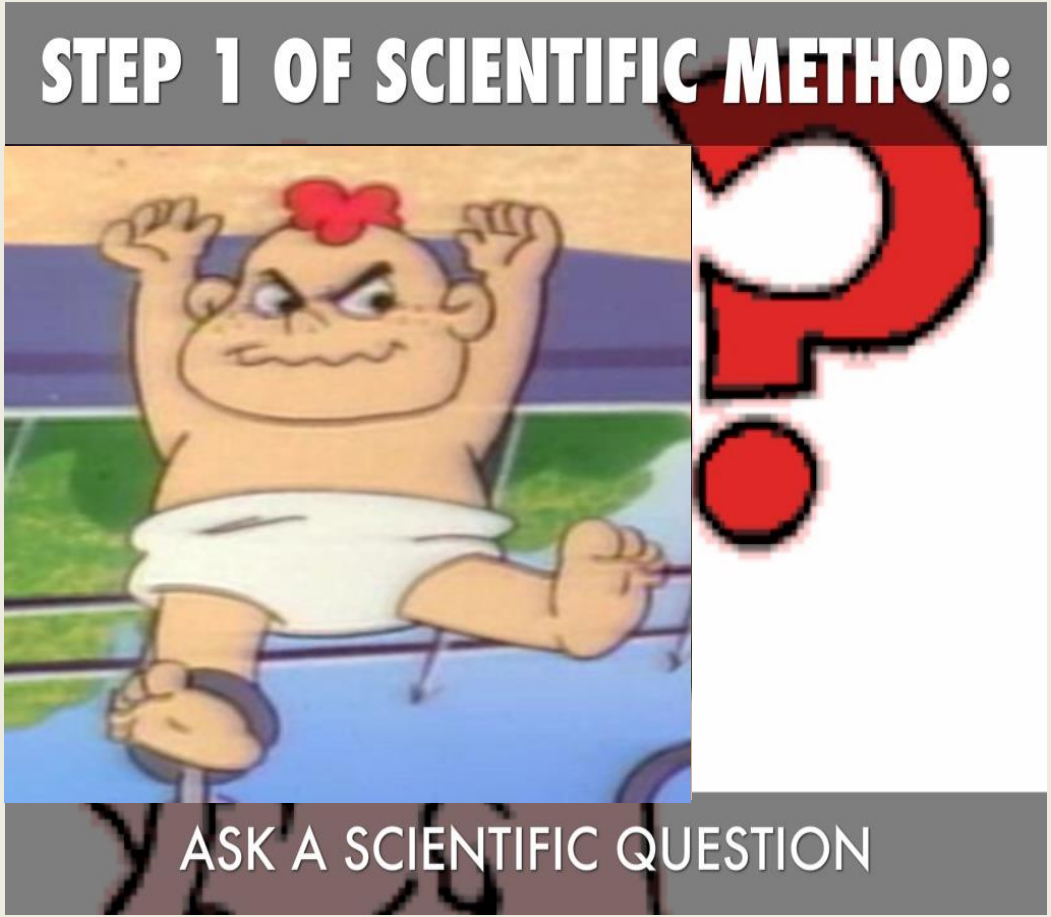
THE SGS - STUDY GUIDE SLIDE – CELL PROCESSES QUIZ

- **Students must KNOW:**
  1. What is Homeostasis, and what conditions have to be met for a Cell to be in this state?
  2. What are the two main types of Cell Transport?
  3. What is the difference between a Hypotonic, Isotonic, and Hypertonic Solution AND Cell?
  4. Which organelle is mainly responsible for Endocytosis and Exocytosis, and what structure does it use to perform these transport processes?
  5. How does the rate of diffusion change with temperature?

- **Students must be able to DO:**
  1. List and define 2 examples of Passive Transport.
  2. List and define 2 examples of Active Transport.
  3. List 3 real world examples of Diffusion.
  4. Describe what the human body does to maintain Homeostasis.
  5. Draw environments with varying solute concentration and show/describe what happens to a cell placed in this environment.
  6. Understand how the concept of a “Semi-permeable membrane” was on display during “The Osmosis and Diffusion Lab”.

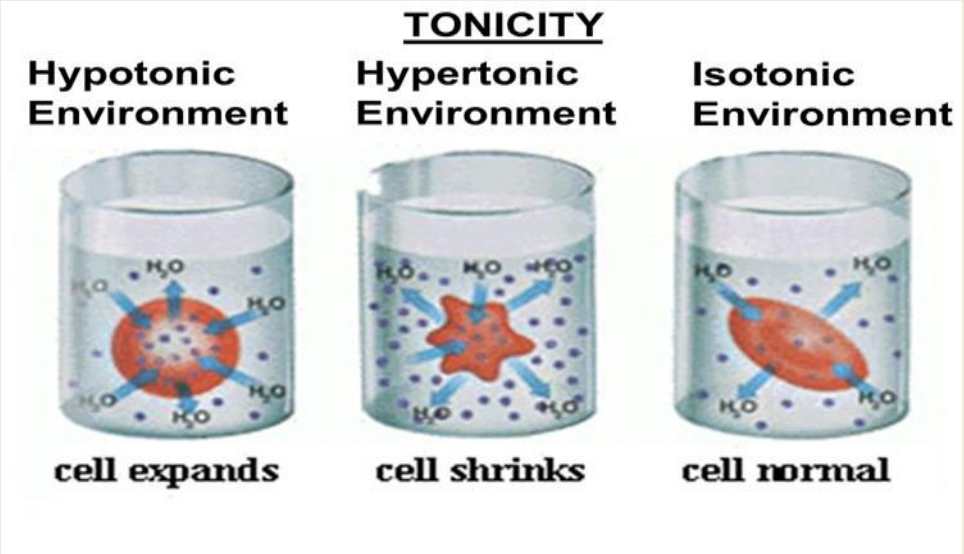
Today's Big Scientific ?

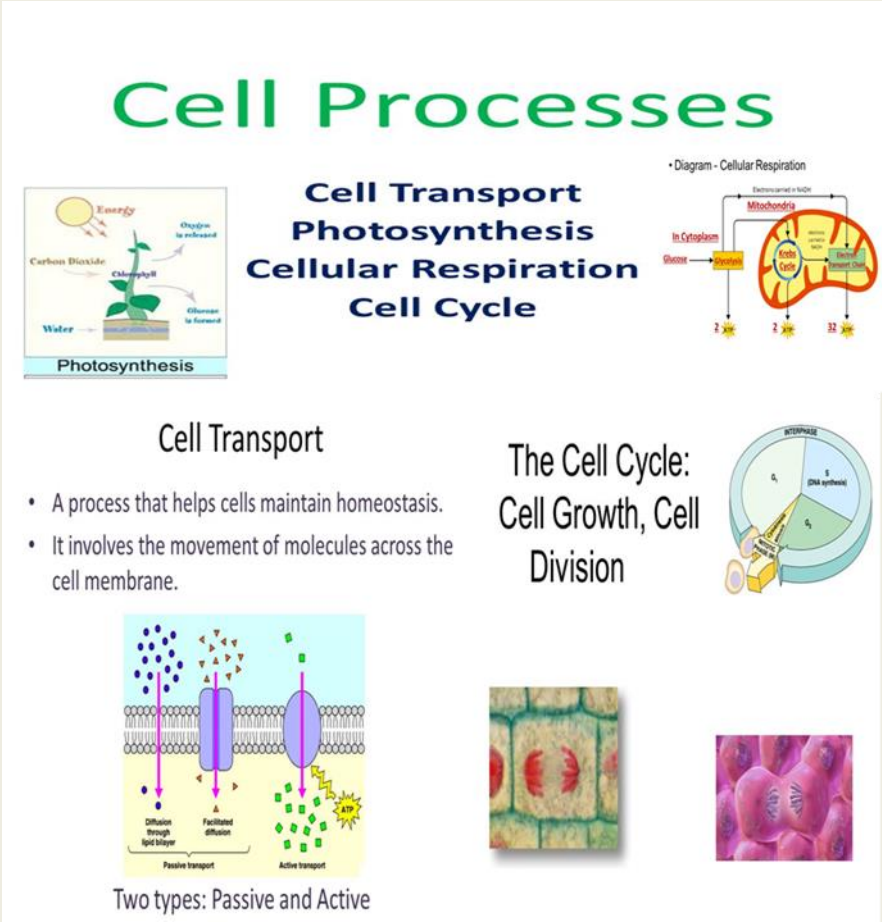
- Today's Big Scientific Question =
- How can we REINFORCE our knowledge of cell processes in order to DESCRIBE what happens to cells as their environment changes!!!



What Cells "Do" and Where They "Live"

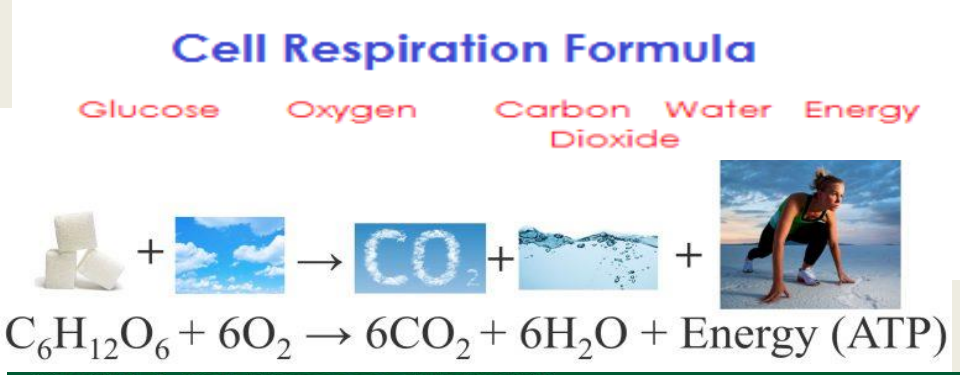
- To answer this question, let us first review what cells DO and how we DESCRIBE their "liquidy" environments!

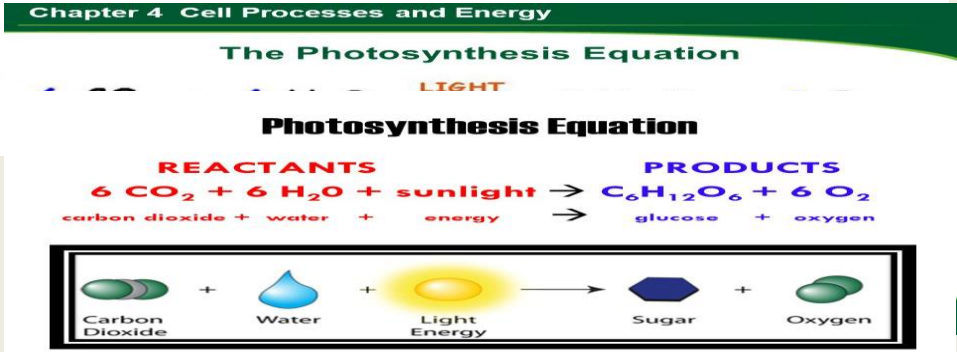


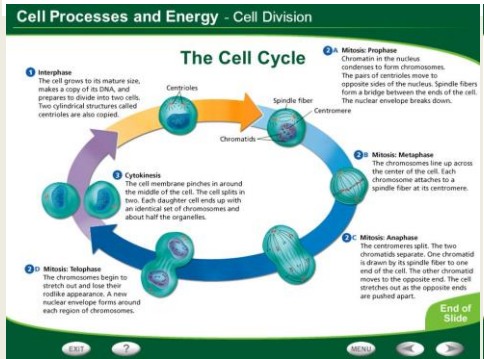


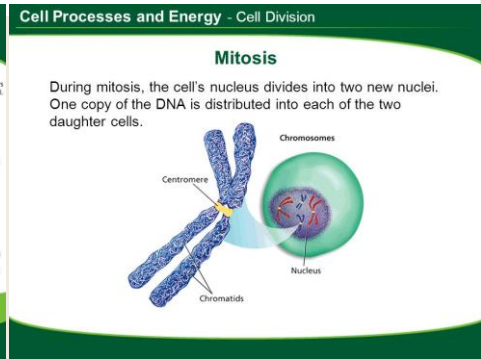
The Major Cell Processes

- Students, recall that everything a cell DOES requires ENERGY!
  - Cells need FOOD to use Cellular Respiration to get energy, and we know that Animal Cells EAT their food whereas Plant Cells MAKE it!
  - Maintaining Homeostasis via "Cell Transport" and the "Cell Cycle" (GROWTH AND REPRODUCTION!) are two major ways cells USE the energy they make!









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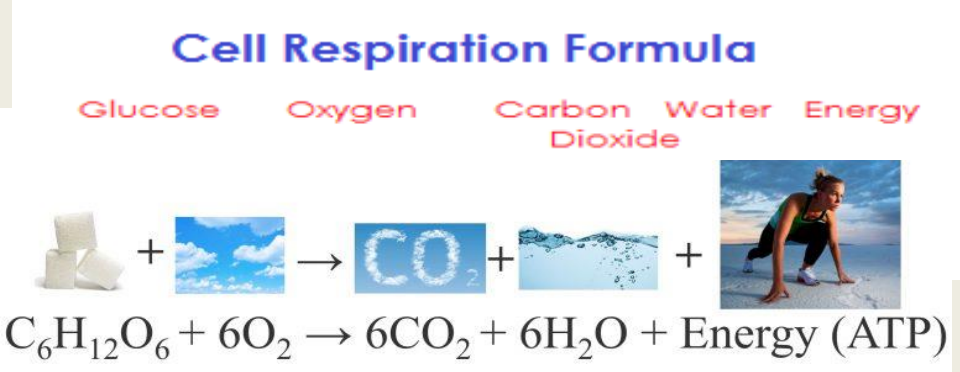
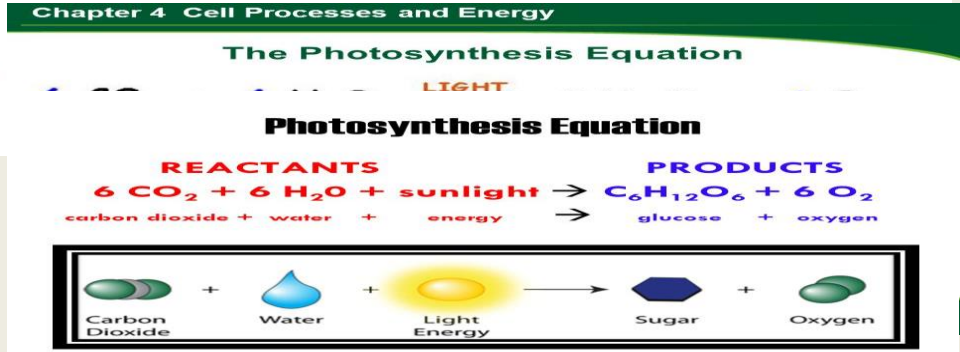
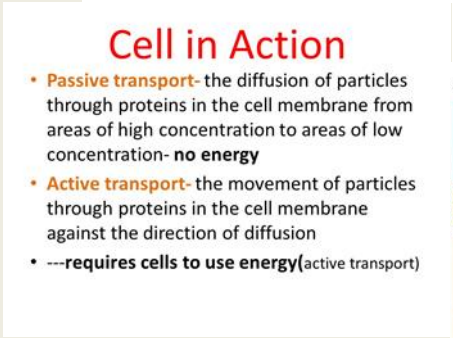
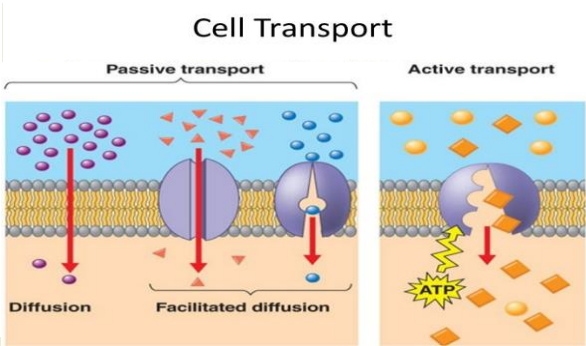
  - Cells need FOOD to use Cellular Respiration to get energy, and we know that Animal Cells EAT their food whereas Plant Cells MAKE it!
  - Maintaining Homeostasis via "Cell Transport" and the "Cell Cycle" (GROWTH AND REPRODUCTION!) are two major ways cells USE the energy they make!



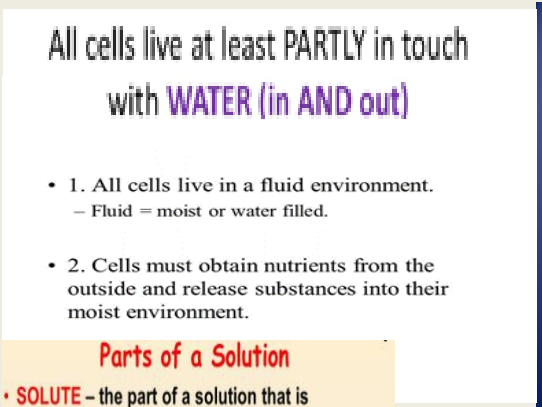


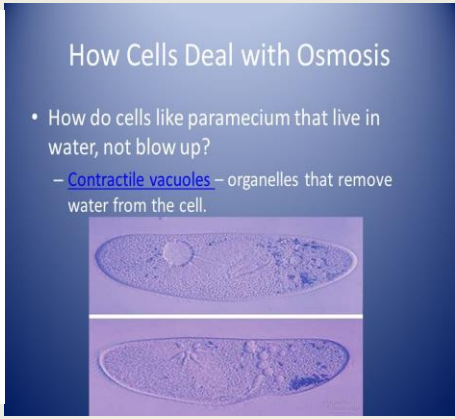


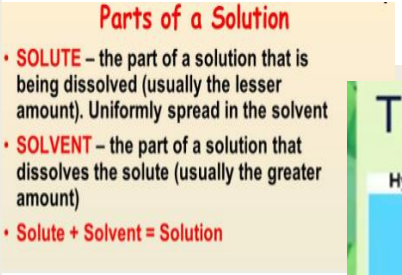


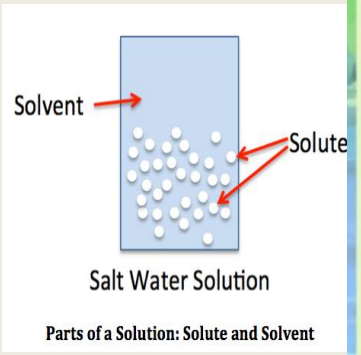
The Cellular Environment

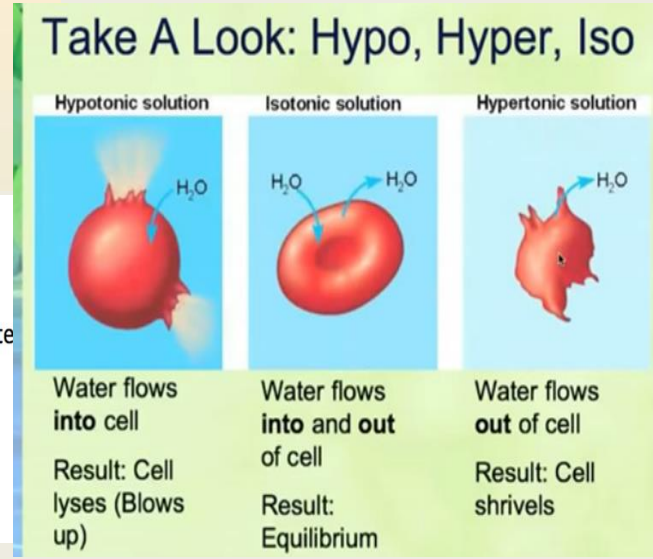
- Single-Celled organisms LIVE in WATER-based solutions, while the cells in Multi-Cellular organisms must also be NEAR watery solutions to survive!
- Thus, we use these SCIENTIFIC TERMS to describe the SOLUTIONS in which cells are found!
  - **Hypotonic Solution** = A SOLUTION that has LESS solute (think SALT) in it than inside of a cell!
  - **Isotonic Solution** = A SOLUTION that has EQUAL solute (think SALT) in it to a cell!
  - **Hypertonic Solution** = A SOLUTION that has MORE solute (think SALT) in it than inside of a cell!
- NOTE! Solution ≠ Cell!











Learning About Cell Environments: Let's Get <u>Active</u>!

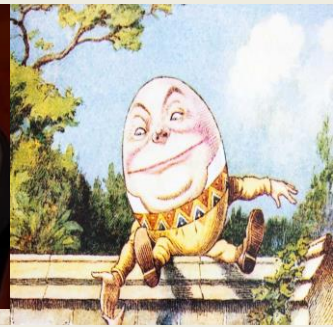
- So! Before we learn more about describing cells as their ENVIRONMENTS change we need to REVIEW and VISUALIZE what happens to cells in various SOLUTIONS!
- We thus need to head to **VID CITY**!!@!

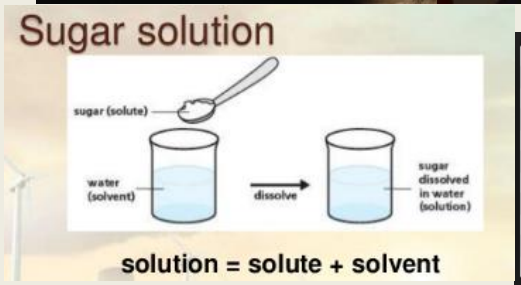
Accomplishing Today's AO = Video City

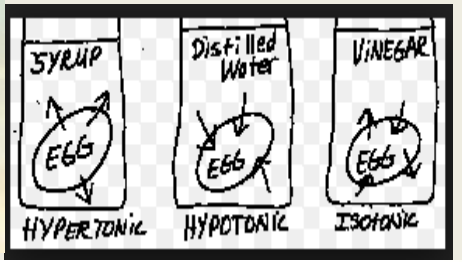
- In order to accomplish today's Academic Objective we will be heading over to "**Video City**" to help us see and review the types of solutions a cell can be found in!
- **GET EXCITED!**

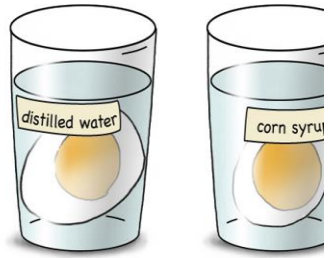
Vid City– Osmosis and the Egg

- Today's entry from Vid City is called "Osmosis and the Egg" and in it we are going to play a Scientific Question & Answer Game to identify and distinguish the unique changes that occur in CELLS placed in solutions of various SOLUTE concentrations!



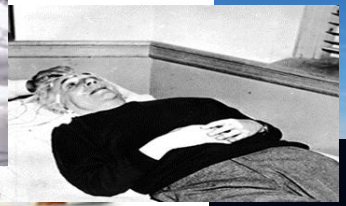






Vid City Setup – Osmosis and the Egg

- For this segment of Vid City all we need is our pencil, our Science Fusion Books & scientific minds, our Ears & attentions, AND the RANDOMIZER!
- So, let's get "3-dimensional" and VID OUT….!



Vid City Steps – Osmosis and the Egg

- 1. Take out your Science Fusion books and GET READY to LISTEN UP, since BLUE MARKS could very well be at **steak** today!!!!!

Vid City Steps – Osmosis and the Egg

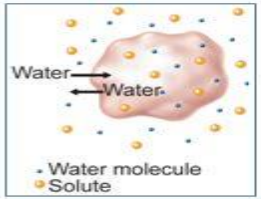
- https://www.youtube.com/watch?v=o8E1C9ftoBo
- https://www.youtube.com/watch?v=0c8acUE9Itw
- https://www.youtube.com/watch?v=7chnk

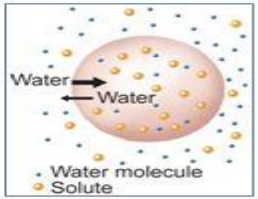
Vid City Steps – Osmosis and the Egg

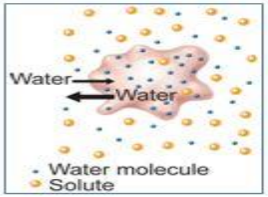
Osmosis Matching

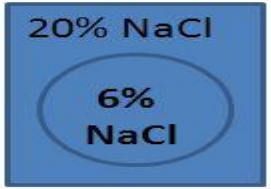
•Draw lines connecting each picture to the appropriate solution type

Osmosis is the _____
Of _____ across a
Selectively permeable _____.









Isotonic Solution

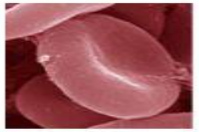
Shrunk

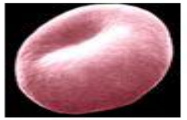
Normal

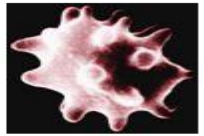
Hypotonic Solution

Swollen

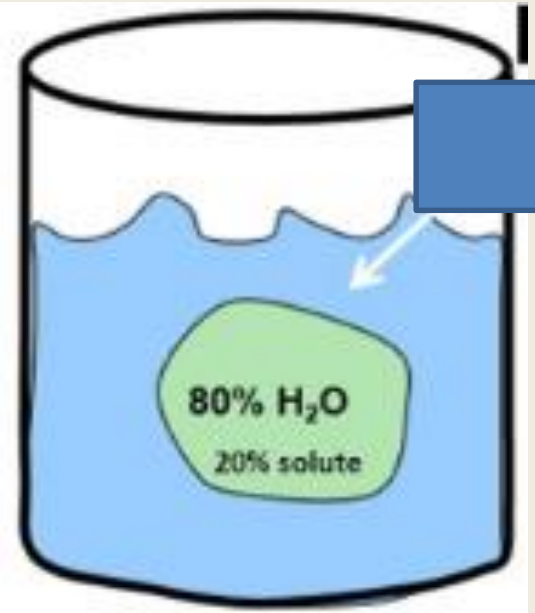
Hypertonic Solution



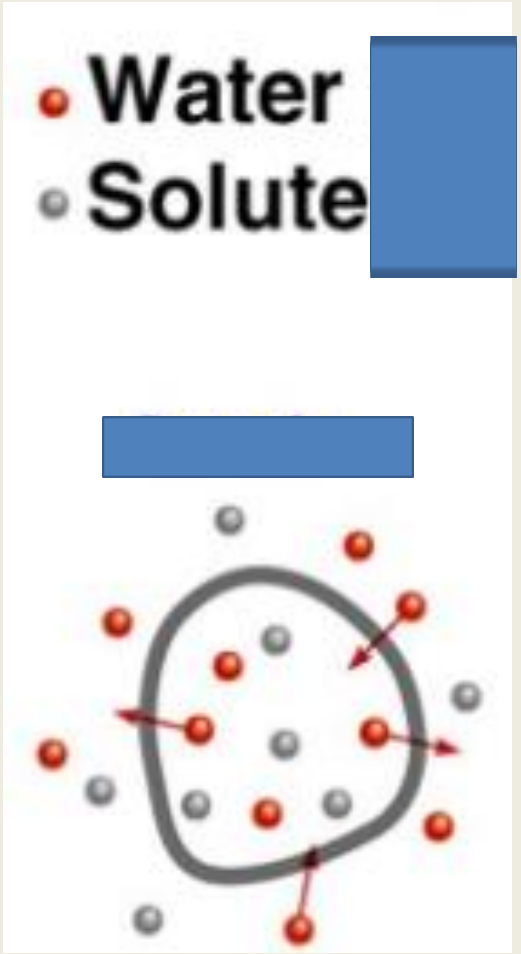


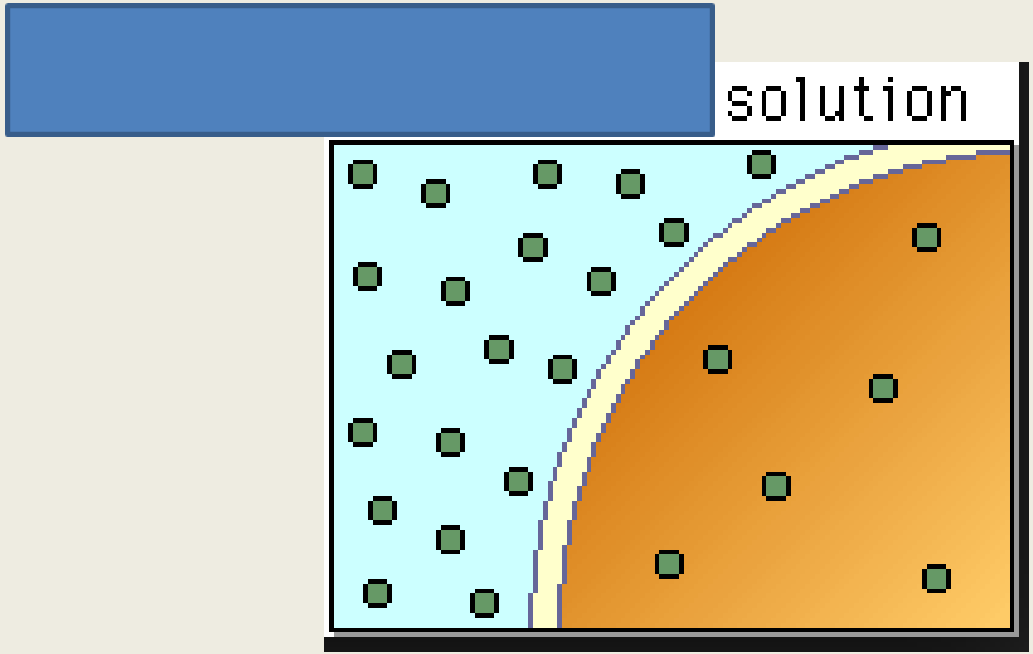


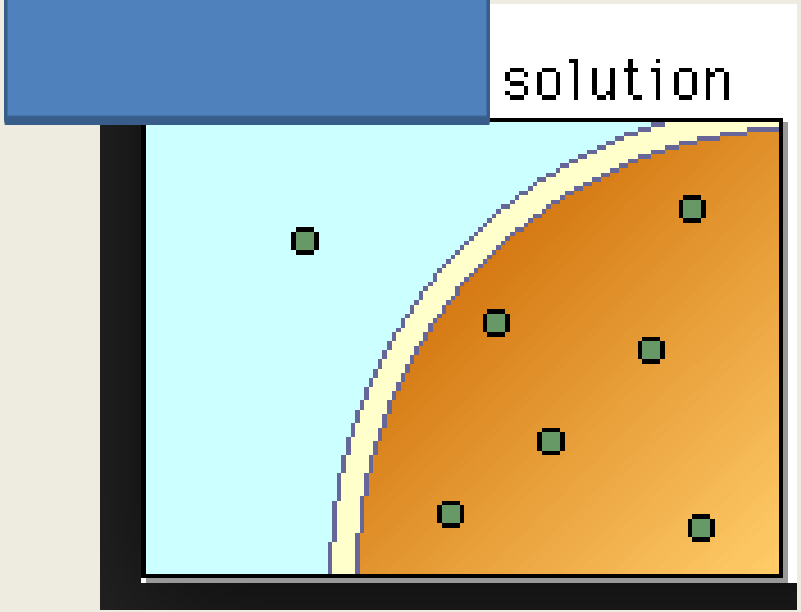
VID CITY BONUS – For the following, is the cell in a HYPOTONIC, ISOTONIC, or HYPERTONIC environment?!

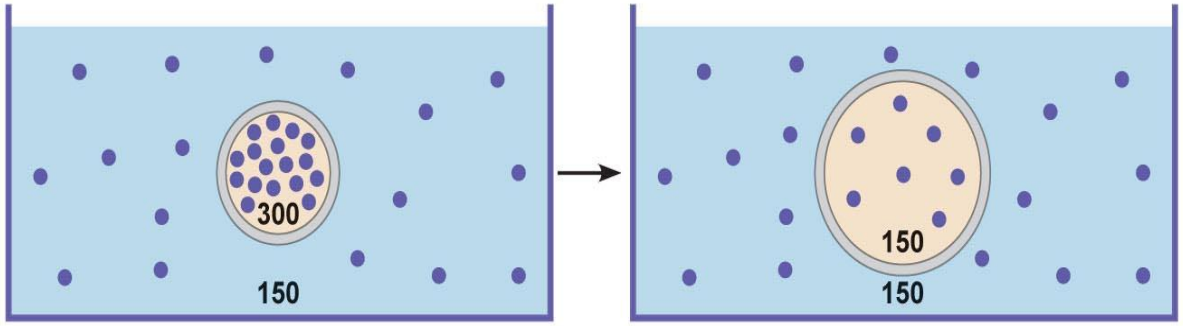


Cup: 70% Water
30% Solutes


Water
Solute

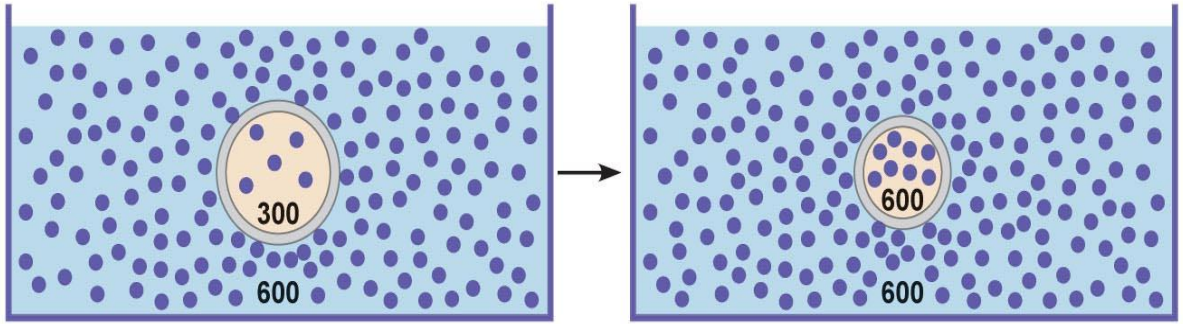

solution


solution



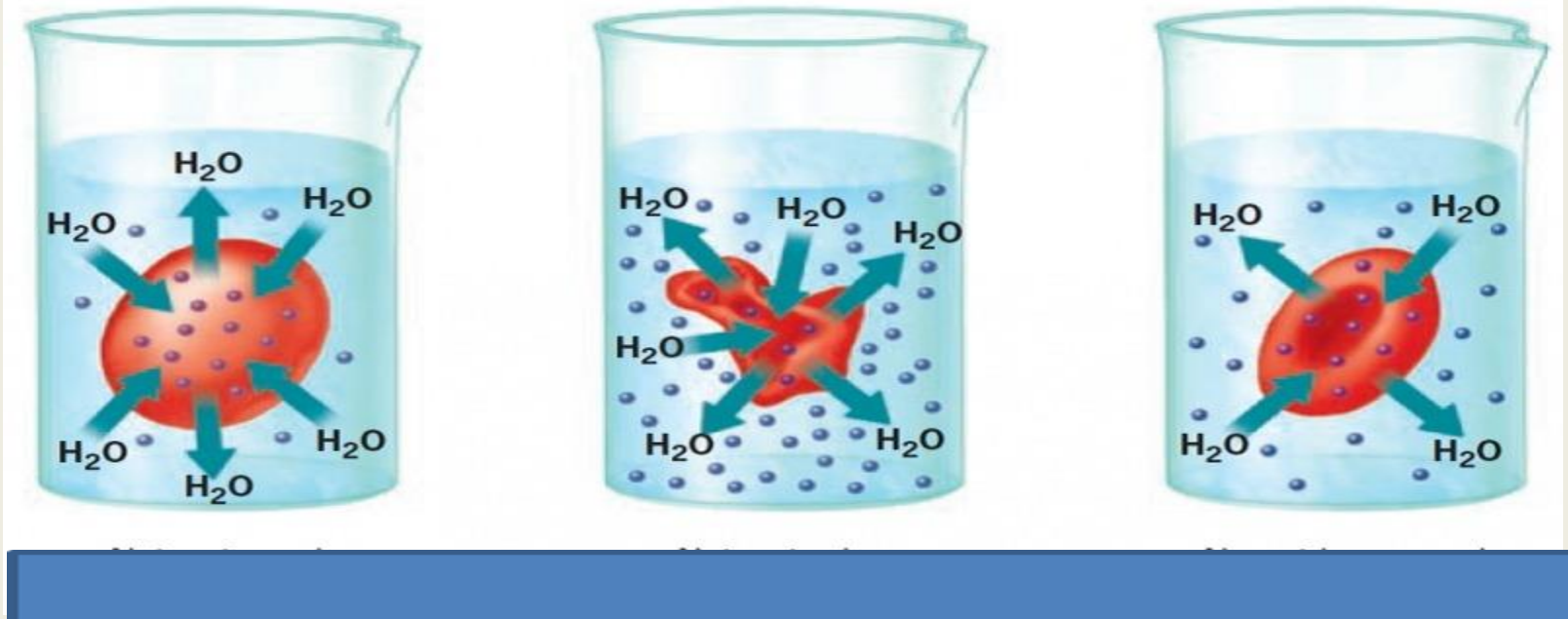
Cell volume = V_o Cell volume = $2V_o$

(a)



Cell volume = V_o Cell volume = $\frac{1}{2}V_o$

(b)


H_2O
H_2O
H_2O
H_2O
H_2O
H_2O
H_2O
H_2O
H_2O
H_2O
H_2O
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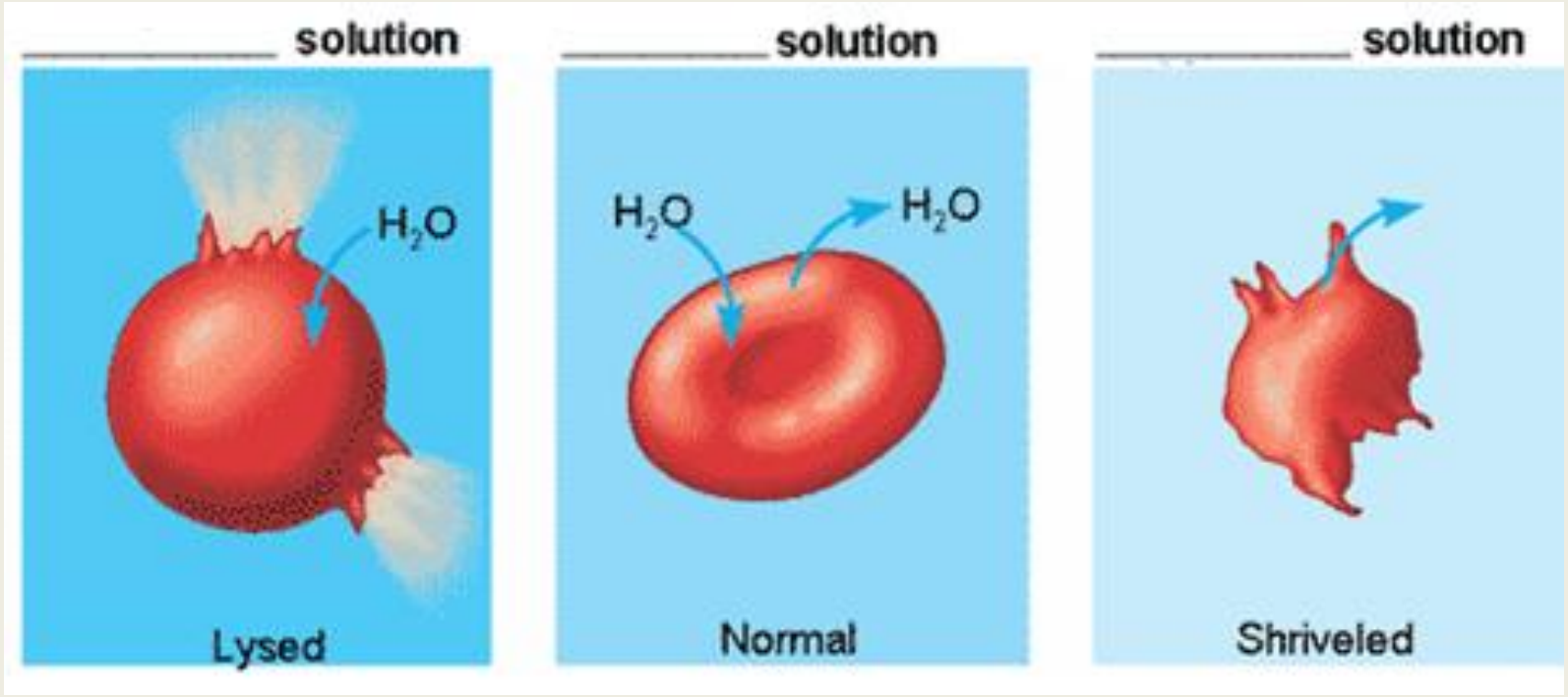
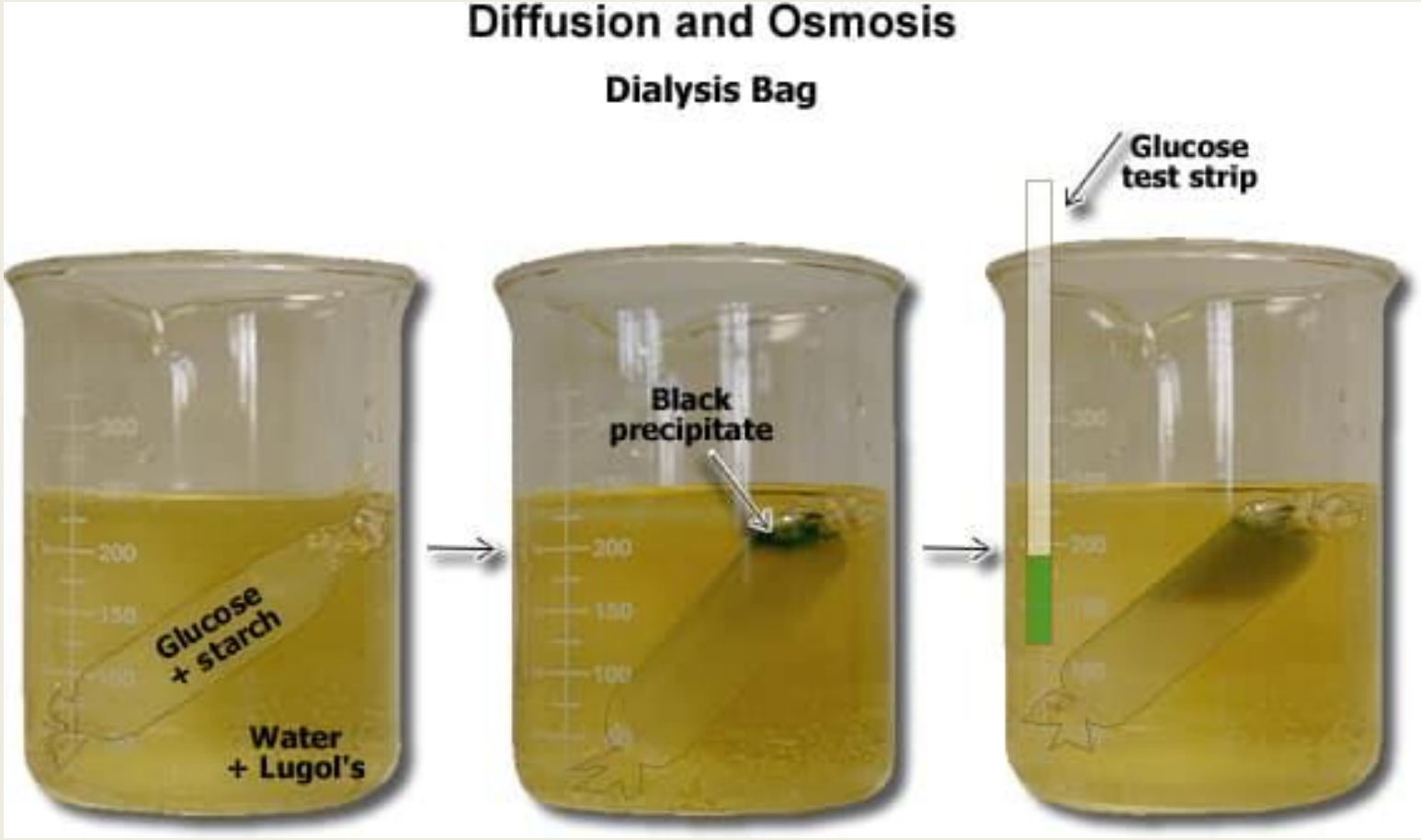
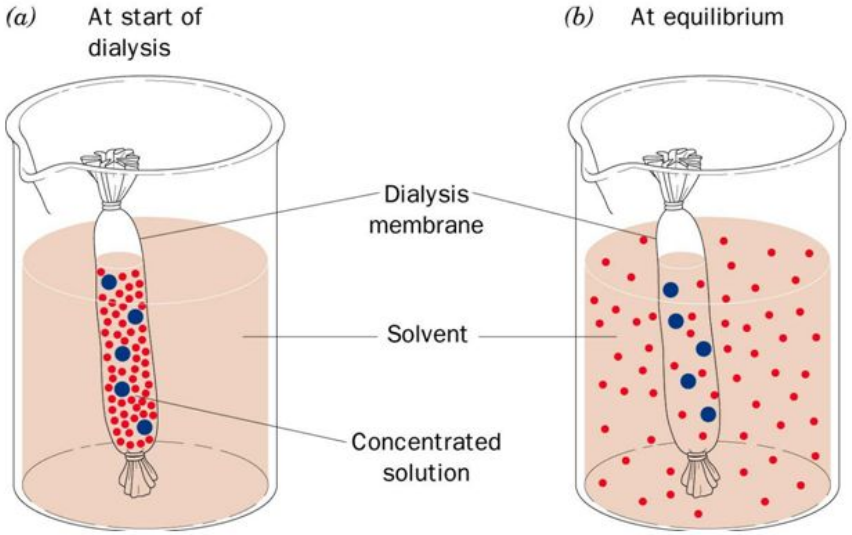
H_2O
H_2O
H_2O


_____ solution
H_2O
Lysed
_____ solution
H_2O
H_2O
Normal
_____ solution
Shriveled

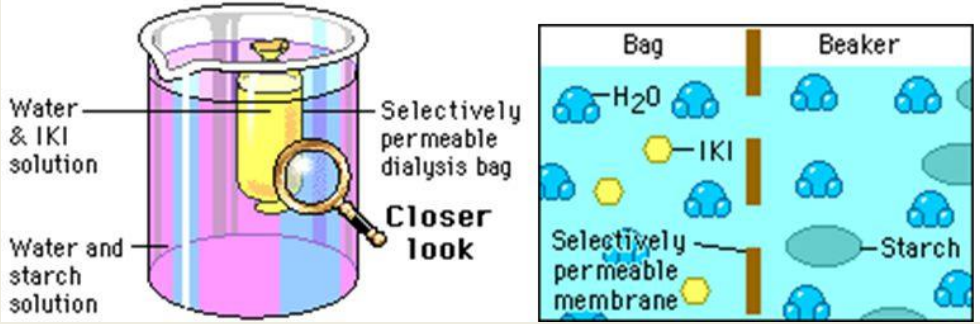
VID CITY BONUS – What's in the Dialysis Tubing; Iodine, Starch, or BOTH?


Diffusion and Osmosis
Dialysis Bag
Glucose test strip
Black precipitate
Glucose + starch
Water + Lugol's

- Glucose— Benedict's reagent (small)
- Starch— Iodine (large)



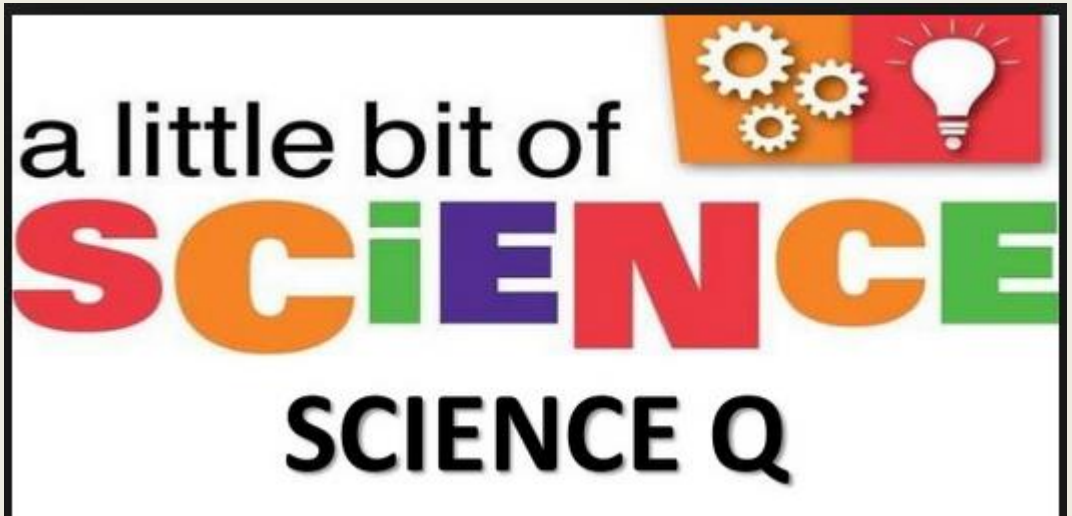
Diffusion & Osmosis



Vid City – HW Problems and Questions

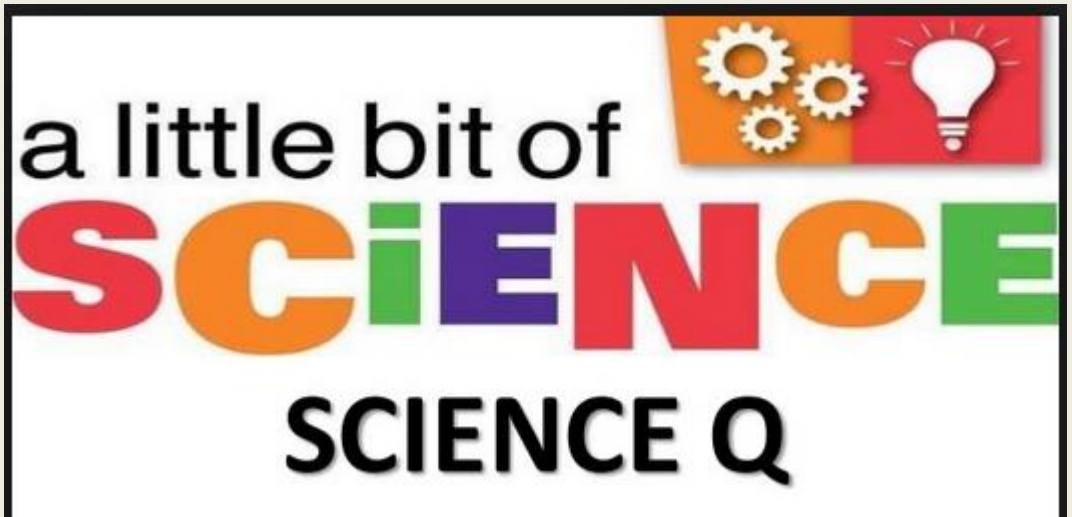
Bell 2 Bell

- We work what in this class?!?!?!
  - **BELL 2 BELL**
- Every single precious SECOND of academic instructional time is thus utilized in this classroom!
- You students will thus be vocally quizzed EVERY DAY until I DISMISS you at the end of class (with a positive greeting and a thank-you of course!).



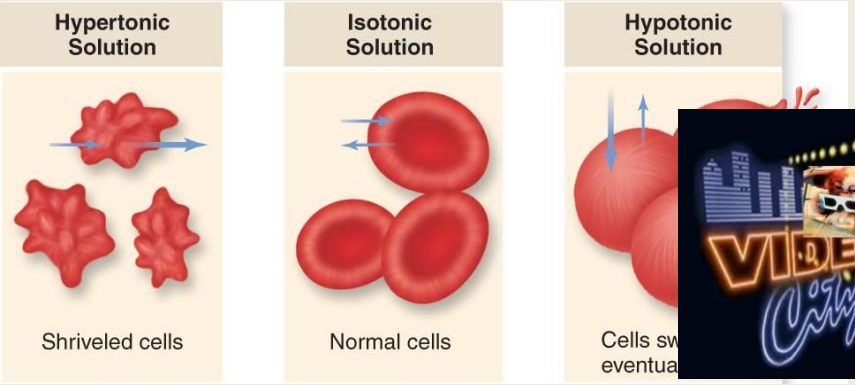
Bell 2 Bell

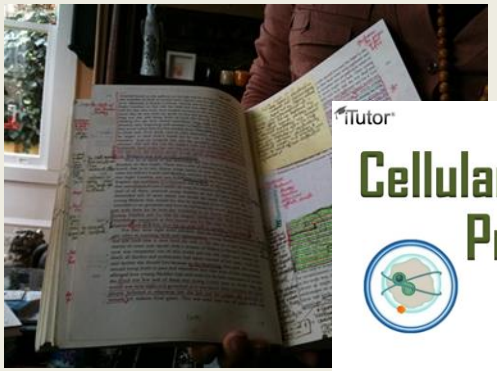
- We work **BELL 2 BELL** in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!

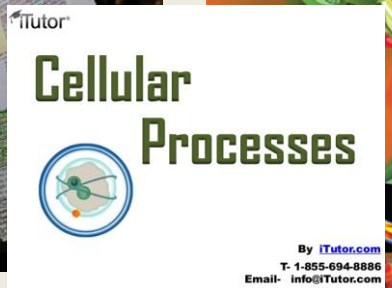


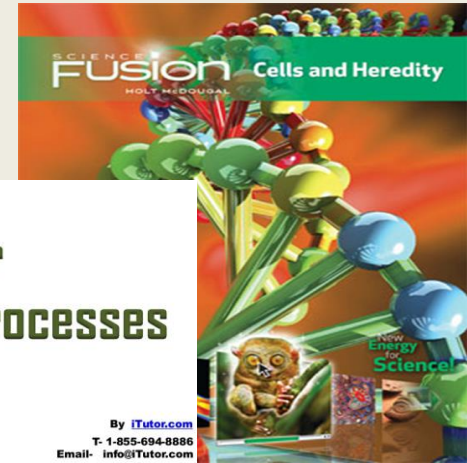
Tomorrow's Academic Objective and Plan

- Tomorrow you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!
- *HW = Read & DO Pg. 60-61 ± VID CITY HW Questions!









WEDNESDAY, FEBRUARY 21st

DO NOW

- In your notebooks, to be checked, solve this problem…

Know/Given: There are 3600 moles per hour in 1 mole per second, 60 moles per minute in 1 mole per second, and 1440 moles per day in 1 mole per minute. These are units of diffusion!

$$3600\frac{mol}{h} = 1\frac{mol}{s}$$

$$60\frac{mol}{min} = 1\frac{mol}{s} \qquad 1440\frac{mol}{day} = 1\frac{mol}{min}$$

Asked: How many moles per day are in 7200 moles per hour?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
   - Today's **QP** = Kidneys are organs designed to FILTER our blood. DESIGN and SKETCH a device that can filter the blood of someone without healthy kidneys!
2. Open books, WORK on today's **AO!**
3. ***HW** = STUDY FOR QUIZ + L00K at the Study Guide Slide and BRING ME YOUR QUESTIONS!

TODAY'S ACADEMIC OBJECTIVE

Today you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!

DO NOW – Units of Diffusion

- **Know/Given:** There are 3600 moles per hour in 1 mole per second, 60 moles per minute in 1 mole per second, and 1440 moles per day in 1 mole per minute. These are units of diffusion!

$$3600\frac{mol}{h} = 1\frac{mol}{s}$$

$$60\frac{mol}{min} = 1\frac{mol}{s} \qquad 1440\frac{mol}{day} = 1\frac{mol}{min}$$

- **Asked:** How many moles per day are in 7200 moles per hour?

What is KA^2 format? This is an example of a "1-pointer" on a DO NOW!

- **Know:**

$$3600\frac{mol}{h} = 1\frac{mol}{s},\ 60\frac{mol}{min} = 1\frac{mol}{s},\quad 1440\frac{mol}{day} = 1\frac{mol}{min}$$

$$\frac{3600\frac{mol}{h}}{1\frac{mol}{s}} = 1 \quad \frac{1\frac{mol}{s}}{3600\frac{mol}{h}} = 1 \quad \frac{60\frac{mol}{min}}{1\frac{mol}{s}} = 1 \quad \frac{1\frac{mol}{s}}{60\frac{mol}{min}} = 1 \quad \frac{1440\frac{mol}{day}}{1\frac{mol}{min}} = 1 \quad \frac{1\frac{mol}{min}}{1440\frac{mol}{day}} = 1$$

- **Asked:** How many moles per day are in 7200 moles per hour?
- **Answer:**

$$\mathbf{7200}\frac{\boldsymbol{\cancel{mol}}}{\boldsymbol{\cancel{h}}} * \frac{\mathbf{1}\frac{\boldsymbol{mol}}{\boldsymbol{s}}}{\mathbf{3600}\frac{\boldsymbol{\cancel{mol}}}{\boldsymbol{\cancel{h}}}} = \mathbf{2}\frac{\boldsymbol{\cancel{mol}}}{\boldsymbol{\cancel{s}}} * \frac{\mathbf{60}\frac{\boldsymbol{mol}}{\boldsymbol{min}}}{\mathbf{1}\frac{\boldsymbol{\cancel{mol}}}{\boldsymbol{\cancel{s}}}} = \mathbf{120}\frac{\boldsymbol{\cancel{mol}}}{\boldsymbol{\cancel{min}}} * \frac{\mathbf{1440}\frac{\boldsymbol{mol}}{\boldsymbol{day}}}{\mathbf{1}\frac{\boldsymbol{\cancel{mol}}}{\boldsymbol{\cancel{min}}}} = \mathbf{172,800}\frac{\boldsymbol{mol}}{\boldsymbol{day}}$$

DO NOW – Never Forget to Listen to Akila!

OH NO! Where in the World is Akila?!

- Students! LISTEN UP! Akila, the one-and-only mentor and friend of Mr. Floyd, has gone MISSING!!!
- Has he been kidnapped?! Or is this modest man simply on-the-run from his overbearing fame!?

OH NO! Where in the World is Akila?!

- All we do know is that the only CLUES we have to help us solve this mystery are these SCIENTIFIC RIDDLES!
- **CHIEF** Floyardee thus needs the help of his student scientist's SCIENTIFIC MINDS to CRACK THIS CODE!
- The first SCIENTIFIC RIDDLE we thus have to solve is…→

DO NOW – Translating and Concluding Our Answer!

- **Answer:**
- $7200\frac{\cancel{mol}}{\cancel{h}} * \frac{1\frac{mol}{s}}{3600\frac{\cancel{mol}}{\cancel{h}}} = 2\frac{\cancel{mol}}{\cancel{s}} * \frac{60\frac{mol}{min}}{1\frac{\cancel{mol}}{\cancel{s}}} = 120\frac{\cancel{mol}}{\cancel{min}} * \frac{1440\frac{mol}{day}}{1\frac{\cancel{mol}}{\cancel{min}}} = 172,800\frac{mol}{day}$

- **Translate and Conclude:** Students, you just did a MULTI-STEP, FRACTIONAL UNIT CONVERSION!!! The Chef MUST provide his student scientists with CHALLENGE!!!
- **$ci Fact** → Many factors affect the rate at which particles diffuse! One often overlooked factor is the “medium” aka STUFF the particles are diffusing in! VISCOSITY is another factor as well!

Factors Affecting Diffusion Rate

Temperature	• Higher temperature → Diffuse Faster
Surface Area	• Larger surface → Diffuse Faster
Concentration Gradient	• Higher Gradient → Diffuse faster
Size of Particles	• Smaller particles → Diffuse faster
Diffusion Medium	• Solid → Slowest • Liquid → Faster • Gas → Fastest

Material	Viscosity
Water	1-5 cps
Blood	10 cps
Corn Syrup	50-100 cps
Maple Syrup	150-200 cps
Castor Oil	250-500 cps
Honey	2-3,000 cps
Molasses	5-10,000 cps
Chocolate Syrup	10-25,000 cps
	50-70,000 cps
	150-200,000 cps
	1-2,000,000 cps

Viscosity unit

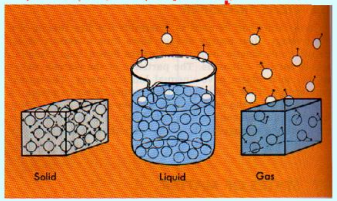
- Viscosity has the dimensions of $ML^{-1}T^{-1}$
- In units
  - CGS: poise or centipoise (cp)
  - SI : Pa·s = 1000 m Pa·s
  - kinematic viscosity in centistokes (cSt)
- Conversions
  - 1000 m Pa·s = 1 Pa·s = 1Ns/m²
  - 100 cP = 0.1 Pa·s = 100 m Pa·s =1 dyne·s/cm²

$\frac{mol}{day}$

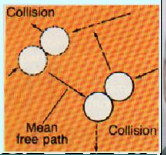
Viscosity

- viscosity: the resistance of a fluid to flowing and movement
  - we say a thick fluid has high viscosity, or is very viscous
  - we say a thin fluid has low viscosity

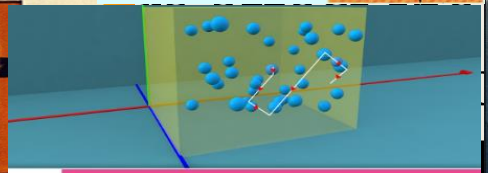
Solid, Liquid, Gas



The *mean free path* of a molecule is the distance it travels between collisions.



Les petits dossiers des Copains d'abord



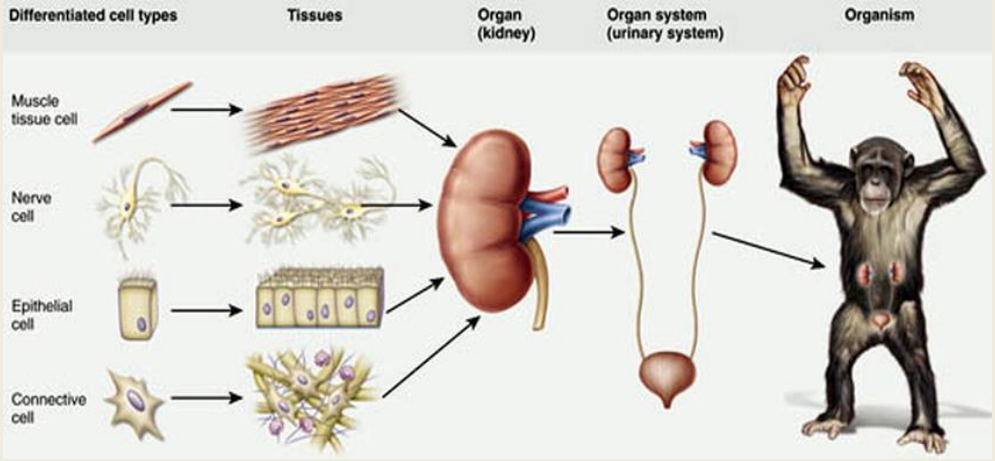
MEAN FREE PATH

medium" aka

Today's Qualitative Prompt

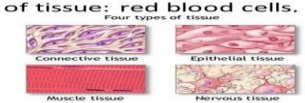
Kidneys are organs designed to FILTER our blood. DESIGN and SKETCH a device that can filter the blood of someone without healthy kidneys!

- Students, recall that ORGANS are specialized structures composed of TISSUES, groups of similar CELLS that perform a common function!

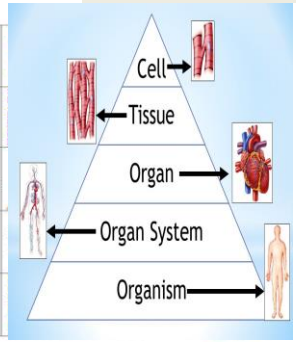


Tissues

- A tissue is a group of cells working together to perform a specific job in the body. The material around and between the cells is also part of the tissue.
  - Examples of tissue: red blood cells, fat, and muscle



Cell	Basic structural and functional unit of a living organism
Tissue	Group of cells with similar structures, working together to perform a shared function
Organ	Structure made up of a group of tissues, working together to perform specific functions
Organ System	Group of organs with related functions, working together to perform body functions
Organism	Living thing performing all seven life processes

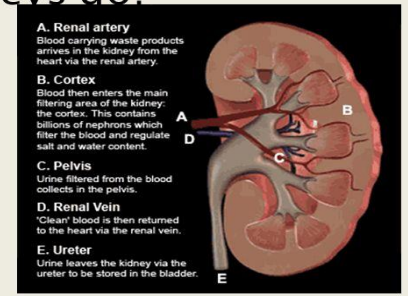


Today's Qualitative Prompt

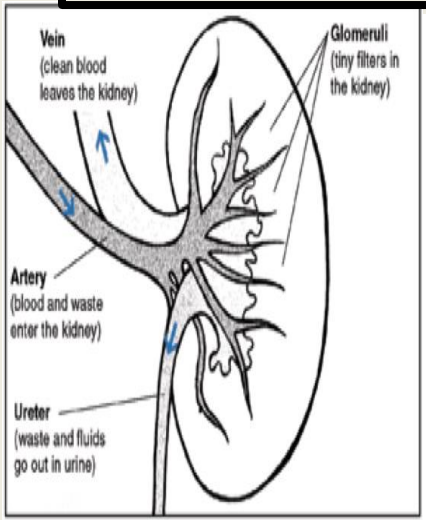
Kidneys are organs designed to FILTER our blood. DESIGN and SKETCH a device that can filter the blood of someone without healthy kidneys!

- The human kidney is an organ, and its FUNCTION is to filter out and help remove WASTES from your blood and body!

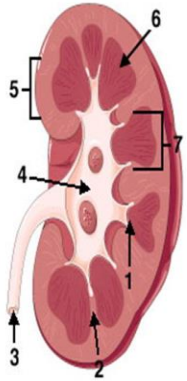
What do the kidneys do?



1. remove toxic waste products
2. remove excess water and salts
3. take part in controlling your blood pressure
4. produce erythropoietin (epo for short) which stimulates red cell production from the bone marrow - you get anaemic without this
5. help to keep calcium and phosphate in balance for healthy bones
6. maintain the blood in a neutral (non-acid) state



How do the Kidneys aid in the removal of wastes?



- Produce urine and regulate water/salt balance in the blood.
- ****major organ of the excretory system****

Today's Qualitative Prompt

Kidneys are organs designed to FILTER our blood. DESIGN and SKETCH a device that can filter the blood of someone without healthy kidneys!

- However, some individuals do not have properly functioning kidneys! They thus must use "dialysis" techniques to externally filter their blood with the help of a SEMI-PERMEABLE MEMBRANE!

What is dialysis?

Dialysis involves diverting the blood through an 'artificial kidney' machine that cleans it and returns it to the body.

What happens during kidney dialysis?

1. A tube is connected to a vein in the patient's arm.
2. The patient's blood flows along the tube, into the machine.
3. Inside the machine, the blood is pumped through semi-permeable tubes surrounded by dialysis fluid. Dialysis fluid contains sodium, magnesium, calcium chloride and potassium chloride and sodium acetate, in the same concentrations as the blood plasma of a healthy person.

di·al·y·sis

/dīˈaləsəs/

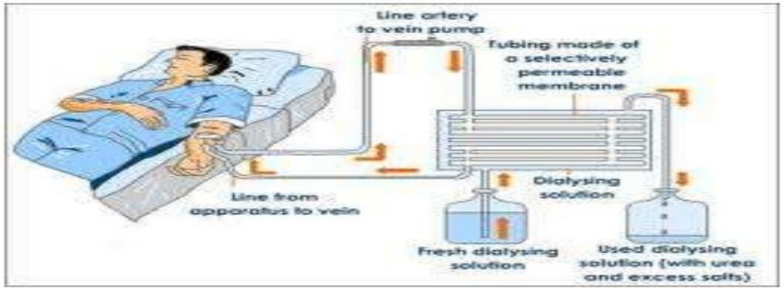
noun CHEMISTRY

the separation of particles in a liquid on the basis of differences in their ability to pass through a membrane.

- MEDICINE

the clinical purification of blood by dialysis, as a substitute for the normal function of the kidney.

Dialysis



Today's Qualitative Prompt

Kidneys are organs designed to FILTER our blood. DESIGN and SKETCH a device that can filter the blood of someone without healthy kidneys!

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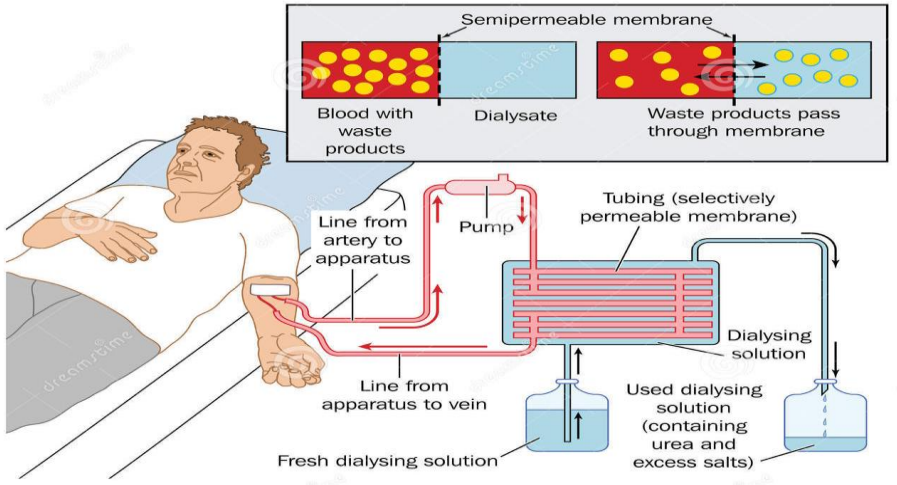
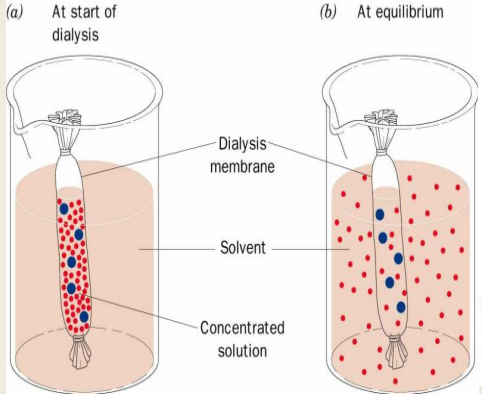


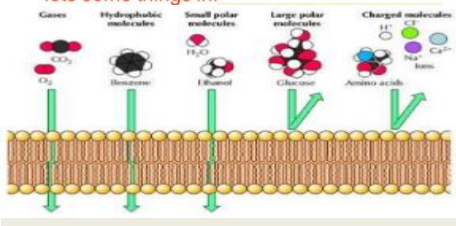
What is dialysis tubing?

- **Dialysis tubing** is a type of semi-permeable membrane tubing used in the separation of molecules from the blood during dialysis



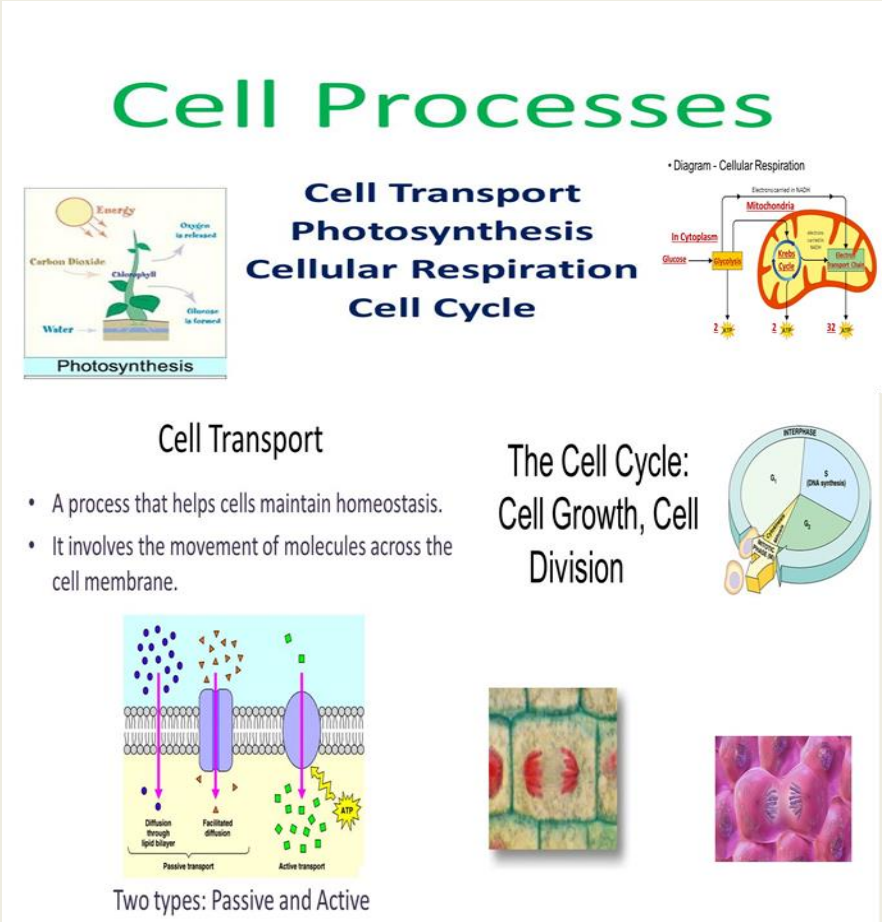
Semipermeable Membrane

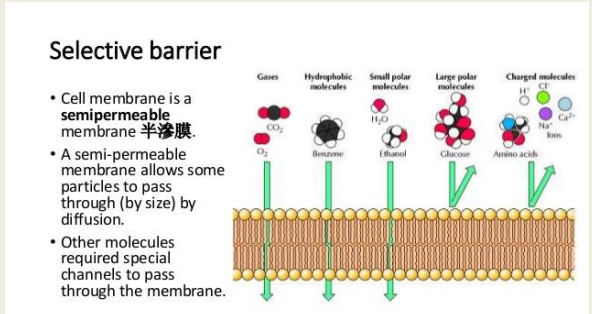
- The Cell Membrane is a **Semipermeable membrane** – it keeps some things out and lets some things in.



Today's Qualitative Prompt – Today's Big Scientific ?

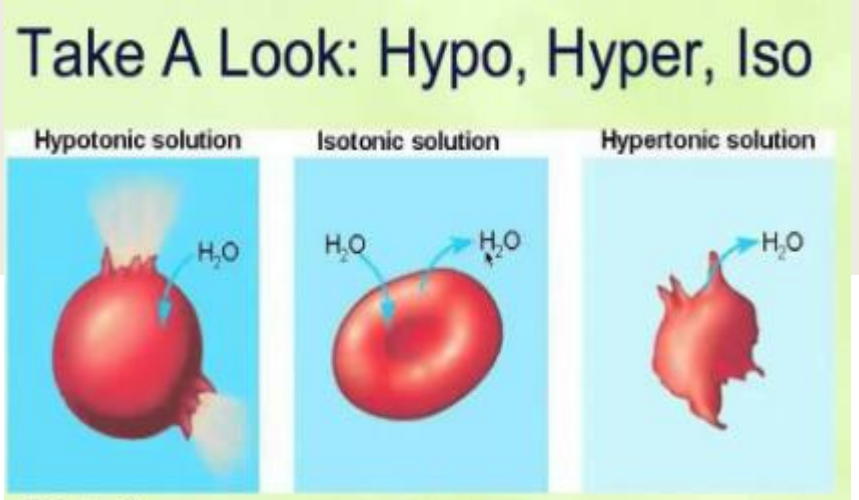
- So! We want to know!
- How can we REINFORCE our knowledge of cell processes in order to DESCRIBE what happens to cells as their environment changes!!!

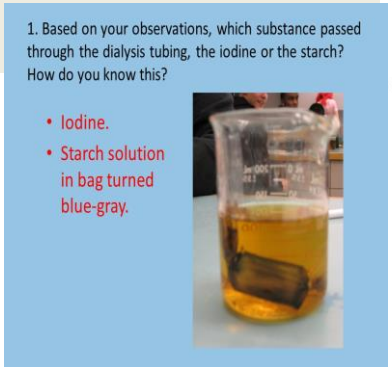


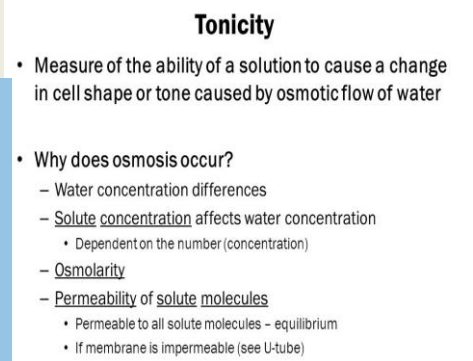


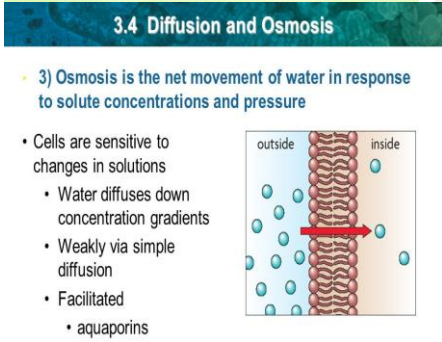
Today's Qualitative Prompt – Today's Big Scientific ?

- Today our big scientific problem to solve is THUS going to be how we as student scientists can FIGURE OUT how to PREDICT how cells change as their surroundings vary!
- **GET EXCITED!**







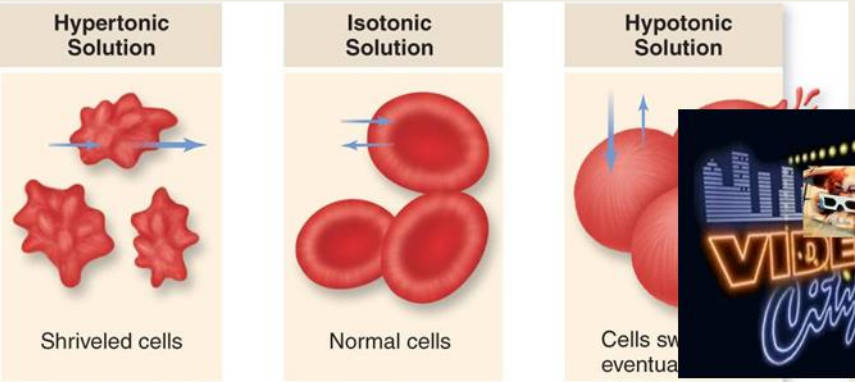


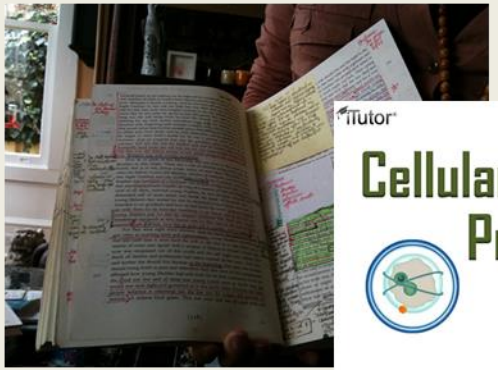
Today's Academic Objective and Standards

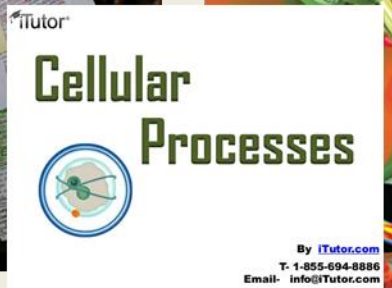
- Today you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!
- Standards Met: 3.1.B.A9, 3.1.B.A1, 3.2.7.A6, 3.1.7.A1, 3.4.7.C2, 3.4.7.D2, CC.2.1.7.E.1, CC.2.2.7.B.3, **NGSS** Standard - MS-LS1-1.

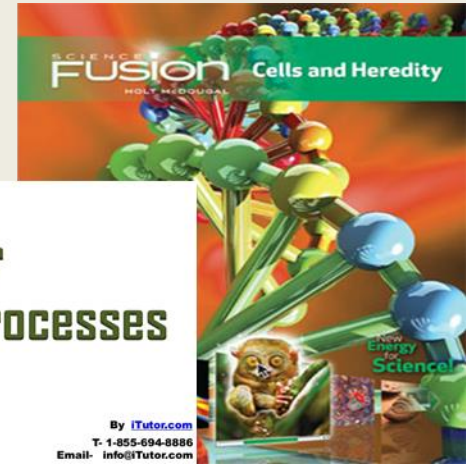
Yesterday's Homework Review

- ***HW** = Read & DO Pg. 60-61 ± VID CITY HW Questions!
  - SO! Let's review WHAT, WHY, and HOW cells survive in their environments!?!



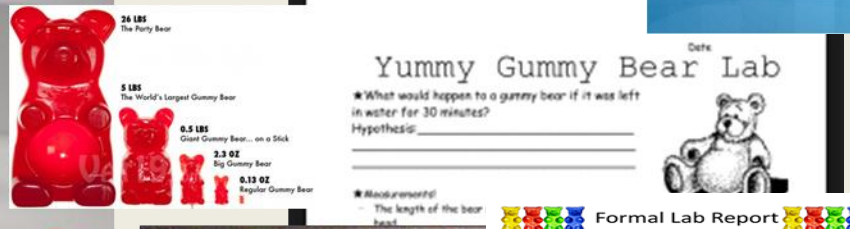


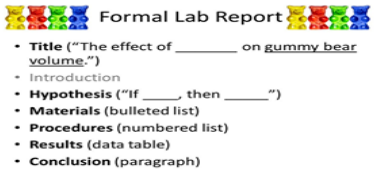




Yesterday's Homework Review

- ***HW** = Bring-In's LAB REPORT **(DUE THE DAY OF OUR QUIZ)!!!**
  - So! What gummy conclusions did you make?!





Bring-In's Lab – Formal Lab Report Write Up

- Students, Listen UP UP UP! You will be required to WRITE a formal, 1-page Lab Report for our Bring-In's Lab!
- This will be submitted along with your QUIZ, and the REQUIREMENTS can be viewed below!

Formal Lab Report

- **Title** ("The effect of _____ on gummy bear _____")
- Introduction
- **Hypothesis** ("If ____, then _____")
- **Materials** (bulleted list)
- **Procedures** (numbered list)
- **Results** (data table)
- **Conclusion** (paragraph)

Conclusion:

*Should refer back to hypothesis
Was it right or wrong?
*Use data to explain how you know if it is right or wrong
*How can this lab be related to everyday life?
Why would scientists do this lab?
*Experimental errors
No one is perfect!
Explain what went wrong even if it didn't affect the outcome of the experiment

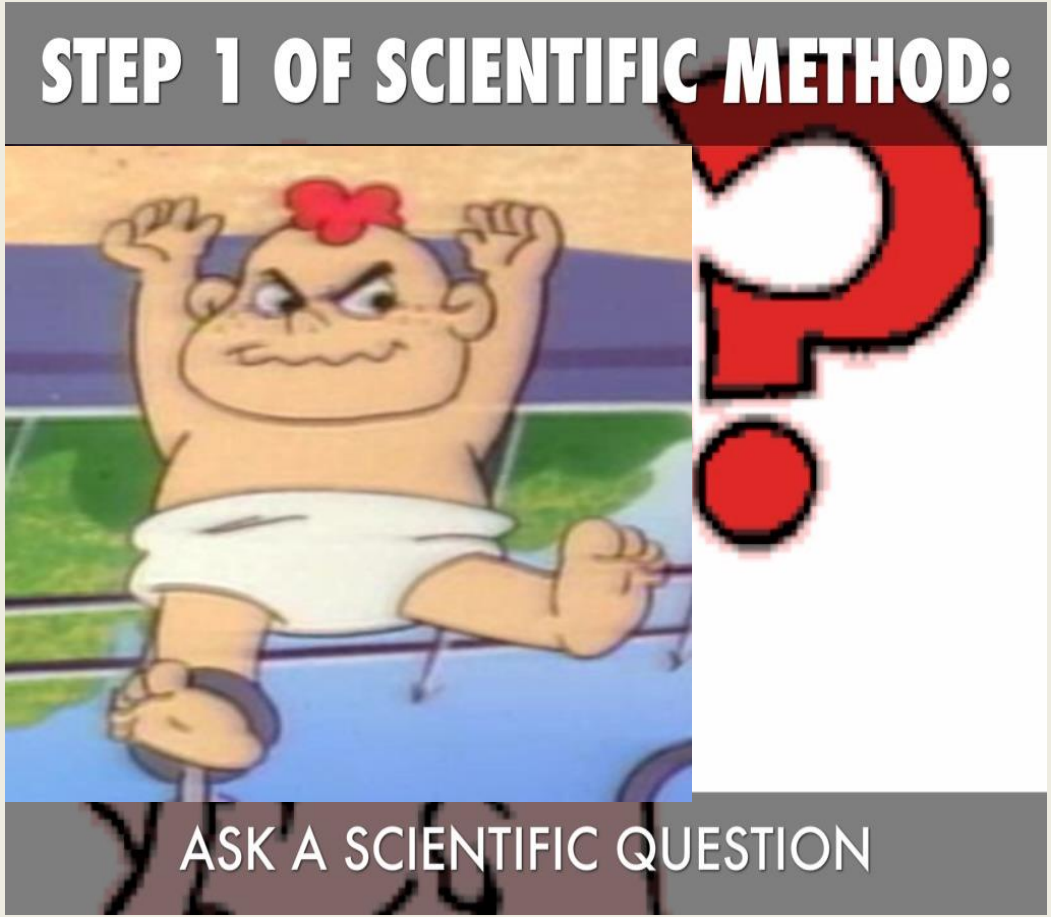
Study Guide Slide – Cell Processes Quiz

- **Students must KNOW:**
  1. What is Homeostasis, and what conditions have to be met for a Cell to be in this state?
  2. What are the two main types of Cell Transport?
  3. What is the difference between a Hypotonic, Isotonic, and Hypertonic Solution AND Cell?
  4. Which organelle is mainly responsible for Endocytosis and Exocytosis, and what structure does it use to perform these transport processes?
  5. How does the rate of diffusion change with temperature?

- **Students must be able to DO:**
  1. List and define 2 examples of Passive Transport.
  2. List and define 2 examples of Active Transport.
  3. List 3 real world examples of Diffusion.
  4. Describe what the human body does to maintain Homeostasis.
  5. Draw environments with varying solute concentration and show/describe what happens to a cell placed in this environment.
  6. Understand how the concept of a “Semi-permeable membrane” was on display during “The Osmosis and Diffusion Lab”.

Today's Big Scientific ?

- Today's Big Scientific Question =
- How can we REINFORCE our knowledge of cell processes in order to DESCRIBE what happens to cells as their environment changes!!!



Learning About Cell Environments: Let's Get Active!

- So! Before we learn more about how the ENVIRONMENT of a cell affects its ability to perform the PROCESSES it needs to do to maintain HOMEOSTASIS, we need to REINFORCE and REVIEW our understanding of how cells FUNCTION!
- We thus need to "HEAD DOWN to **GAME-TOWN**"!!@!

Accomplishing Today's AO = Game-Town

- In order to accomplish today's Academic Objective we will be heading down to "Game-Town" to help us review and reinforce the many processes cells perform!
- GET EXCITED…BECAUSE SOME BLUE COULD BE AT *STEAK*!
- **TODAY'S CHOSEN GAME SHOW WILL NOW LAUNCH OFF IN 4…3…2…1…!**


4


$100,000
THE
$100,000
PYRAMID
RULES/CREDITS
HOW TO PLAY/EDIT
GAME SETTINGS
BEGIN GAME

GAME SETTINGS

ROUND TIMER
(in seconds)

1

FINAL PYRAMID TIMER
(in seconds)

1

LEFT TEAM

The Red Herrings

RIGHT TEAM

The Akila Captors

RESET TO DEFAULT VALUES

CREDITS

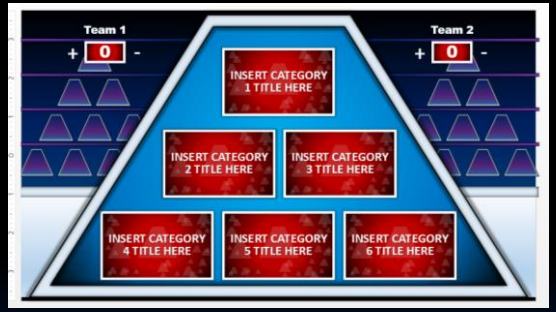
BACK

ABOUT GAME

ROUND SLIDE | CATEGORY SLIDE | WINNER'S CIRCLE

HOW TO PLAY

- Click on the Team Name to indicate the Team that is ready to play. The Team Name in yellow is selected to play the round.
- After you select the Team ready to play, then click on one of the available six categories.
- Already selected categories will be replaced by a pyramid shape.
- There are + and – buttons to modify team score by the current round's increment (by 1 or 2)



HOW TO EDIT

- Select a square and replace the text.
- Try to keep these attention grabbing headings short, sweet, related to your category.

CAUTION

Modifying anything other than the text mentioned above can and will disrupt gameplay. This includes but not limited to moving or deleting shapes or slides.

BACK

GAME RULES

ABOUT • This is a game where teams of 2 take turns giving clues for their teammate to guess as many words within the time limit. There are 2 rounds, 6 categories per round. Each team is given 30 seconds per category to correctly guess 7 words.

STARTING • Flip a coin to determine which team goes first and gets to choose their first category. Play then continues by the other team choosing a category and playing.

ILLEGAL CLUES • Any player giving illegal clues will have that word disqualified and move to the next word in the category. Illegal clues are as follows: Clues that contain any part of the word, clues that begin “Starts with _” or “Rhymes with _”

PASSING • If a player has a hard time giving clues, or guessing clues, either player can pass a word, and can return to it if time allows.

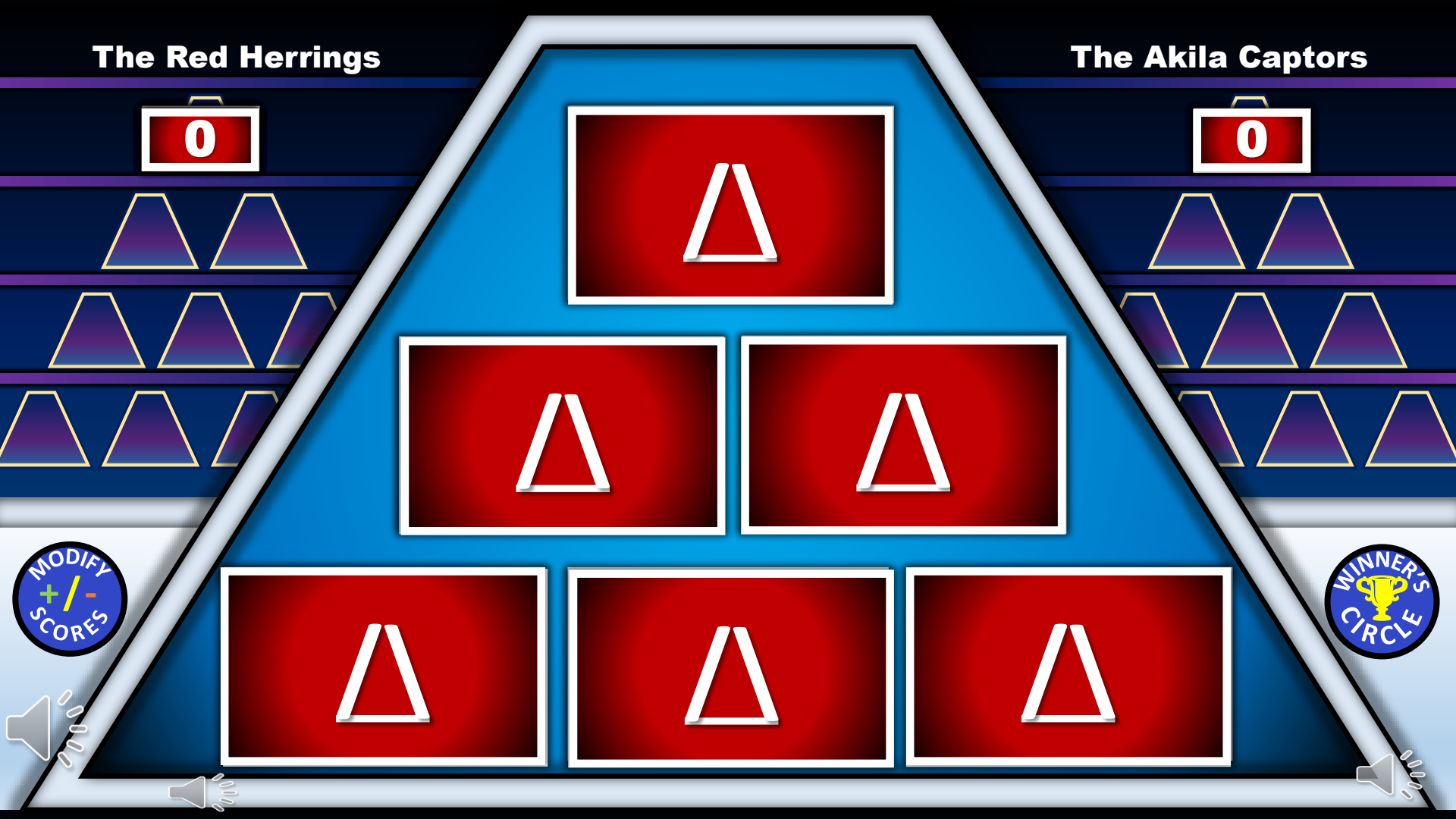
WINNING • The team with the most points at the end of each round will then proceed to the Winner’s Circle.

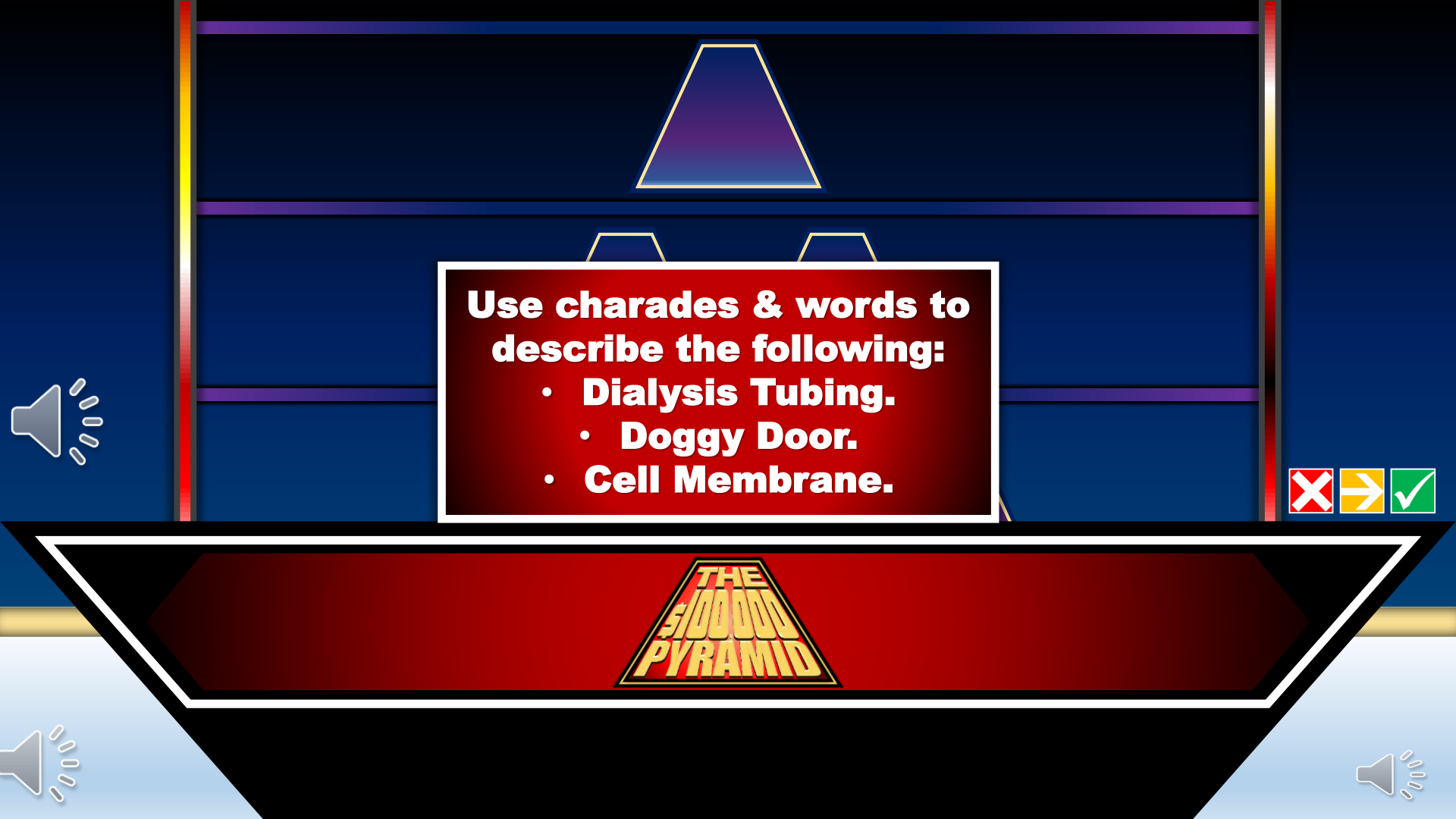
WINNER’S CIRCLE • Gameplay is reversed in the Final Pyramid. The player giving clues must list off clues so that their teammate can guess the category. The Clue giver may not use their hands, and must give their clues as a list of items, not descriptions.

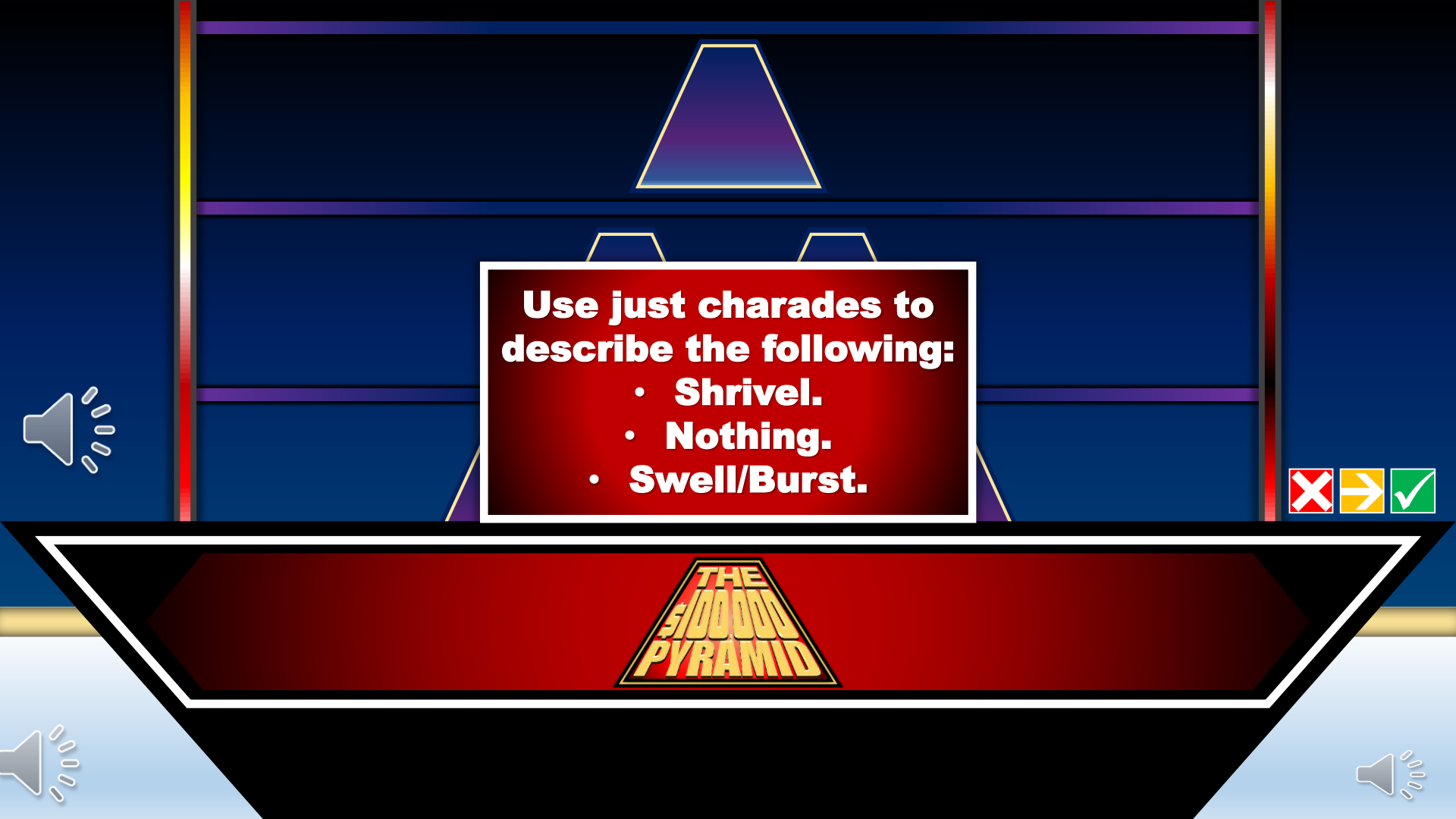
CREDITS

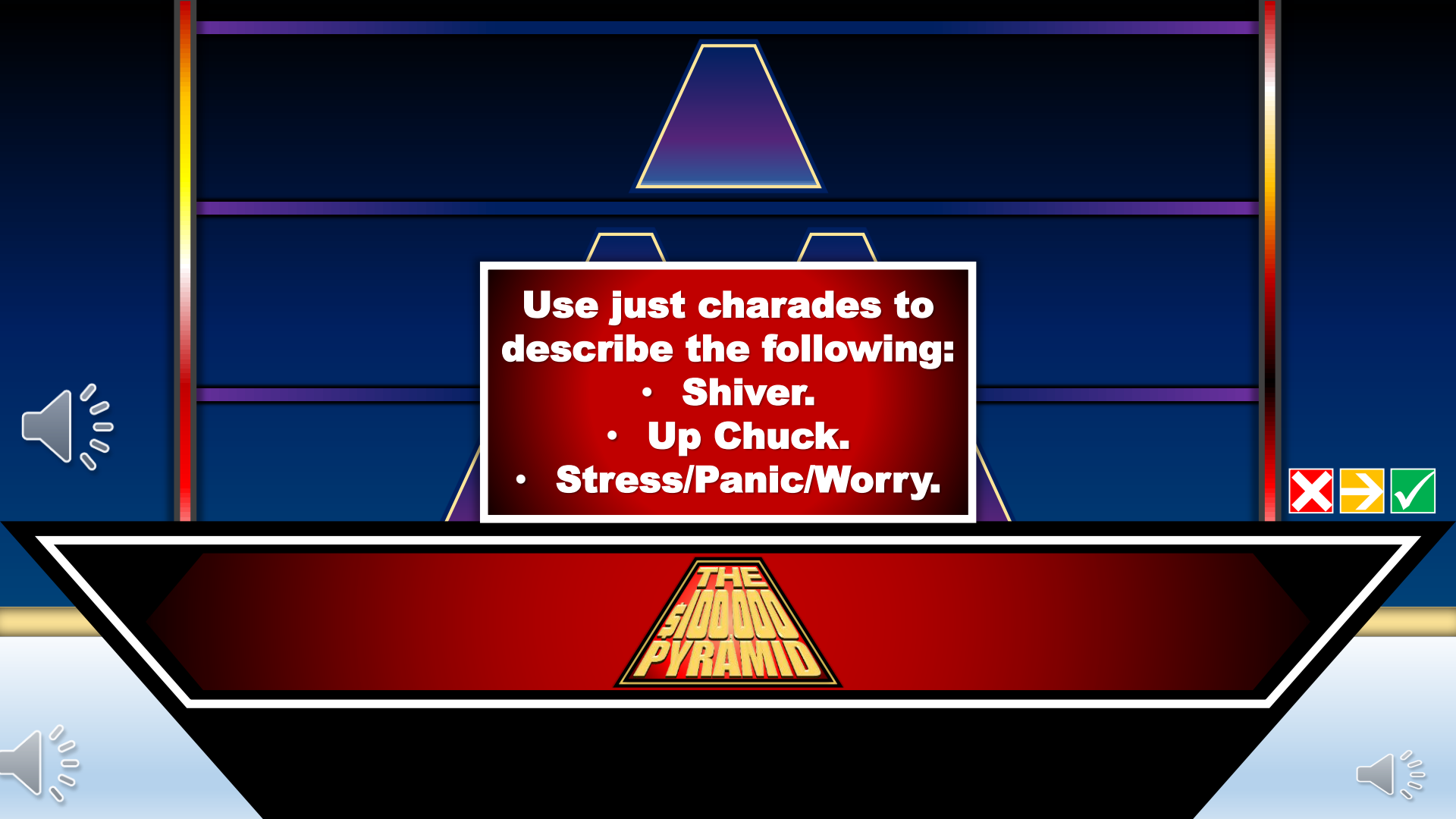
This is an unofficial $100,000 Pyramid Game. Official Site: http://abc.go.com/shows/the-100000-pyramid

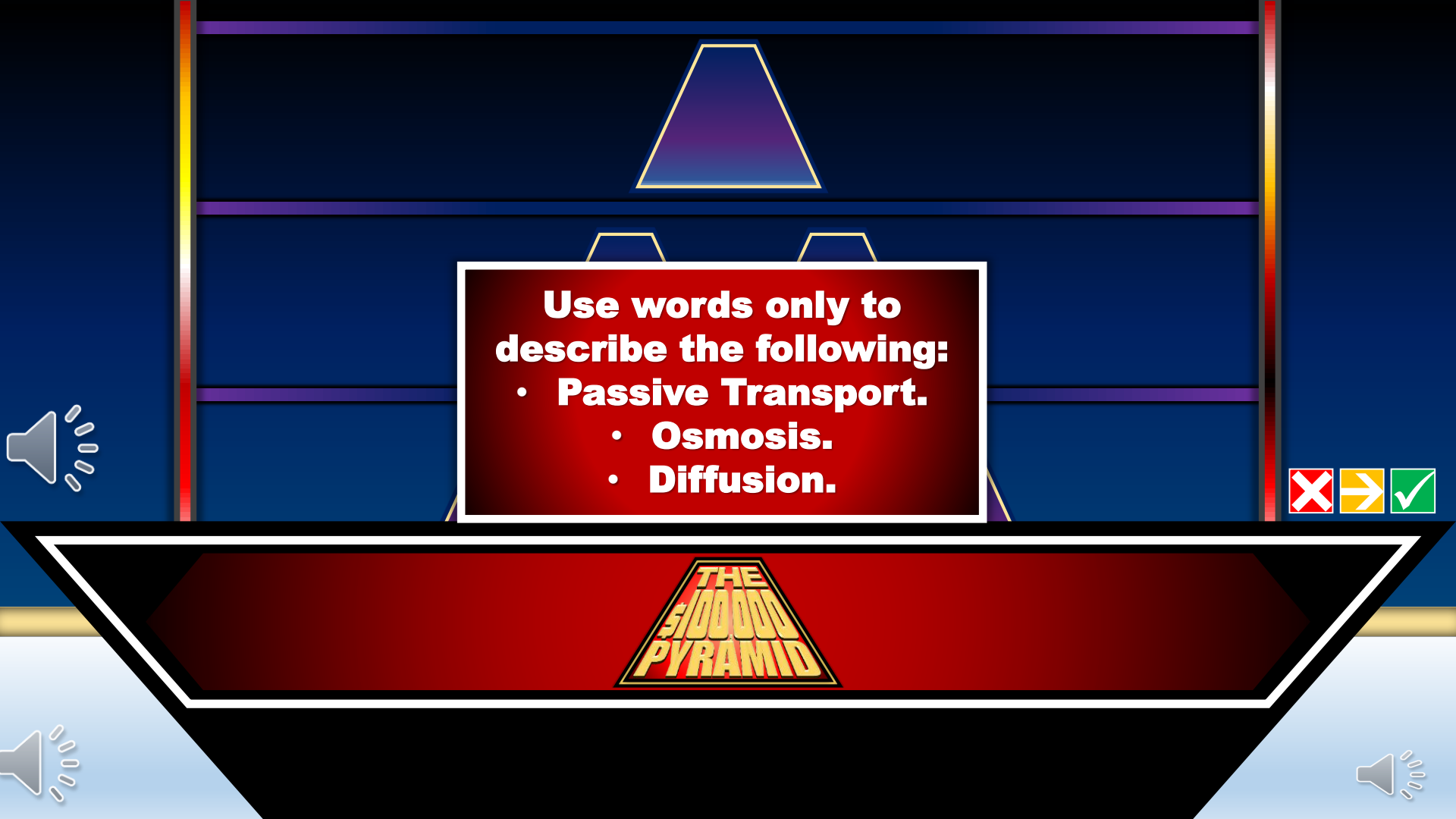
BACK


The Red Herrings
0
The Akila Captors
0
MODIFY
+/-
SCORES
WINNER'S
CIRCLE


Use charades & words to describe the following:
• Dialysis Tubing.
• Doggy Door.
• Cell Membrane.
THE $100,000 PYRAMID

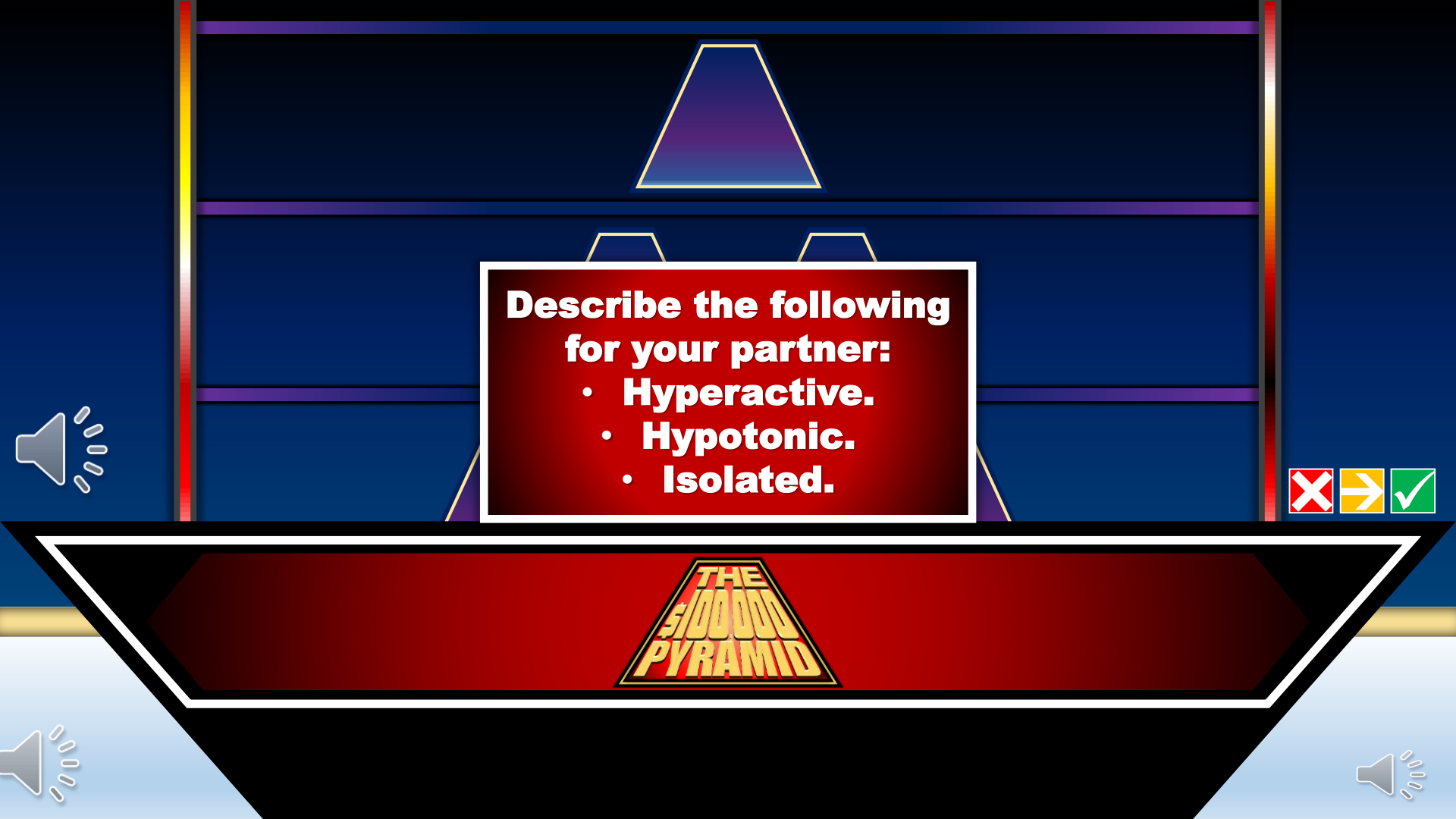

Use just charades to describe the following:
• Shrivel.
• Nothing.
• Swell/Burst.
THE $100,000 PYRAMID


Use just charades to describe the following:
• Shiver.
• Up Chuck.
• Stress/Panic/Worry.
THE $100,000 PYRAMID


Use words only to describe the following:
• Passive Transport.
• Osmosis.
• Diffusion.
THE $100,000 PYRAMID

Describe the following for your partner:

- Hyperactive.
- Hypotonic.
- Isolated.




Describe the following to your partner in words:
• Active Transport.
• Endocytosis.
• Exocytosis.
THE $100,000 PYRAMID

Winners' Circle

1:00

/???\

/What is Diffusion?\

/What is Osmosis?\

/What will happen to a Hypotonic Cell in a Hypertonic Solution?\

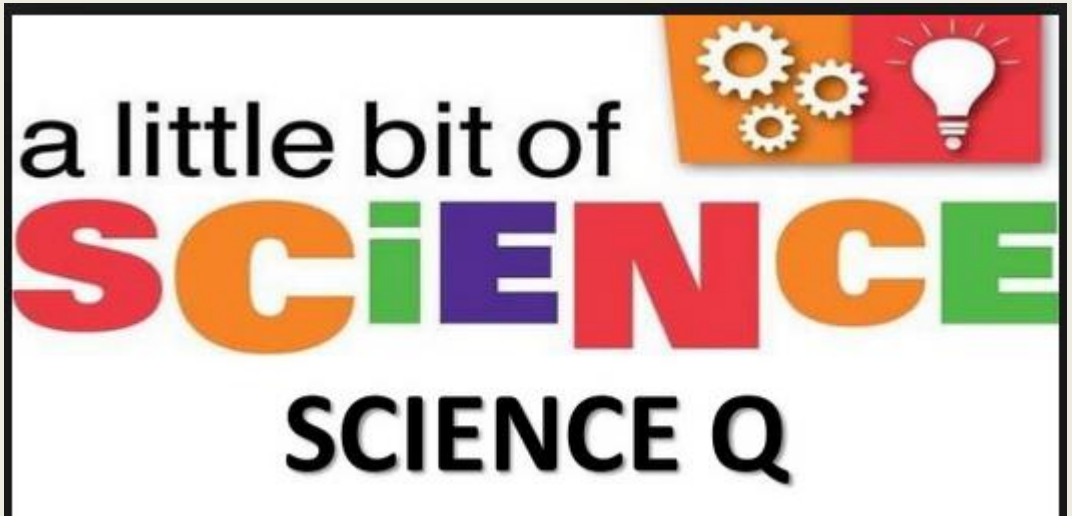
/What Organelle Creates Vesicles for Active Transport?\

/What will happen to a Hypertonic Cell in a Hypotonic Solution?\


$100,000
THE
$100,000
PYRAMID
THANKS FOR PLAYING!

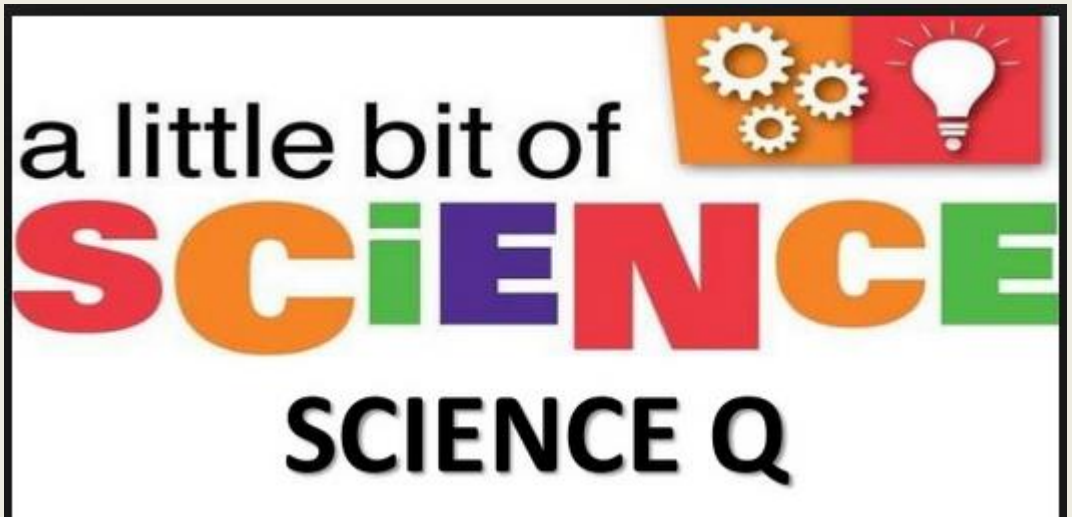
Bell 2 Bell

- We work what in this class?!?!?!
  - **BELL 2 BELL**
- Every single precious SECOND of academic instructional time is thus utilized in this classroom!
- You students will thus be vocally quizzed EVERY DAY until I DISMISS you at the end of class (with a positive greeting and a thank-you of course!).



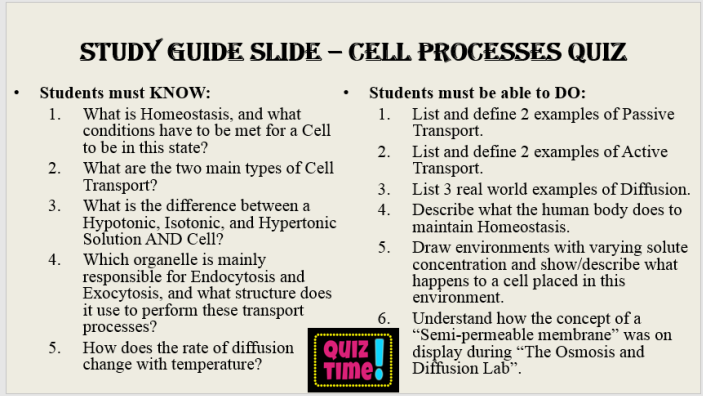
Bell 2 Bell

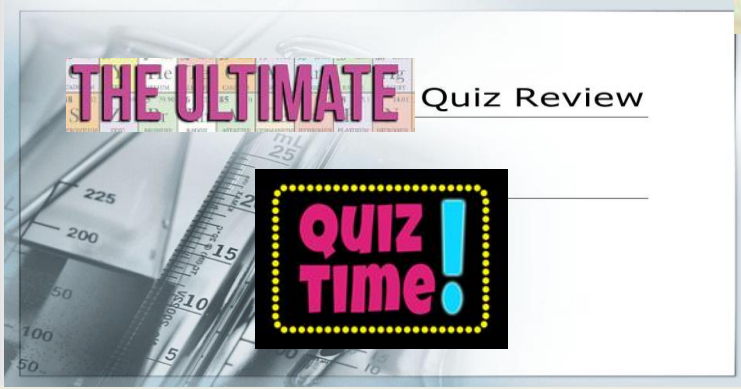
- We work **BELL 2 BELL** in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!

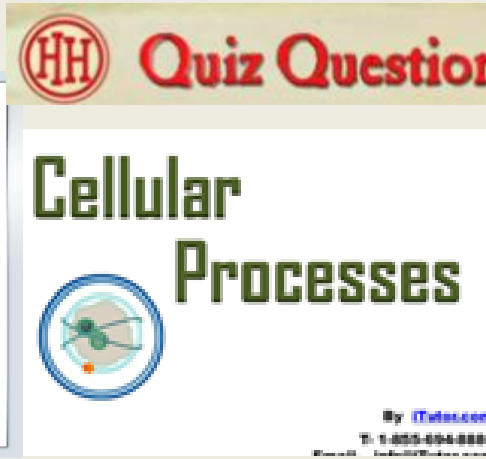


Tomorrow's Academic Objective and Plan

- Tomorrow you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!
- *HW = STUDY FOR QUIZ + L∞K at the Study Guide Slide and BRING ME YOUR QUESTIONS!







THURSDAY, FEBRUARY 22nd

DO NOW

- In your notebooks, to be checked, solve this problem…

Know/Given: There are 3600 moles per hour in 1 mole per second, 60 moles per minute in 1 mole per second, and 1440 moles per day in 1 mole per minute. These are units of diffusion!

$$3600\frac{mol}{h} = 1\frac{mol}{s}$$

$$60\frac{mol}{min} = 1\frac{mol}{s} \qquad 1440\frac{mol}{day} = 1\frac{mol}{min}$$

Asked: How many moles per hour are in 86,400 moles per day?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
   - Today's **QP** = QP LAB REVIEW = DRAW which substances MOVED into and out of the DIALYSIS TUBING, and EXPLAIN how the tubing is like a real cell!
2. Open books, WORK on today's **AO!**
3. ***HW** = STUDY FOR QUIZ + FINISH BRING-IN'S LAB REPORT!

TODAY'S ACADEMIC OBJECTIVE

Today you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!

DO NOW – Units of Diffusion

- **Know/Given:** There are 3600 moles per hour in 1 mole per second, 60 moles per minute in 1 mole per second, and 1440 moles per day in 1 mole per minute. These are units of diffusion!

$$3600\frac{mol}{h} = 1\frac{mol}{s}$$

$$60\frac{mol}{min} = 1\frac{mol}{s} \qquad 1440\frac{mol}{day} = 1\frac{mol}{min}$$

- **Asked:** How many moles per hour are in 86,400 moles per day?

What is KA^2 format? This is an example of a "1-pointer" on a DO NOW!

- **Know:**

$$3600\frac{mol}{h} = 1\frac{mol}{s},\ 60\frac{mol}{min} = 1\frac{mol}{s},\quad 1440\frac{mol}{day} = 1\frac{mol}{min}$$

$$\frac{3600\frac{mol}{h}}{1\frac{mol}{s}} = 1 \quad \frac{1\frac{mol}{s}}{3600\frac{mol}{h}} = 1 \quad \frac{60\frac{mol}{min}}{1\frac{mol}{s}} = 1 \quad \frac{1\frac{mol}{s}}{60\frac{mol}{min}} = 1 \quad \frac{1440\frac{mol}{day}}{1\frac{mol}{min}} = 1 \quad \frac{1\frac{mol}{min}}{1440\frac{mol}{day}} = 1$$

- **Asked:** How many moles per hour are in 86,400 moles per day?
- **Answer:**

$$\mathbf{86,400\frac{\cancel{mol}}{\cancel{day}} * \frac{1\frac{mol}{min}}{1440\frac{\cancel{mol}}{\cancel{day}}} = 60\frac{\cancel{mol}}{\cancel{min}} * \frac{1\frac{mol}{s}}{60\frac{\cancel{mol}}{\cancel{min}}} = 1\frac{\cancel{mol}}{\cancel{s}} * \frac{3600\frac{mol}{hour}}{1\frac{\cancel{mol}}{\cancel{s}}} = 3600\frac{mol}{hour}}$$

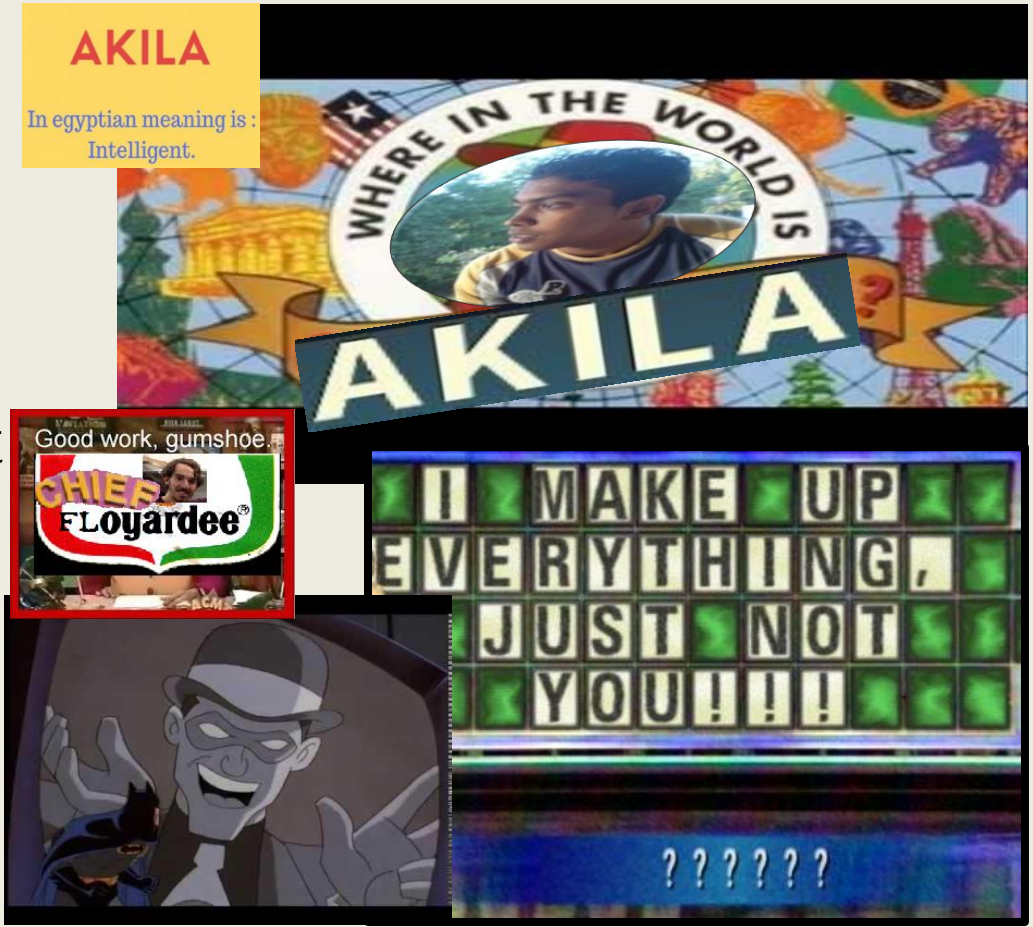
DO NOW – Never Forget to Listen to Akila!

OH NO! Where in the World is Akila?!

- Students! LISTEN UP! Akila, the one-and-only mentor and friend of Mr. Floyd, has gone MISSING!!!
- Has he been kidnapped?! Or is this modest man simply on-the-run from his overbearing fame!?

OH NO! Where in the World is Akila?!

- All we do know is that the only CLUES we have to help us solve this mystery are these SCIENTIFIC RIDDLES!
- **CHIEF** Floyardee thus needs the help of his student scientist's SCIENTIFIC MINDS to CRACK THIS CODE!
- The first SCIENTIFIC RIDDLE we thus have to solve is…→

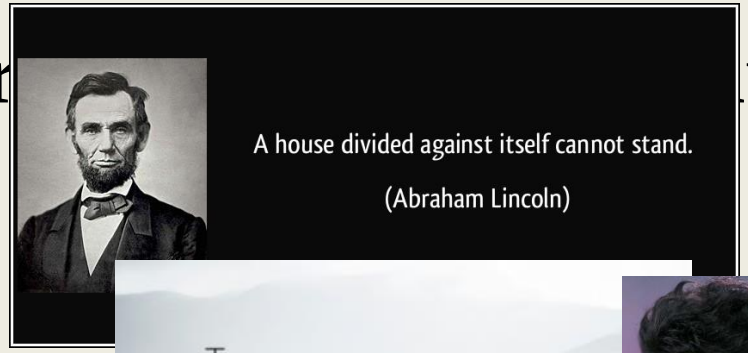


DO NOW – Translating and Concluding Our Answer!

- **Answer:**
- $86,400\frac{\cancel{mol}}{\cancel{day}} * \frac{1\frac{mol}{min}}{1440\frac{\cancel{mol}}{\cancel{day}}} = 60\frac{\cancel{mol}}{\cancel{min}} * \frac{1\frac{mol}{s}}{60\frac{\cancel{mol}}{\cancel{min}}} = 1\frac{\cancel{mol}}{\cancel{s}} * \frac{3600\frac{mol}{hour}}{1\frac{\cancel{mol}}{\cancel{s}}} = 3600\frac{mol}{hour}$

- **Translate and Conclude:** Students, always TRUST YOUR INSTINCTS (3600 is the same number, but it's also the answer!) ALSO, you just did ANOTHER MULTI-STEP, FRACTIONAL UNIT CONVERSION!!! The Chef MUST keep cooking up some CHALLENGES for his student scientists…AND THAT MEANS HE ALSO HAS TO GET BACK ON THE COURT!!!!!!!!!!!!
- **$ci Fact** → If a fractional "conversion factor equation" has the SAME units on either side, we can use SCIENTIFIC MATH to CANCEL out the equivalent units and SIMPLIFY our equation! #ALGEBRA SKILLS!
  - Example: $60\frac{mol}{min} = 1\frac{mol}{s}$ simplifies to $60\frac{1}{min} = 1\frac{1}{s}$ aka $60s = 1min$

$$\frac{2}{2} = 1$$

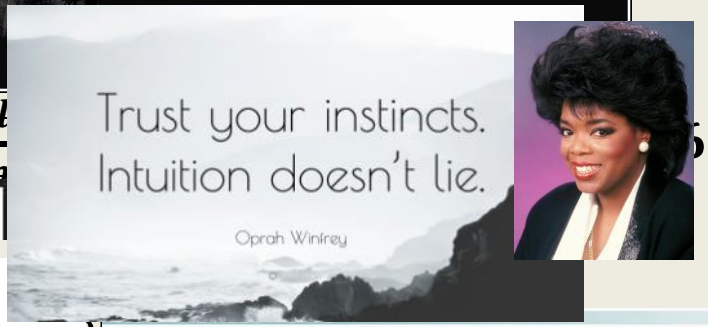


uding Our

$60\frac{mol}{min}$

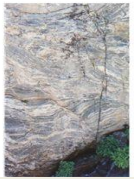
$500\frac{mol}{hour}$

WORDS INTO MATH



Rock Divisions

- Rocks are divided into 3 categories based on how they were formed.
  - Igneous
  - Sedimentary
  - Metamorphic



$$y^3/y^3 = 1$$

Study.com

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ifies to

$$\log_9 3x = \log_9 15$$

The logs have the same base, so they cancel.

$$\frac{3x}{3} = \frac{15}{3}$$

Divide both sides by 3 to get x by itself.

$$x = 5$$

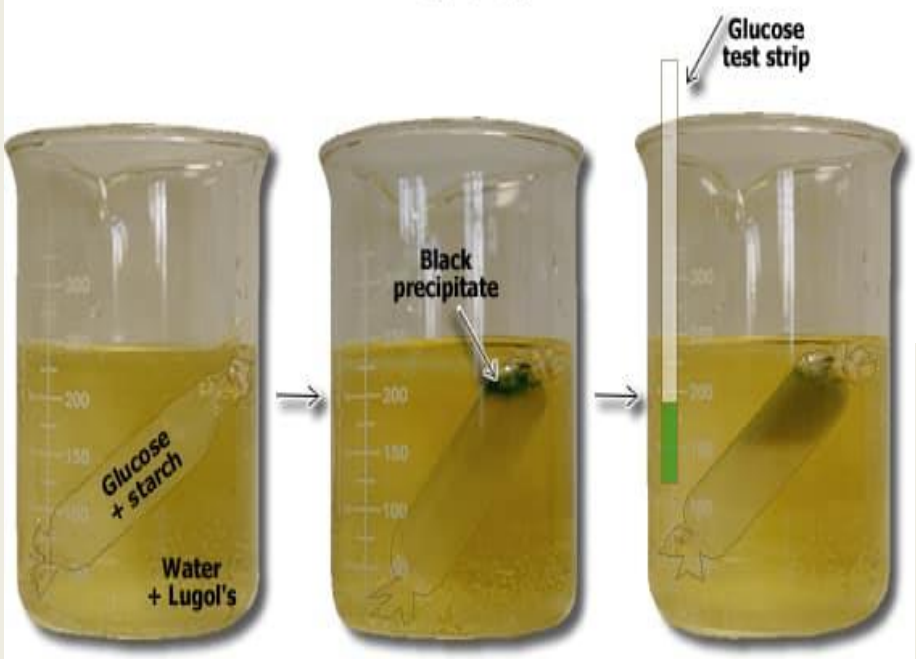
Today's Qualitative Prompt

QP LAB REVIEW = DRAW which substances MOVED into and out of the DIALYSIS TUBING, and EXPLAIN how the tubing is like a real cell!

- Students, recall that we initially put GLUCOSE and STARCH into the dialysis tubing and IODINE into the cup during our LAB UP Experiment!

What is dialysis tubing?

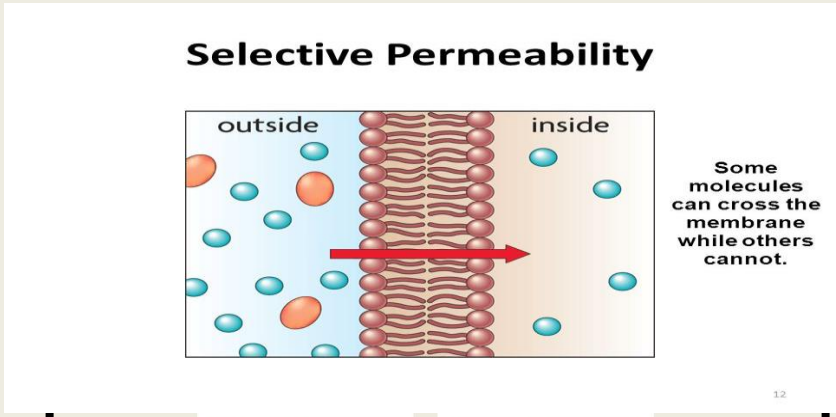
- **Dialysis tubing** is a type of semi-permeable membrane tubing used in the separation of molecules from the blood during dialysis

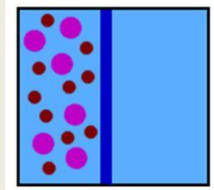


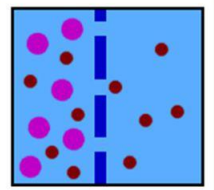
Today's Qualitative Prompt

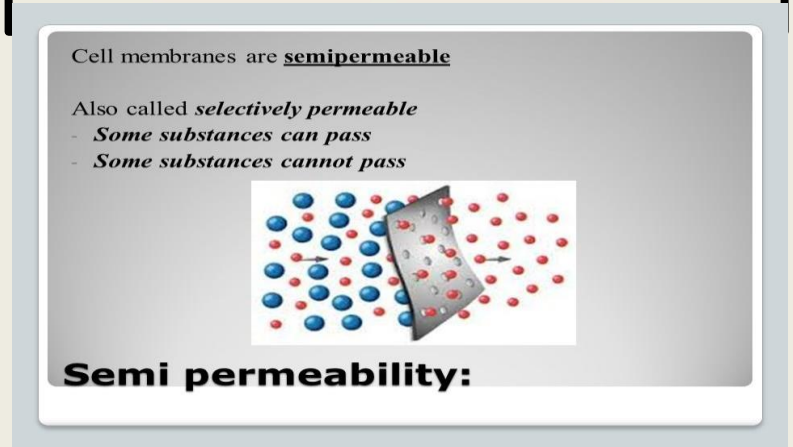
DRAW which substances MOVED into and out of the DIALYSIS TUBING, and EXPLAIN how the tubing is like a real cell!

- Due to the SELECTIVE PERMEABILITY of the dialysis tubing, the IODINE diffused on in while the GLUCOSE diffused on out!





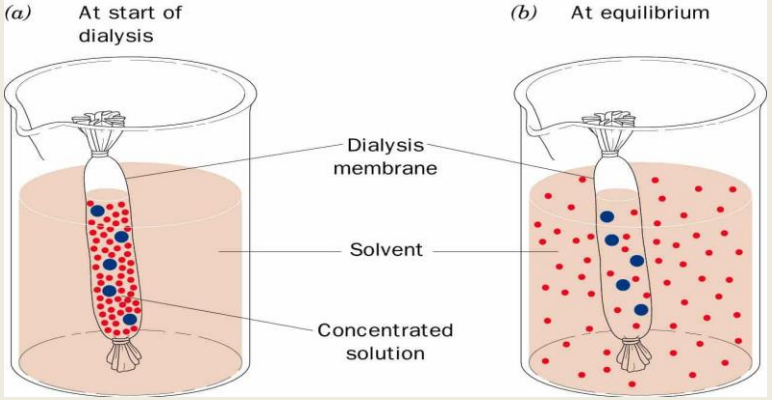




Today's Qualitative Prompt

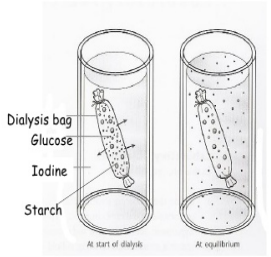
DRAW which substances MOVED into and out of the DIALYSIS TUBING, and EXPLAIN how the tubing is like a real cell!

- Due to the SELECTIVE PERMEABILITY of the dialysis tubing, the IODINE diffused on in while the GLUCOSE diffused on out!



Dialysis Bag Experiment

- Dialysis Bag
  - Semi-permeable membrane
  - Water, glucose, & starch
- What passes through the dialysis bag?
  - Glucose (Benedict's Test)
  - Starch (Iodine Solution)
- Time Course Experiment
  - Every 10 minutes, measure the amount of glucose & starch present in the beaker



T0 → Weigh

T80 → Weigh

Part 2 pg. 83

Today's Qualitative Prompt

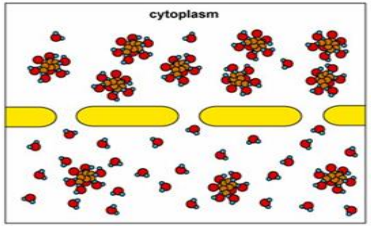
DRAW which substances MOVED into and out of the DIALYSIS TUBING, and EXPLAIN how the tubing is like a real cell!

- However, the STARCH was too large to pass through the pores in the dialysis tubing, since like a real CELL the tubing has a SEMI-PERMEABLE membrane!

PART A: Diffusion and Dialysis Tubing

- What happened to the **STARCH**?
  - Iodine moved into bag (high → low [ ])
  - Starch too big → do NOT move
  - STARCH + Iodine = BLACK COLOR
- What happened to the **GLUCOSE**?
  - Moved out of bag (high → low [ ])
  - Benedict test has POSITIVE result in presence of glucose
    - it was cloudy and changed color
    - Not a lot of glucose present

Molecules in this lab ranked largest to smallest



Largest

Starch

Glucose

Water

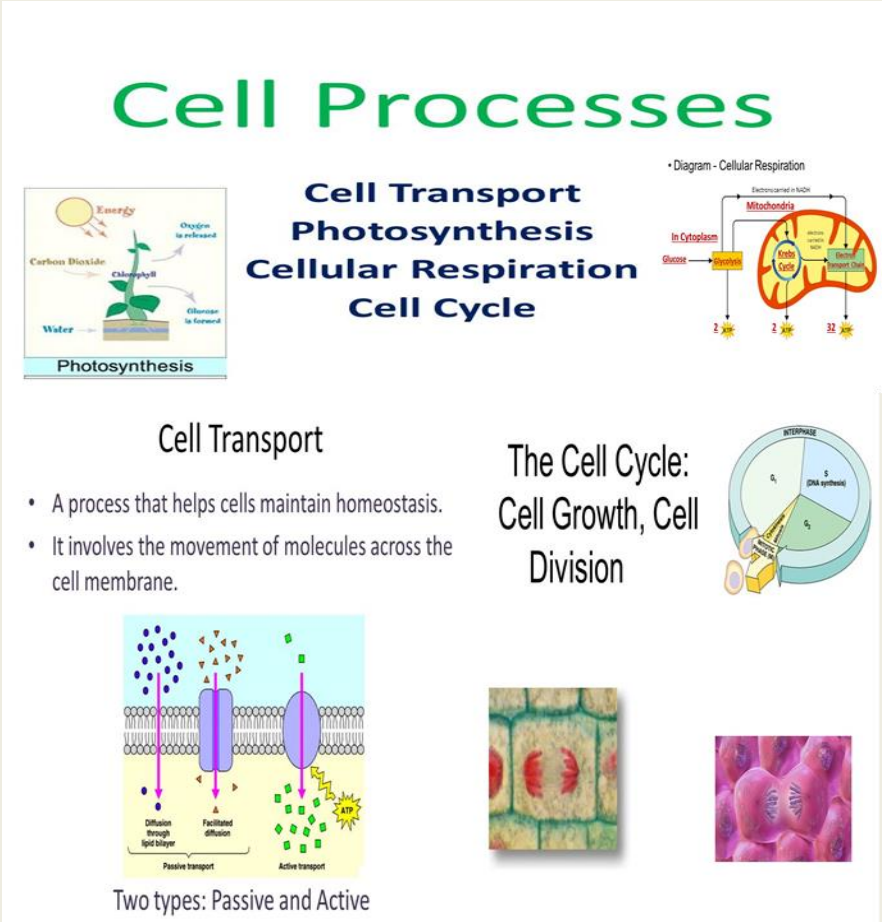
Pores in dialysis tubing

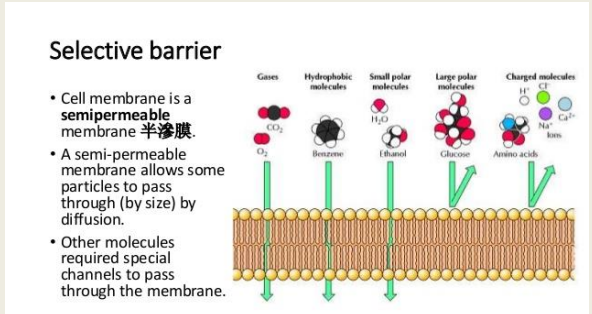
Lugol's solution Iodine. (Starch turns blue-black in the presence of iodine solution).

Smallest

Today's Qualitative Prompt – Today's Big Scientific ?

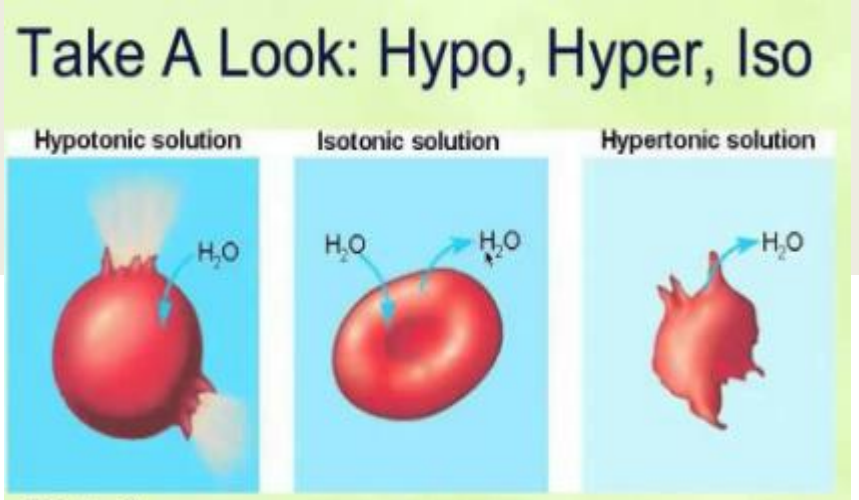
- So! We want to know!
- How can we REINFORCE our knowledge of cell processes in order to DESCRIBE what happens to cells as their environment changes!!!

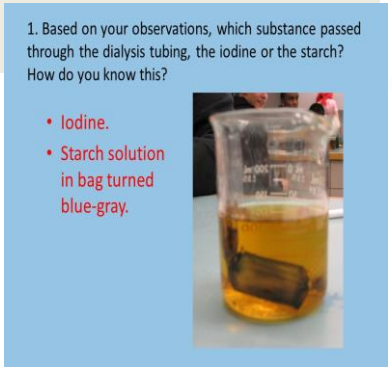


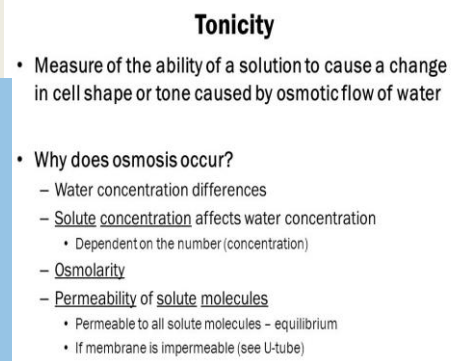


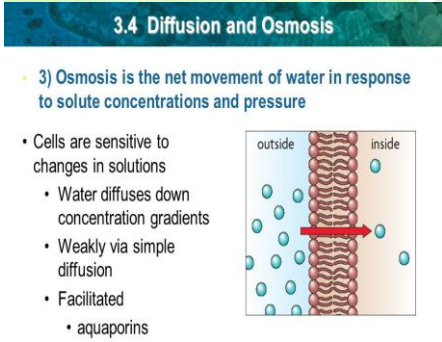
Today's Qualitative Prompt – Today's Big Scientific ?

- Today our big scientific problem to solve is THUS going to be how we as student scientists can FIGURE OUT how to PREDICT how cells change as their surroundings vary!
- **GET EXCITED!**







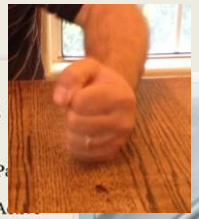


Today's Academic Objective and Standards

- Today you will RE-EXAMINE what cells do to maintain Homeostasis by REVIEWING your knowledge of key Cell Processes!
- Standards Met: 3.1.B.A9, 3.1.B.A1, 3.2.7.A6, 3.1.7.A1, 3.4.7.C2, 3.4.7.D2, CC.2.1.7.E.1, CC.2.2.7.B.3, **NGSS** Standard - MS-LS1-1.

Yesterday's Homework Review

- ***HW** = STUDY FOR QUIZ + L∞K at the Study Guide Slide and BRING ME YOUR QUESTIONS!
  - Demand that I answer your questions!



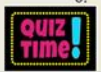
STUDY GUIDE SLIDE – CELL PROCESSES QUIZ

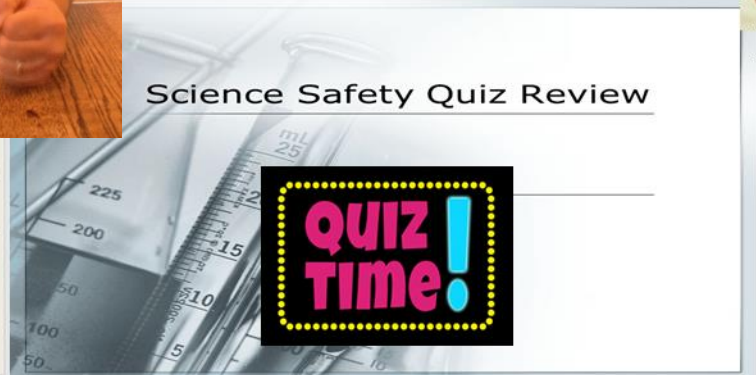
Students must KNOW:

1. What is Homeostasis, and what conditions have to be met for a Cell to be in this state?
2. What are the two main types of Cell Transport?
3. What is the difference between a Hypotonic, Isotonic, and Hypertonic Solution AND Cell?
4. Which organelle is mainly responsible for Endocytosis and Exocytosis, and what structure does it use to perform these transport processes?
5. How does the rate of diffusion change with temperature?

Students must be able to DO:

1. List and define 2 examples of P… Transport.
2. List and define 2 examples of A… Transport.
3. List 3 real world examples of Diffusion.
4. Describe what the human body does to maintain Homeostasis.
5. Draw environments with varying solute concentration and show/describe what happens to a cell placed in this environment.
6. Understand how the concept of a "Semi-permeable membrane" was on display during "The Osmosis and Diffusion Lab".





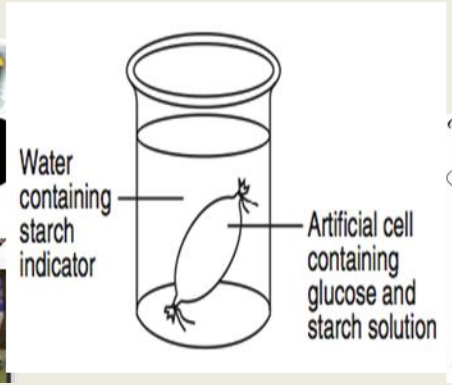
THE SGS - STUDY GUIDE SLIDE – CELL PROCESSES QUIZ

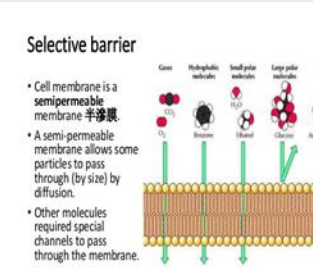
- **Students must KNOW:**
  1. What is Homeostasis, and what conditions have to be met for a Cell to be in this state?
  2. What are the two main types of Cell Transport?
  3. What is the difference between a Hypotonic, Isotonic, and Hypertonic Solution AND Cell?
  4. Which organelle is mainly responsible for Endocytosis and Exocytosis, and what structure does it use to perform these transport processes?
  5. How does the rate of diffusion change with temperature?

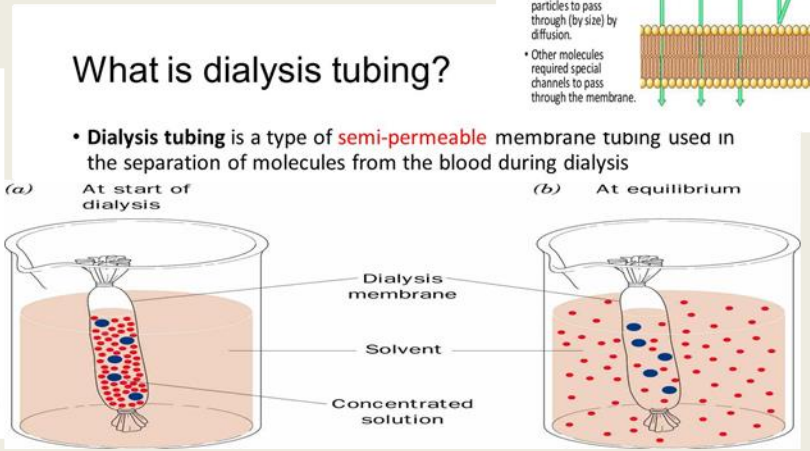
- **Students must be able to DO:**
  1. List and define 2 examples of Passive Transport.
  2. List and define 2 examples of Active Transport.
  3. List 3 real world examples of Diffusion.
  4. Describe what the human body does to maintain Homeostasis.
  5. Draw environments with varying solute concentration and show/describe what happens to a cell placed in this environment.
  6. Understand how the concept of a “Semi-permeable membrane” was on display during “The Osmosis and Diffusion Lab”.

Yesterday's Homework Review

- ***HW** = Finish Lab UP Experiment HW Problems & Questions!
  - SO! What substance moved where, and how do we KNOW?!

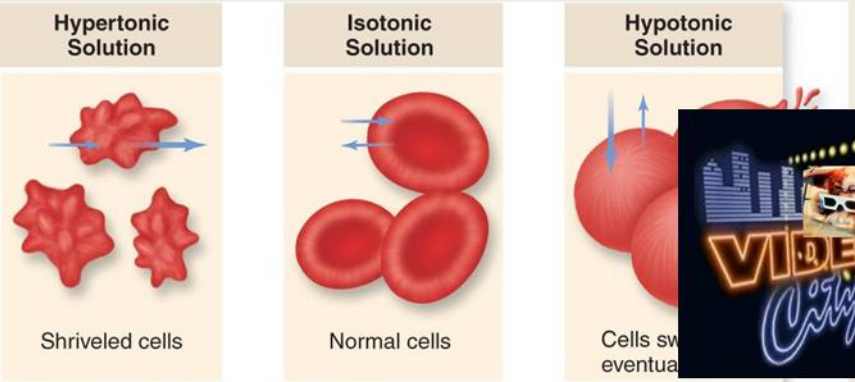


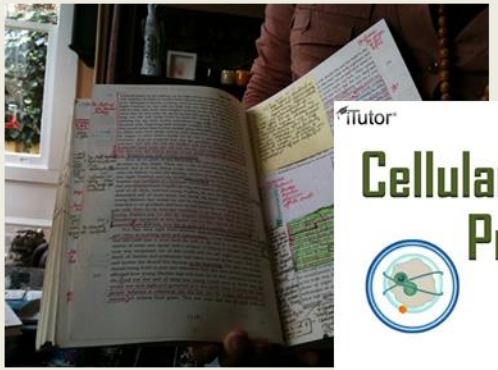


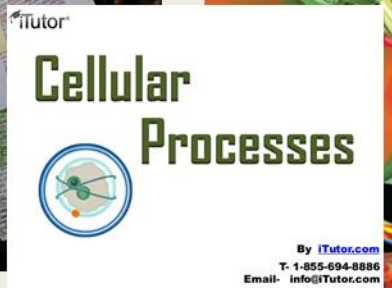


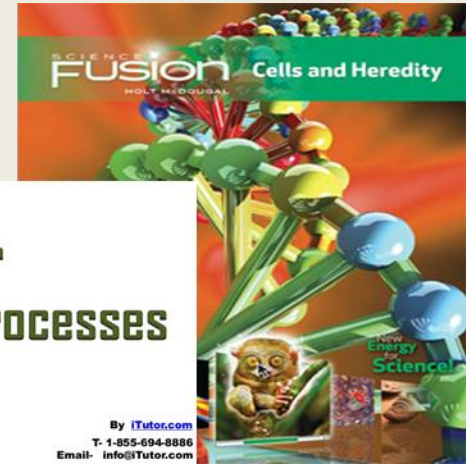
Yesterday's Homework Review

- ***HW** = Read & DO Pg. 60-61 ± VID CITY HW Questions!
  - SO! Let's review WHAT, WHY, and HOW cells survive in their environments!?!



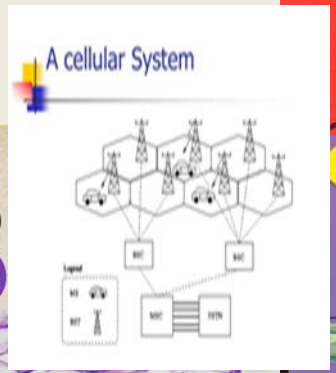


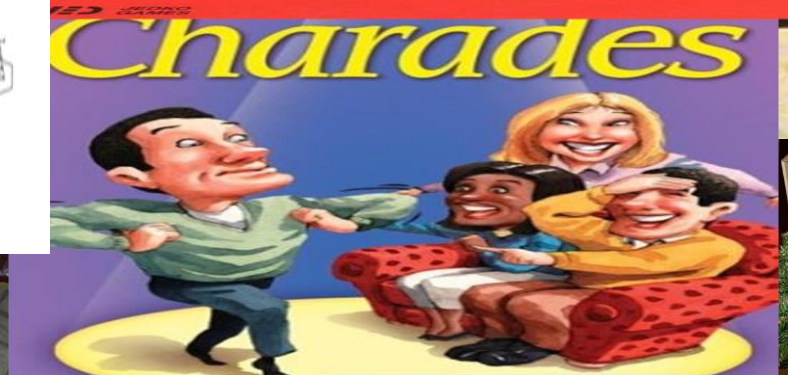




Yesterday's Homework Review

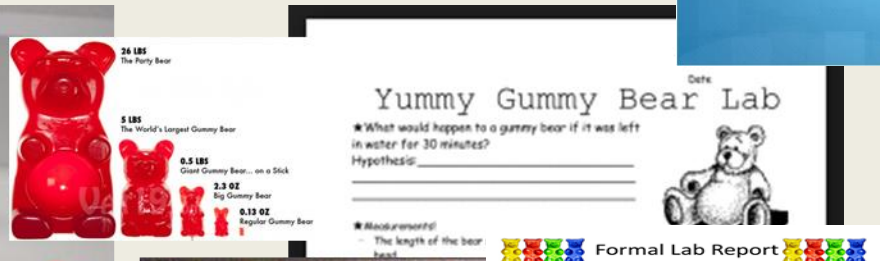
- ***HW** = FINISH Cell Analogy Projects/Posters!!!
  - SO! Find a spot in our classroom to hang up your Projects 'N' Posters!

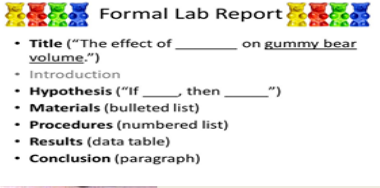




Yesterday's Homework Review

- ***HW** = Bring-In's LAB REPORT **(DUE THE DAY OF OUR QUIZ)!!!**
  - So! What gummy conclusions did you make?!
  - Also, take out those CB's and write up some more!





Bring-In's Lab – Formal Lab Report Write Up

- Students, Listen UP UP UP! You will be required to WRITE a formal, 1-page Lab Report for our Bring-In's Lab!
- This will be submitted along with your QUIZ, and the REQUIREMENTS can be viewed below!

Formal Lab Report

- **Title** ("The effect of _____ on gummy bear _____")
- Introduction
- **Hypothesis** ("If ____, then _____")
- **Materials** (bulleted list)
- **Procedures** (numbered list)
- **Results** (data table)
- **Conclusion** (paragraph)

Conclusion:

*Should refer back to hypothesis
Was it right or wrong?
*Use data to explain how you know if it is right or wrong
*How can this lab be related to everyday life?
Why would scientists do this lab?
*Experimental errors
No one is perfect!
Explain what went wrong even if it didn't affect the outcome of the experiment

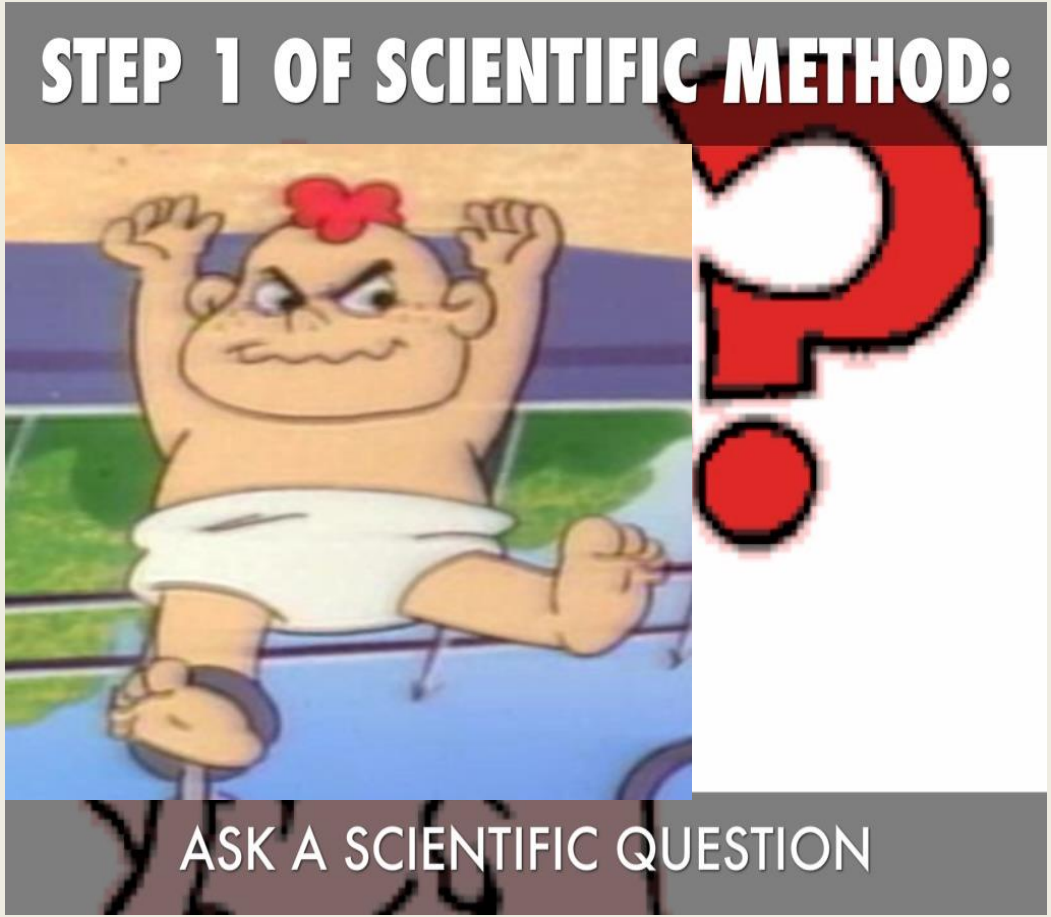
THE SGS - STUDY GUIDE SLIDE – CELL PROCESSES QUIZ

- **Students must KNOW:**
  1. What is Homeostasis, and what conditions have to be met for a Cell to be in this state?
  2. What are the two main types of Cell Transport?
  3. What is the difference between a Hypotonic, Isotonic, and Hypertonic Solution AND Cell?
  4. Which organelle is mainly responsible for Endocytosis and Exocytosis, and what structure does it use to perform these transport processes?
  5. How does the rate of diffusion change with temperature?

- **Students must be able to DO:**
  1. List and define 2 examples of Passive Transport.
  2. List and define 2 examples of Active Transport.
  3. List 3 real world examples of Diffusion.
  4. Describe what the human body does to maintain Homeostasis.
  5. Draw environments with varying solute concentration and show/describe what happens to a cell placed in this environment.
  6. Understand how the concept of a “Semi-permeable membrane” was on display during “The Osmosis and Diffusion Lab”.

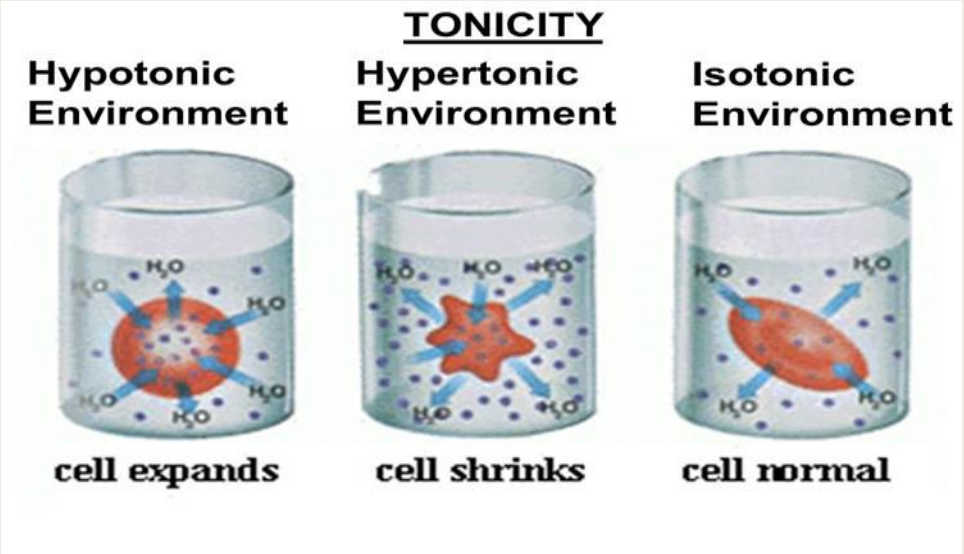
Today's Big Scientific ?

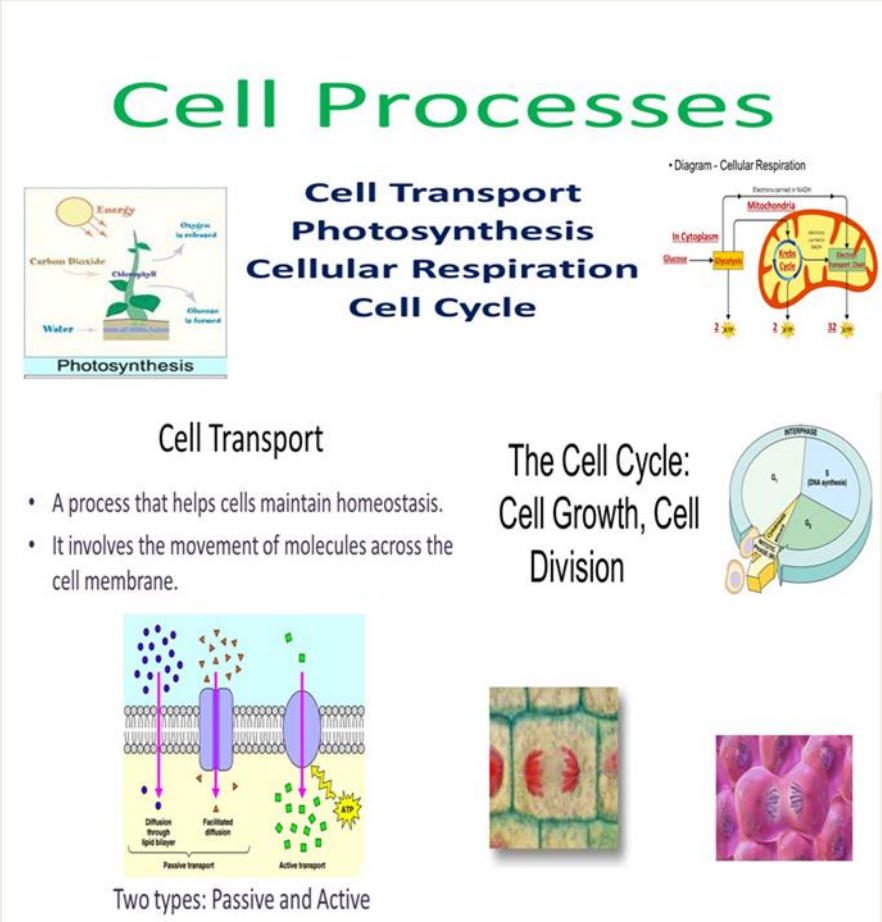
- Today's Big Scientific Question =
- How can we REINFORCE our knowledge of cell processes in order to DESCRIBE what happens to cells as their environment changes!!!



What Cells "Do" and Where They "Live"

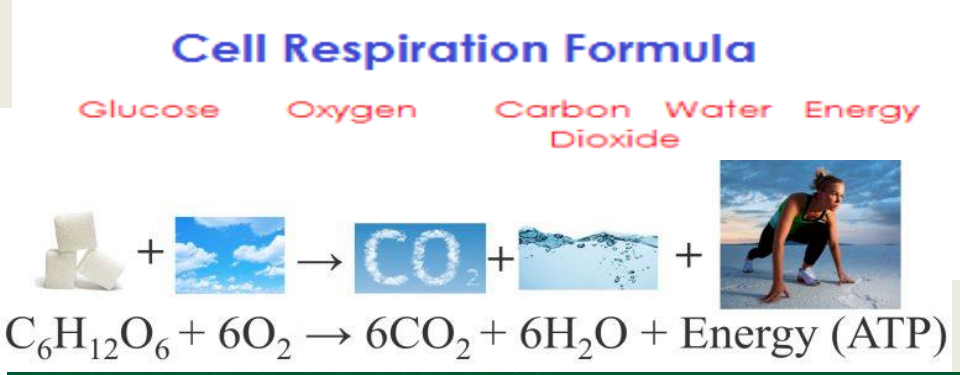
- To answer this question, let us first review what cells DO and how we DESCRIBE their "liquidy" environments!

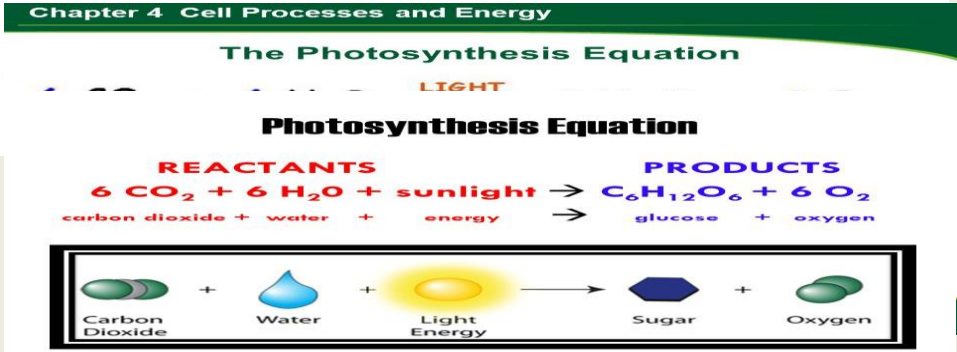


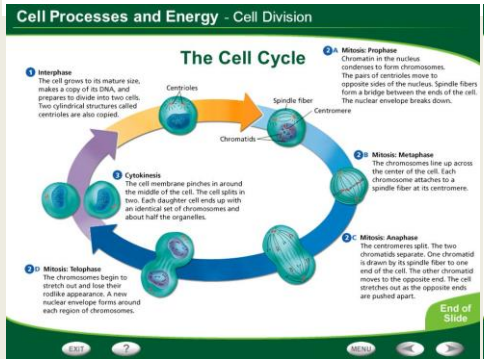


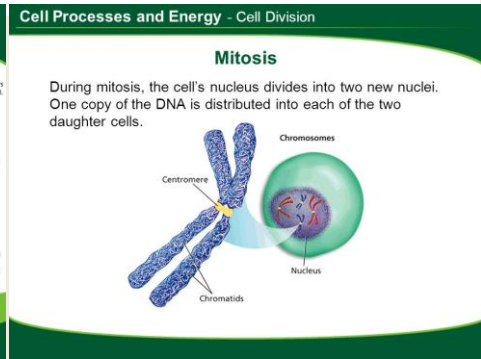
The Major Cell Processes

- Students, recall that everything a cell DOES requires ENERGY!
  - Cells need FOOD to use Cellular Respiration to get energy, and we know that Animal Cells EAT their food whereas Plant Cells MAKE it!
  - Maintaining Homeostasis via "Cell Transport" and the "Cell Cycle" (GROWTH AND REPRODUCTION!) are two major ways cells USE the energy they make!









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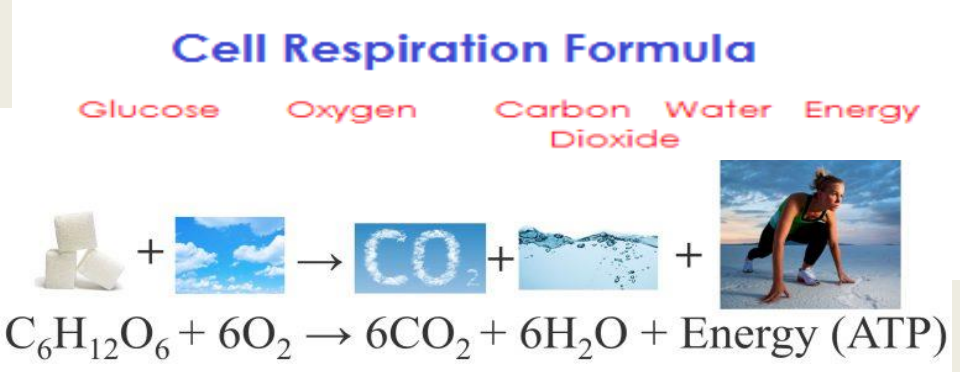
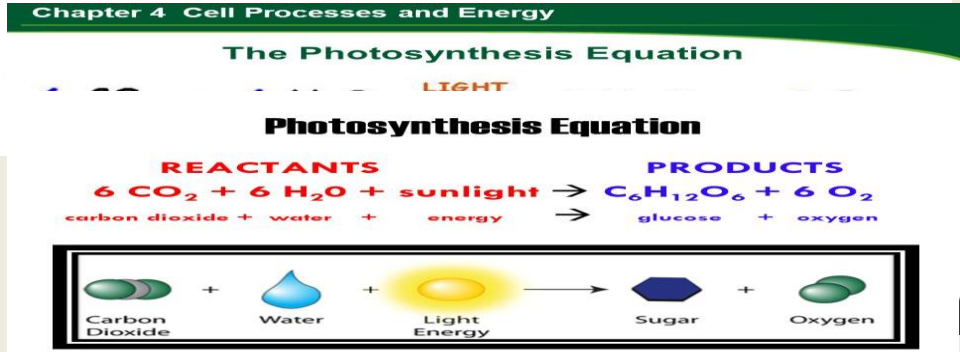
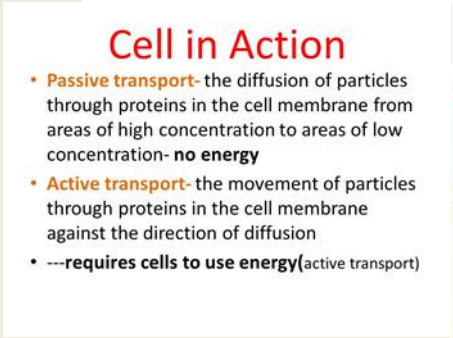
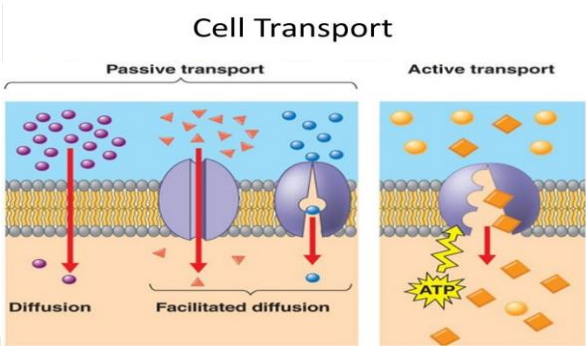


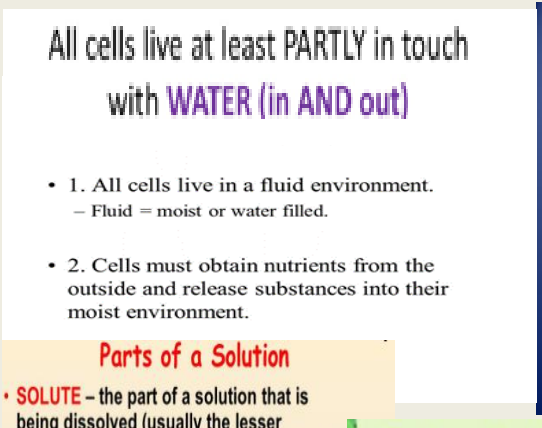


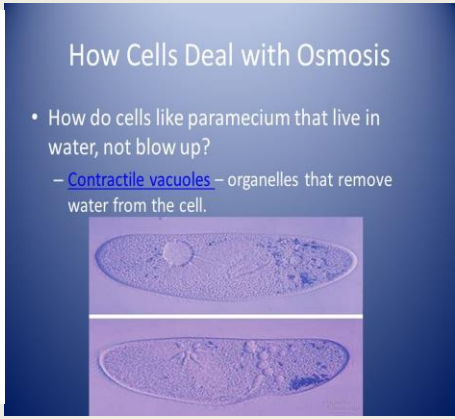


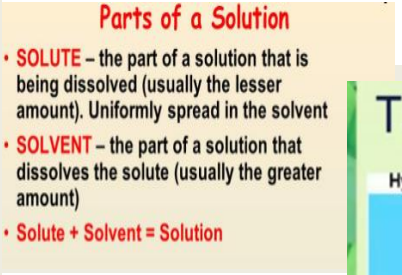


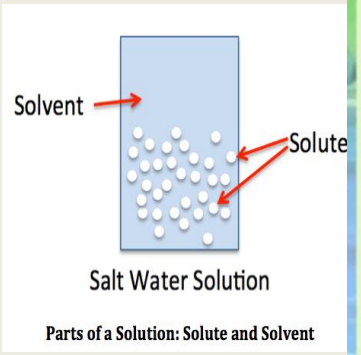
The Cellular Environment

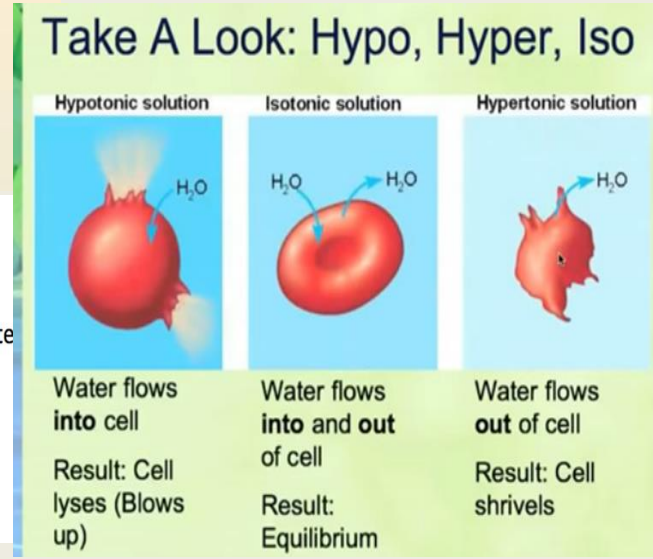
- Single-Celled organisms live in WATER-based solutions, while the cells in Multi-Cellular organisms must also be near watery solutions to survive!
- Thus, we use these SCIENTIFIC TERMS to describe the SOLUTIONS in which cells are found!
  - **Hypotonic Solution** = A SOLUTION that has LESS solute (think SALT) in it than inside of a cell!
  - **Isotonic Solution** = A SOLUTION that has EQUAL solute (think SALT) in it to a cell!
  - **Hypertonic Solution** = A SOLUTION that has MORE solute (think SALT) in it than inside of a cell!
- NOTE! Solution ≠ Cell!





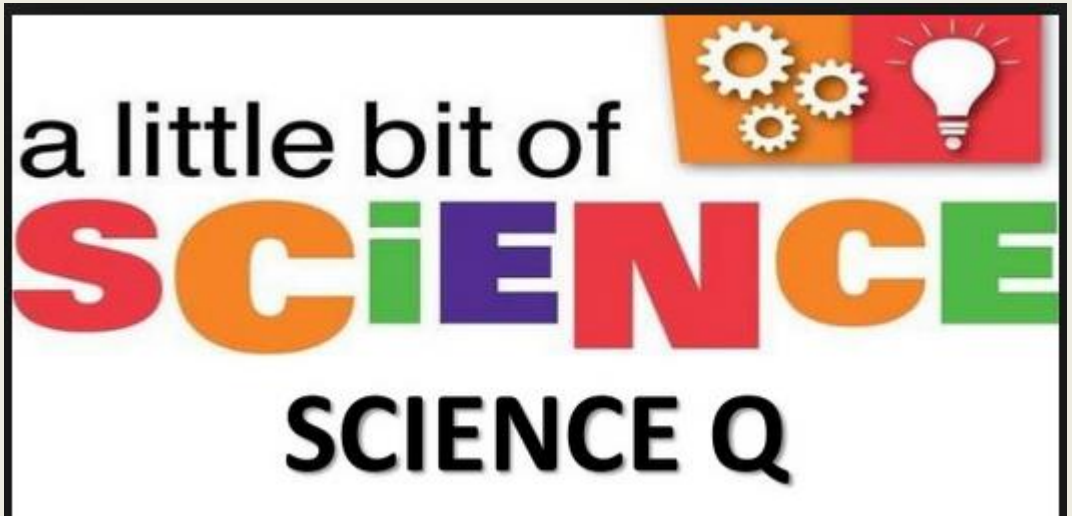






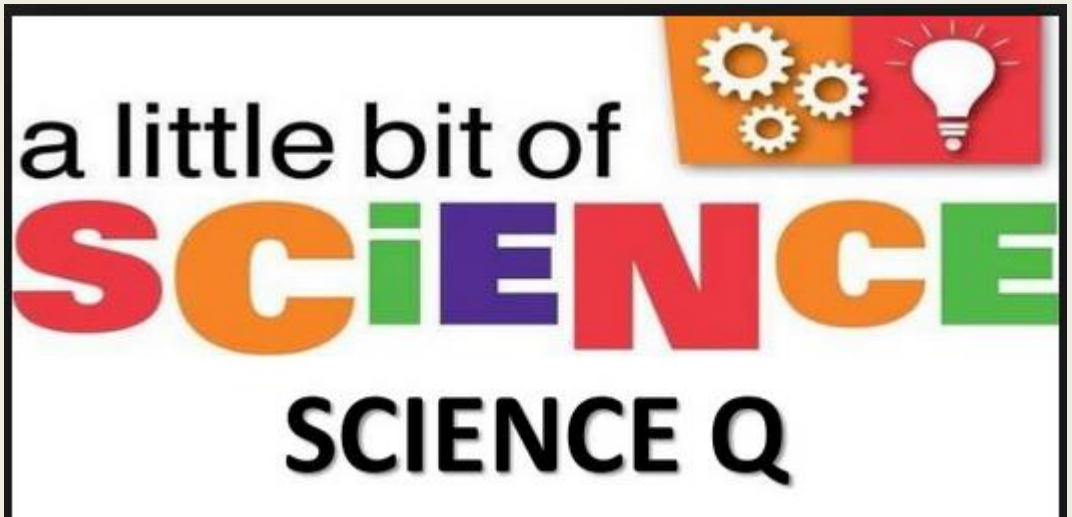
Bell 2 Bell

- We work what in this class?!?!?!
  - **BELL 2 BELL**
- Every single precious SECOND of academic instructional time is thus utilized in this classroom!
- You students will thus be vocally quizzed EVERY DAY until I DISMISS you at the end of class (with a positive greeting and a thank-you of course!).



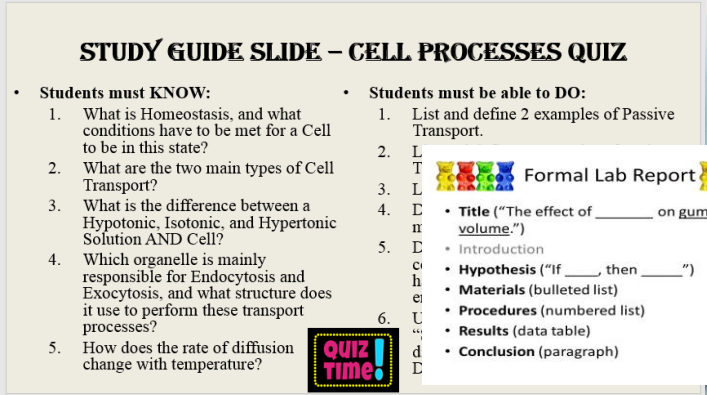
Bell 2 Bell

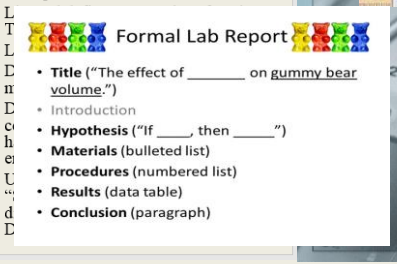
- We work **BELL 2 BELL** in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!

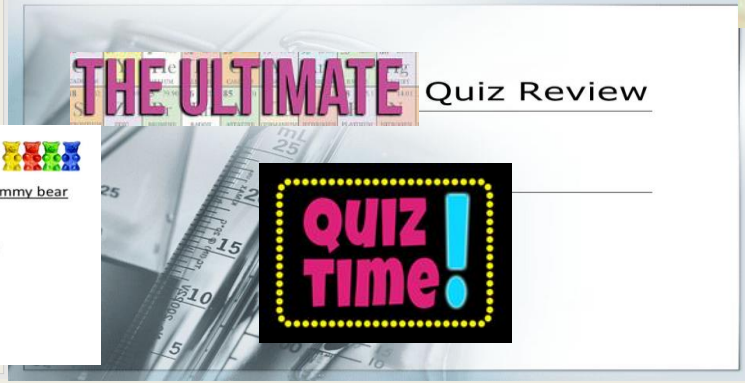


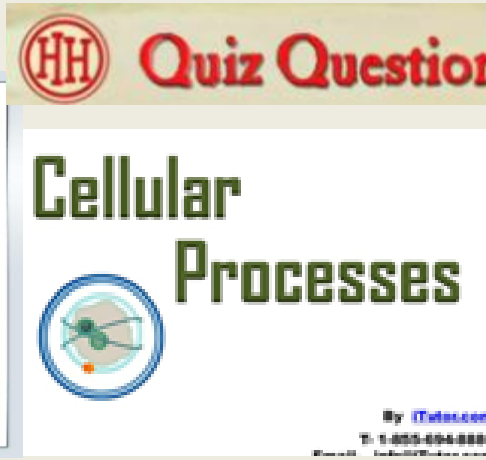
Tomorrow's Academic Objective and Plan

- Tomorrow you will EMPLOY your knowledge of what cells do in order to ACE a quiz on cell processes!
- *HW = STUDY FOR QUIZ + FINISH BRING-IN'S LAB REPORT!









FRIDAY, FEBRUARY 23rd

DO NOW

- In your notebooks, to be checked, solve this problem…

Know/Given: There are 60 moles per minute in 1 mole per second and 1000 mili-moles per minute in 1 mole per minute. These are units of diffusion!

$$60\,\frac{mol}{min} = 1\,\frac{mol}{s}\,,\quad 1000\,\frac{mmol}{min} = 1\,\frac{mol}{min}$$

Asked: How many mili-moles per minute are in 6 moles per second?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
   - Today's **QP** = QP QUIZ BONUS = LIST the 2 parts of a SOLUTION and then DRAW an example of each one!
2. Open books, WORK on today's **AO!**
3. ***HW** = Read & Do Pg. 88-89 then solve this using Long Division; 22 ÷ 7=?!

TODAY'S ACADEMIC OBJECTIVE

Today you will EMPLOY your knowledge of what cells do in order to ACE a quiz on cell processes!

DO NOW – Units of Diffusion

- **Know/Given:** There are 60 moles per minute in 1 mole per second and 1000 mili-moles per minute in 1 mole per minute. These are units of diffusion!

$$60\,\frac{mol}{min} = 1\,\frac{mol}{s}\,, \qquad 1000\,\frac{mmol}{min} = 1\,\frac{mol}{min}$$

- **Asked:** How many mili-moles per minute are in 6 moles per second?

What is KA^2 format? This is an example of a "1-pointer" on a DO NOW!

- **Know:**

$$60\frac{mol}{min} = 1\frac{mol}{s}\ ,\quad 1000\frac{mmol}{min} = 1\frac{mol}{min}$$

$$\frac{60\frac{mol}{min}}{1\frac{mol}{s}} = 1 \qquad \frac{1\frac{mol}{s}}{60\frac{mol}{min}} = 1 \qquad \frac{1000\frac{mmol}{min}}{1\frac{mol}{min}} = 1 \qquad \frac{1\frac{mol}{min}}{1000\frac{mmol}{minh}} = 1$$

- **Asked:** How many mili-moles per minute are in 6 moles per second?
- **Answer:** $\mathbf{6\frac{\cancel{mol}}{\cancel{s}} * \frac{60\frac{mol}{min}}{1\frac{\cancel{mol}}{\cancel{s}}} = 360\frac{\cancel{mol}}{\cancel{min}} * \frac{1000\frac{mmol}{min}}{1\frac{\cancel{mol}}{\cancel{min}}} = 360,000\frac{mmol}{min}}$

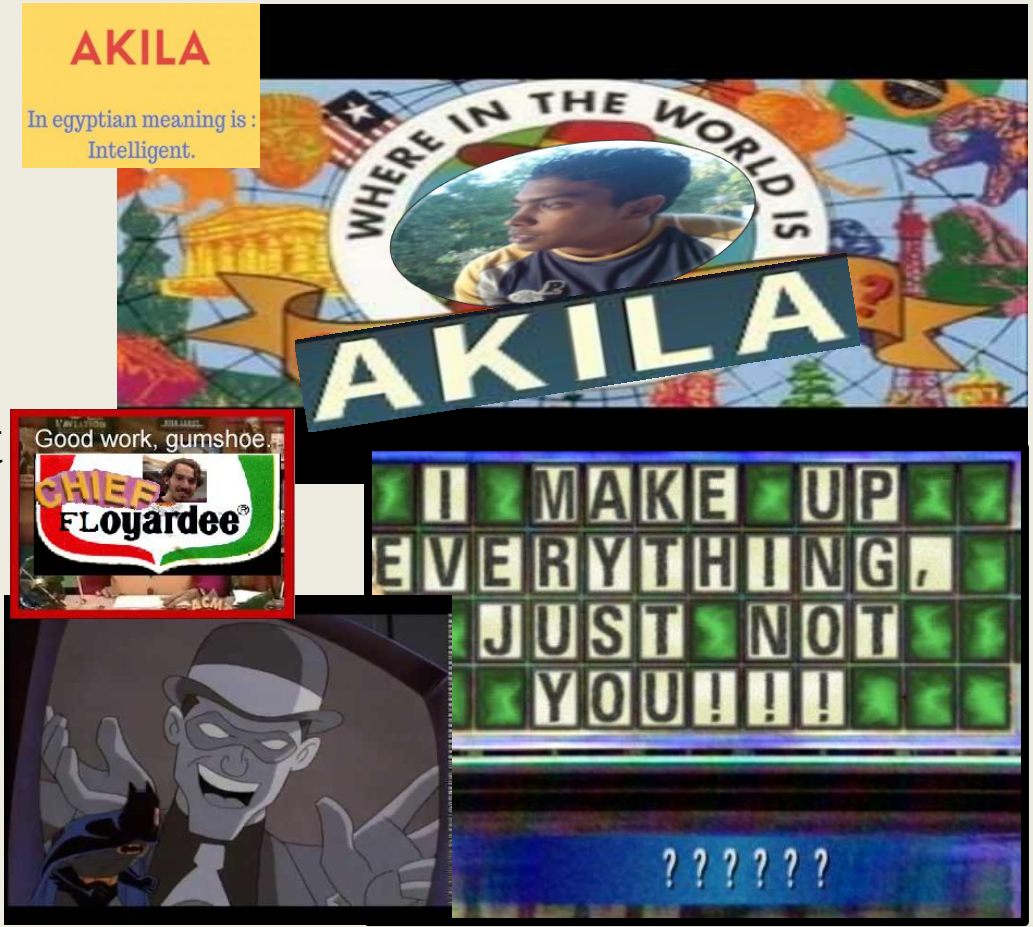
DO NOW – Never Forget to Listen to Akila!

OH NO! Where in the World is Akila?!

- Students! LISTEN UP! Akila, the one-and-only mentor and friend of Mr. Floyd, has gone MISSING!!!
- Has he been kidnapped?! Or is this modest man simply on-the-run from his overbearing fame!?

OH NO! Where in the World is Akila?!

- All we do know is that the only CLUES we have to help us solve this mystery are these SCIENTIFIC RIDDLES!
- **CHIEF** Floyardee thus needs the help of his student scientist's SCIENTIFIC MINDS to CRACK THIS CODE!
- The first SCIENTIFIC RIDDLE we thus have to solve is…→



DO NOW – Translating and Concluding Our Answer!

- **Answer:**

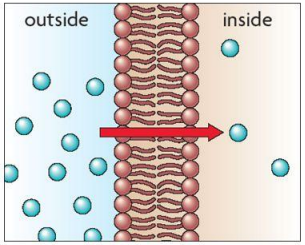
$$6\frac{\cancel{mol}}{\cancel{s}} * \frac{60\frac{mol}{min}}{1\frac{\cancel{mol}}{\cancel{s}}} = 360\frac{\cancel{mol}}{\cancel{min}} * \frac{1000\frac{mmol}{min}}{1\frac{\cancel{mol}}{\cancel{min}}} = 360,000\frac{mmol}{min}$$

- **Translate and Conclude:** Students, with or without Akila's presence we must never forget his words of wisdom! Also, at this RATE of DIFFUSION a cell will SO TOTALLY be well nourished!
- **$ci Fact** → Diffusion is a type of "Passive Transport", and this energy-free process explains why, given enough time, most SOLUTES will disperse into a SOLVENT to create a SOLUTION!

3.4 Diffusion and Osmosis

Passive transport does not require energy input from a cell.

- Molecules can move across the cell membrane through passive transport.
- There are two types of passive transport.
  - diffusion
  - osmosis

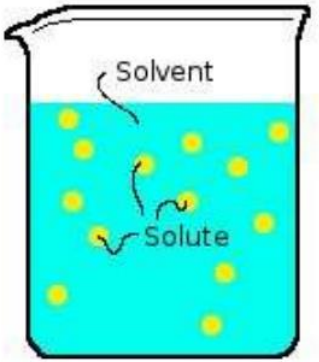


An

Parts of a Solution

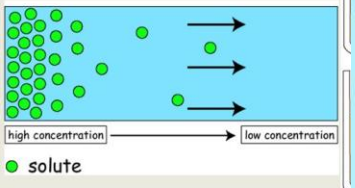
A **liquid (solvent)** with a **substance (the solute)** dissolved in it

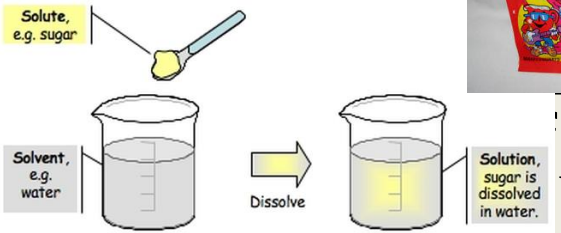
- Particles are atoms, molecules, or ions (very small)



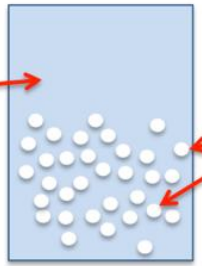
Diffusion & Osmosis

- Diffusion: Movement of solute from an area of high concentration to low concentration
- Osmosis: Diffusion of water





Solvent



Solute

Salt Water Solution

Solution: Solute and Solvent

energy free process

SOLUTES will disp

most

OLUTION!

Today's Qualitative Prompt

QP QUIZ BONUS = LIST the 2 parts of a SOLUTION and then DRAW an example of each one!

- Students, the almighty QP is like a Swiss Army Knife; it can be used to give and check notes, to review scientific math, to act as a formative assessment, and more!

Today's Qualitative Prompt

QP QUIZ BONUS = LIST the 2 parts of a SOLUTION and then DRAW an example of each one!

- And as you know students, we have a DO NOW and QP to do EVERY DAY in Mr. Floyd's!
- On Quiz and Test days, these are usually for BONUS POINTS!

Today's Qualitative Prompt

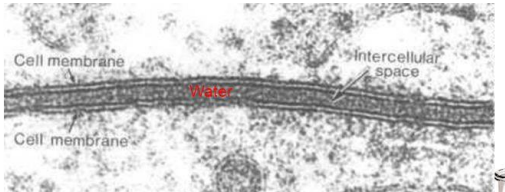
QP QUIZ BONUS = LIST the 2 parts of a SOLUTION and then DRAW an example of each one!

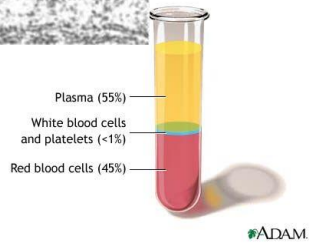
- Students, do not forget the following concepts!
  - Materials that cells need can be TRANSPORTED efficiently in a LIQUID MEDIUM!
  - Cells thus exist either immersed in solutions or near the presence of a LIQUID!

Diffusion!

- Cells exist in a ***liquid environment*** ~ This makes it easier for materials (food, oxygen, water) to move into and out of the cell.
- **Diffusion** = Molecules move from areas of **concentration** of that substance to areas of _____ concentration.

All cells must exist in a liquid environment



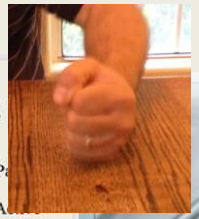


Today's Academic Objective and Standards

- Today you will EMPLOY your knowledge of what cells do in order to ACE a quiz on cell processes!
- Standards Met: 3.1.B.A9, 3.1.B.A1, 3.2.7.A6, 3.1.7.A1, 3.4.7.C2, 3.4.7.D2, CC.2.1.7.E.1, CC.2.2.7.B.3, **NGSS** Standard - MS-LS1-1.

Yesterday's Homework Review

- ***HW** = STUDY FOR QUIZ + L∞K at the Study Guide Slide and BRING ME YOUR QUESTIONS!
  - Demand that I answer your questions!



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5. How does the rate of diffusion change with temperature?

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2. List and define 2 examples of A… Transport.
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4. Describe what the human body does to maintain Homeostasis.
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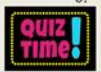
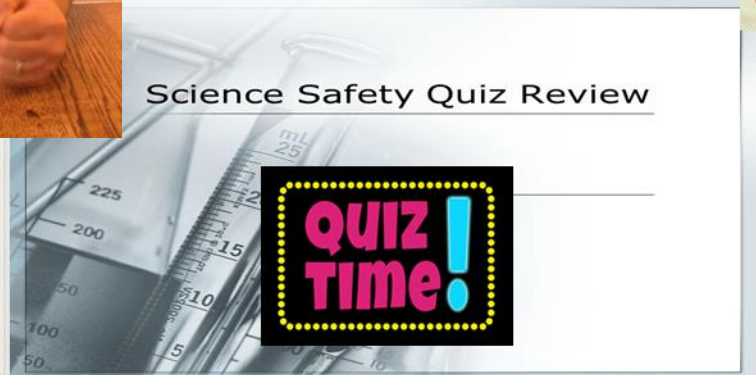
6. Understand how the concept of a "Semi-permeable membrane" was on display during "The Osmosis and Diffusion Lab".





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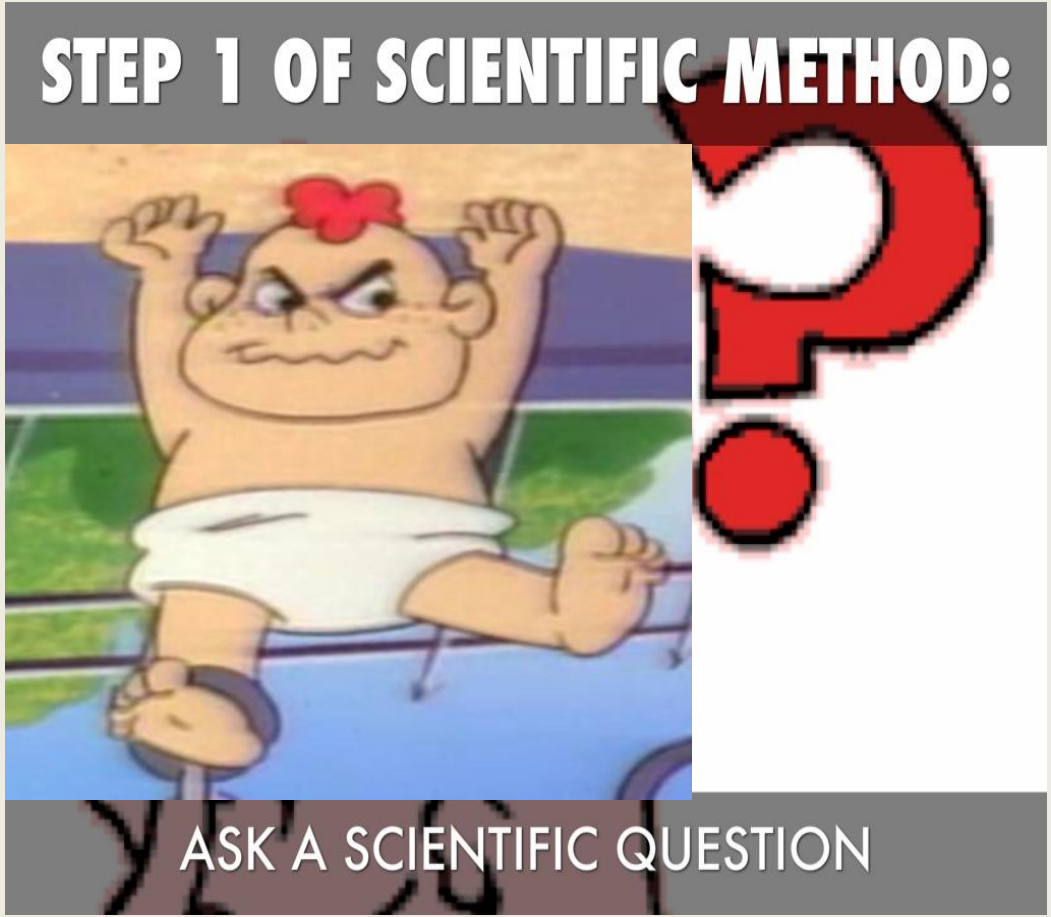

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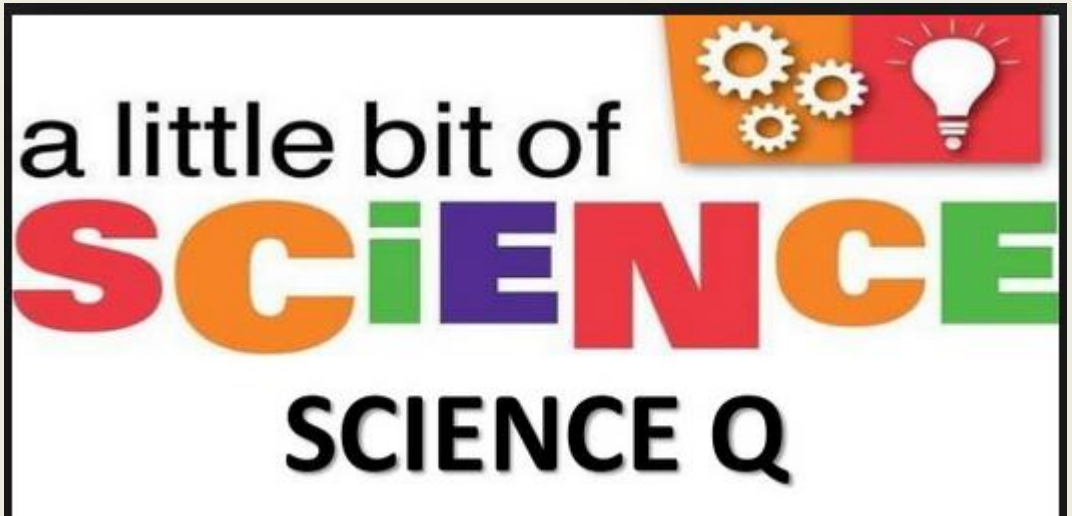

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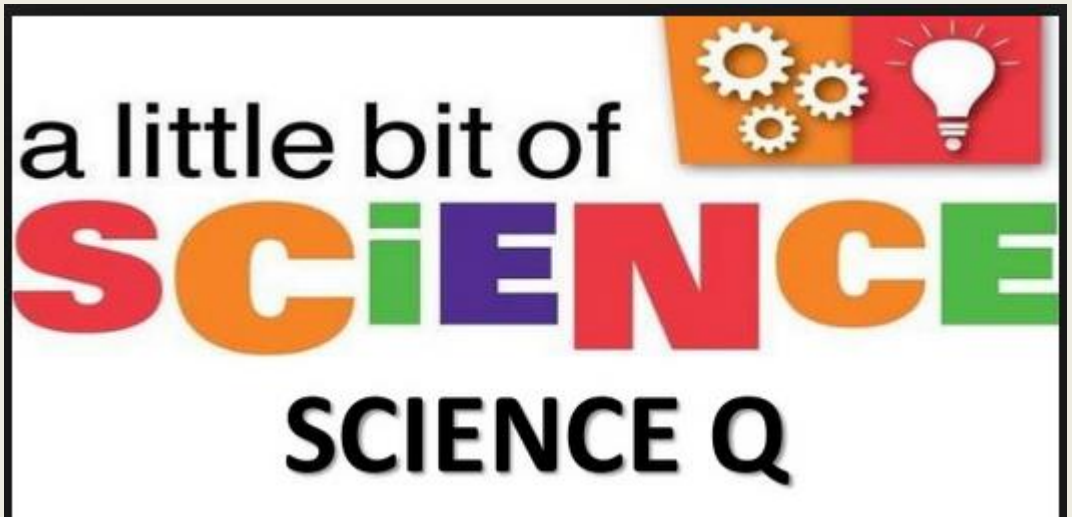
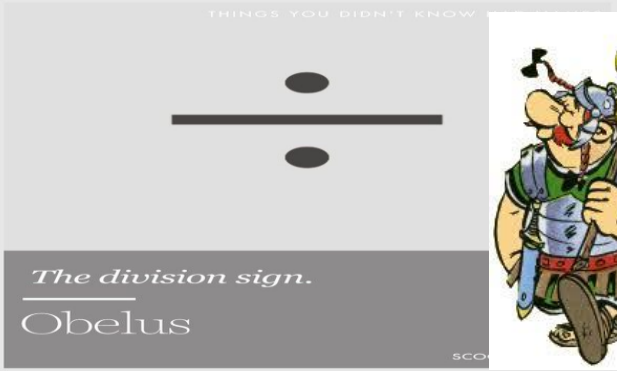
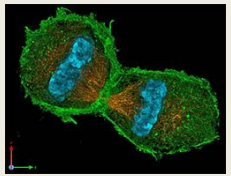


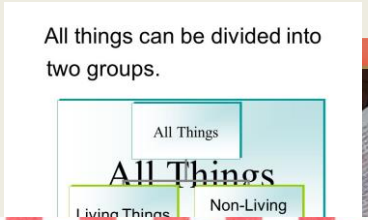
Tomorrow's Academic Objective and Plan

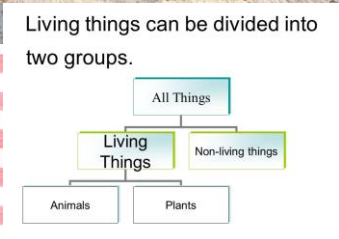
- Tomorrow you will ILLUSTRATE analogies for the parts of the cell in order to RELATE the "cellular system" to a SYSTEM in our world!
- *HW = Read & Do Pg. 88-89 then solve this using Long Division; 22 ÷ 7=?!



$$R_1 = 3.14159263589793238462\cdots$$
$$R_2 = 3.14159263589793238462\cdots$$
$$R_3 = 3.14159263589793238462\cdots$$
$$\vdots$$
$$R_n = 3.14159263589793238462\cdots$$







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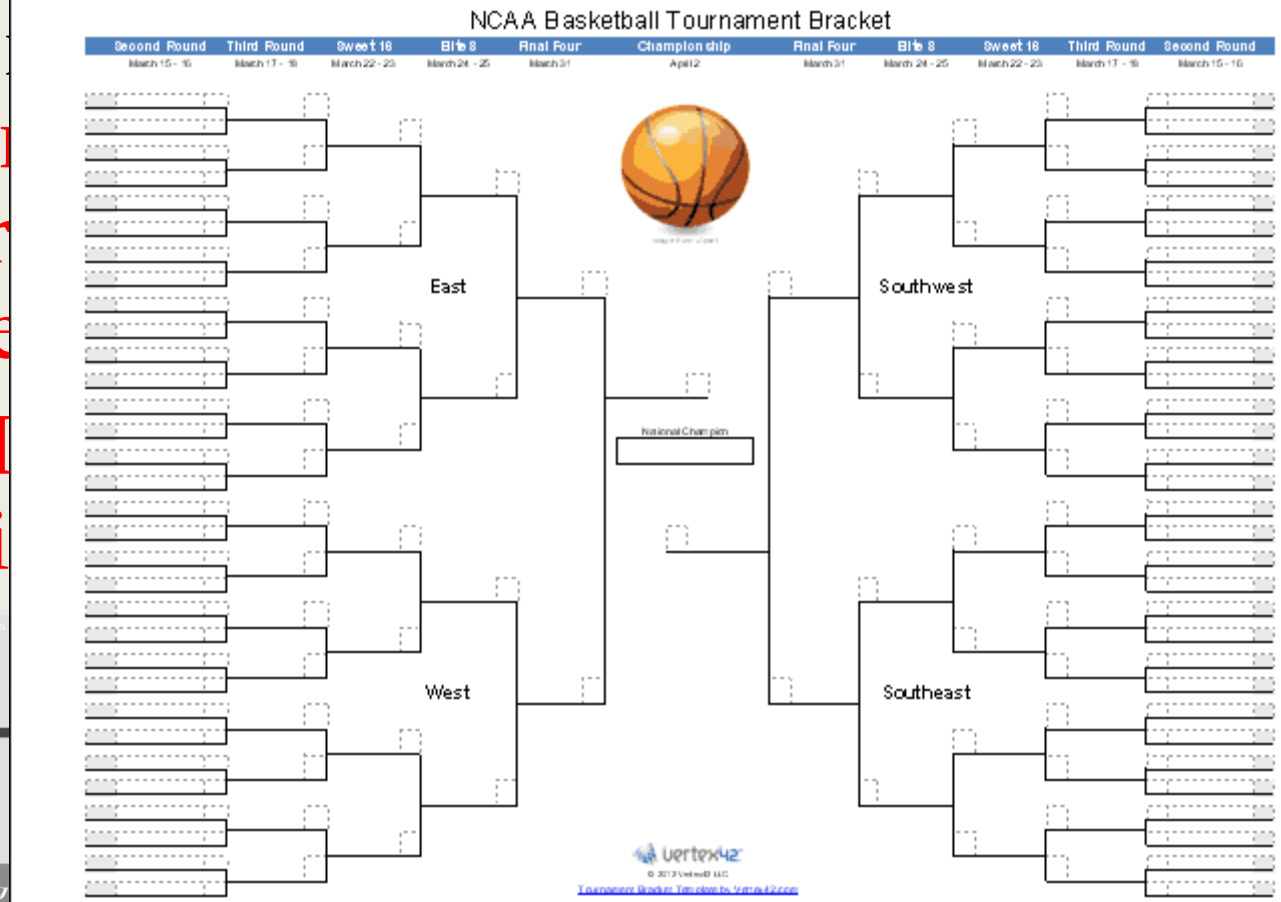

ing things can be divided into
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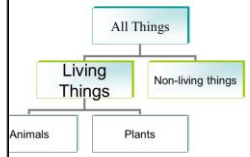

The division sig
Obelus