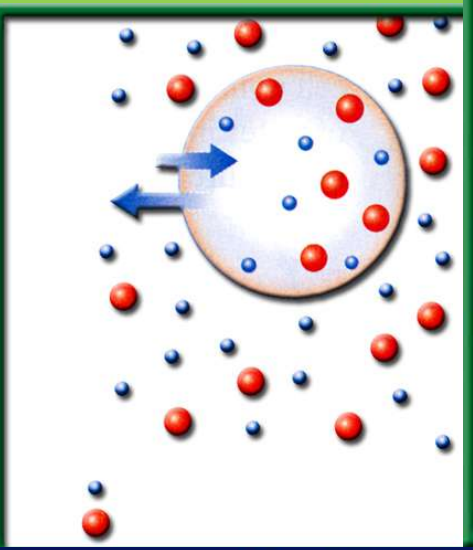
# Cells
# Plasma Membrane & Organelles, Structure of DNA

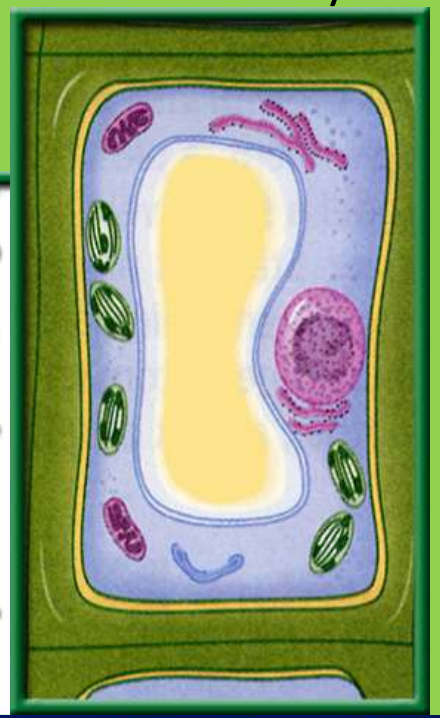
Week 7

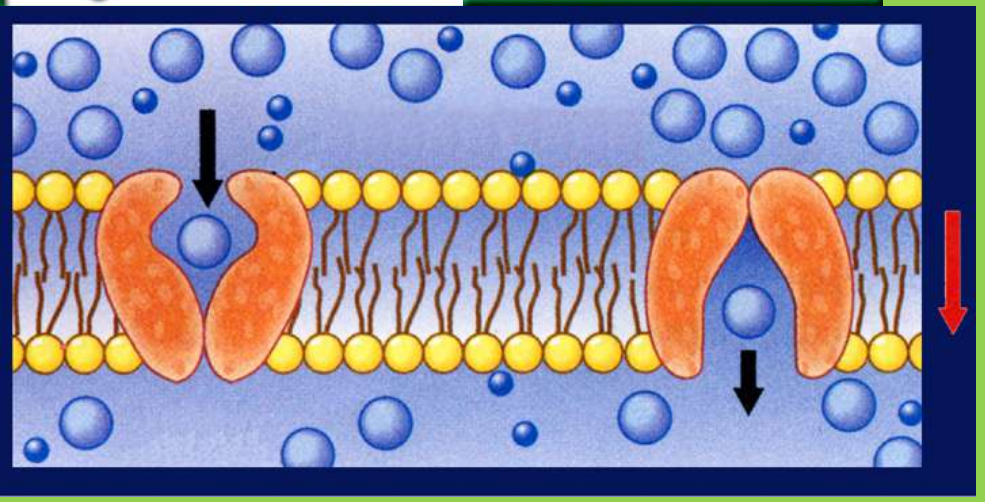
2/24 Cellular Transport 8.1

Obj. TSW explain how cells regulate their surroundings through their semi permeable membranes by comparing and contrasting organelles in a plant and animal cell.

P. 48 NB

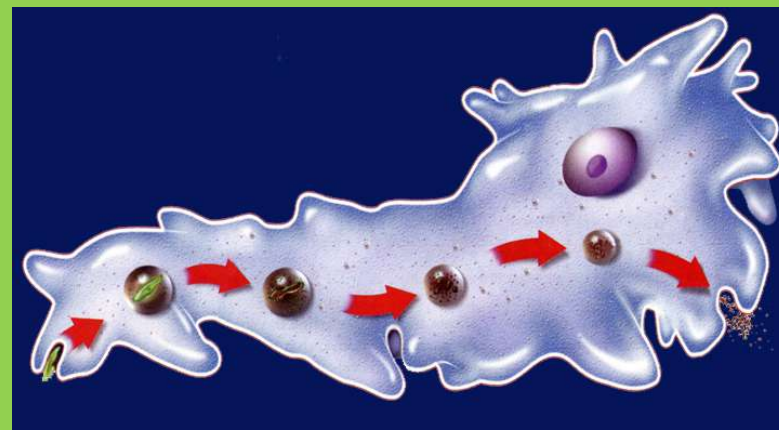






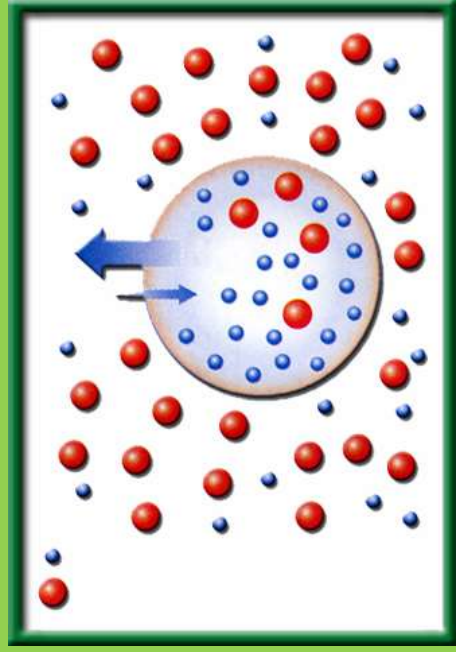
1. What is Osmosis?
2. Compare & Contrast **Isotonic, Hypotonic, and Hypertonic Solutions**.
3. Compare & Contrast **Passive Transport & Active Transport.**

1. **HW – Read CH 8.3, 1 page notes. P.53 NB**

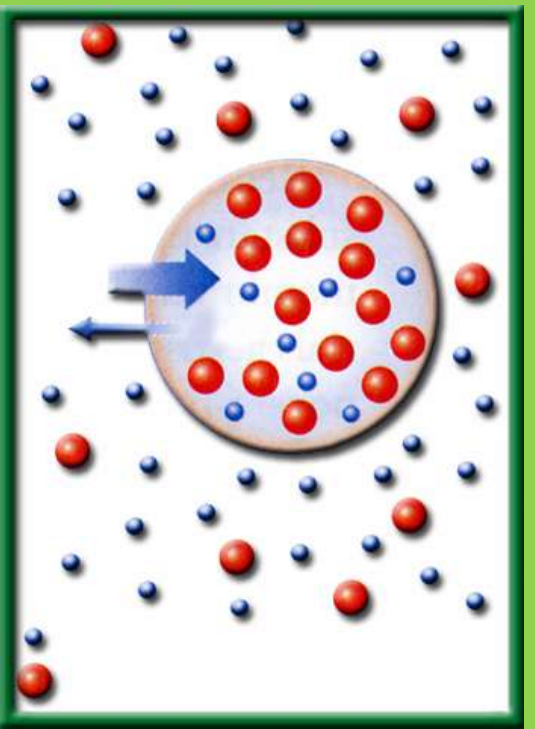


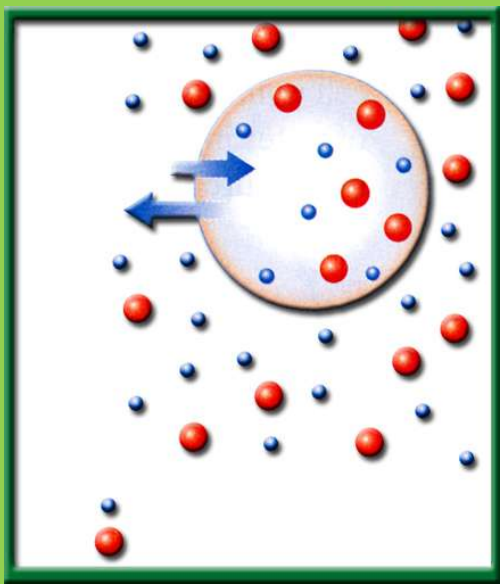
2/27 Osmosis CH 8.1 & 8.2

Obj. TSW learn how water moves through a plasma membrane by participating in a demonstration of Osmosis. P. 50 NB

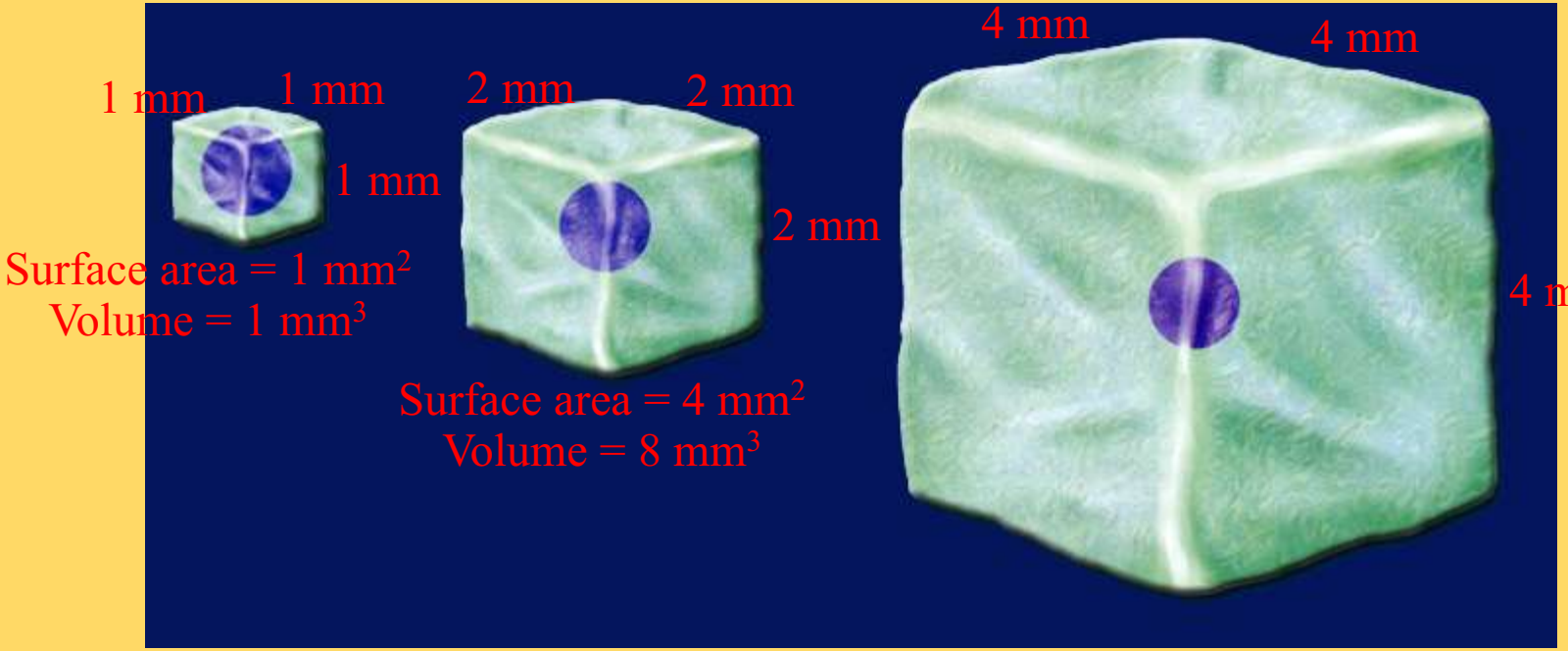


1. Why do cells have to be small?
2. Solvent is a solution, solute is the substance like sugar and salt. Explain what happens to a cell or egg in a Hypotonic solution. Use words like Solute and Solvent.
3. Explain plasmolysis, why does grass that has been salted in the winter along side roads die?



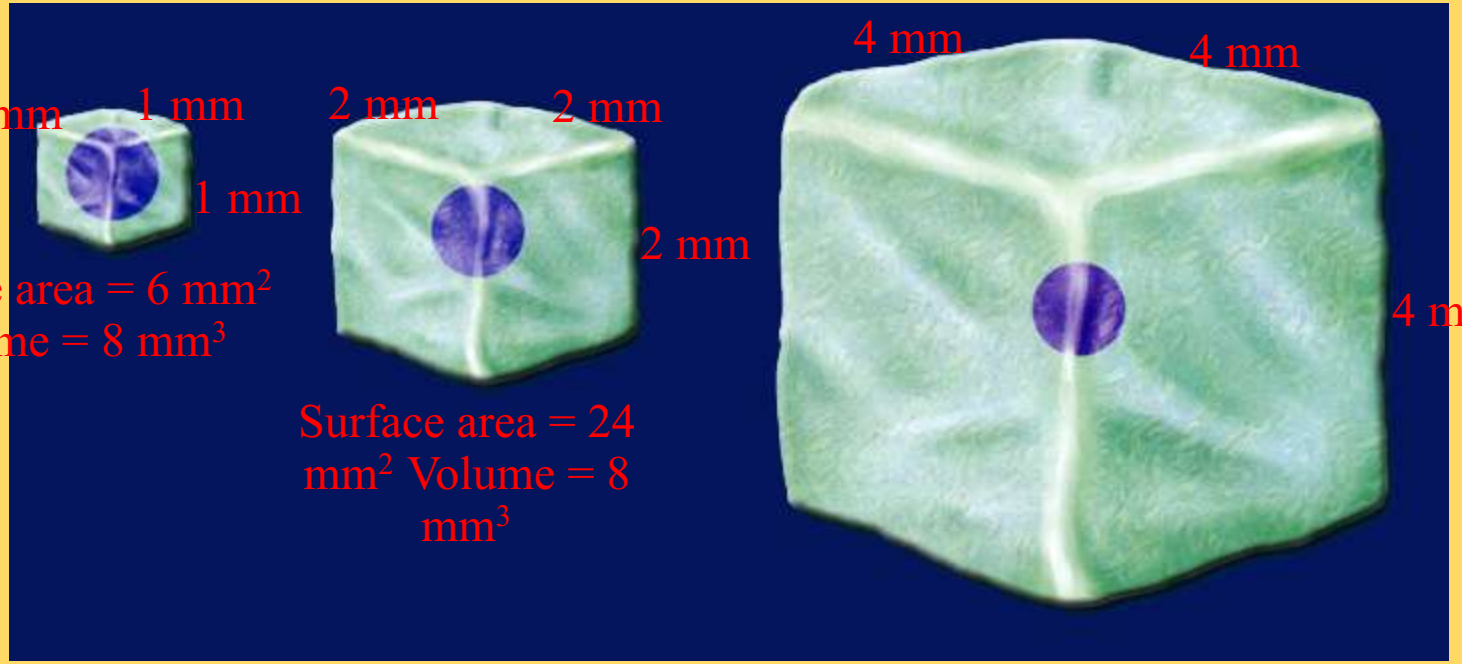


# 1. Surface area-to-volume ratio



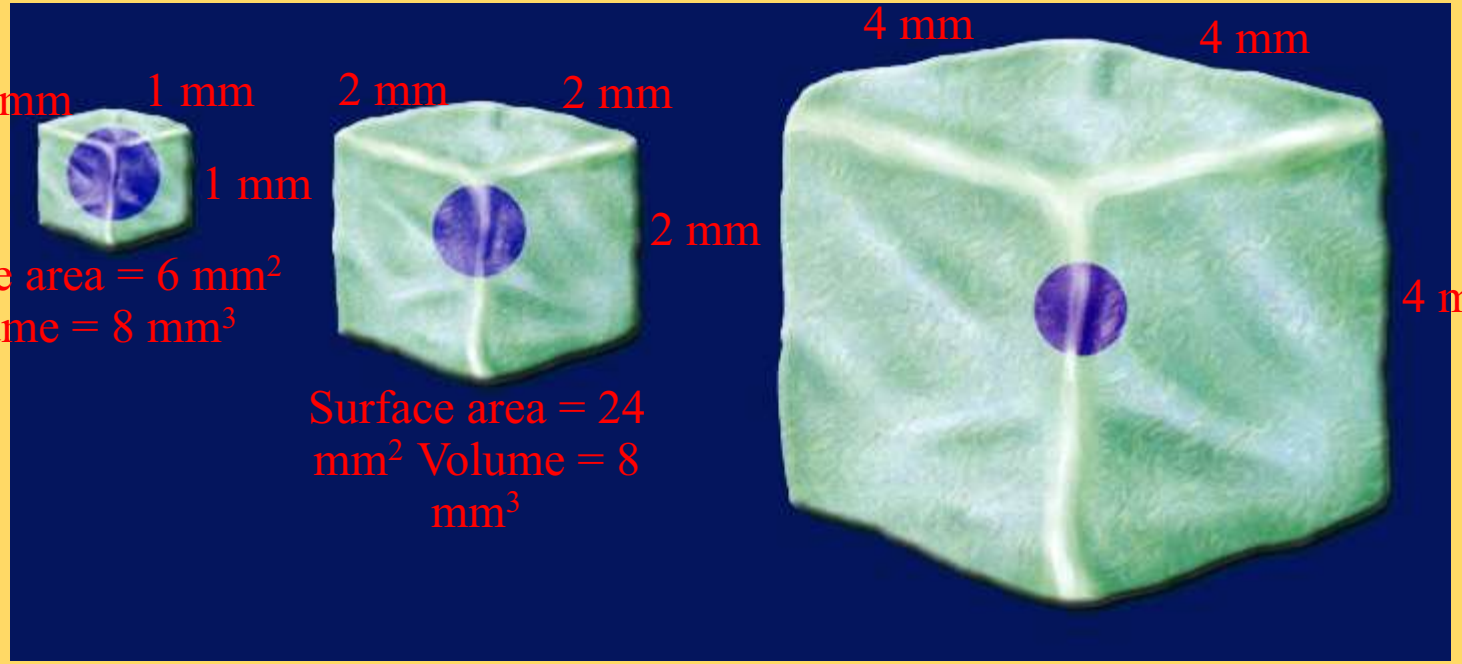

- As a cell's size increases, its volume increases much faster than its surface area.

# Surface area-to-volume ratio




- If cell size doubled, the cell would require eight times more nutrients and would have eight times more waste to excrete.

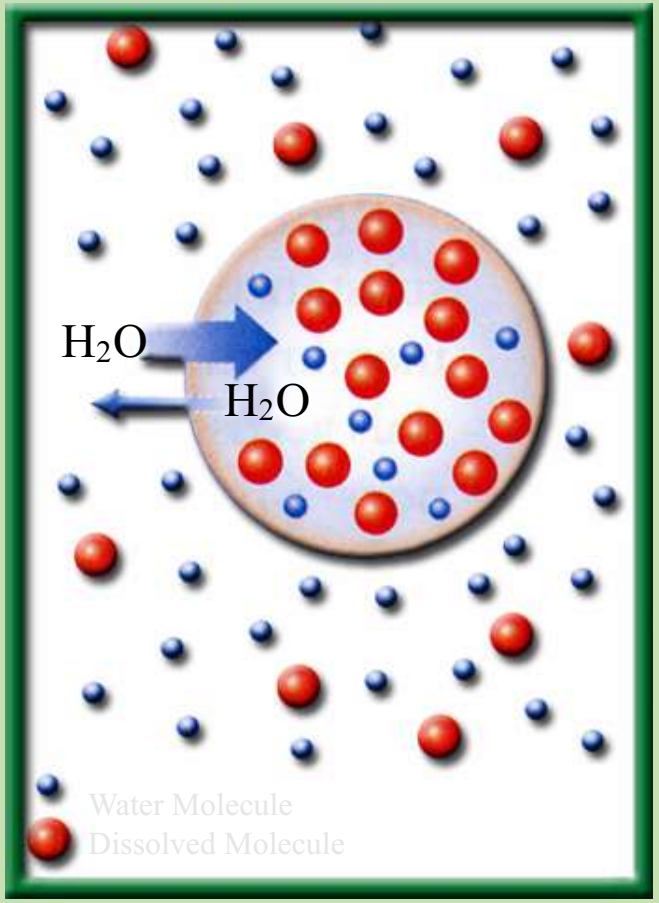
# Surface area-to-volume ratio



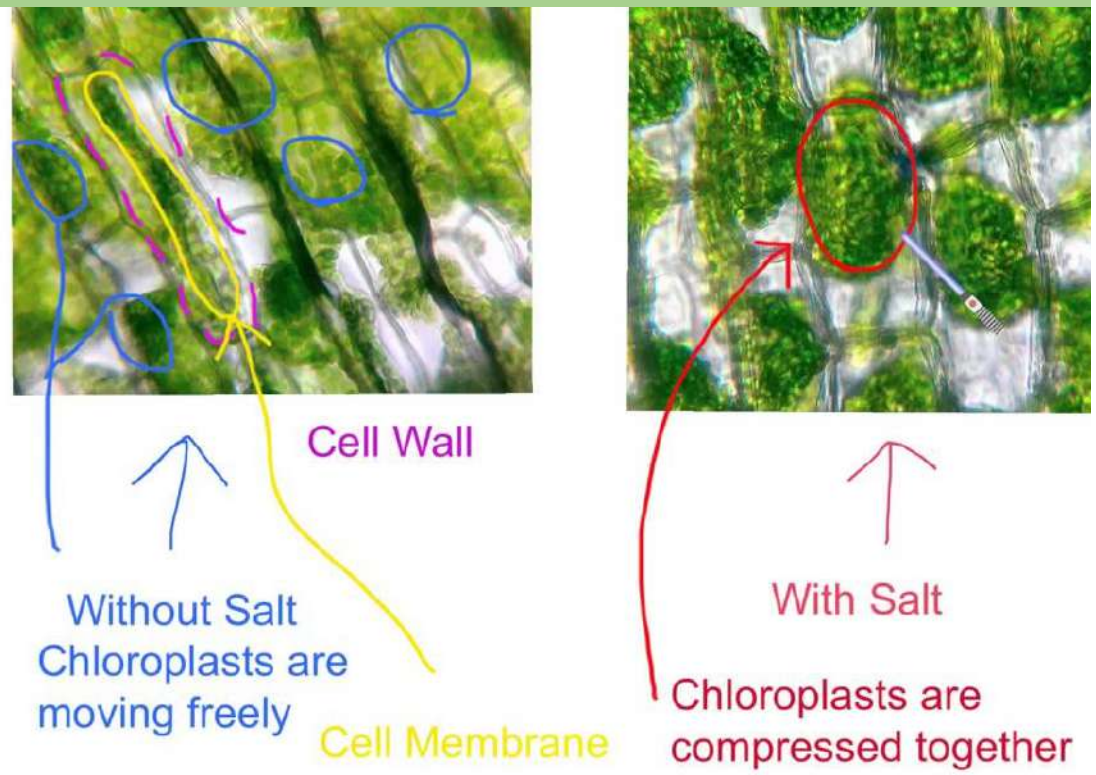

- The cell would either starve to death or be poisoned from the buildup of waste products.

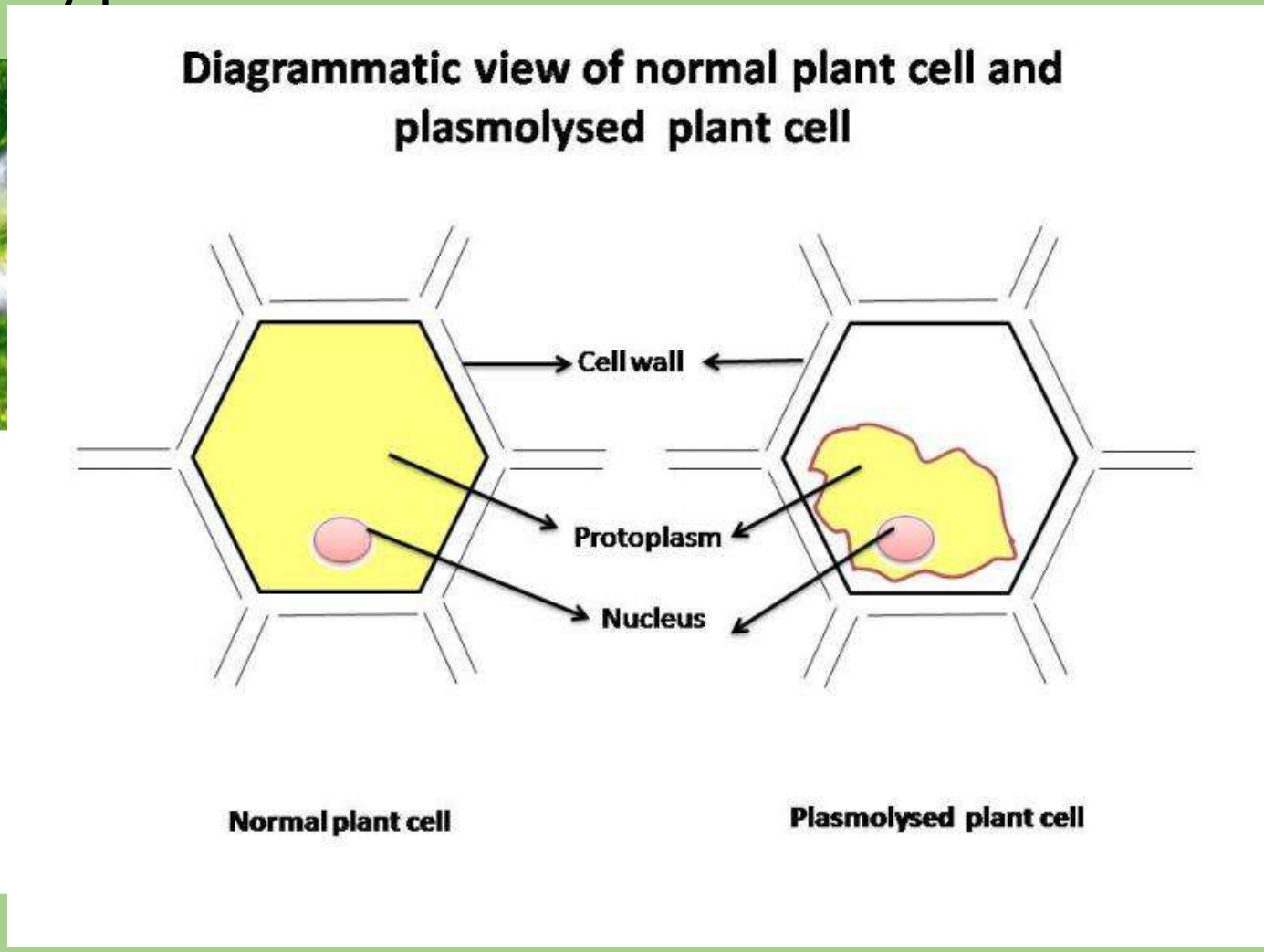
# 2. Cells in a hypotonic solution

- In a **hypotonic solution**, water (solvent) enters a cell by osmosis, causing the **cell to swell**. There is a higher concentration of solute (sugar) in the cell. To reach equilibrium, the solvent must enter the cell.
- *Lysed- to explode*



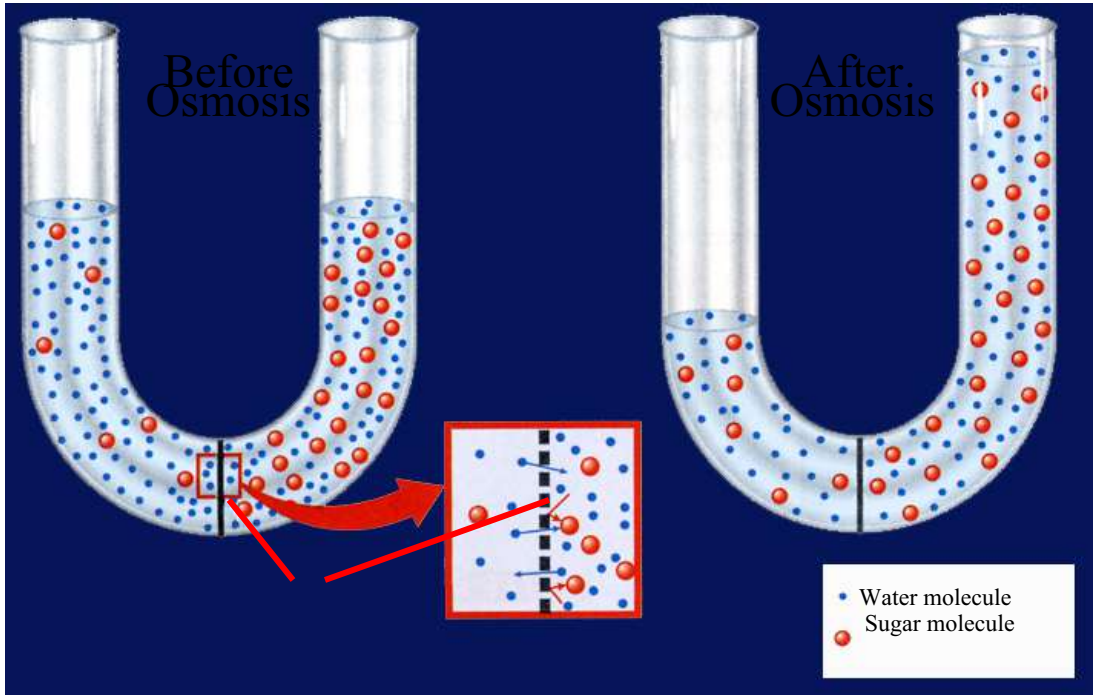
3. Plasmolysis – The shrinking of the cell due to loss of water from increased solute concentration outside the cell. This is an example of Hypertonic solution.



# What controls osmosis?
# #1.The movement of water.

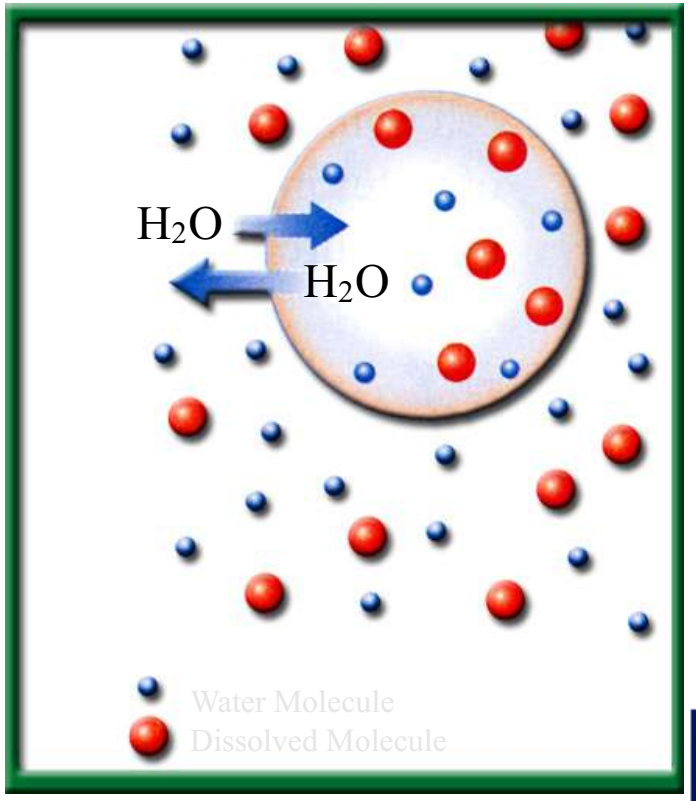
- Unequal distribution of particles, called a concentration gradient, is one factor that controls osmosis.



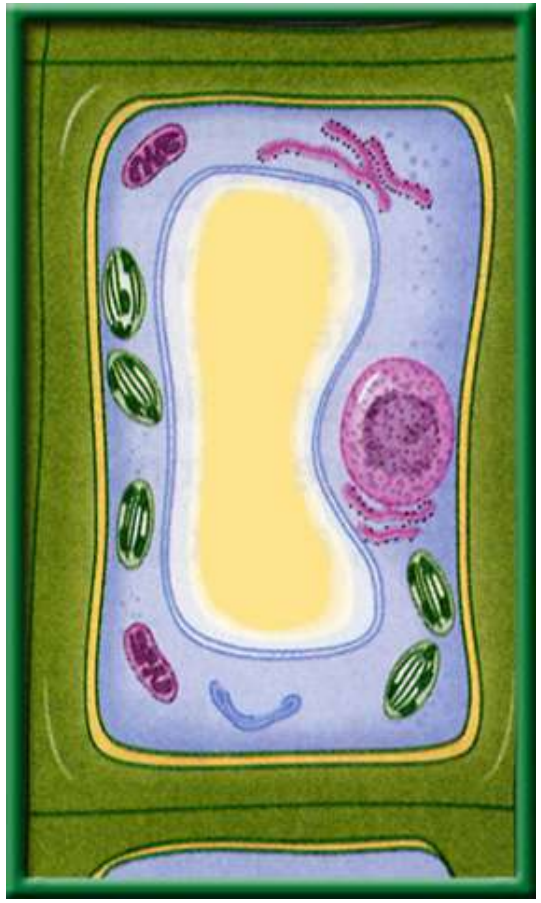

Selectively permeable membrane

# Cells in an isotonic solution

- In an isotonic solution, the concentration of dissolved substances in the solution is the same as the concentration of dissolved substances inside the cell.



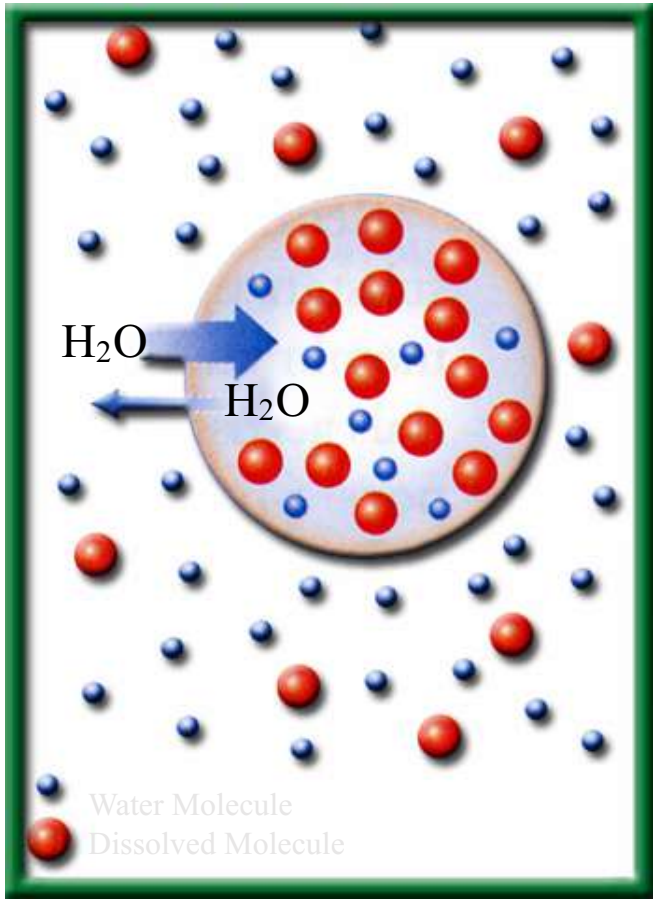
# Cells in an isotonic solution



- A plant cell has its **normal shape** and pressure in an **isotonic solution**.

# Cells in a hypotonic solution

- In a **hypotonic solution**, water enters a cell by osmosis, causing the **cell to swell**.
- *Lysed- to explode*

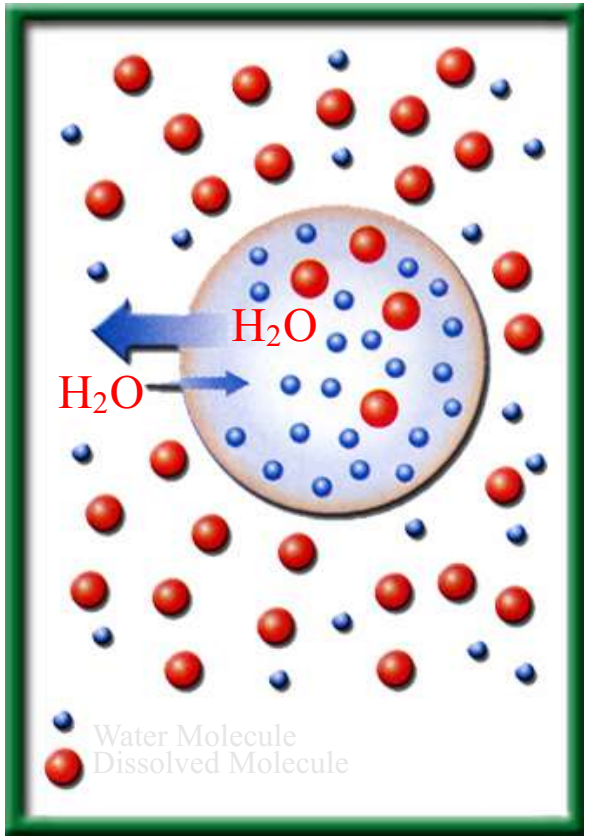


# Cells in a hypotonic solution

- Plant cells swell beyond their normal size as pressure increases.

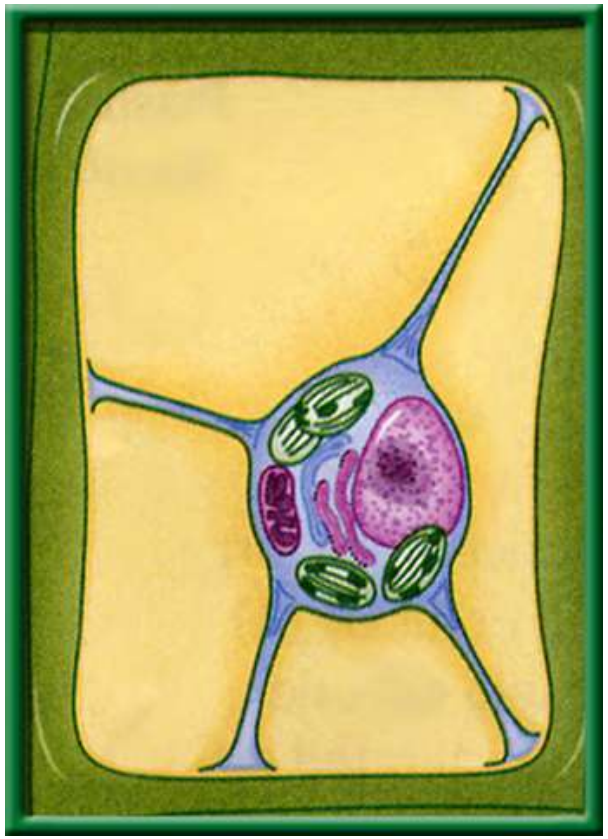
# Cells in a hypertonic solution

- In a **hypertonic solution**, water leaves a cell by osmosis, causing the **cell to shrink**.



# Cells in a hypertonic solution

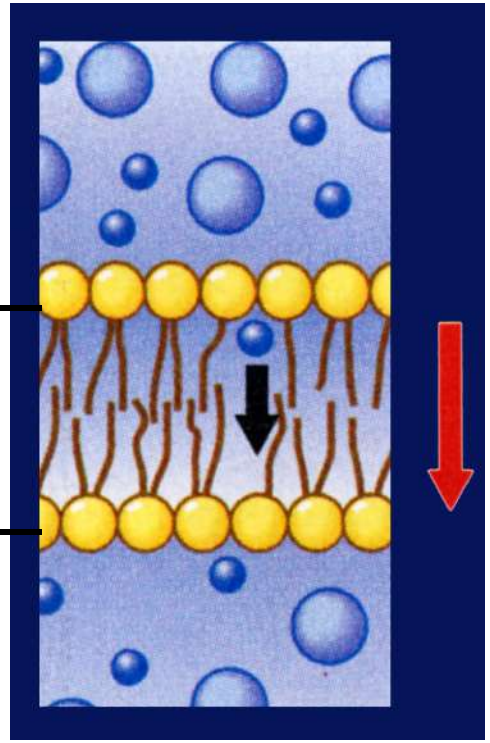
- Plant cells lose pressure as the plasma membrane shrinks away from the cell wall.



# #2.Passive Transport

- When a cell uses **no energy** to move particles across a membrane passive transport occurs.

•Osmosis
•Diffusion
•Facilitated Diffusion

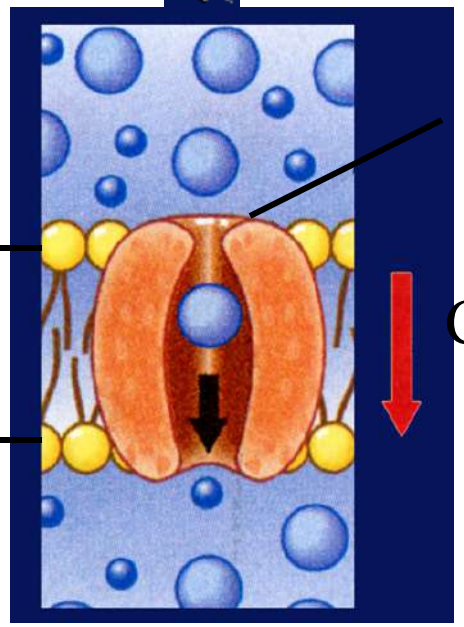



Moves from High Concentration to Low Concentration

Concentration gradient

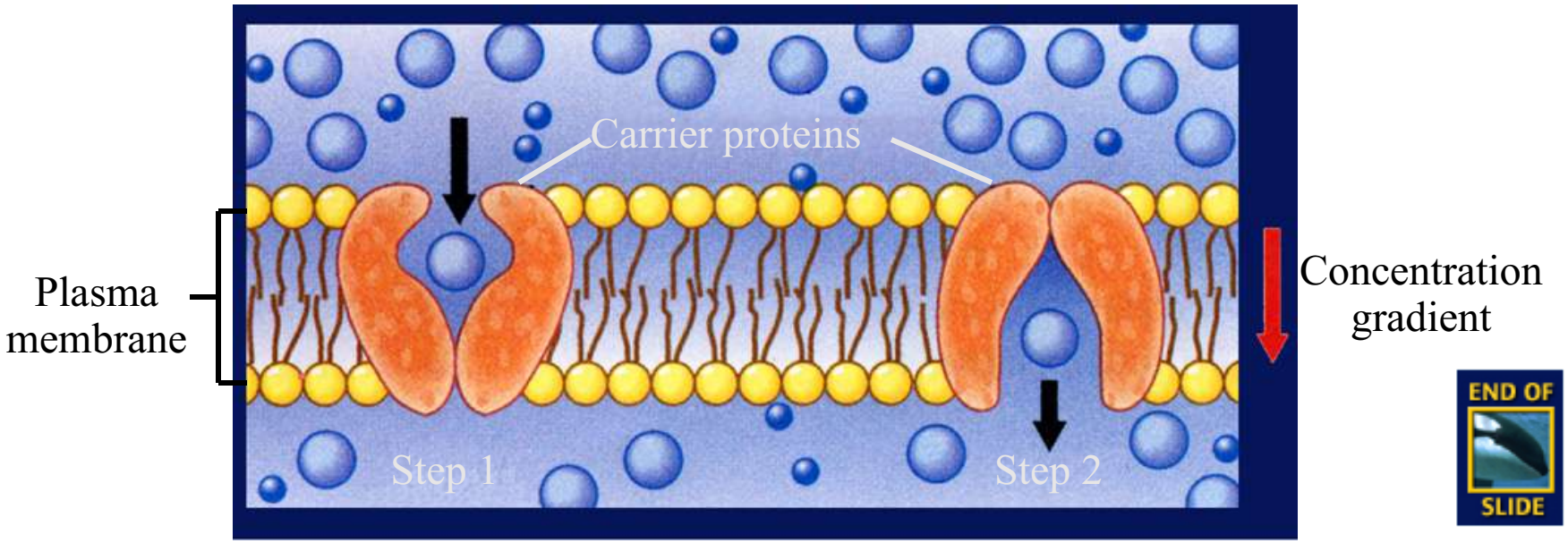
# Passive Transport by proteins

- Passive transport of materials across the membrane using transport proteins is called facilitated diffusion.



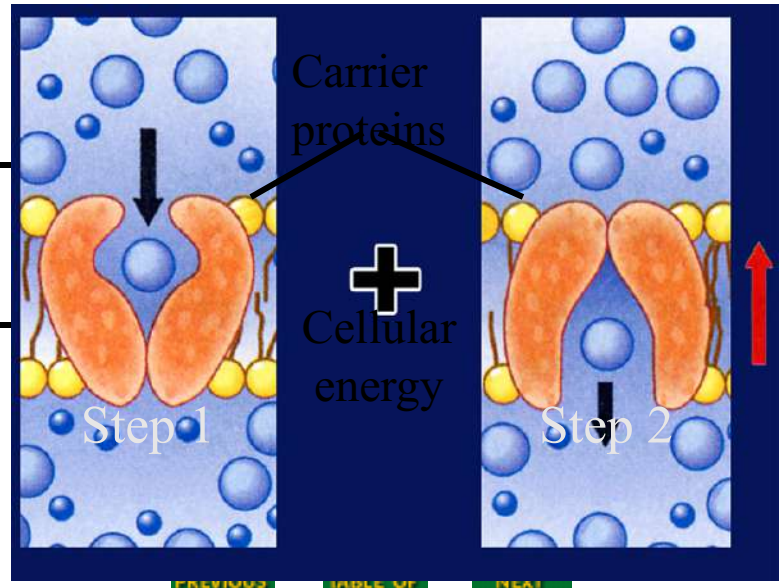
# Passive transport by proteins

- The movement is with the concentration gradient (High to Low), and requires no energy input from the cell.



# Active Transport

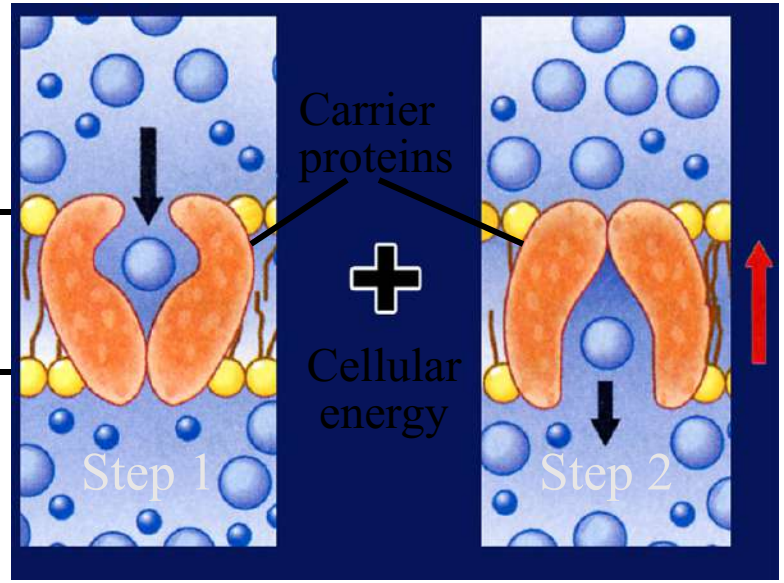
- Movement of materials through a membrane against a concentration gradient (Low to High) is called active transport and **requires energy** from the cell.



# How active transport occurs

- In active transport, a transport protein called a carrier protein first binds with a particle of the substance to be transported.

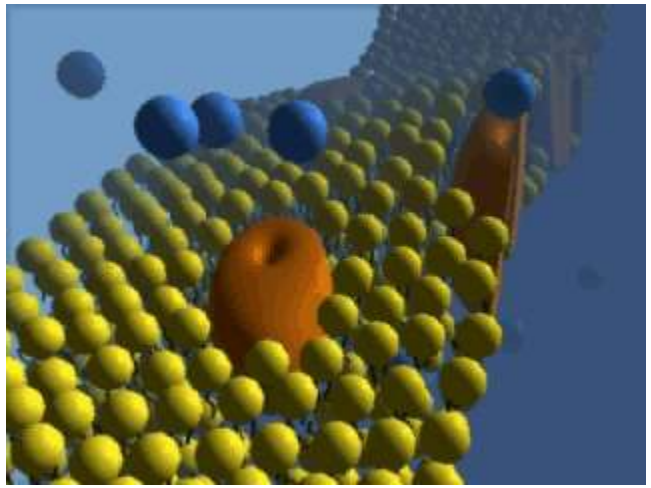
Exocytosis
Endocytosis



# How active transport occurs

Click image to view movie.

# How active transport occurs



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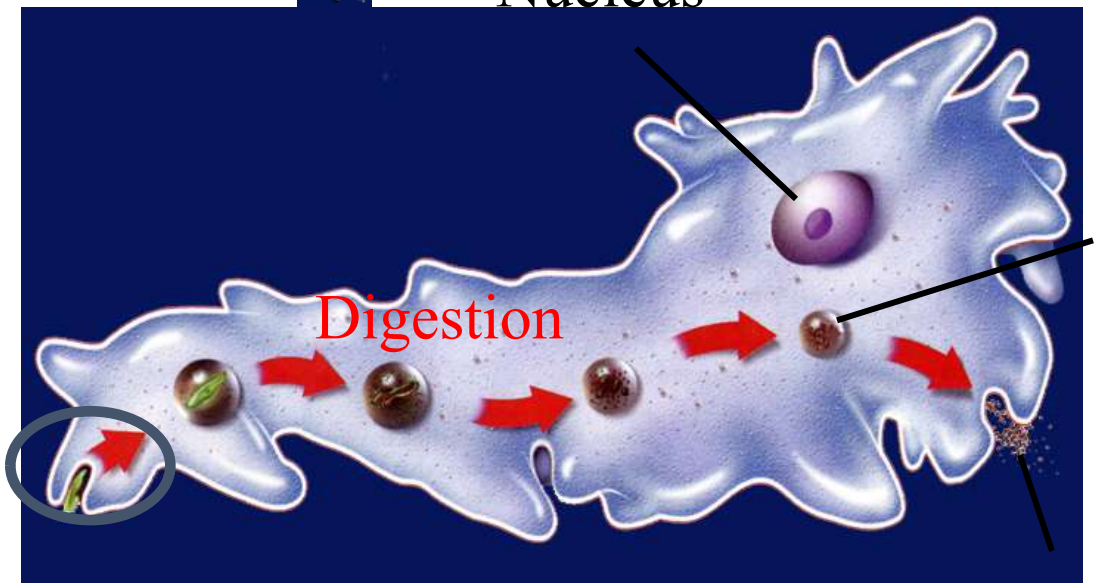
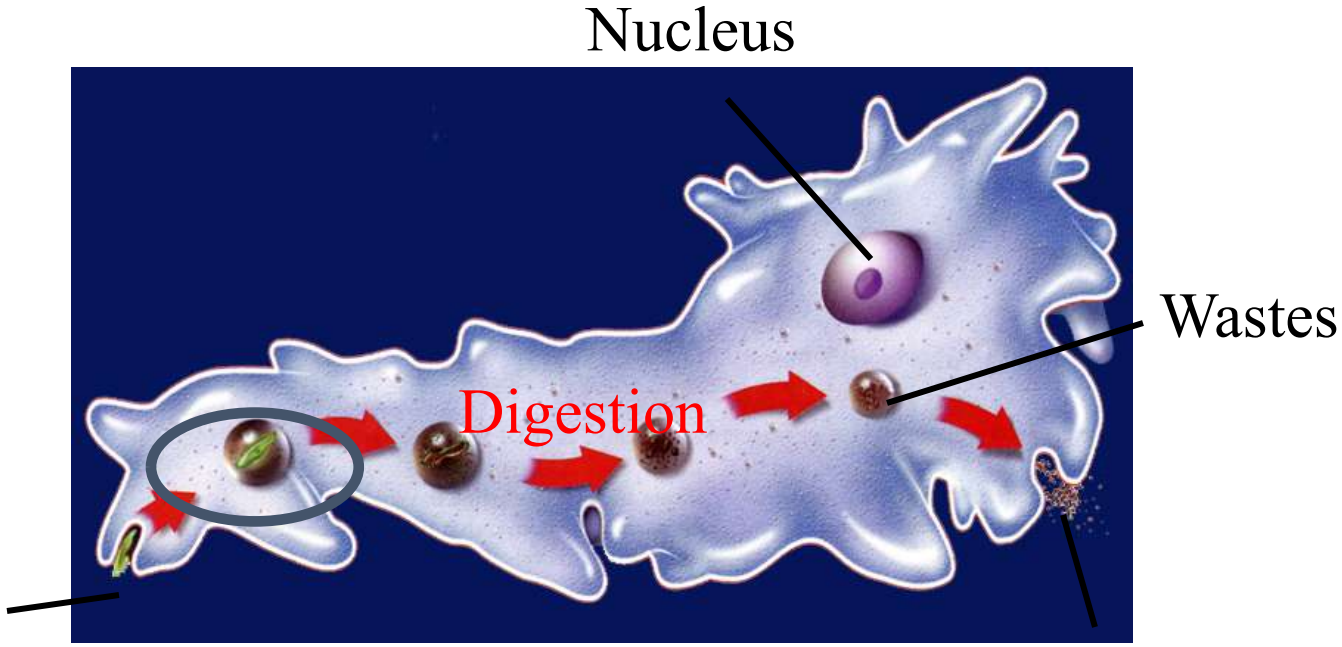
# Transport of Large Particles- Active Transport

- Endocytosis is a process by which a cell surrounds and **takes in material** from its environment.



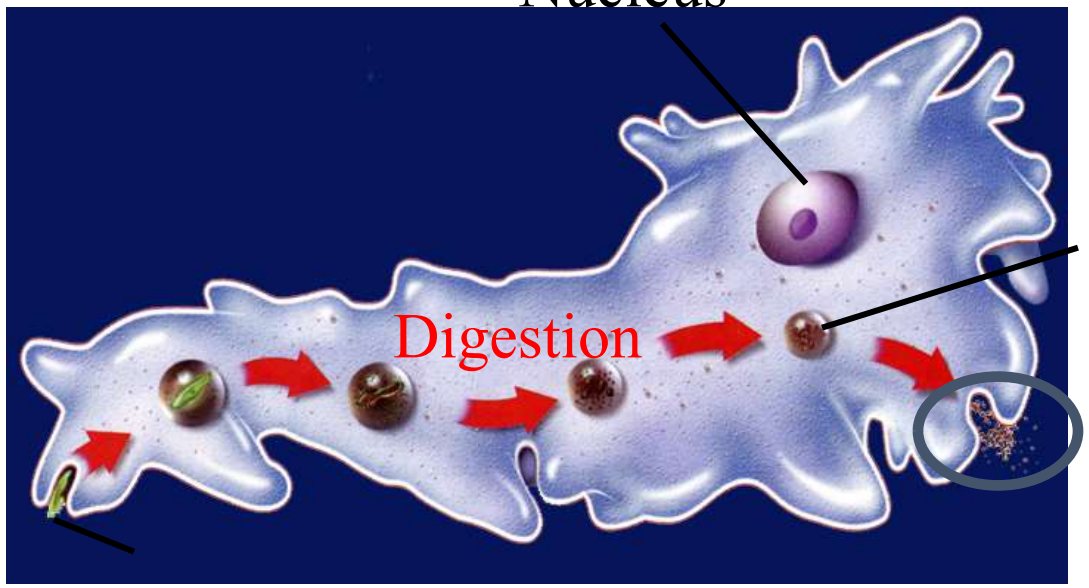
# Transport of Large Particles

- The material is engulfed and enclosed by a portion of the cell's plasma membrane.



# Transport of Large Particles – Active Transport

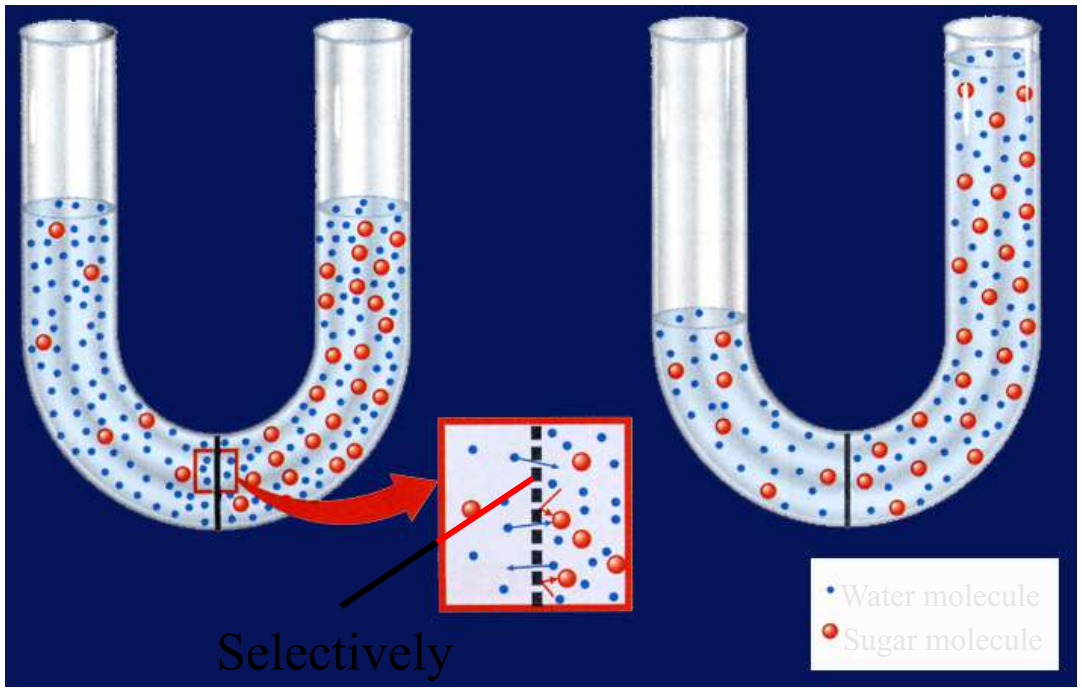
- Exocytosis is the expulsion or secretion of **materials from a cell**



Section Check

# Question 1

The diffusion of water across a selectively permeable membrane is called _____.




C. exocytosis

D. osmosis

# Question 2

What is the expected result of having an animal cell in a hypertonic solution?

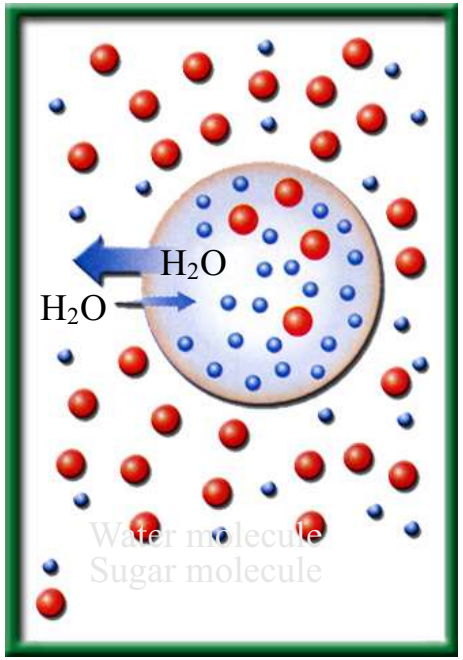
A. The cell shrivels up.

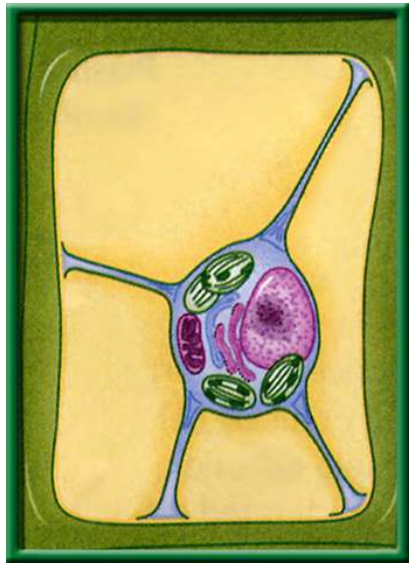
B. The plasma membrane shrinks away from the cell wall.

C. The cell swells up.

D. The cell retains its normal shape.

The answer is A. In a hypertonic solution, cells experience osmosis of water out of the cell. Animal cells shrivel because of decreased pressure in the cells.



# Question 3

A grocer mists the celery display with water to keep it looking fresh. What type of solution is the celery now in?

A. isotonic

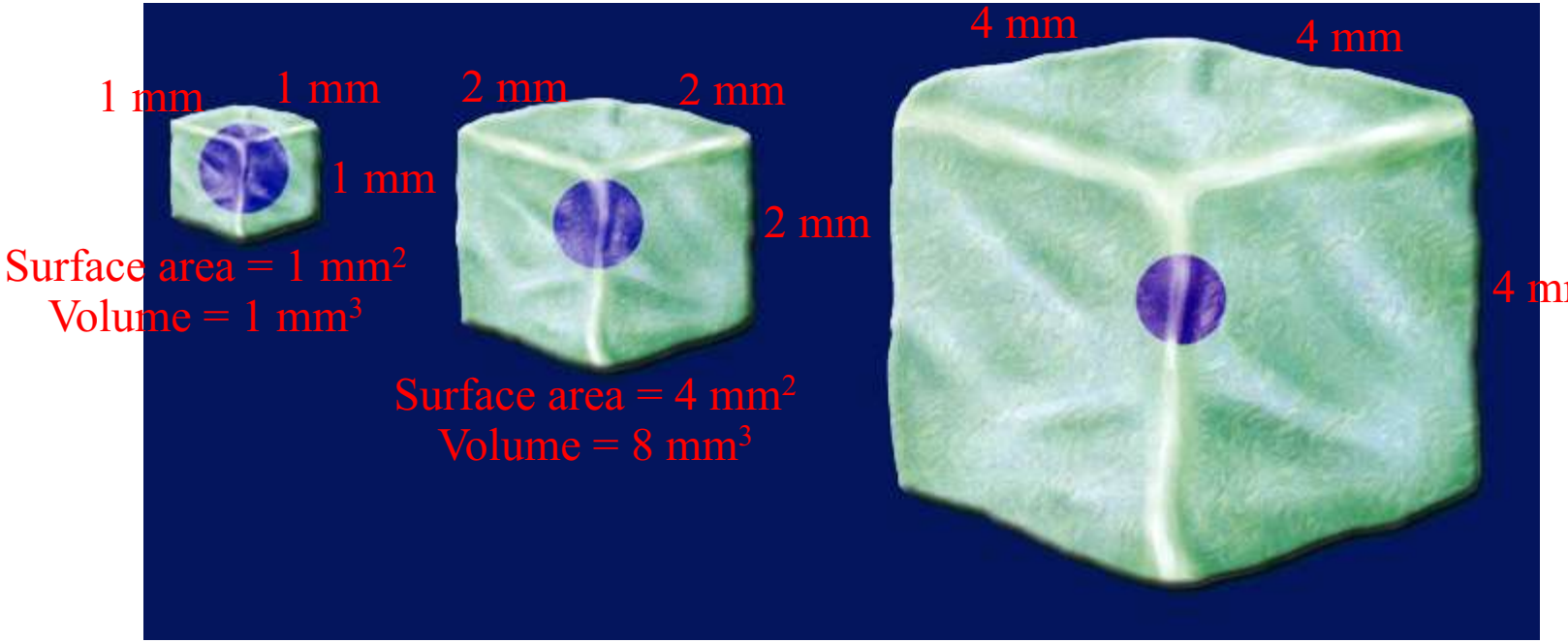
B. hypotonic

C. hypertonic

D. exotonic

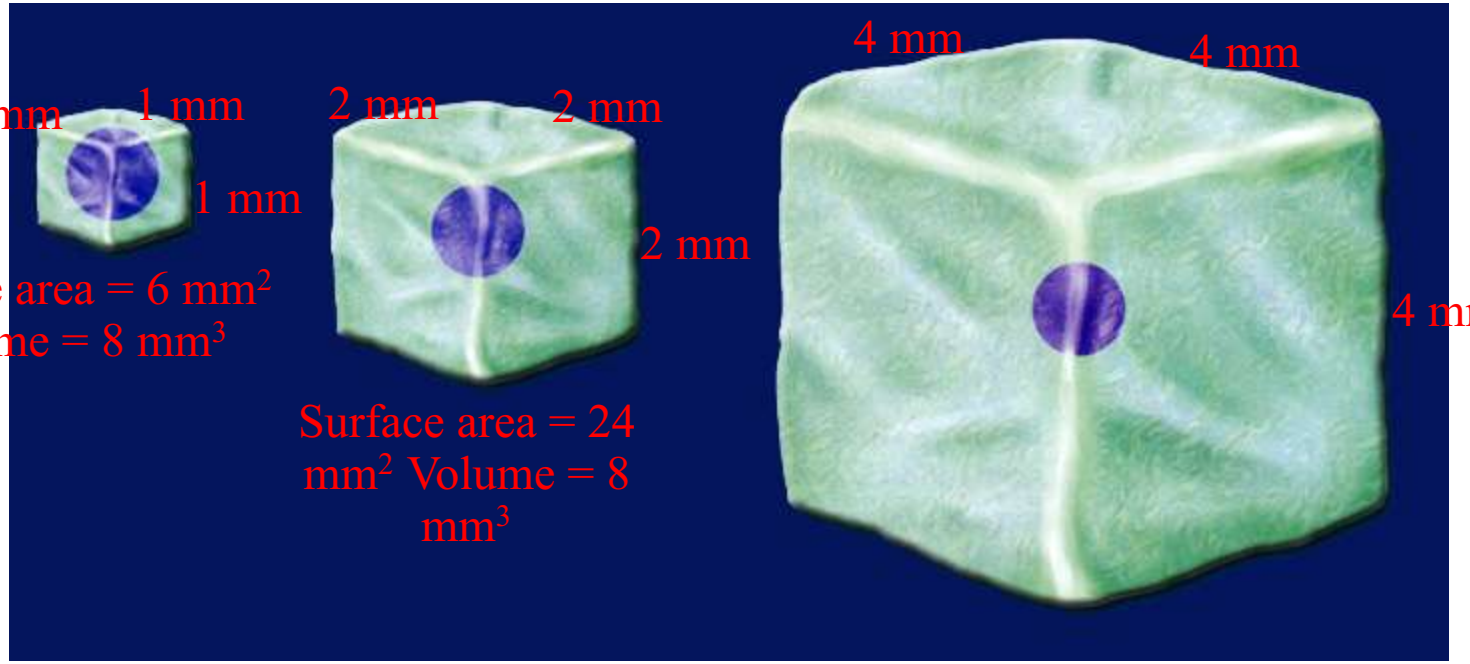
The answer is B. Plant cells contain a rigid cell wall and do not burst even in a hypotonic solution.

# Surface area-to-volume ratio



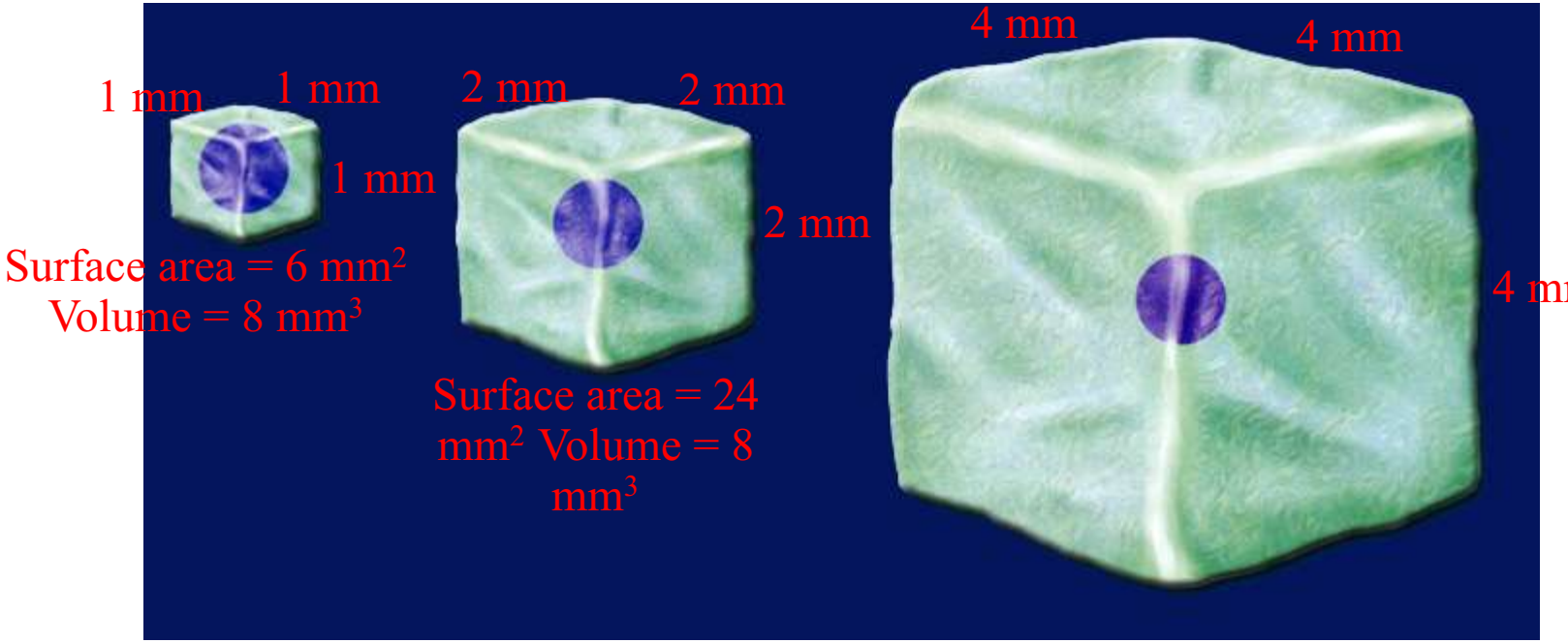

- As a cell's size increases, its volume increases much faster than its surface area.

# Surface area-to-volume ratio




- If cell size doubled, the cell would require eight times more nutrients and would have eight times more waste to excrete.

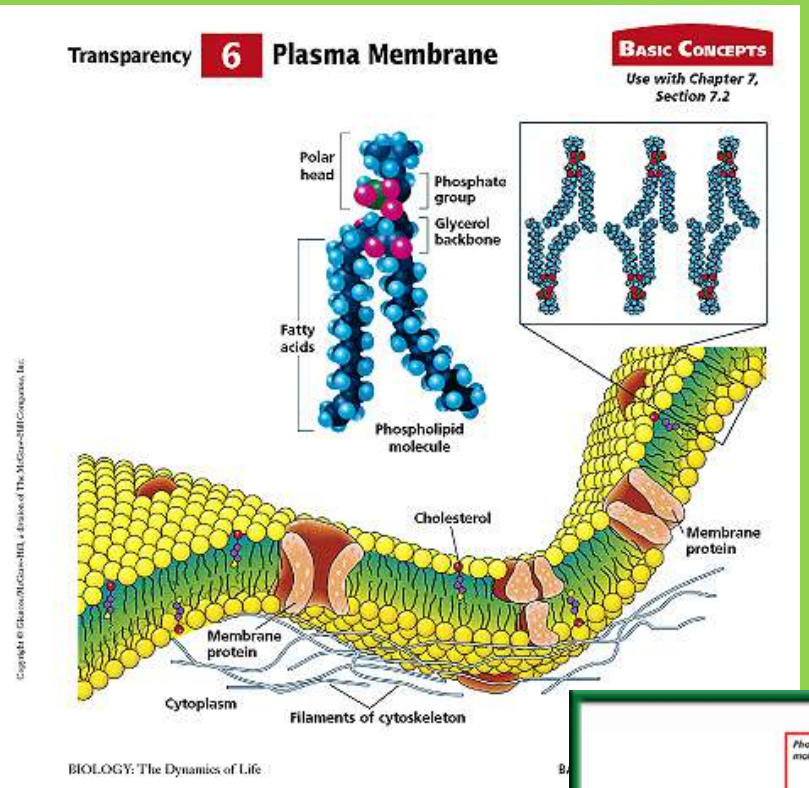
# Surface area-to-volume ratio

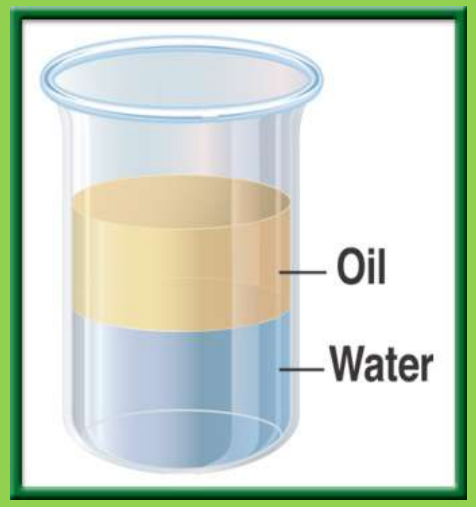



- The cell would either starve to death or be poisoned from the buildup of waste products.

# 2/28 The Plasma Membrane 7.2

Obj. TSW demonstrate their knowledge and understanding of how the plasma membrane is semipermeable & taking notes. P.52NB

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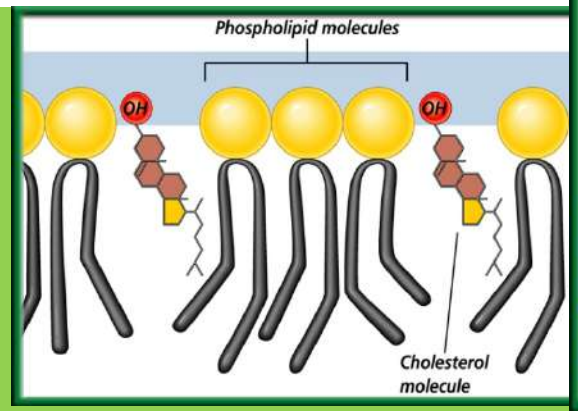
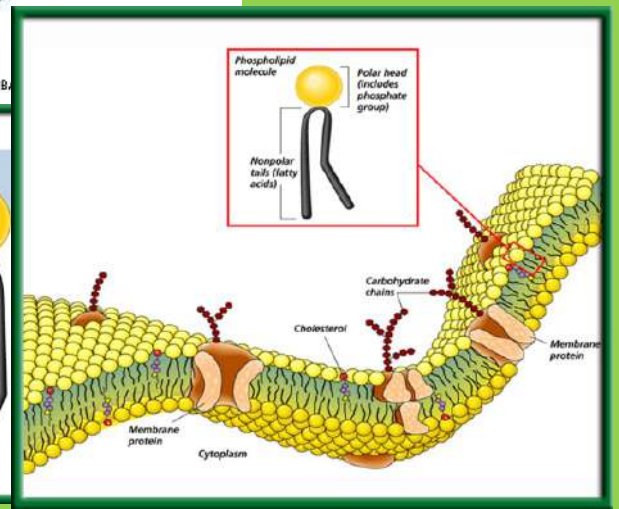
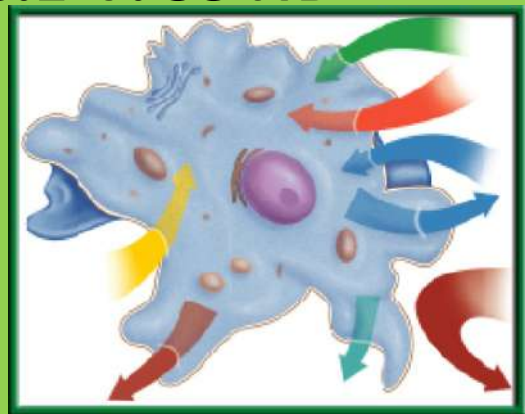
1. Explain what **selectively permeable (semi-permeable)** means.
2. Why is the plasma membrane called a **Fluid Mosaic Model**?
3. Write the 4 Macromolecules/ biomolecules. For each one, explain it's location and how it helps the cell function.

**HW – NOTES CH 8.1 P. 53 NB**

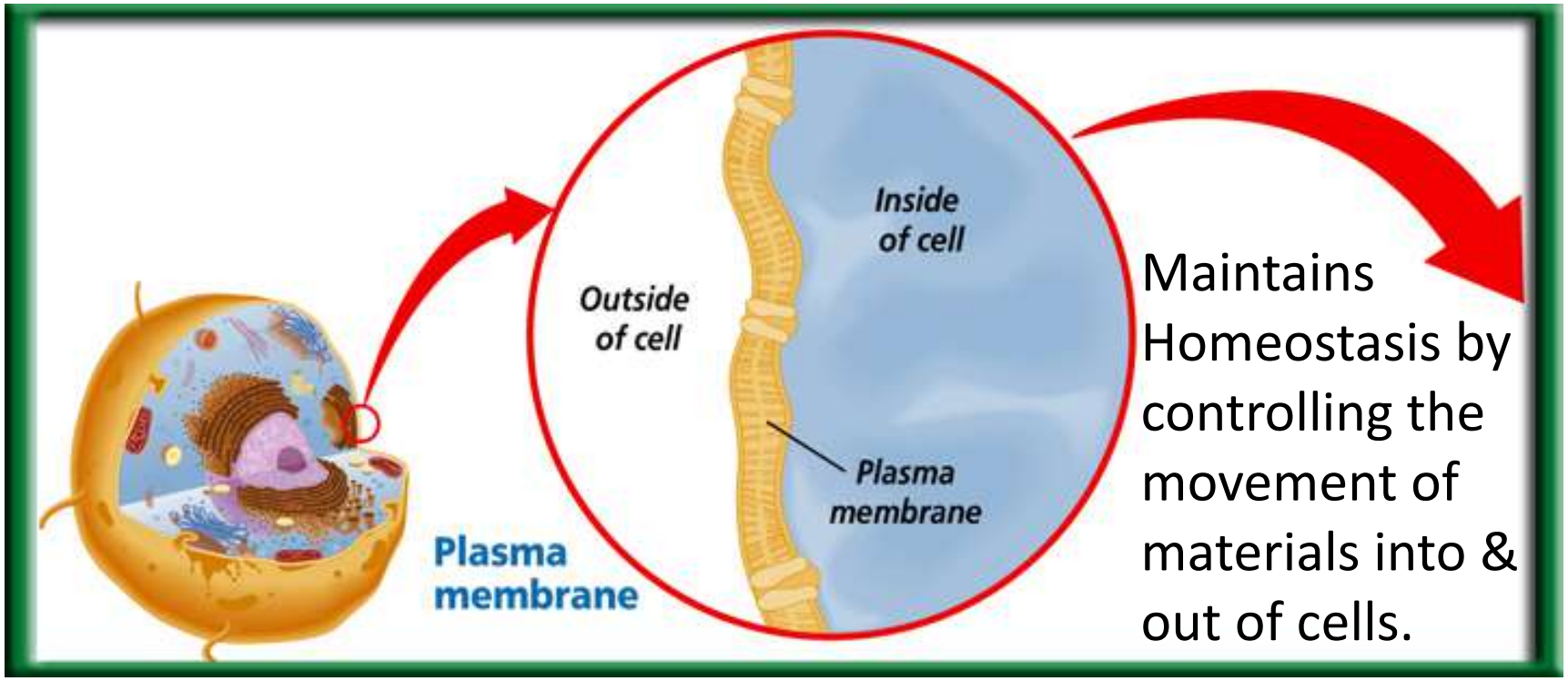


# 1. Plasma Membrane – Selectively Permeable, some things can go in , some go out, but not everything.

## Phospholipid Bilayer




Maintains Homeostasis by controlling the movement of materials into & out of cells.

END OF SLIDE

To return to the chapter summary click escape or close this document.

Image Bank

# Cell Wall

Made of cellulose, not digestible by humans.

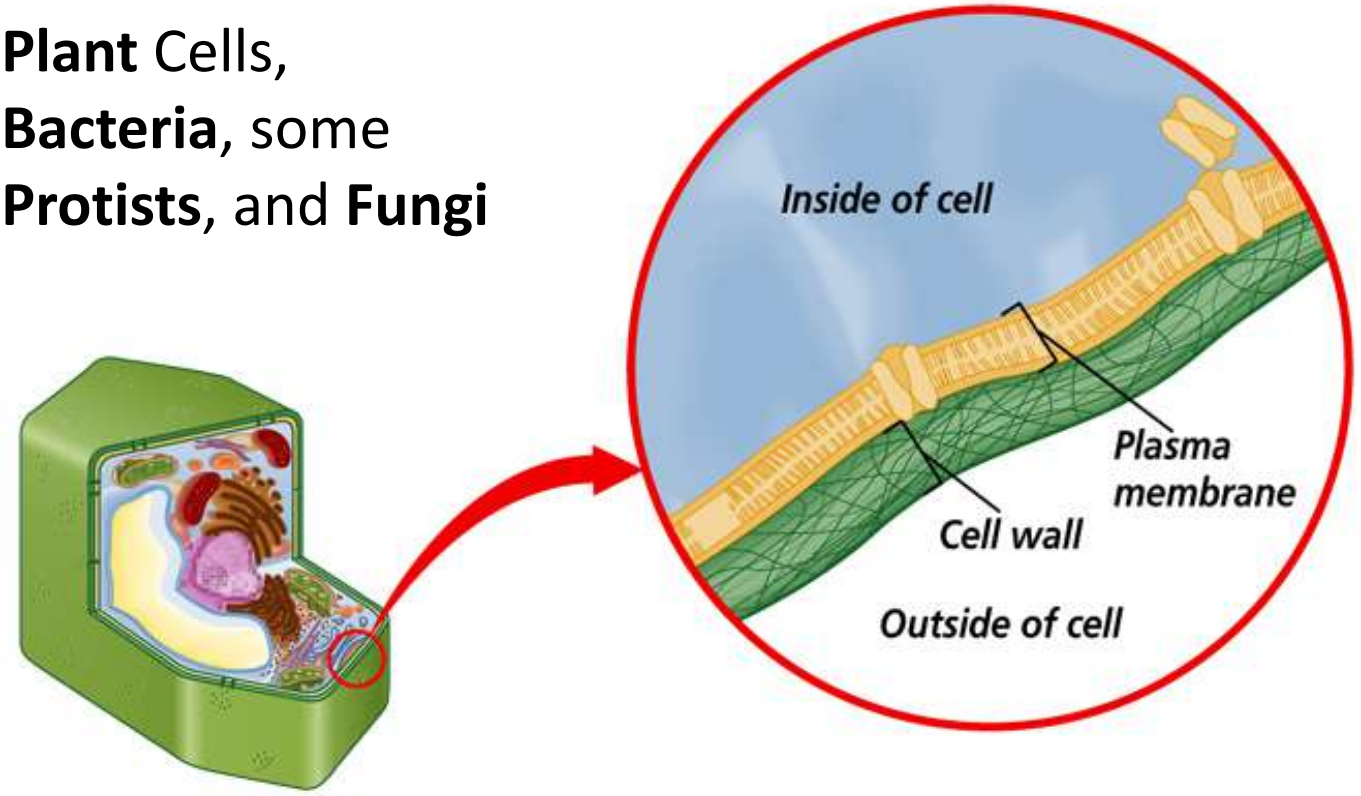
Provides protection and support.

Found in:

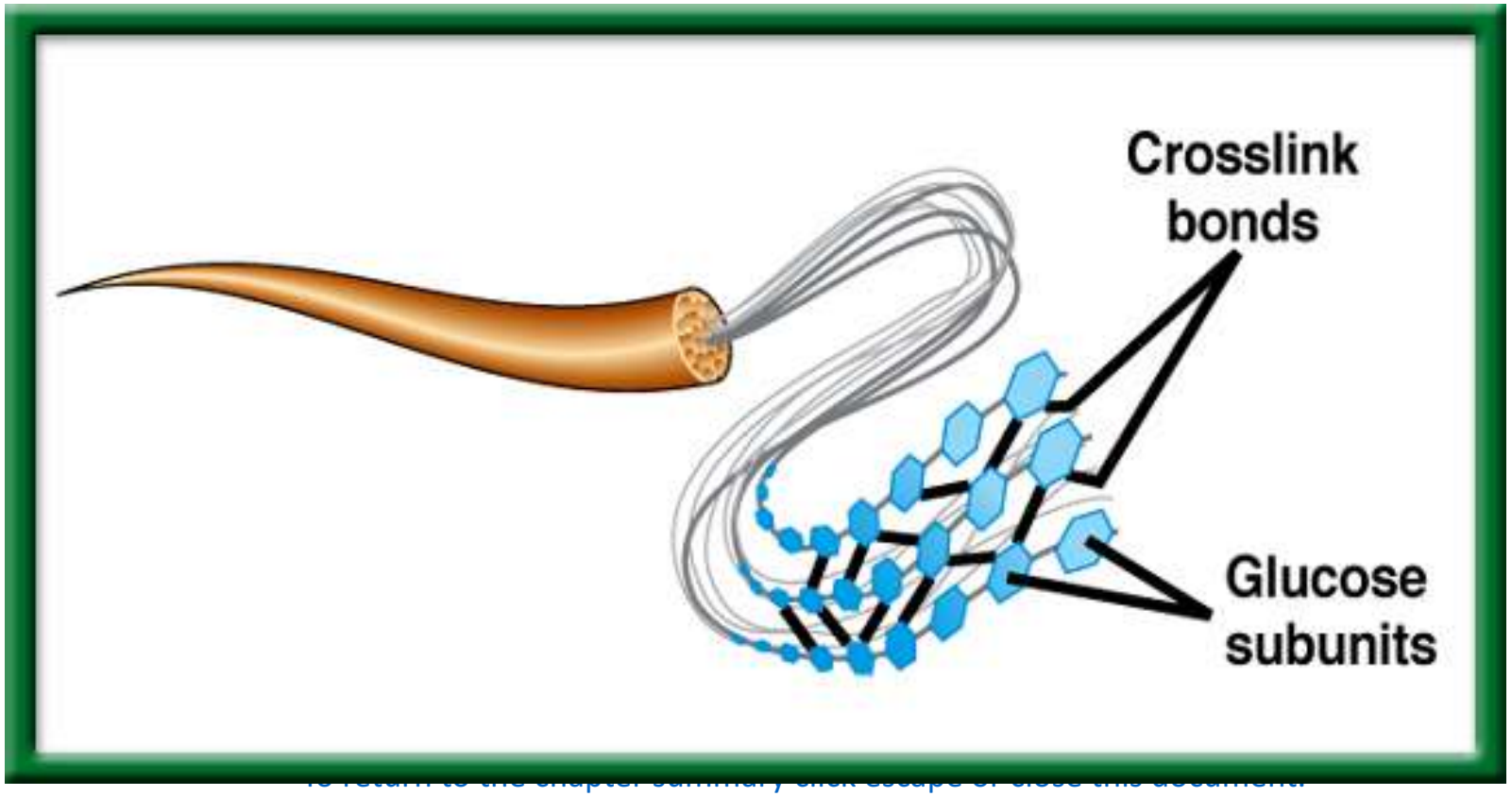
**Plant** Cells,

**Bacteria**, some

**Protists**, and **Fungi**



# Structure of Cellulose – Cell Wall of Plants
# We call it Fiber.

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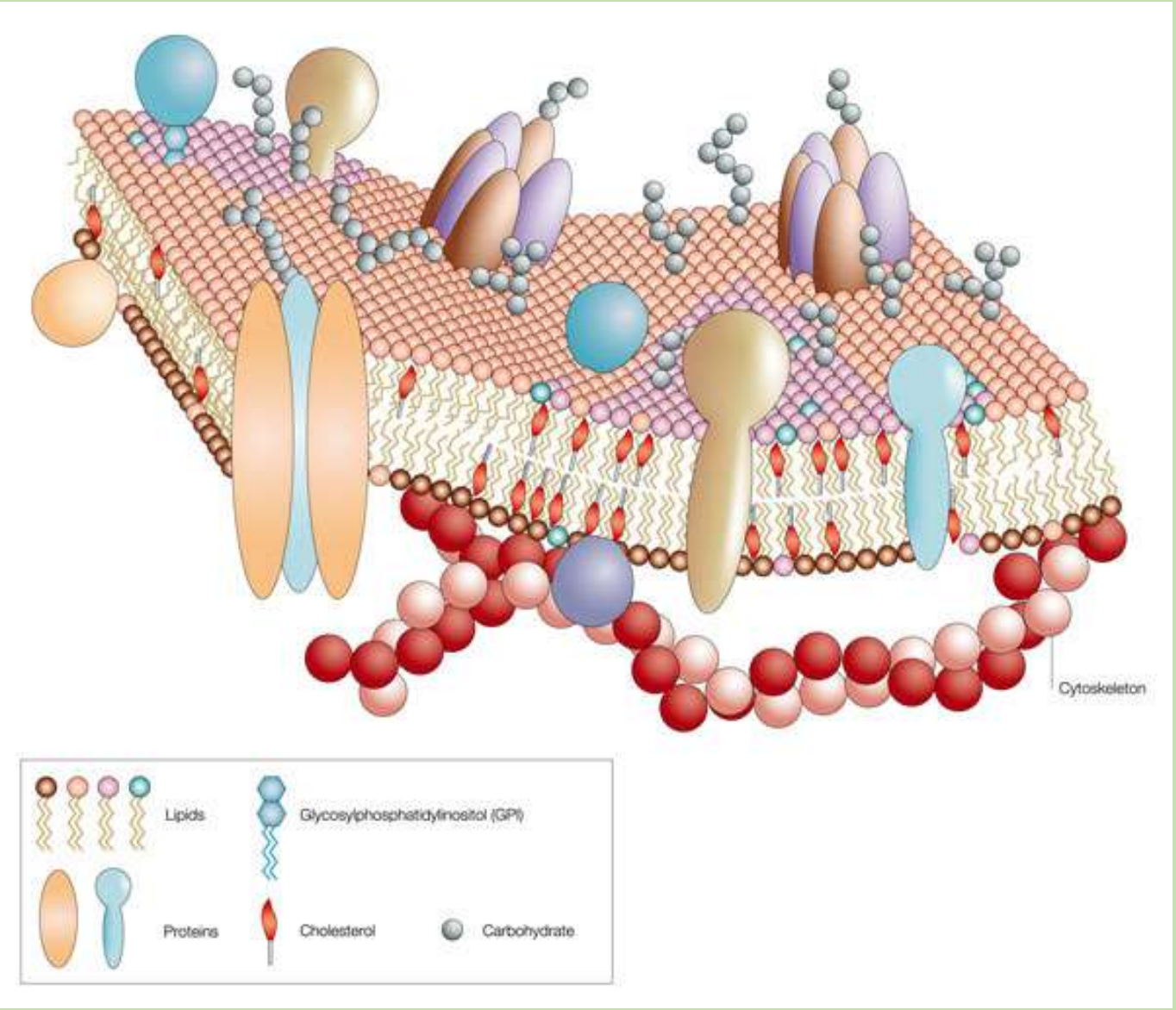
RESOURCES

# ID the Carbohydrates, Proteins, Lipids, & Cholesterols

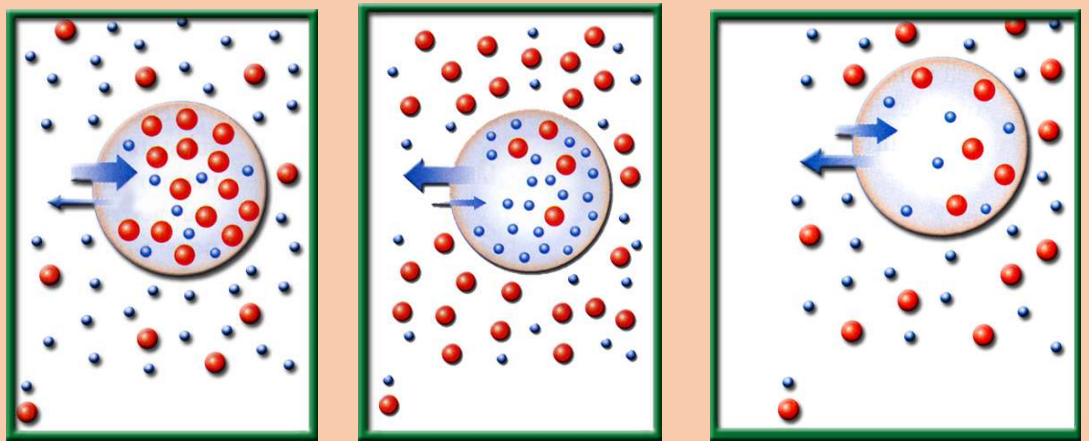



2. The Plasma Membrane is a Fluid Mosaic Model because it moves like waves on a lake and the proteins & carbohydrates on the surface look like a mosaic.

3. What is the function of each of these Macromolecules in the Plasma Membrane?

# Osmosis Hypothesis p. 49 NB

- If we put an egg that the shell has been dissolved in vinegar for 24 hours into Karo Syrup, then the egg will _____.
- If we put an egg that the shell has been dissolved in vinegar for 24 hours into water, then the egg will _____.
- If we put an egg that the shell has been dissolved in vinegar for 24 hours into salt water, then the egg will _____.
- By the third day you should have an AXES Paragraph written about Osmosis, and how cells are impacted by different solutions.



Chapter 8 **Cellular Transport and the Cell Cycle**

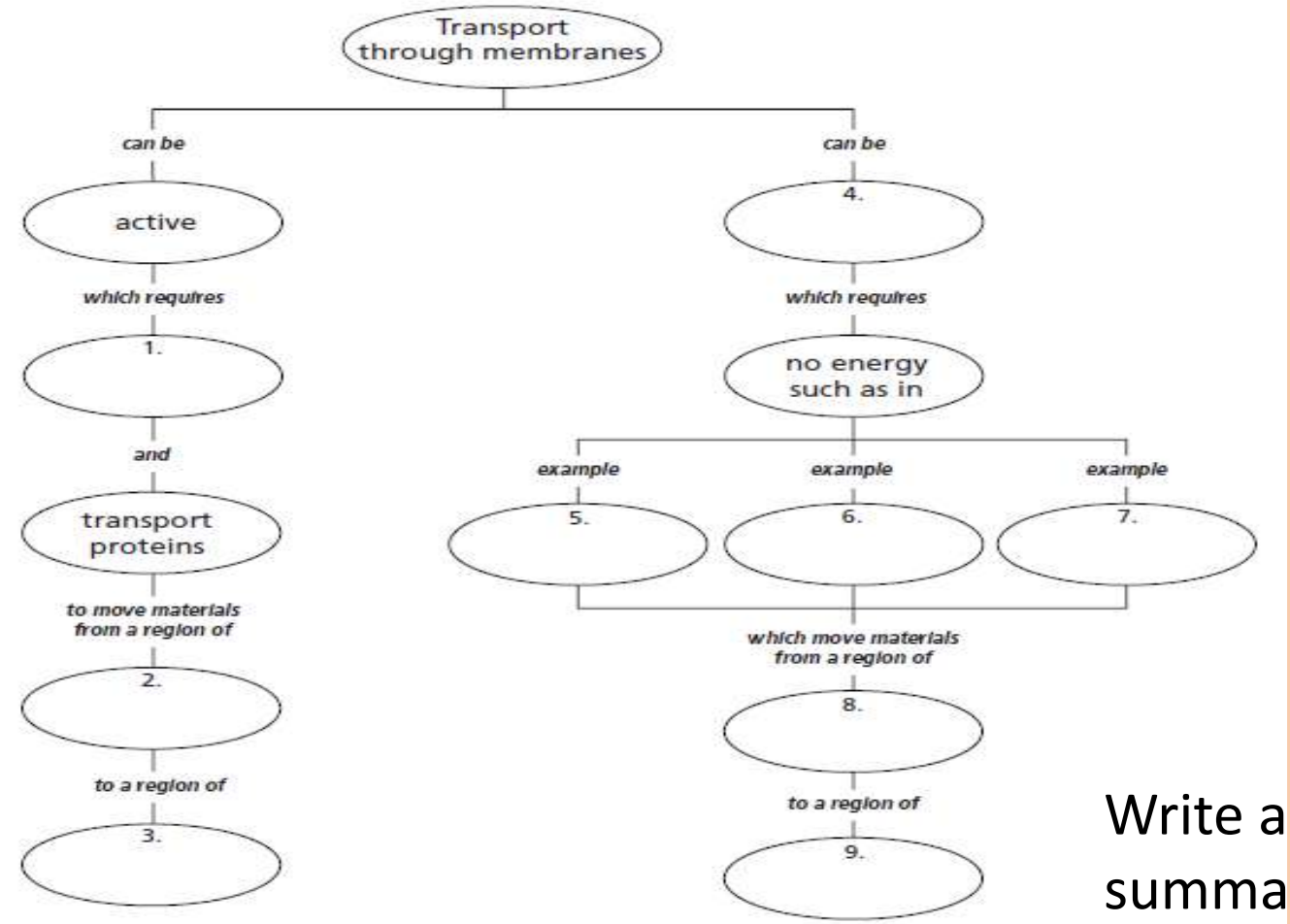
P. 51NB

Concept Mapping

*Use with Chapter 8, Section 8.1*

## Transport Through Membranes

Complete the concept map on transport of materials through membranes. Use these words or phrases one or more times: *simple diffusion, energy, higher concentration, lower concentration, osmosis, passive, facilitated diffusion.*




- Simple Diffusion
- Energy
- Higher Concentration
- Lower Concentration
- Osmosis
- Passive
- Facilitated Diffusion

Write a 4 sentence summary

# HW CH 8 Cellular Transport

| | Isotonic | Hypotonic | Hypertonic |
|---|---|---|---|
| 1. Causes the cell to swell | | ☺ This is the answer😐 | |
| 2. Doesn't change the shape of the cell | ☺ | | |
| 3.Causes Osmosis | ☺ | ☺ | ☺ |
| 4. Causes the cell to shrink | | | ☺ |

5. Channel Protein
6. Energy
7. Endocytosis
8. Passive Transport
9. Exocytosis
10. Facilitated Diffusion
11. Active Transport
12. Carrier Protein

# Osmosis -(Movement of water) Demo Pg. 29NB

- Qualitative Data:
  - Egg in Karo syrup has shrunk and has a dent in it. Hypertonic Solution.
  - Egg in Water has swelled and is stuck in the beaker. Hypotonic Solution.
  - Egg in Salt Water* has stayed the same, and moves around in the beaker. Isotonic Solution.

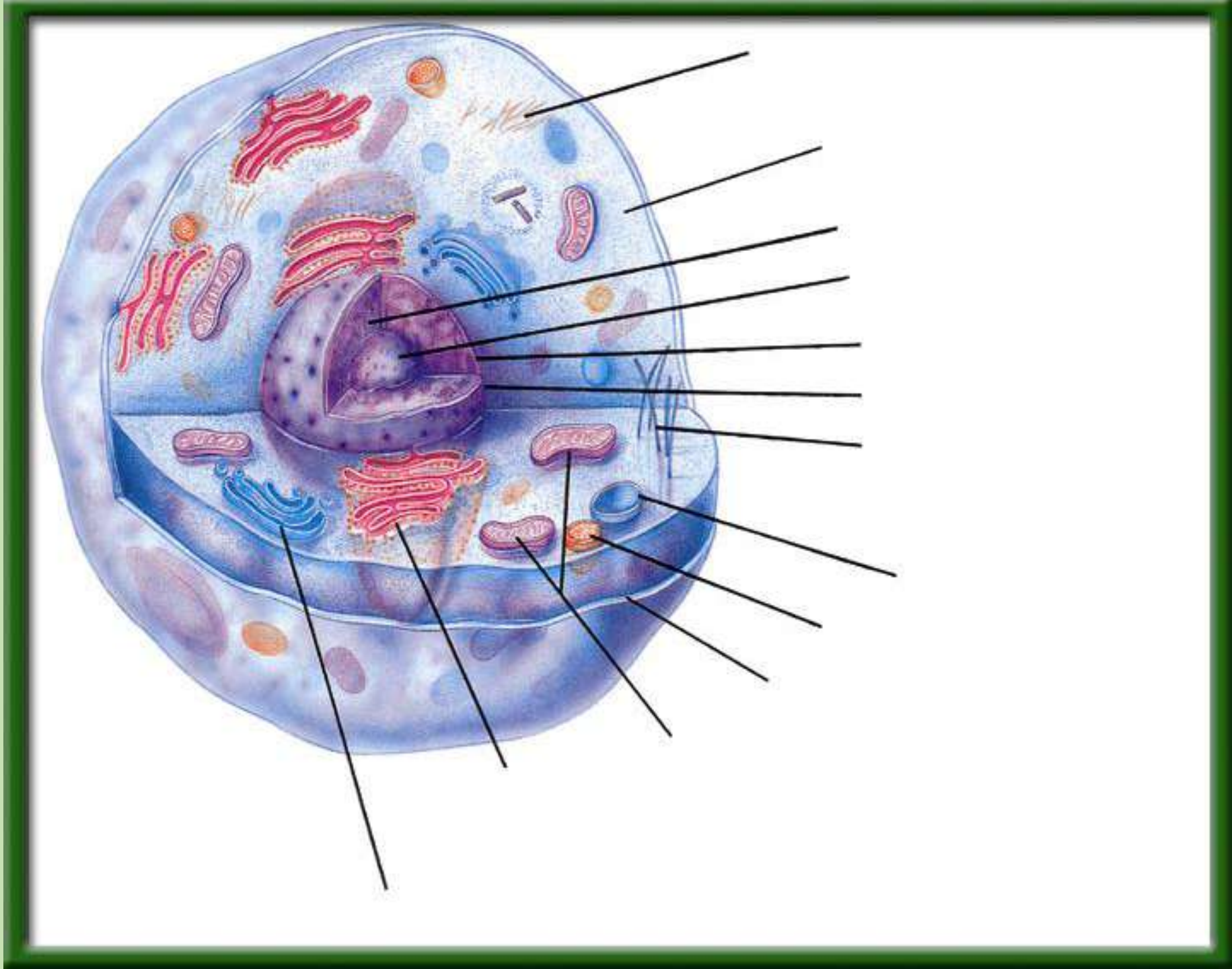
**Conclusion:**
**p. 49**
**An egg soaked in Salt water had no noticeable change. Therefore, the salt water solution is Isotonic. An egg soaked in water had part of the yolk sticking out and therefore, the solution was hypotonic because the egg swelled. An egg soaked in karo syrup shrunk and attracted a gazillion ants, therefore the solution was hypertonic.**

**Put egg in Karo syrup into water**
**Put water Egg into Karo Syrup**

**Concentration gradient**
**Solute**
**Solvent**
**Equilibrium**

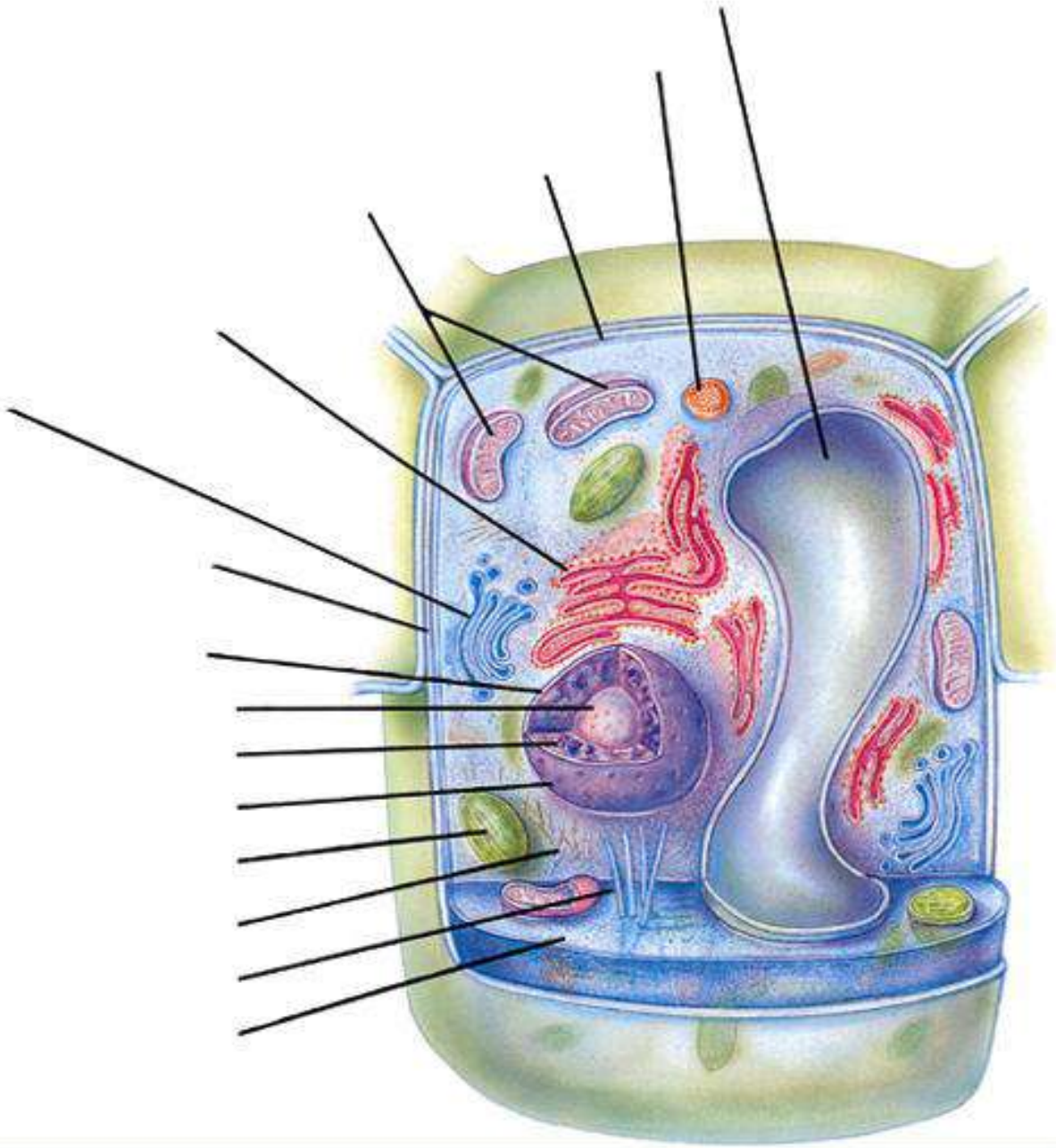
Name that ANIMAL Organelle Activity

- Nucleus
- Plasma Membrane
- Mitochondria
- Golgi Apparatus
- Ribosomes
- Endoplasmic Reticulum
- Cytoplasm
- Vacuole
- *Centriole



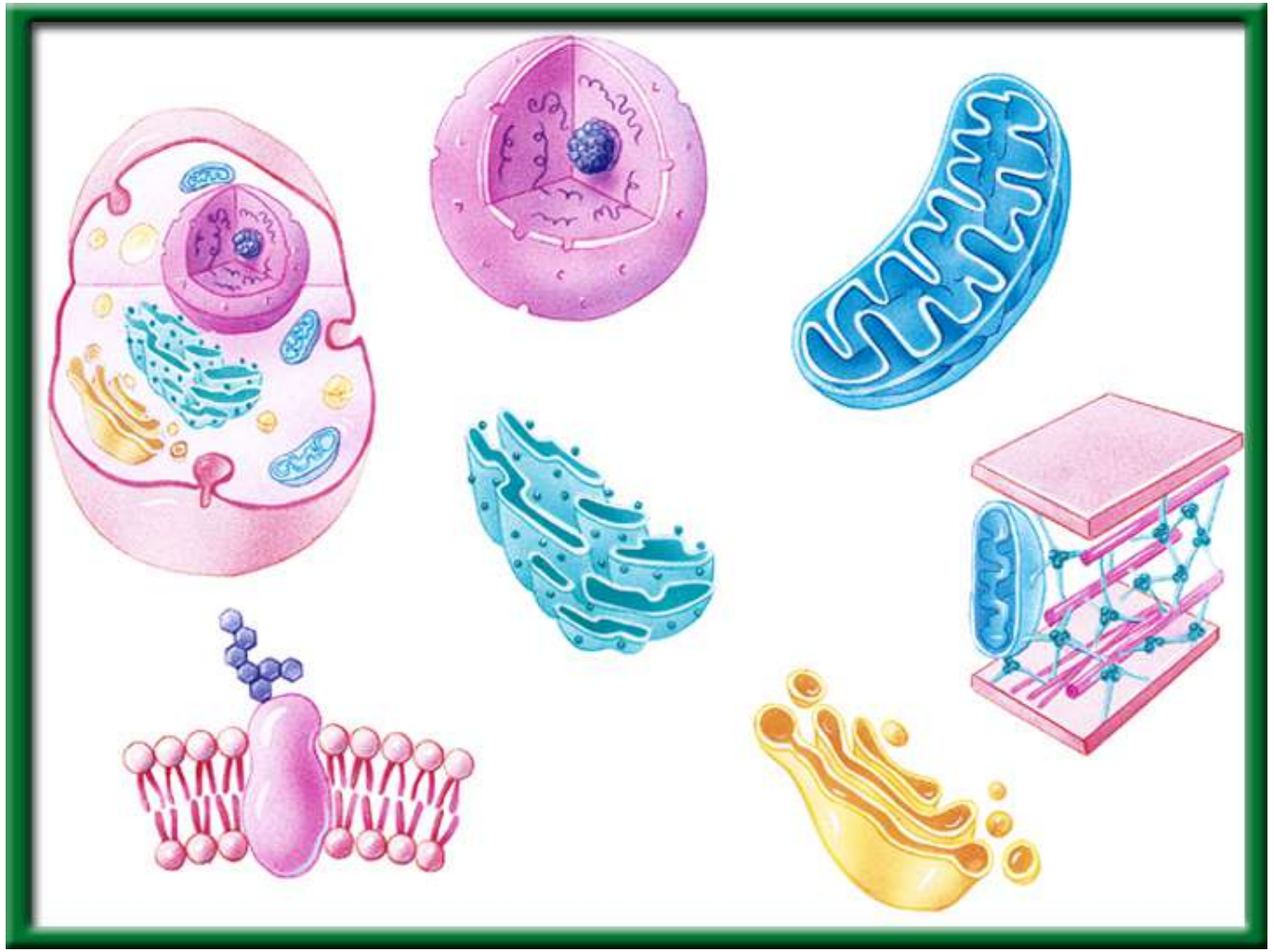
Name that PLANT Organelle Activity

- Nucleus
- Plasma Membrane
- Mitochondria
- Golgi Apparatus
- Ribosomes
- Endoplasmic Reticulum
- Cytoplasm
- Vacuole
- *Chloroplast
- *Cell Wall



7.1

# Transparencies

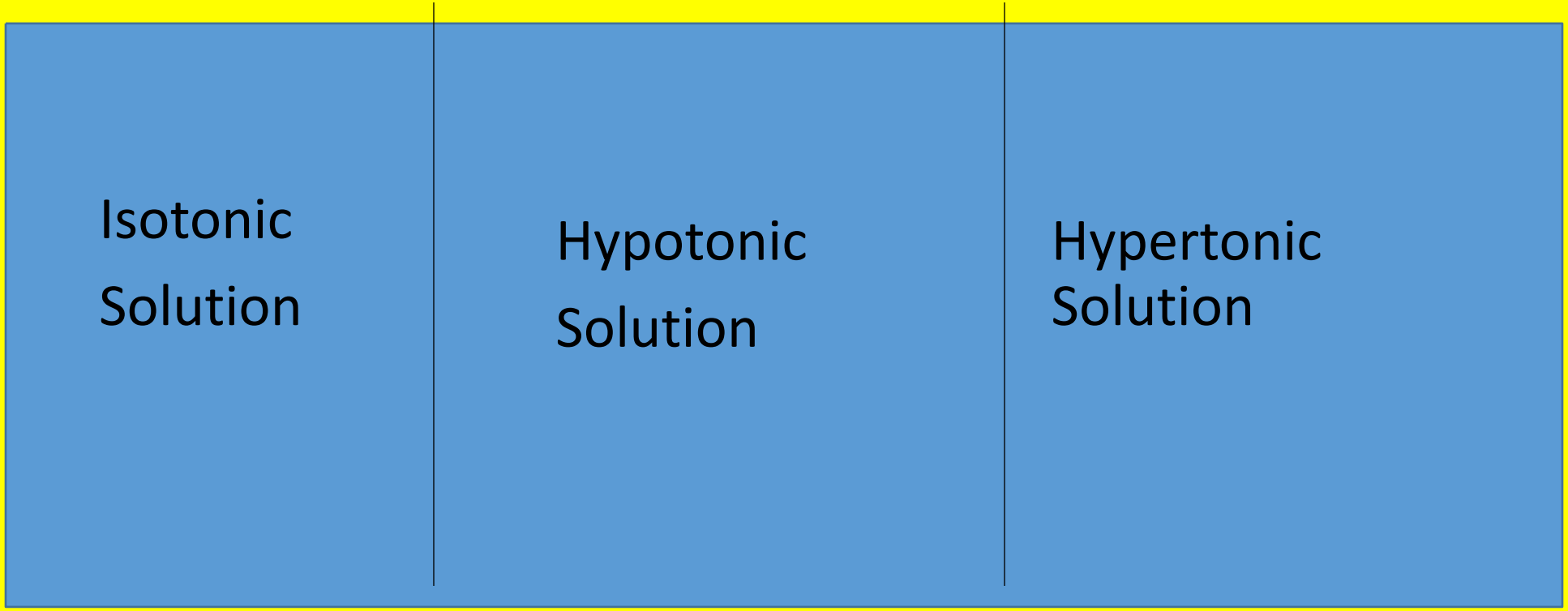


To return to the chapter summary click escape or close this document.

END OF SLIDE

# How Osmosis affects cells in…p.51NB

Directions:  Draw a picture of a cell, and a description of if the cell swells, shrinks or stays the same.  Explain the concentration gradient using  the words solute and solvent.




How Osmosis affects cells in…

# #1. Cell Theory

- All organisms are made of one or more cells.
- Cells are  the basic unit of structure & organization of organisms.
- All cell come from preexisting cells.

# Compare & Contrast Cell Transport

- Passive Transport
- Active Transport

# Activity: Make your Desk a Cell p. 53NB

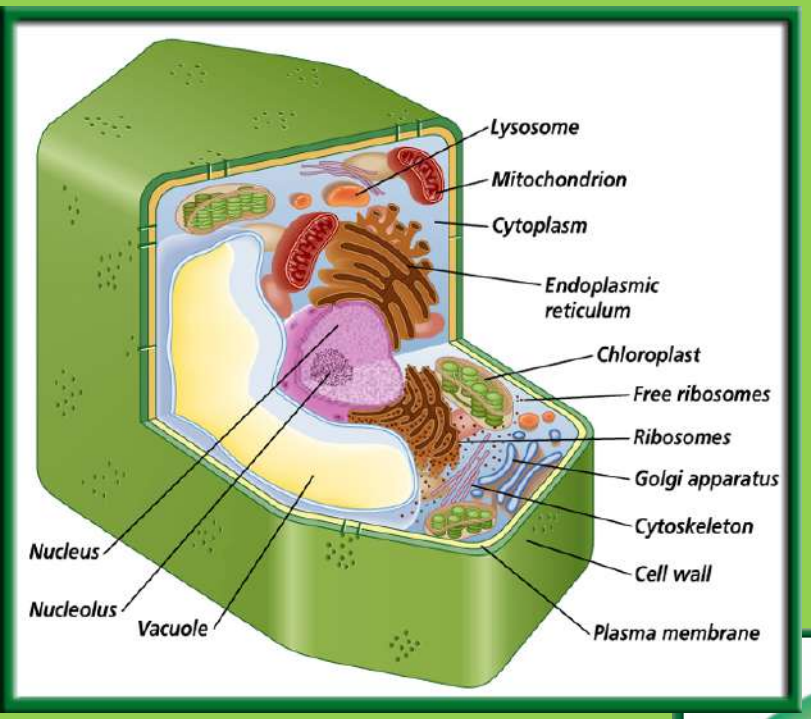
- After researching Cellsalive.com for the following organelles: **Nucleus, Cytoplasm, Endoplasmic Reticulum, Golgi Body, Vacuole, Mitochondria, Plasma Membrane, Chloroplast & Cell Wall (Plant cell)** take notes on page3 NB. Title: Cell Organelles
- Then with a partners and one desk, **make a plasma membrane** around the desk. On the inside of the desk, **Draw** and **ID the listed organelles** above on your desk.
- It can be a plant or animal cell
- Mrs. McAllister must grade your “cell”.

3/1 **Photosynthesis: Trapping the Sun's Energy** 9.2

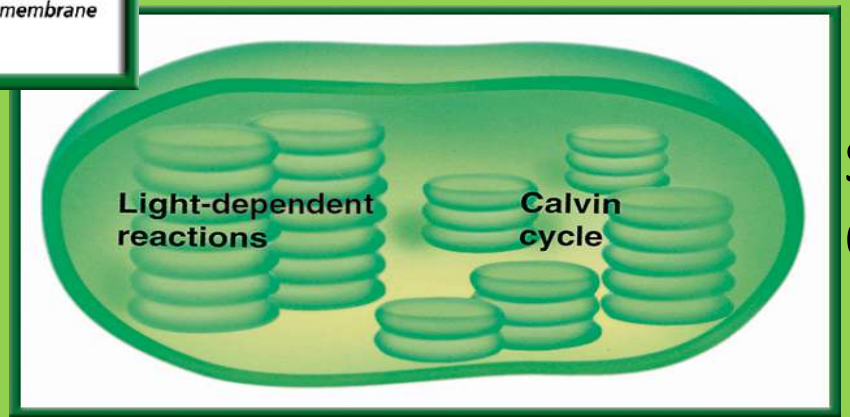
Obj. TSW demonstrate how usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar by completing the warm up and participating in a photosynthesis class activity. P.54 NB

[Cellsalive.com](Cellsalive.com)

**HW – Study Guide**



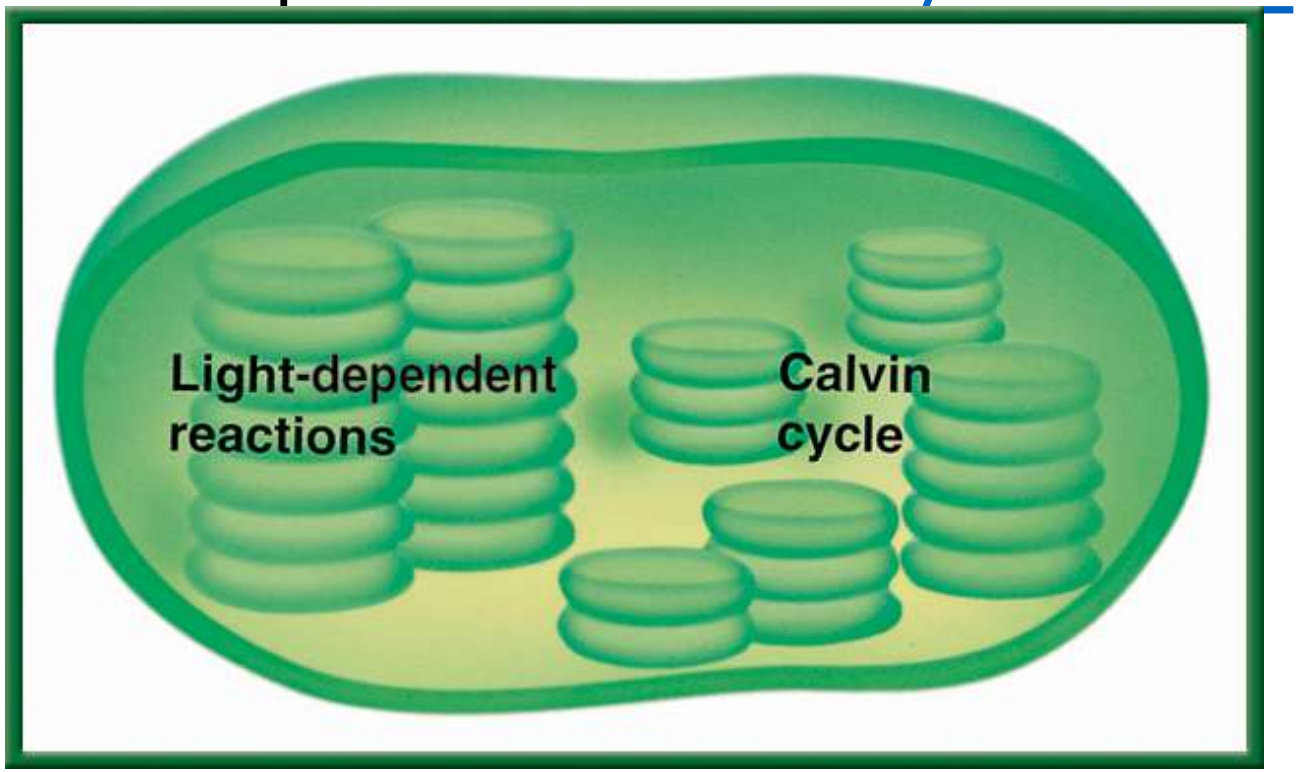

1. What organelle in the plant cell traps the suns energy, what is that process called?
2. Write and memorize the equation for photosynthesis.
3. What are the Reactants and the Products for Photosynthesis, what is the catalyst for this process?




Show Photosynthesis video

Osmosis AXES

# #1 Chloroplast - Photosynthesis




#2. $6CO_2 + 6H_20 \rightarrow 6O_2 + C_6H_{12}O_6$

#3. Reactants Products

# Reactants and Products : Making a cake

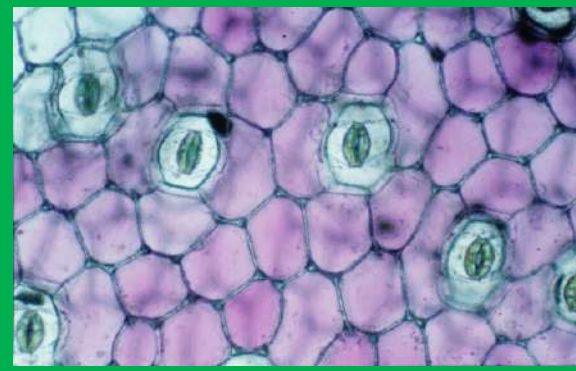
Reactants

Catalyst


Product

Angelica’s cake!

Making of Carbohydrates & Cellular Respiration p.55NB
Working with three other students:
answer questions 1 – 3. Each students gets to have a job.



## Photosynthesis

$6\ CO_2 + 6\ H_2O \rightarrow C_6H_{12}O_6 + 6\ O_2$

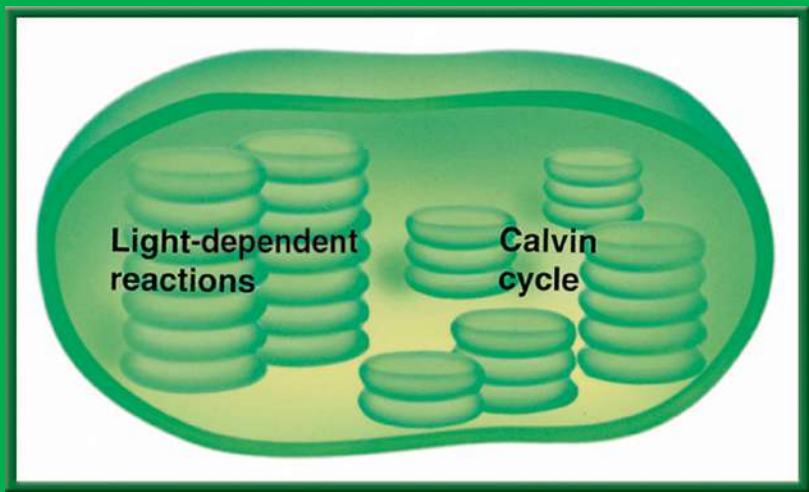
- Hydrogen
- Carbon
- Oxygen

1 Roots – collect 6 $H_2O$
2 Stomata – Collect 6 $CO_2$
3 Chloroplasts – collect 6 light energy convert to chemical energy
4 Product of Photosynthesis- make Glucose & 6 O2

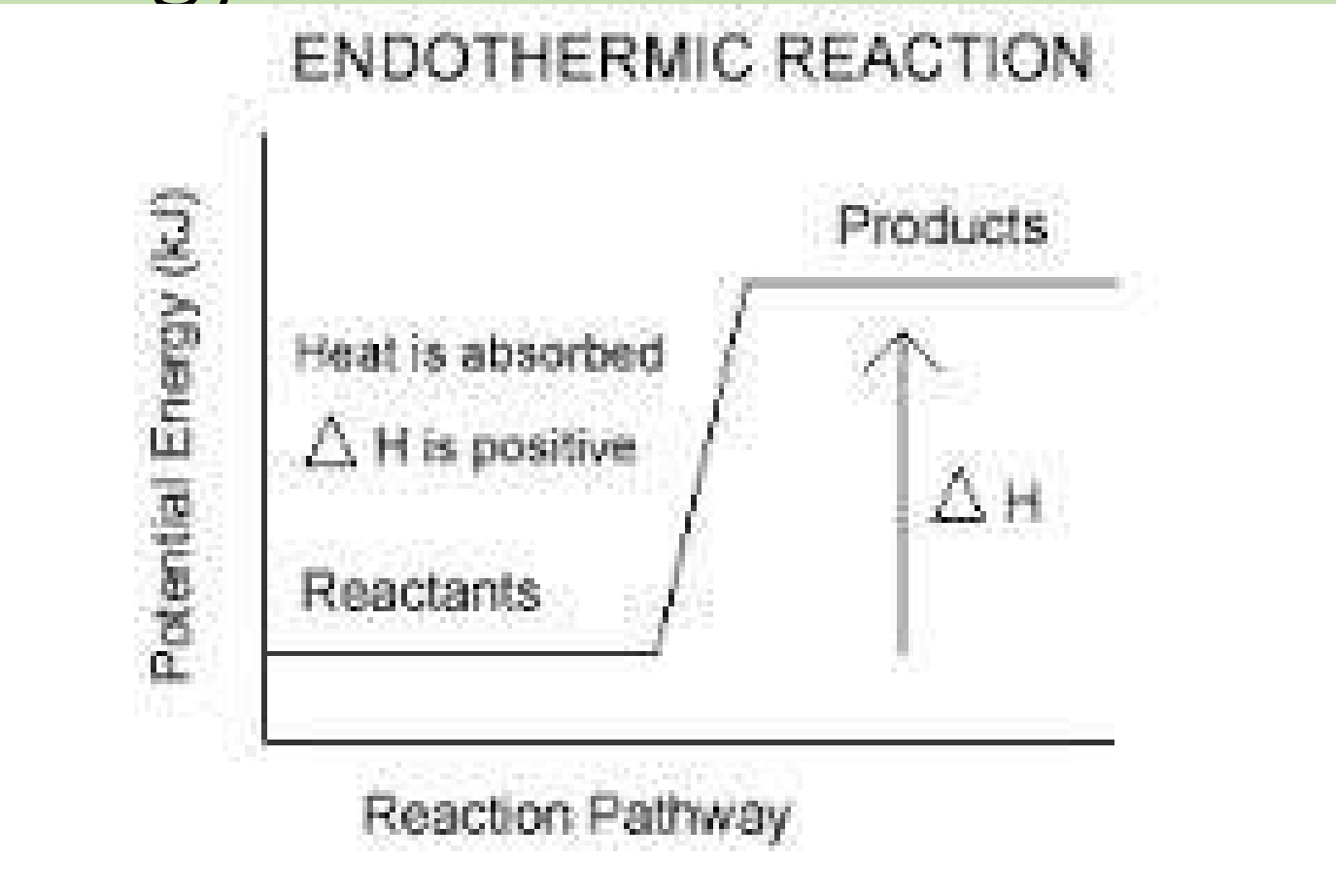
## Cellular Respiration

$C_6H_{12}O_6 + 6\ O_2 \rightarrow 6\ CO_2 + 6\ H_2O + 36\ ATP + Heat$

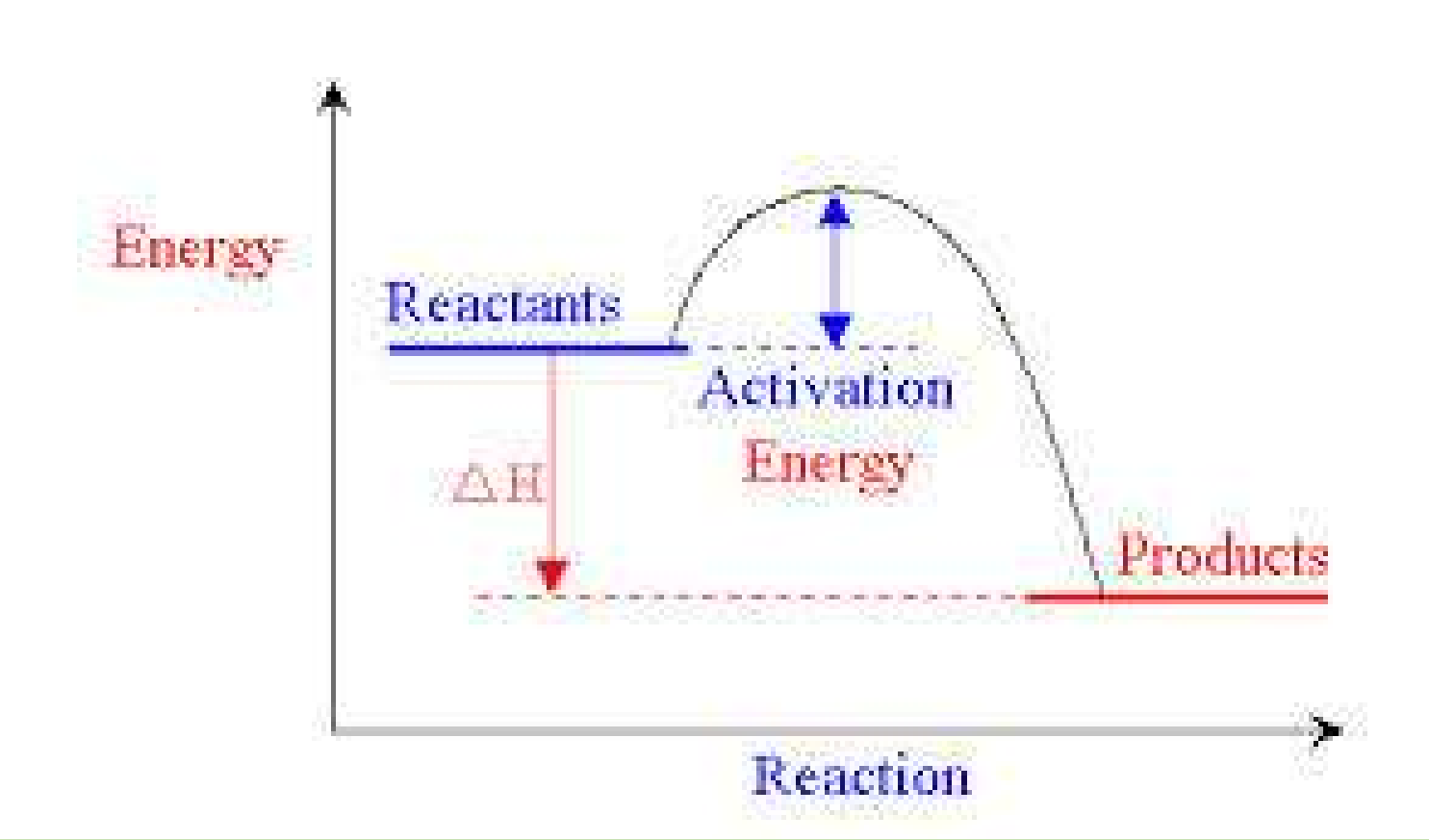
Disassemble your Glucose & $O_2$ to the proper carts.



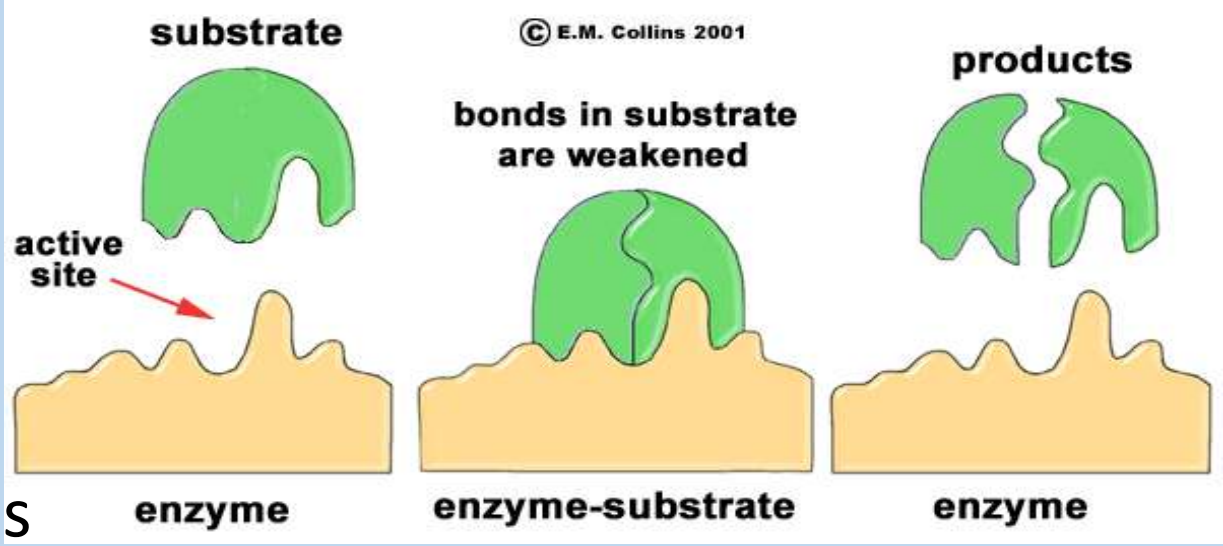
# Endothermic Reaction – Photosynthesis p. 55 NB
Stores energy in chemical bonds.



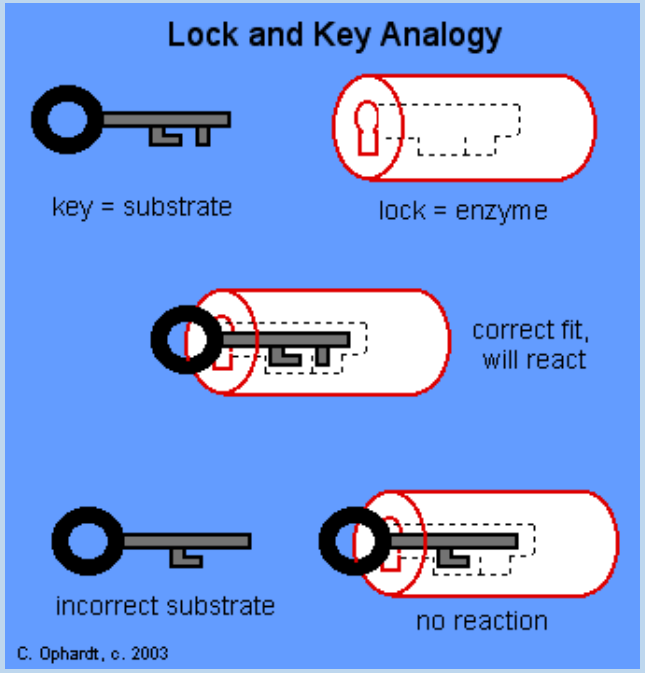
# Exothermic Reaction – Yeast + Hydrogen Peroxide
# Cellular Respiration p. 55 NB
# Produces Heat



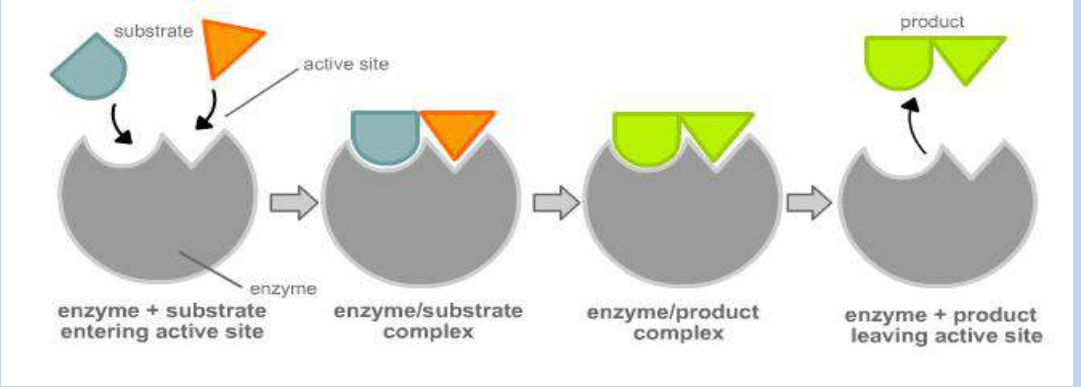
Macromolecules
& Subunits Notes
p. 31NB




- **Lipid** $_{(pm)}$ – Fatty Acids
- **Carbohydrate**$_{(pm)}$ - Saccharides
- **Protein** $_{(pm)}$ ( Enzymes)– Amino Acids
  - Temperature
  - pH
  - [Substrate ] & [Enzymes]
  - [Salt]
- Nucleic Acid - Nucleotides



# Enzyme Activity

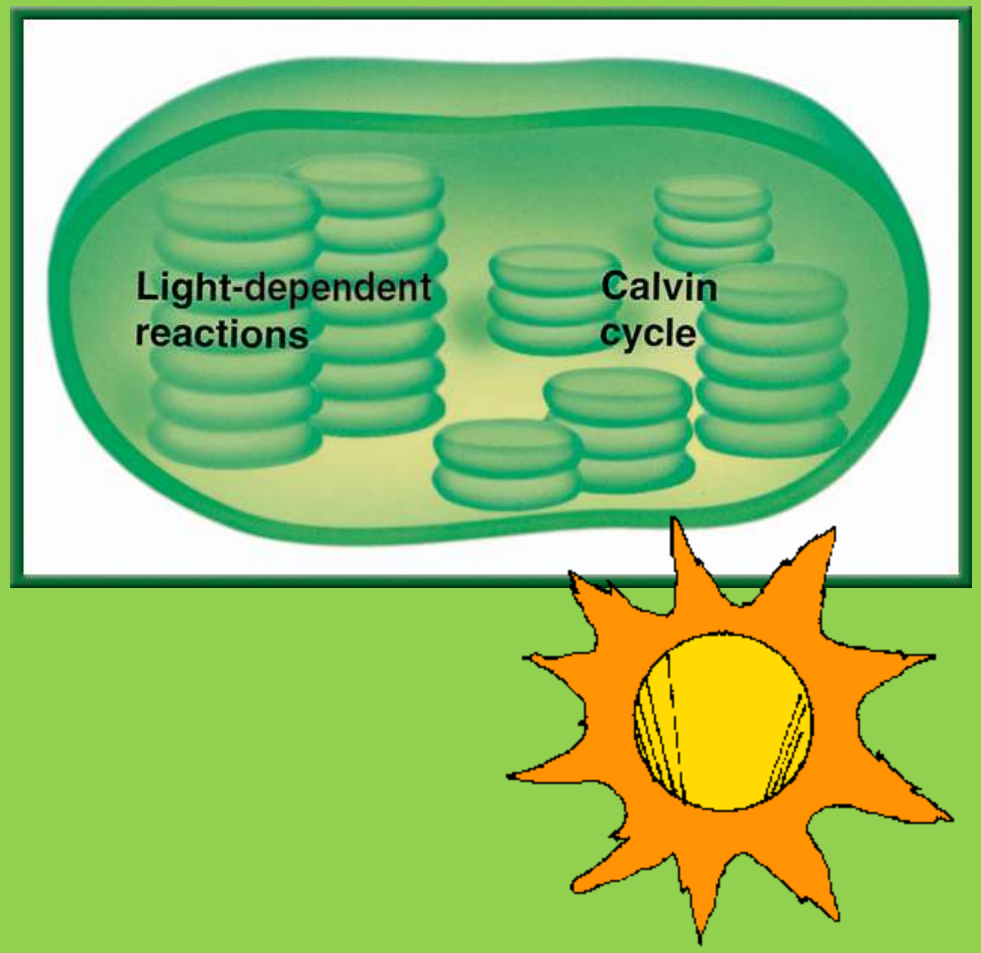



- You will be given a substrate or a part of an enzyme.
- Find the matching part, that fits your active site.
- Bring your matching Enzyme/ Substrate combinations (Lock & Key) to McAllister
- I will quiz you on your knowledge of monomers and polymers in endergonic & exergonic reactions.

3/2 Light-Dependent & Light-Independent Reactions CH 9.2

Obj. TSW demonstrate how light energy is captured by chloroplasts and converted to chemical energy (glucose) from $CO_2$ and $H_20$ by doing a flow chart. 56 NB

**Cellsalive.com**



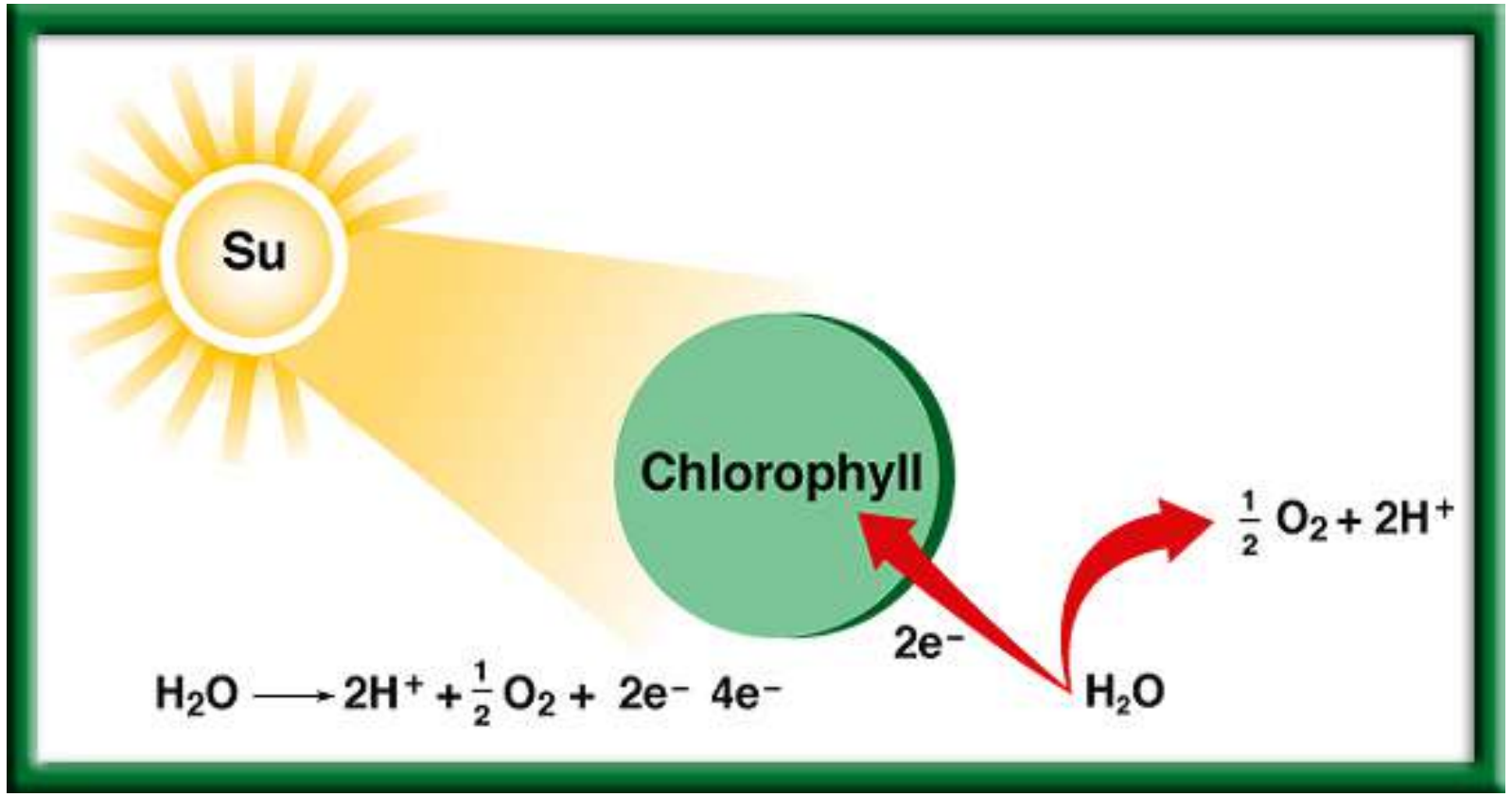

1. Why is **Photolysis** important?
2. Compare and Contrast **Light Dependent** reactions and **Light Independent** reactions.
3. Where does the **Calvin Cycle** happen in the cell and what does it produce?

**Study guide is due tomorrow! P. 59NB**

**Read CH 6.3, 7, 8.1 & 9**

**Show Videos**

#1. Photolysis – Breaks up $H_2O$ (Water) to release O, that makes $O_2$.



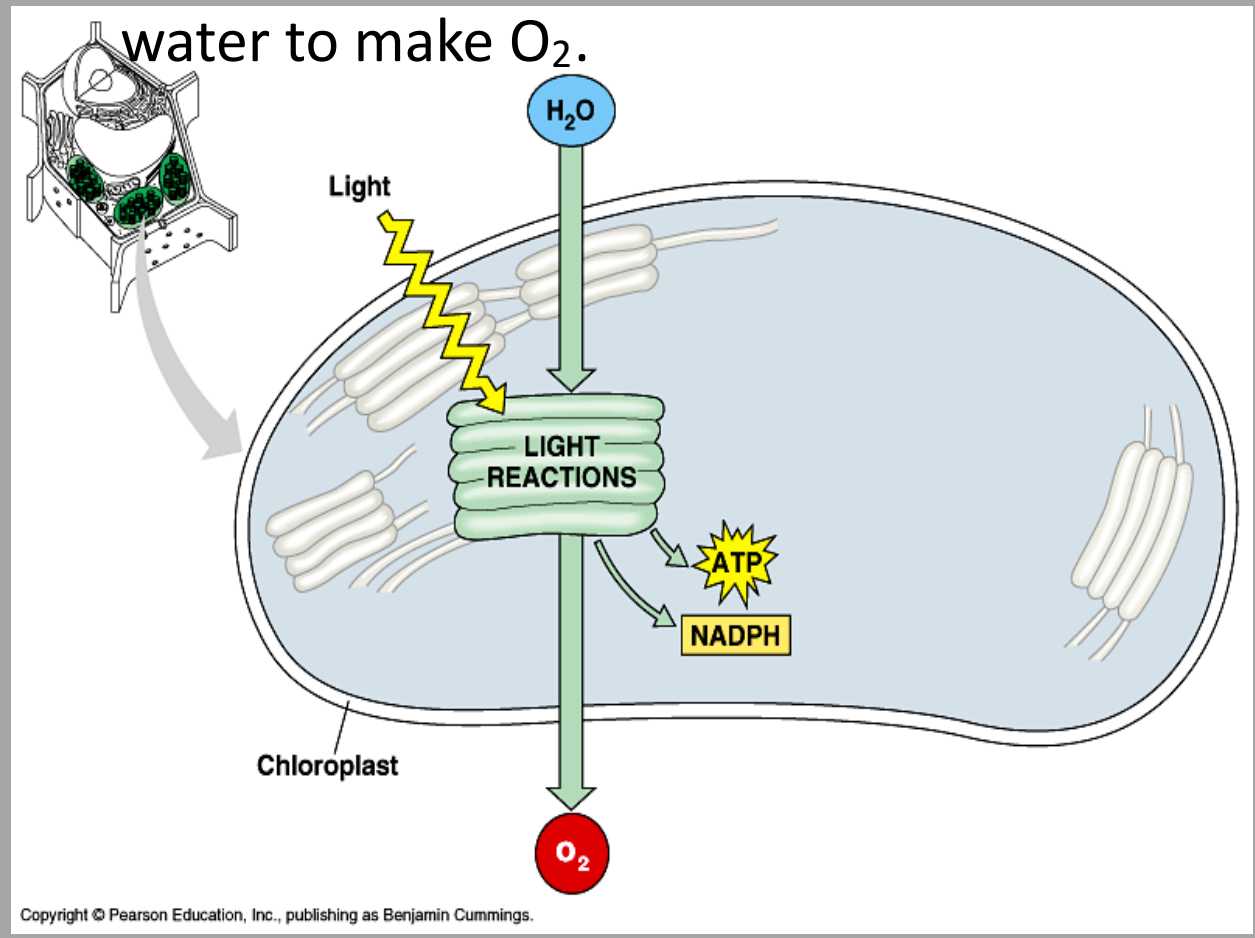

To return to the chapter summary click escape or close this document.

# Restoring electrons

- The oxygen produced by photolysis is released into the air and supplies the oxygen we breathe.
- The electrons are returned to chlorophyll.
- The hydrogen ions are pumped into the thylakoid, where they accumulate in high concentration.

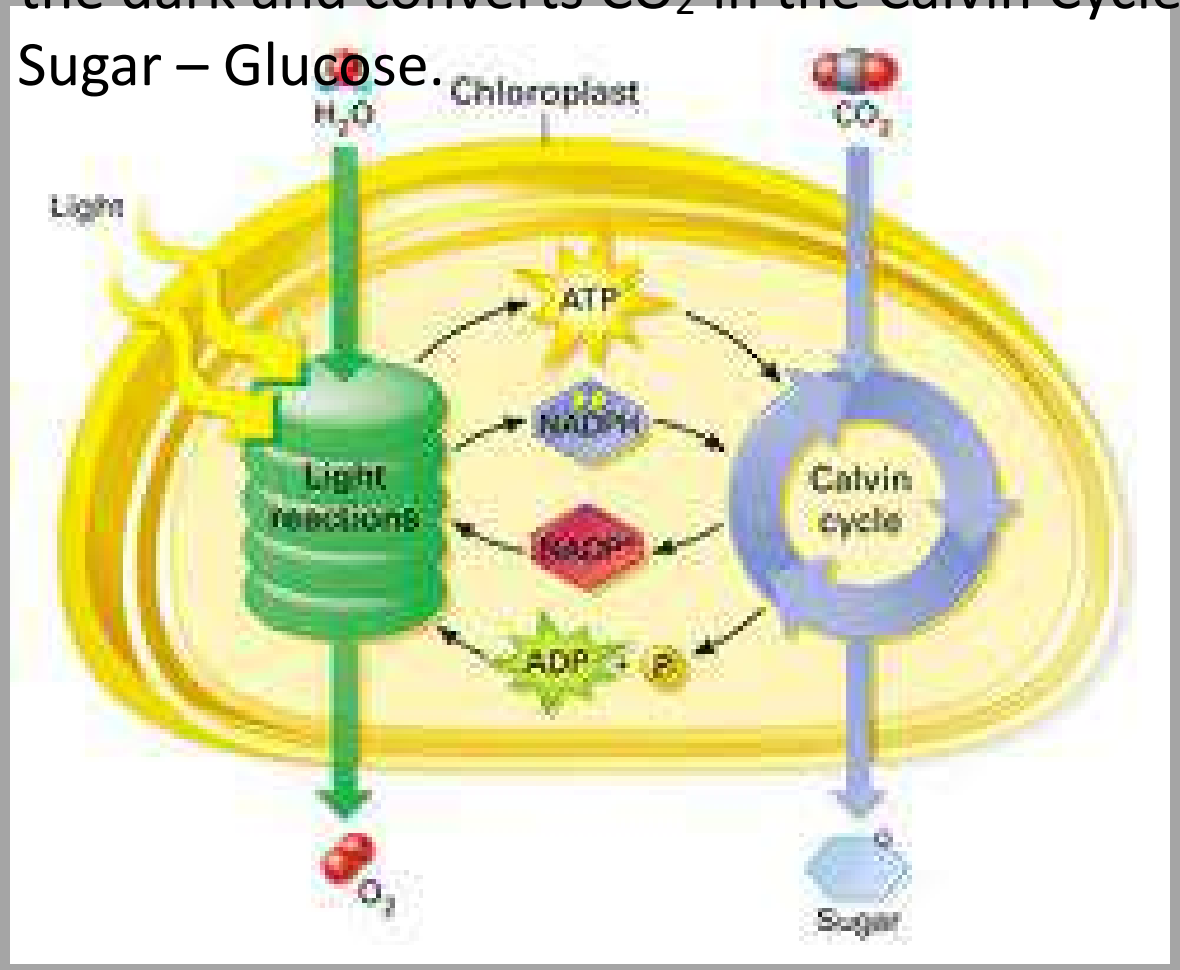
# #2. How does light energy become chemical energy?

**Light Dependent Reaction** happens in the light when the light hits the Grana and splits water to make $O_2$.



# #2. How does light energy become chemical energy?

**Light Independent Reaction** happens in the light or the dark and converts $CO_2$ in the Calvin Cycle to Sugar – Glucose.



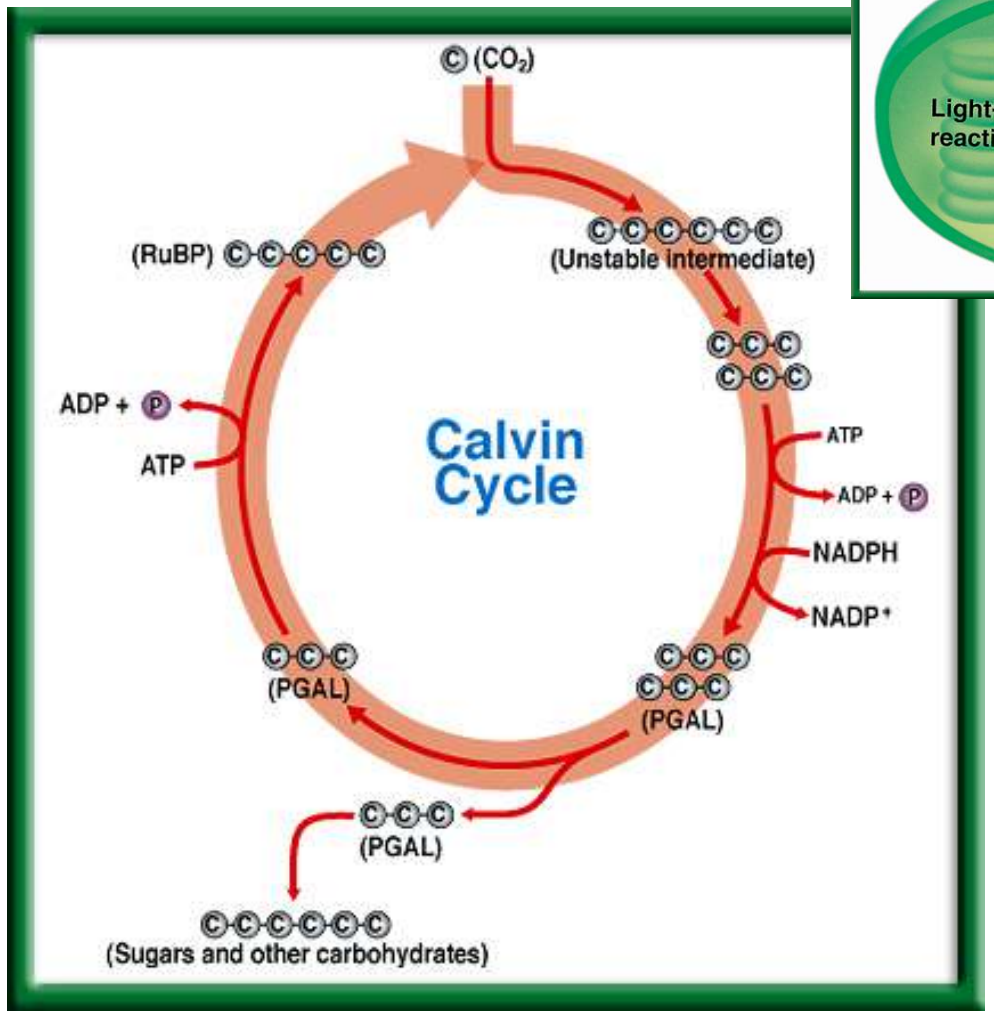
# Trapping Energy from Sunlight

- Photosynthesis happens in two phases.

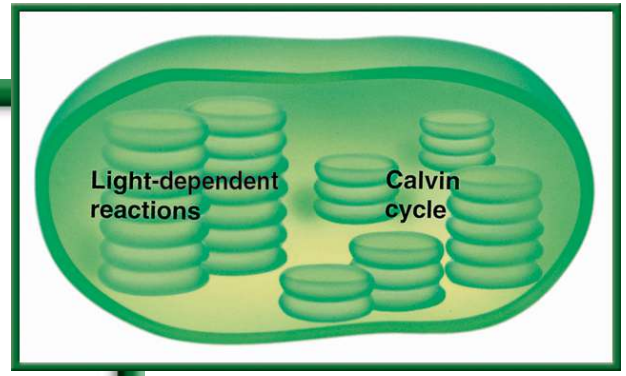
1. The light-dependent reactions convert light energy into chemical energy.
2. The molecules of ATP produced in the light-dependent reactions are then used to fuel the light-independent reactions that produce simple sugars.

- The general equation for photosynthesis is written as $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

#3. The **Calvin Cycle** happens in the **Stroma** of the **Chloroplast**, and produces the glucose for the plant.




Calvin Cycle




To return to the chapter summary click escape or close this document.

# For your Note Card Period 4 Biology

- Study Cells, organelles & functions, Transport – Active & Passive, ATP, Photosynthesis, Prokaryotes, Eukaryotes, Osmosis, Folded membranes are important.
- Viruses – nonliving because it has a host cell to reproduce
- CH 6.3, CH 7, CH 8.1, CH 9.1

# How to Make Carbohydrates Activity p. 55NB

1. $6\ CO_2 + 6\ {}_2O \rightarrow C_6\ {}_{12}O_6 + 6\ O$

Carbon Dioxide + Water = Glucose + Oxygen

2. Sunlight – Catalyst

3. The chlorophyll inside the chloroplast

# Glucose Synthesis Activity

Photosynthesis: $6\ CO_2 + 6\ H_2O \rightarrow C_6H_{12}O_6 + 6\ O$

- Black = Carbon

- Red = Oxygen
- Person 1 – Root = O
- Person 2 – Stomata = $CO_2$
- Person 3 – Chloroplast = Light Energy (Sun)
- Person 4 – Glucose Synthesis/ $O_2$
- Person 5 – Get ATP for Cellular Respiration

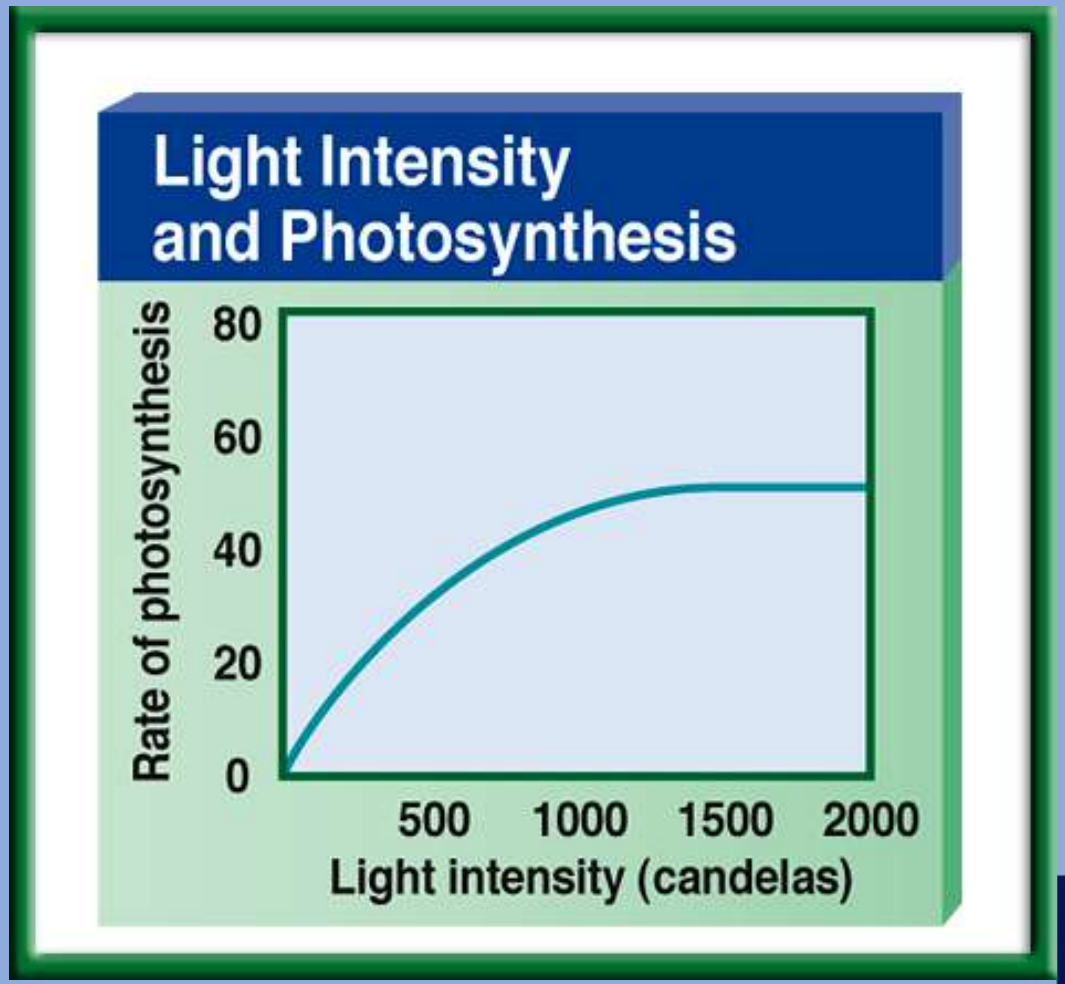
- Glucose
- $C_6H_{12}O_6$

Cellular Respiration: $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_20 + 36\ ATP + Heat$

Image Bank

p. 59 NB

- Copy this graph and explain what it means in a short paragraph.
- Use your knowledge of Independent and Dependent Variables to explain what happens.
- Explain the relationship between the two variables
- Come up with a better title

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p. 35 NB
Write a 3 – 5 sentence summary

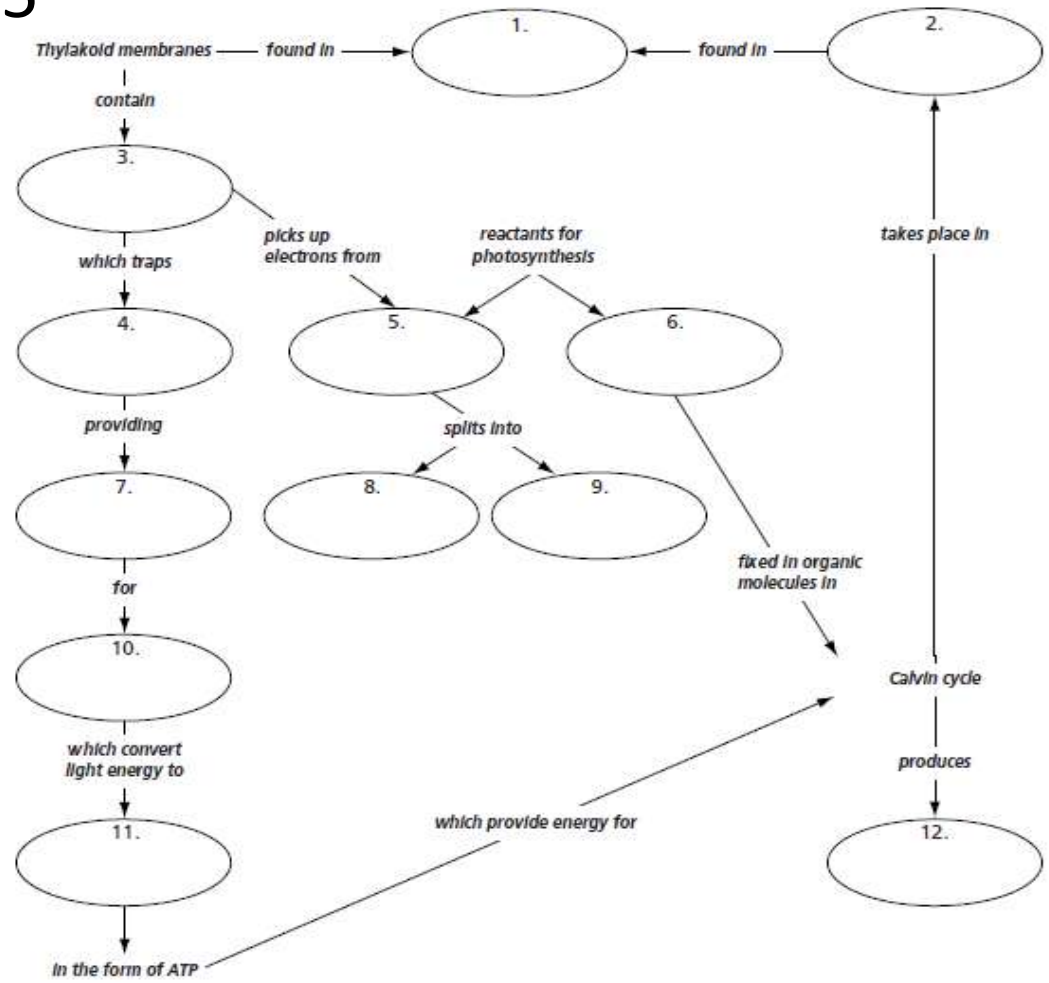
Chapter 9 **Energy in a Cell**

Concept Mapping

*Use with Chapter 9, Section 9.2*

**Photosynthesis: Trapping the Sun's Energy**

Complete the concept map describing photosynthesis. Use these words or phrases once: *chemical energy, oxygen, light-dependent reactions, chlorophyll, stroma, glucose, water, sunlight, oxygen, carbon dioxide, hydrogen ions, chloroplasts.*




Word Bank

- Chemical energy
- Oxygen
- Light Dependent Reactions
- Chlorophyll
- Stroma
- Glucose
- Water
- Sunlight
- Carbon Dioxide
- Hydrogen ions
- Chloroplasts
- Energy

# Taboo

- Chloroplast
- Cell Wall
- Plasma Membrane
- Passive transport
- Active Transport

# Taboo

- Enzyme
- Macromolecule
- Eukaryotic
- Vacuole
- Independent Variable
- Control

# Taboo

- Active Transport
- Dependent Variable
- Hypothesis
- Carbohydrate
- Lipids
- Osmosis

# Taboo

- Cellular Respiration
- Photosynthesis
- Mitochondria
- Theory
- Scientific Method
- Nucleic Acid

# Work on Study Guide Quietly

- **Test is Tuesday**
- **Study Guide is due tomorrow P. 59 NB**

# Honors Biology
# Do the Math

- What is the Percent change in temperature of your Catalase Reaction?
- $\frac{V1 - V2}{V1} \times 100\%$
- $\frac{21 - 36}{21} \times 100\% = ?$
- 76%
- Include this in your Data Analysis.

# Question 1

The process that uses the sun's energy to make simple sugars is _____.

A. cellular respiration

B. glycolysis

C. photosynthesis

D. photolysis

The answer is C. Photosynthesis happens in two phases to make simple sugars and convert the sugars into complex carbohydrates for energy storage.

Question 1

Why do you add baking soda solution to the water containing the Elodea plants?

## Answer

The baking soda supplies carbon dioxide, a necessary component of photosynthesis.

END OF SLIDE

To return to the chapter summary click escape or close this document.

PREVIOUS SLIDE | TABLE OF CONTENTS | NEXT SLIDE | RESOURCES

Question 2

Why does the experiment use aquatic plants?

## Answer

The oxygen given off by an aquatic plant will form visible bubbles in the water that can be easily observed.

END OF SLIDE

To return to the chapter summary click escape or close this document.

PREVIOUS SLIDE  TABLE OF CONTENTS  NEXT SLIDE  RESOURCES

Question 3

What is the independent variable in this experiment?

## Answer

The independent variable in this experiment is the color of light that is directed on the Elodea.

To return to the chapter summary click escape or close this document.

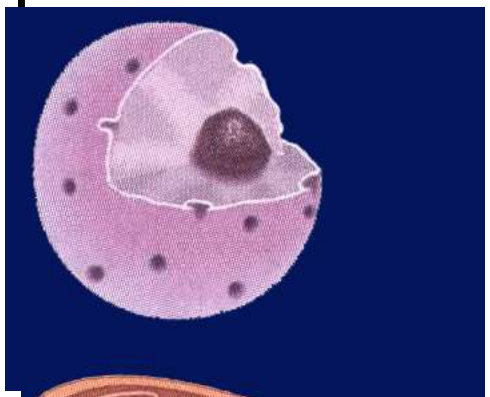
END OF SLIDE

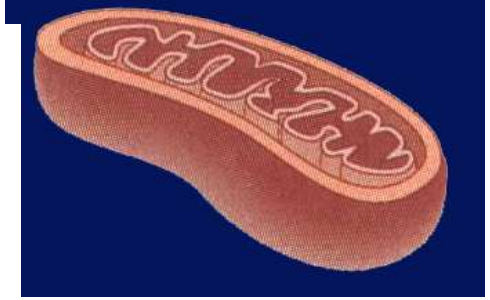
PREVIOUS SLIDE | TABLE OF CONTENTS | NEXT SLIDE

RESOURCES

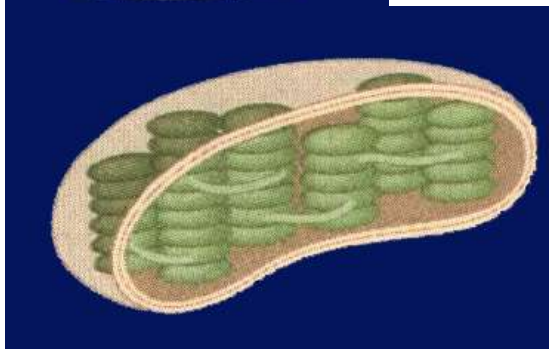
# Question 4

In which of the following structures do the light-dependent reactions of photosynthesis take place?

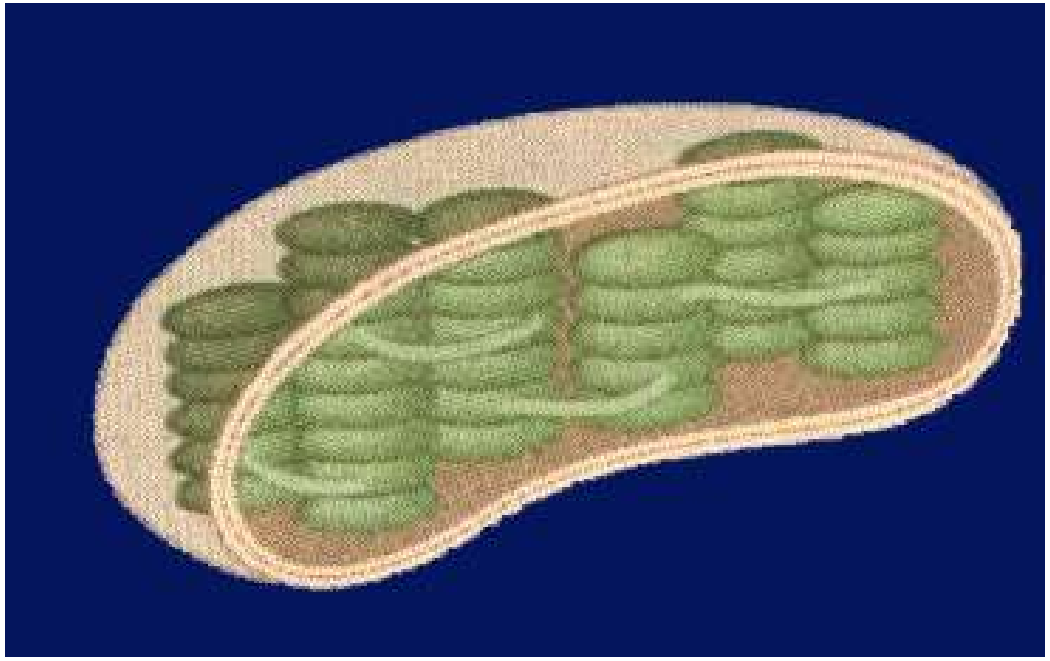
A. 

B. 

C. 

D. 

The answer is D. The light-dependent reactions of photosynthesis take place in the thylakoid membranes of chloroplasts.



# Quote of the Day

Everything you can imagine is real.

- Pablo Picasso

# 3/3 Cellular Respiration & Fermentation 9.3

Obj: TSW be able to compare and contrast photosynthesis and cellular respiration by completing the flow chart activity.

pg. 58 NB

- http://science.pppst.com/biology.html

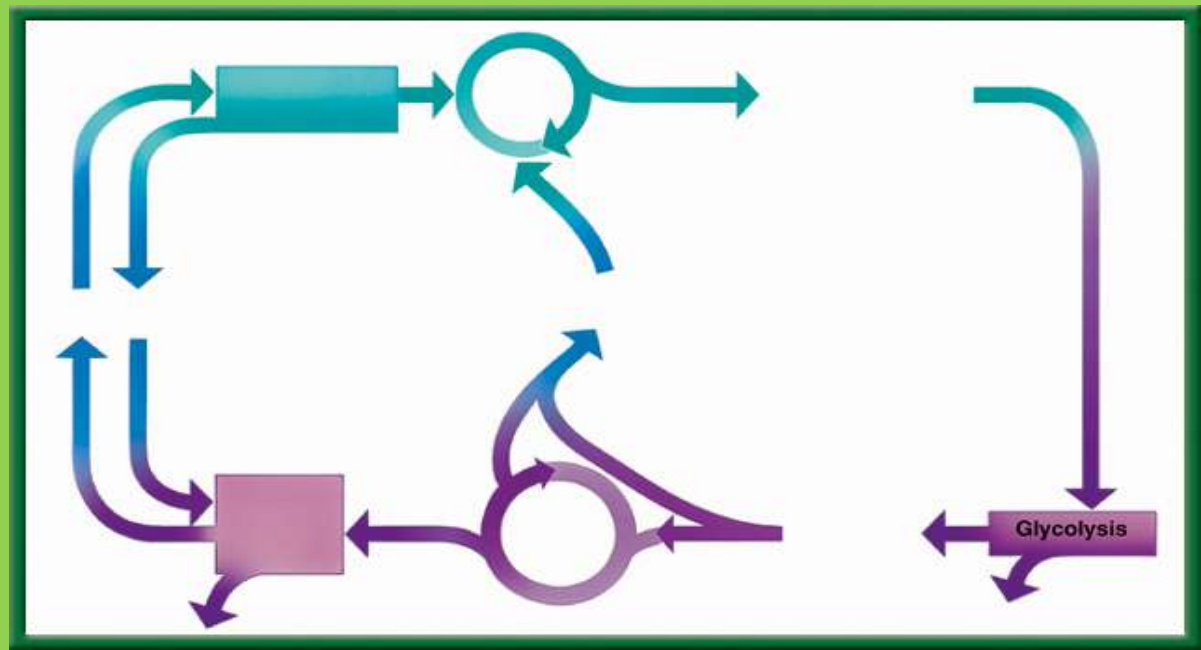
1) What is **Cellular Respiration**? Identify the three stages.

2) How is it related to Photosynthesis?

3) What is fermentation, where does it happen in the cycle?

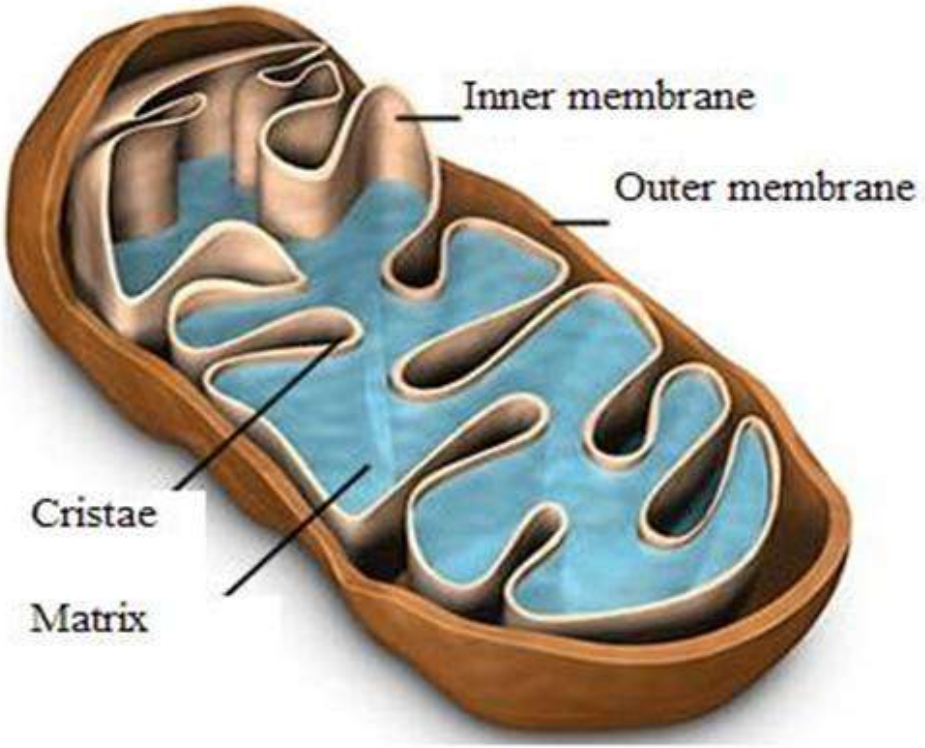
DRAW this diagram on Page 61 NB Landscape style

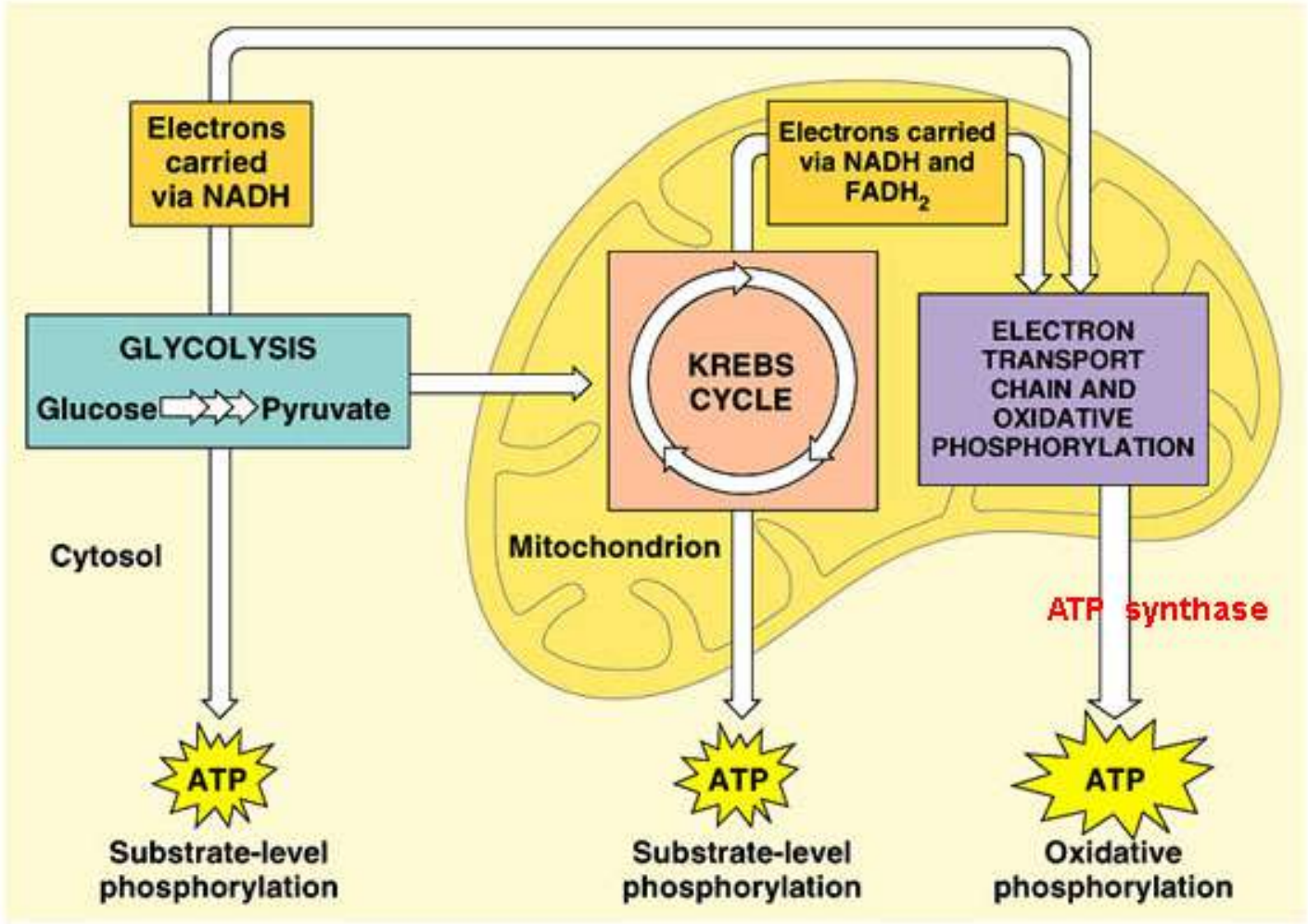
USE ¾ of the page, leave room at the bottom to write an AXES Paragraph



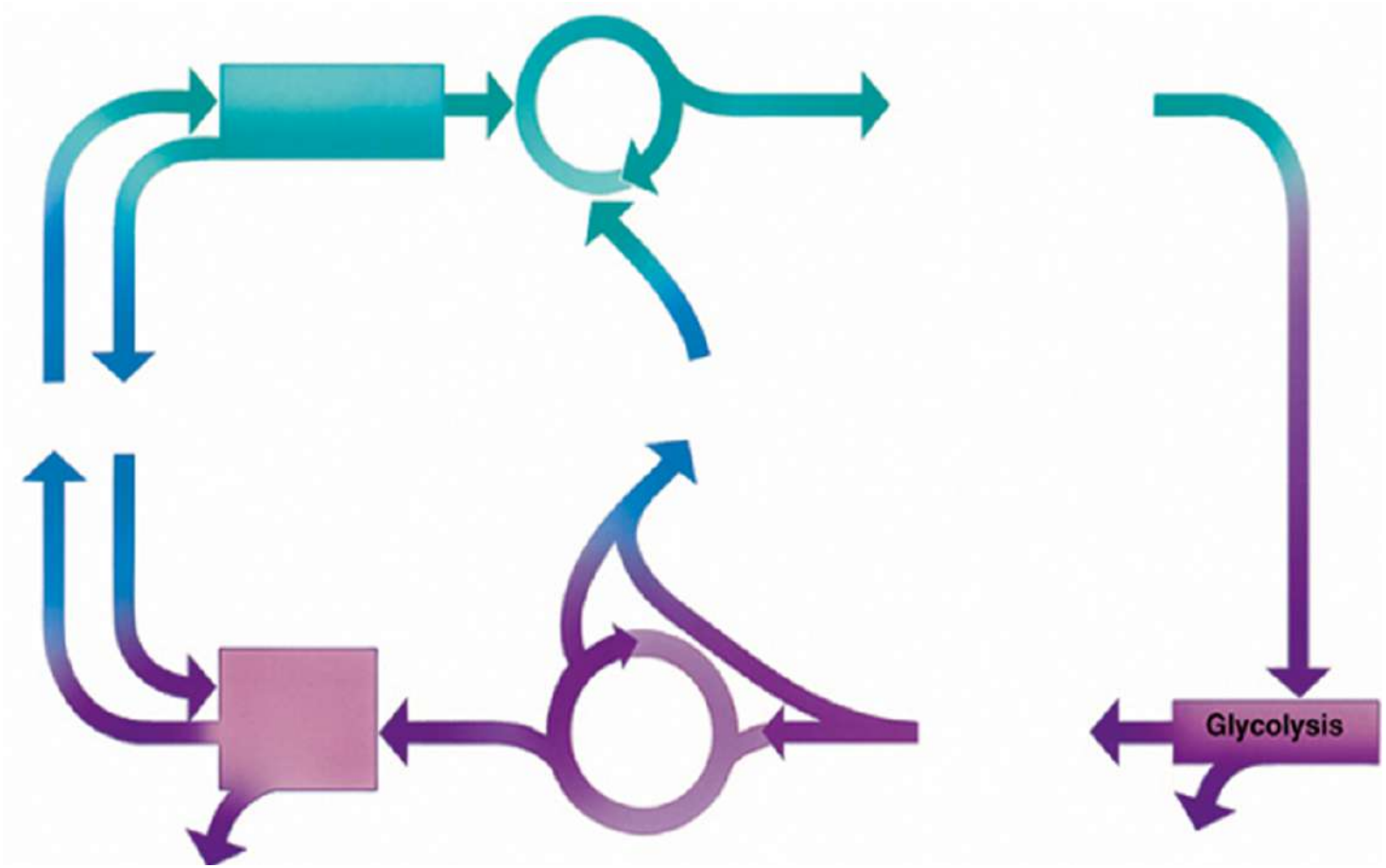
# 1. Cellular Respiration – converts glucose in to ATP and Heat in the mitochondria.

All living organisms perform Cellular Respiration, including plants.



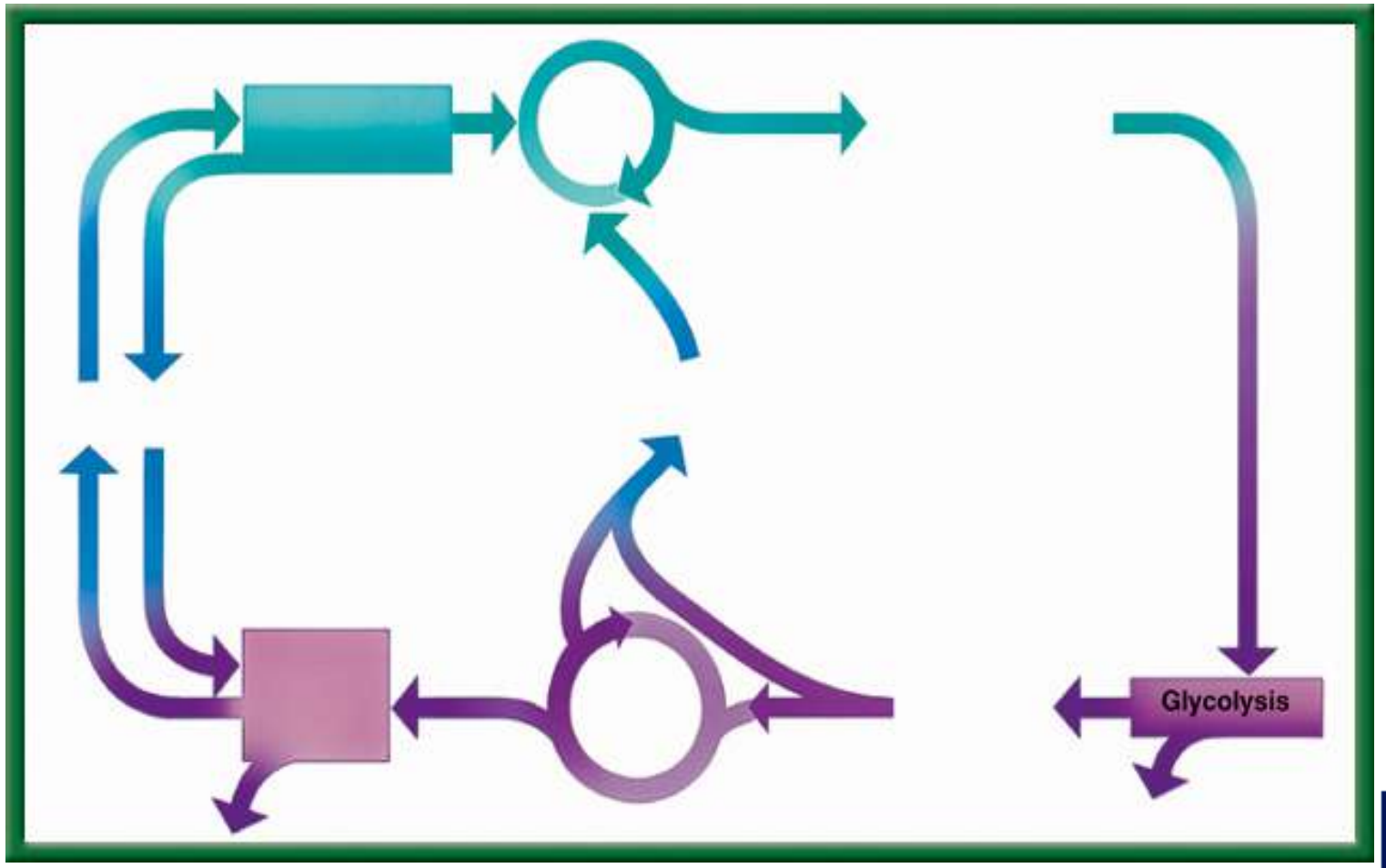



# #2. The reactants for Photosynthesis ($CO_2$ & $H_2O$) are the Products for Cellular Respiration.



2.
P.55 NB Compare and contrast **cellular respiration** and **photosynthesis**.

3. Fermentation happens during glycolysis when not enough oxygen is present.

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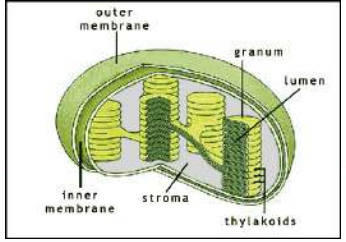
P. 61 NB Write a summary paragraph

# PHOTOSYNTHESIS (in the chloroplast)




**Photolysis**

- Uses light energy to break water ($H_2O$) down to oxygen ($O_2$ ).
- Needs light!

$H_2O$ $O_2$

**Calvin cycle**

Glucose is made

- Uses energy from photolysis and $CO_2$ to produce sugar = glucose → $C_6H_{12}O_6$
- Does not need light!

$CO_2$

Where most of your energy is made. Needs Oxygen

Breaks down sugar into pyruvic acid → $2*(C_3H_6O_3)$ and ATP (energy) Cytoplasm

**Glycolysis**

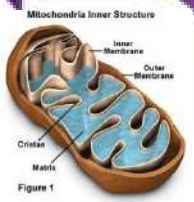
2 ATP

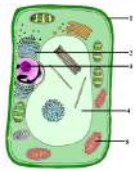
Pyruvic acid

**Citric acid Or Krebs Cycle**

Electron Transport chain

**36 ATP Heat**



# CELLULAR RESPIRATION (in cytoplasm and mitochondria)

# Taboo

Cellular Respiration

Vacuole

Prokayotic

Osmosis

Passive Transport

Macromolecule

# Taboo

- Photosynthesis
- Nucleus
- Eukaryotic Cell
- Active Transport
- DNA
- Protein

# Taboo

- Scientific Method
- Independent Variable
- Plasma Membrane
- Bacteria
- Prokaryotic
- Chloroplast

- Dependent Variable
- Control
- Selective Permeability
- Endoplasmic Reticulum
- Cell Wall
- Vacuole

# Comparing Photosynthesis and Cellular Respiration

## Notes p. 51 or 53 NB

**Table 9.1 Comparison of Photosynthesis and Cellular Respiration**

| Photosynthesis | Cellular Respiration |
|---|---|
| Food synthesized = Endergonic | Food broken down = Exergonic |
| Energy from sun stored in glucose | Energy of glucose released |
| Carbon dioxide taken in | Carbon dioxide given off |
| Oxygen given off | Oxygen taken in |
| Produces sugars = $C_6H_{12}O_6$ | Produces $CO_2$, $H_2O$, ATP & Heat |
| Requires light | Does not require light |
| Occurs only in presence of chlorophyll | Occurs in all living cells, **including plants** |

# Photosynthesis & Cellular Respiration AXES Paragraph Bottom of page 57NB

- The mechanisms for P & CR are related because they are essentially opposite reactions. Photosynthesis transforms energy from the sun and Cellular Respiration makes use of chemical bond energy.
- Photosynthesis = Chloroplast
- Cellular Respiration = Cytoplasm, Mitochondria
- $6CO_2 + 6H_20 \rightarrow C_6H_{12}O_6 + 6O_2$ Photosynthesis
- $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_20 + 36$ ATP + Heat Cellular Respiration

# Gallery Walk – Cell UNIT Review

Describe, Draw, and Explain the importance of each of the following concepts/ processes on a White Board, for a Gallery Walk review. Page 51NB

- Osmosis – 3 Solutions
- Plasma Membrane - Macromolecules
- Eukaryotic Cell - Organelles
- Prokaryotic Cell - Organelles
- Photosynthesis – Equations, stages, Reactants & Products
- Cellular Respiration – Equation, Stages, Reactants & products
- Folded Membranes – Show 4 organelles & 3 benefits of folded membranes
- Active & Passive Transport – examples of each, Concentration gradient
- Macromolecules- name the 4, & their subunits
- Scientific Method
  - Theory & Hypothesis

# Gallery Walk – Cell UNIT Review

Describe, Draw, and Explain the importance of each of the following concepts/ processes on a poster paper, for a Gallery Walk review. Page 51NB

- Osmosis
- Plasma Membrane
- Eukaryotic Cell
- Prokaryotic Cell
- Photosynthesis
- Cellular Respiration
- Folded Membranes
- Active & Passive Transport
- Macromolecules
- Scientific Method

# Quiz Corrections

- Staple the quiz to your Notebook paper
- For each question you got wrong, Explain what was wrong about your answer.
- Tell me the correct answer, and why it is the correct answer.
- EX. Exocytosis is not part of Passive Transport.  Exocytosis is part of Active transport because it requires energy to get rid of wastes.

# Warm Up Answers

1) **Cellular Respiration**: process by which mitochondria break down food molecules (glucose) to produce **ATP**. The stages are: **glycolysis, citric acid cycle, electron transport chain.**

2) **Glycolysis**: series of chemical reactions in the cytoplasm of the cell that breaks down **glucose** into (2) **pyruvic acids- $C_3H_6O_3$.**

3). **Fermentation** – in the absence of Oxygen during glycolysis, Lactic acid (animals) or alcohol (plants) are produced.

Table 9.1 in text

Cellular Respiration: **Food broken down, energy of glucose released, CO2 given off, O2 taken in, does not require light, occurs in all living cells**

**They both produce Energy.**

Photosynthesis: **Food synthesized, energy from sun stored in glucose, CO2 taken in, O2 released, requires light, occurs only cells that contain chlorophyll**

**Both: use electron carriers, have cycles of chemical reactions, and form ATP**

# Cellular Respiration & Yeast

- Get into groups of 3 people.  Get 1 flask, 1 balloon, 1 sugar cube, and ½ tsp. of Yeast, combine with 50 ml warm water.
- Place Balloon on the end of the Flask
- Record results
- What happens to the balloon?
- Why?  What is the process called?  What are the Products?

# Cellular Respiration P. 31

- Question: How much Carbon Dioxide will be produced?
- Independent Variable: Changed the number of sugar (C6 H12 O6) cubes.
- Dependent Variable: More Carbon Dioxide was produced.
- Control: 1 sugar cube was the control.

- Constant: Same Sugar, Yeast, balloons, Flasks
- Materials & Equipment: Yeast – ½ tsp., water – 100 ml, sugar, balloons, Hot plate, Flask
- Experimental Set up:  Draw only
- Safety Concerns: Don’t eat the sugar cubes.
- Procedure : Write the steps….  Step 1,  Step 2, Step 3,

# Enzymes, Cataylase & Potatoes  Page 47 NB

- Get into groups of 3 people.  Get 1 flask, 1 balloon, H2O2, and 1 piece of Potato – raw, 1 piece of potato cooked.
- Place Balloon on the end of the Flask
- Record results
- What happens to the balloon?
- What do you know about enzyme function?
- Under what conditions do they function best?
- Why?  What is the process called?  What are the Products?

# Enzyme Lab P. 47NB

- Question: How much Carbon Dioxide will be produced?
- Independent Variable: Changed the number of pieces of potato, or more $H_2O_2$.
- Dependent Variable: More Carbon Dioxide was produced.
- Control: 10 mL of $H_2O_2$ & 1 piece of potato.

# Enzyme – Catalyse Lab Page 47 NB

- Constant: Same potato, H2O2, balloons, Flasks
- Materials & Equipment: H2O2½ tsp., balloons, Hot plate, Flask
- Experimental Set up:  Draw only
- Safety Concerns: Don’t eat the potatos.
- Procedure : Write the steps….  Step 1,  Step 2, Step 3,
- Answer Analysis questions on the lab.

# Leaf Disk Assay Lab
# Honor Biology Due Friday

- Enter data into **Excel**
- Make a **scatter plot graph** to show the **50% floating point.**
- **Data Analysis:** What does the graph mean? Error analysis
- **Conclusion:** Discuss why measuring the photosynthesis can be a problem. What competing process is occurring at the same time? Include in your discussion the relationship between Photosynthesis and Cellular Respiration by comparing and contrasting the equations.

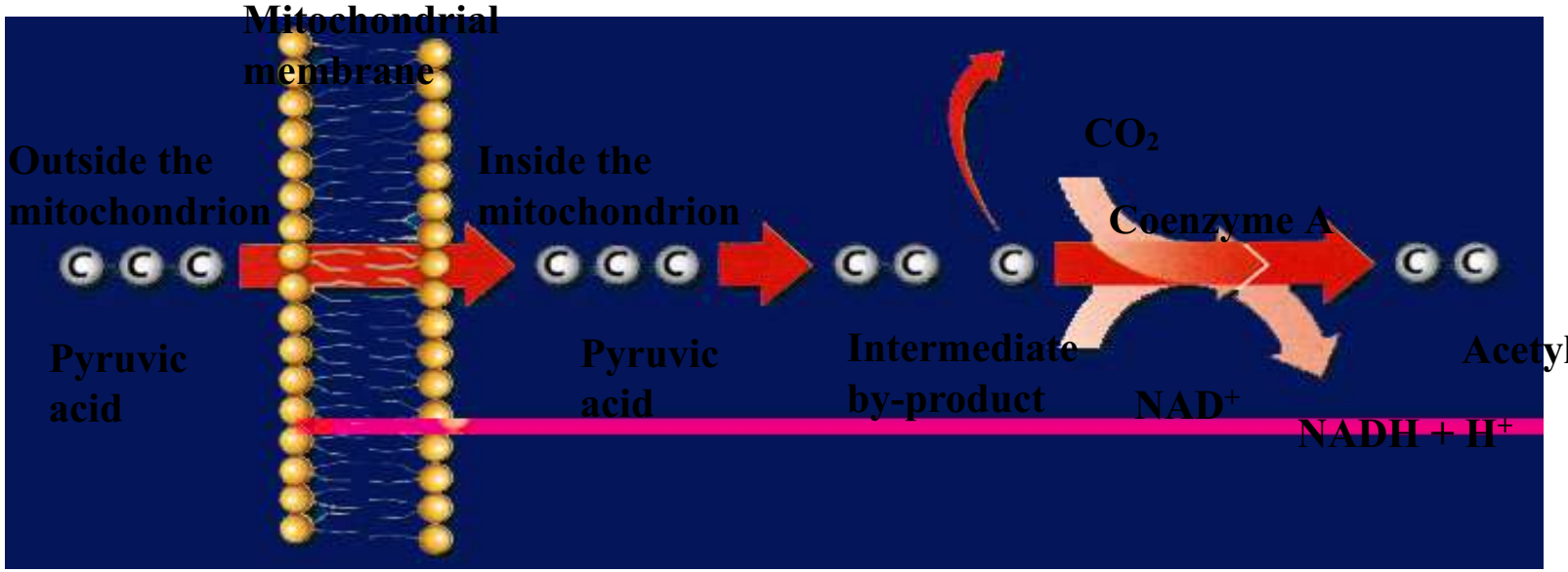
# STAGE 1: GLYCOLYSIS

- Takes place in the cytoplasm of the cell

- Process where glucose is broken down and some energy is released
- In the absence of Oxygen, fermentation happens.

# Glycolysis

- Before citric acid cycle and electron transport chain can begin, pyruvic acid undergoes a series of reactions in which it gives off a molecule of $CO_2$ and combines with a molecule called coenzyme A to form acetyl-CoA.



# STAGE 2: CITRIC ACID CYCLE

- AKA Krebb's cycle
- Happens in the mitochondria
- Produces: carbon dioxide and some ATP

# STAGE 3: ELECTRON TRANSPORT CHAIN

- Happens in the mitochondria
- Series of proteins that transfers energy
- Net creation of whole process: 36 ATP

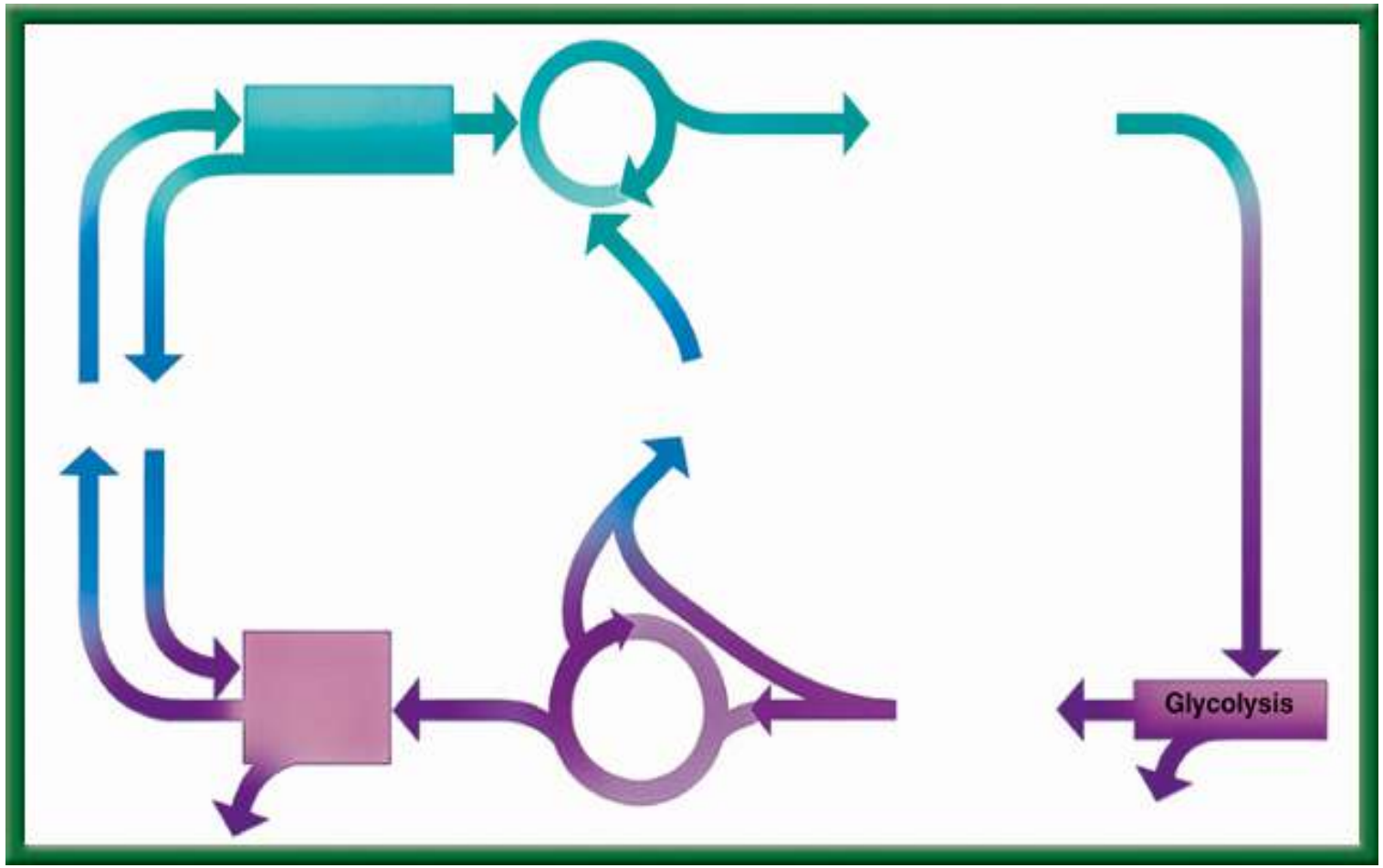
# PROBLEM

- What happens when our cells run out of oxygen? Can cell respiration occur?

# FERMENTATION

- Without oxygen cell respiration can not occur.
- However, instead of giving up and dying, our cells have another way to create energy without using oxygen→ FERMENTATION
- Occurs after glycolysis
- Lactic acid fermentation: animal cells (us!)
- Alcoholic Fermentation: plant cells

# Transparencies




END OF SLIDE

To return to the chapter summary click escape or close this document.