

Hello Biology students:

The following are a series of items that will allow you to stay current with the material which has been covered throughout this school year.

At this time, do not be concerned with the next unit, Mitosis. It is expected that students will complete the assignments individually and submit this work.

All of these assignments can be completed using the notes completed in class, the textbook (online or hard cover), or the internet. To complete these assignments, minimal supplies are necessary.

Thank you, and stay healthy!


Sign in and get started with Teams

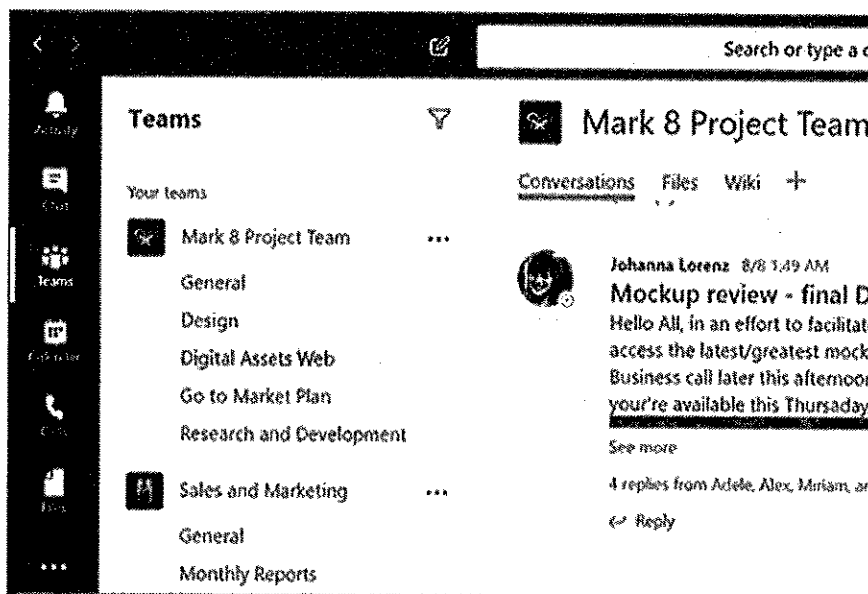
Go to <https://www.office.com/>

1. Sign in with your Office 365 username and password.
 - o The student user name and password is there **PowerSchool information**. The same information used to login to computers at school.
 - o For example: Username: **jsmith@dorchester2.k12.sc.us**
 - o Password: Password

A *team* is a collection of people, conversations, files, and tools — all in one place. A *channel* is a discussion in a team, dedicated to a department, project, or topic.

The best way to get familiar with teams and channels is to pick a team and channel and start exploring!

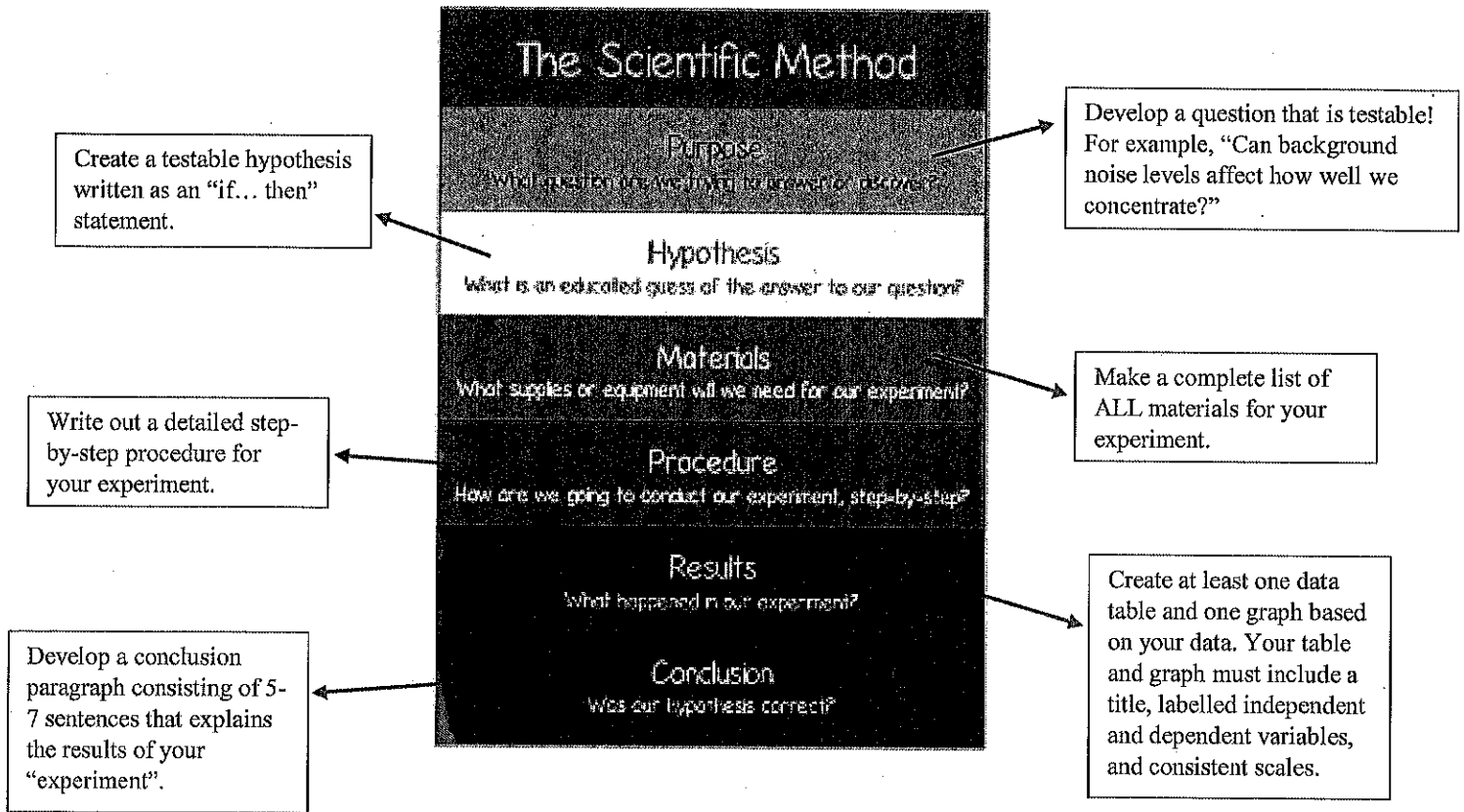
1. Select **Teams**  on the left side of the app and then pick a team.
2. Select a channel and explore the **Conversations**, **Files**, and other tabs.



Unit 1- Scientific Method & Inquiry

Designing Your Own Scientific Experiment

Directions: Your challenge is to design an experiment that can test a scientific [testable] question of your choice! You will thoroughly develop and explain each step of the scientific method and create a data table in preparation for the experiment. You do not have to conduct your experiment, BUT with proper supervision you may be able to complete it on your own at home.



Biomolecules Project

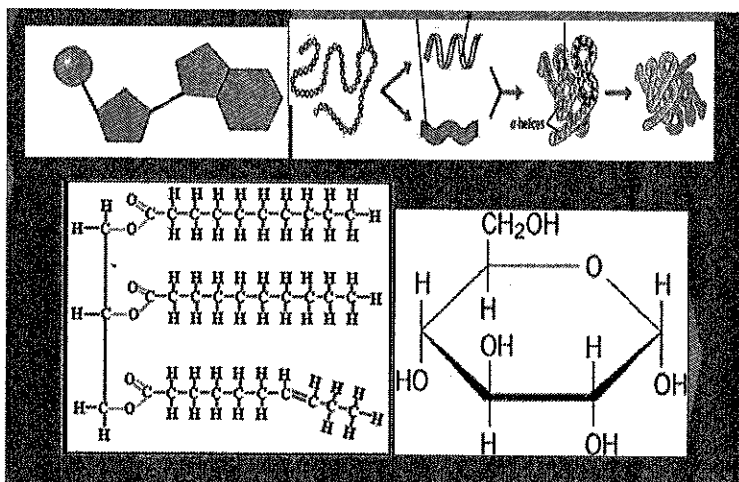
For this assignment you must create a project that compares the **4 biomolecules**. This project will be worth a **test grade!** You get to pick what type of project you do, but all projects will be graded on creativity, accuracy, presentation, and knowledge. You will choose from the list of ideas provided and once you have determined what you will be doing, you will need to refer to the rubric including points for each item of your project.

PROJECT CHOICES

- 1. Newspaper article** – Write an article discussing the properties of each of the biomolecules from the point of view of someone who is prescribing a well-balanced diet for someone. You must include the title of the newspaper, date, all the contributors and answer the “who, what, when, where and why” questions. Your article must be supported by pictures with captions, well organized thoughts, correct grammar and content.
- 2. Poem or song** – Write an original poem or song explaining the properties and characteristics of the 4 biomolecules. The organization of the poem/song must be clear. The poem/song must be descriptive, expressive and creative and must demonstrate an understanding of the concepts. Poems/songs must show correct grammar. For songs, the tune must also be provided.
- 3. Create a presentation of the 4 Biomolecules** – Demonstrate the properties and characteristics of the 4 biomolecules visually by creating some sort of presentation of these processes. The presentation must be accurate, demonstrate knowledge of the information, and be a creative design. It can be a 3D model, poster, PowerPoint, Prezi, etc.
- 4. Write a children’s storybook** – Write an original story explaining the properties and characteristics of the 4 biomolecules. The story must include all the parts of a story including characters, plot, dialogue, vivid descriptions and illustrations. The story must be creative and show correct grammar. The story must be clearly written, illustrated and show an understanding of the concepts. You must create a book to present the story.
- 5. Animated FlipBook** – You must create a flip book depicting the 4 biomolecules that will show the properties and characteristics of each when flipped. Each page must have a picture (colored, and the colors must be consistent throughout the flip book) as well as a description of what is happening to the key components. At the end of the book, you must write a comparison and contrast of the two processes as they are seen in your flip book.

Things TO INCLUDE:

- monomers
- pictures of the chemical structure/organization
- structures
- elements
- functions
- examples (food and actual examples)
- Calorie value
- interesting facts/information



Cell Organelle and Cell Transport Review Activity

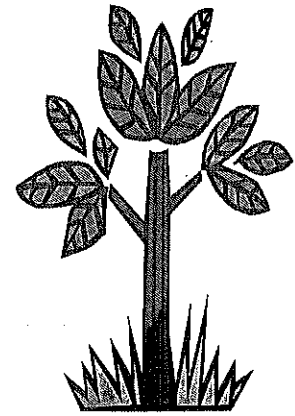
Objective: Create a 3 D cell out of any material you find at home and attach it to a poster board. Use this cell to describe the cell organelles and types of membrane transport and how they help cells maintain homeostasis.

1. Include the following organelles with their function:
 - a. Nucleus- include nuclear envelope and DNA
 - b. Vacuoles
 - c. Lysosomes
 - d. Centrioles
 - e. Ribosomes
 - f. Endoplasmic reticulum- rough and smooth
 - g. Golgi apparatus
 - h. Chloroplast
 - i. Mitochondria
 - j. Cell membrane
2. Use the cell membrane to explain the following:
 - a. diffusion- define diffusion, label and demonstrate diffusion on your cell
 - b. facilitated diffusion- define facilitated diffusion, label and demonstrate facilitated diffusion on your cell.
 - c. Active transport- define protein pumps, endocytosis and exocytosis, label and demonstrate these on your cell.
 - b. Osmosis- on the bottom of your poster, define and create examples of isotonic, hypotonic, and hypertonic solutions.
3. Demonstrate how proteins are made and how they leave the cell. Include the steps on your cell.

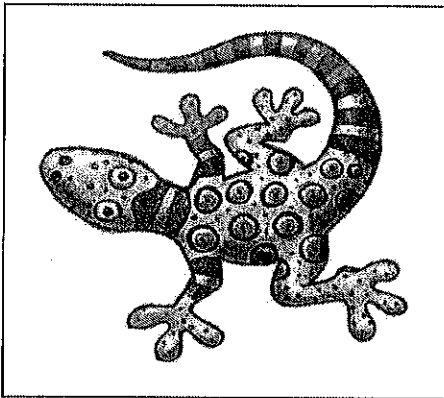
PHOTOSYNTHESIS & CELLULAR RESPIRATION POSTER PROJECT

Directions:

- Design a poster which illustrates the processes of photosynthesis and cellular respiration and the *connections between the two*.
- You can show the relationship between the two in whatever manner you would like (mitochondria/chloroplast, animal/plant, etc).



Poster Requirements.....



Terms to include in the poster:

(these terms must be on the poster and may be used more than once)

Carbon Dioxide (CO₂)
Oxygen (O₂)
Glucose (C₆H₁₂O₆)
Sun
Light Energy
Water (H₂O)
ATP

Locations to identify and include in the poster:

Light Dependent Reaction
Light Independent Reaction (Calvin Cycle)
Krebs Cycle (Citric Acid Cycle)
Electron Transport Chain
Glycolysis
Chloroplast

Mitochondria
Stroma
Thylakoid
Matrix
Inner Membrane of Mitochondria
Cytoplasm

Somewhere on your poster...

Make sure to include *chemical equations* for photosynthesis and cellular respiration on your poster.

On the back of your poster...

Summarize the connection between the two processes, photosynthesis and cellular respiration.

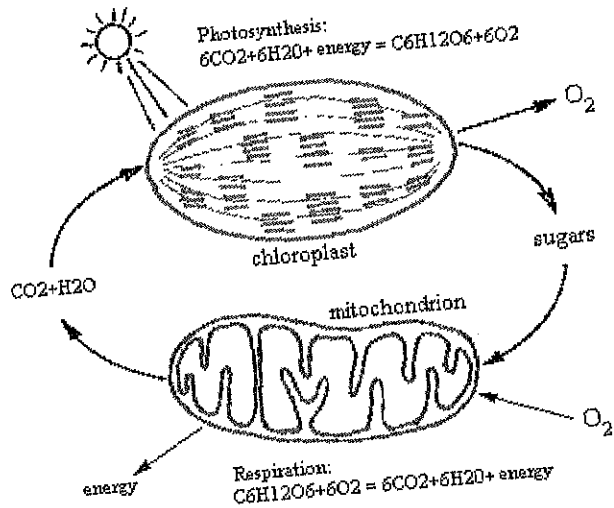
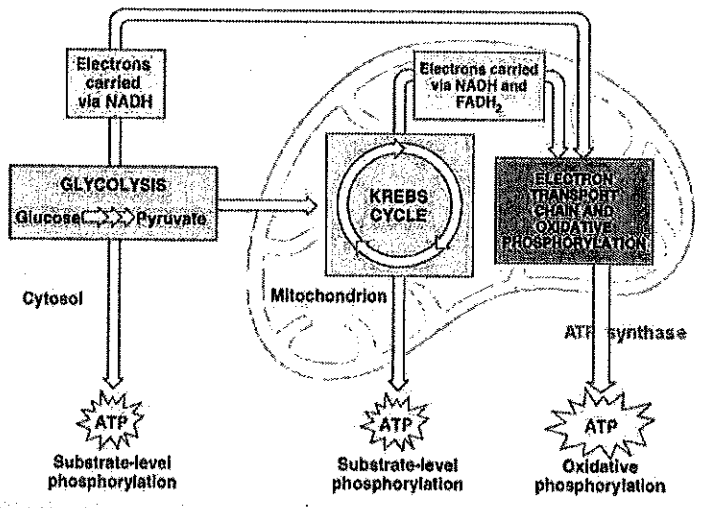
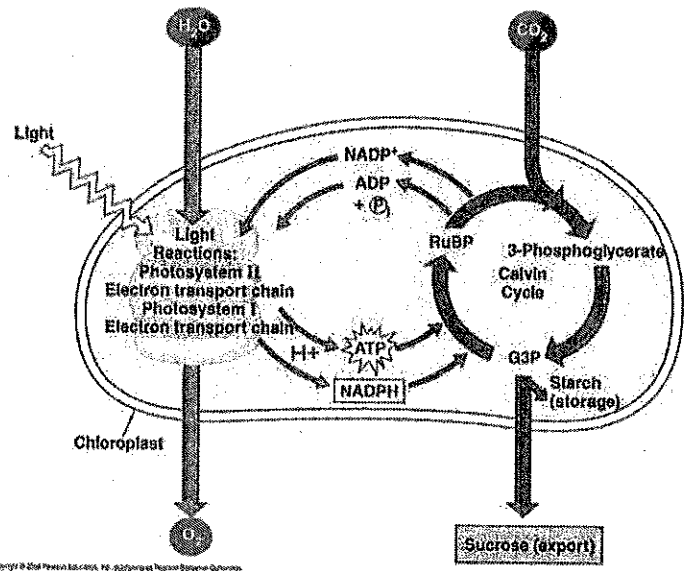
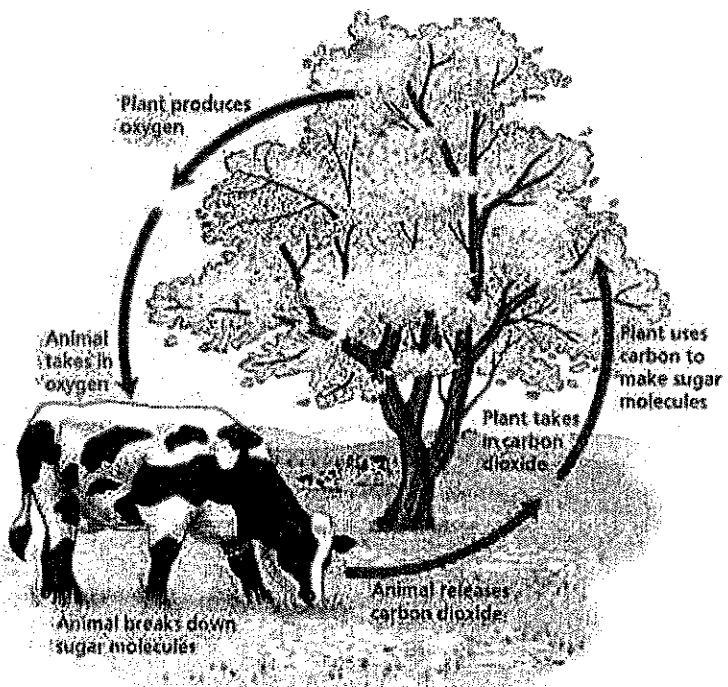
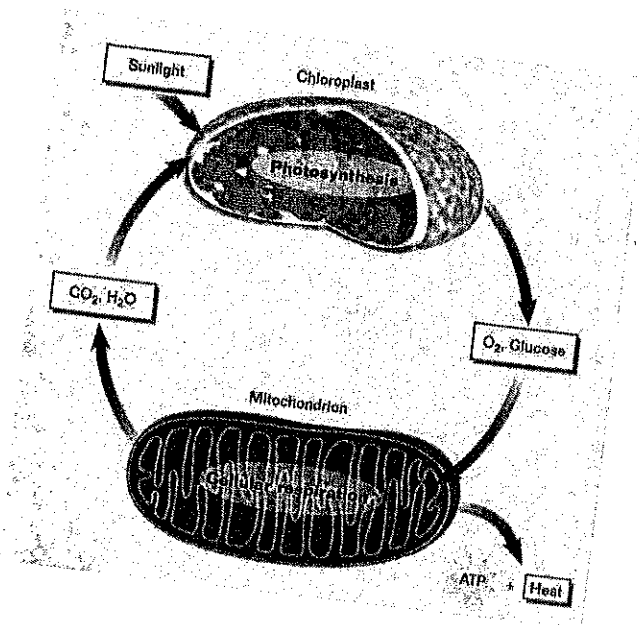


Figure 16 - With the photosynthesis, the solar energy is cumulated by the chloroplasts as sugar molecules. With the glycolysis and the respiration, made by mitochondria, the energy is liberated and supplied to the cell for its biochemical processes.



DNA Replication Comic Strip

Your job is to draw out the process of DNA replication and briefly describe what is happening step by step.

Create a comic strip or mini poster to showcase your knowledge of DNA replication.

Your Comic Strip should include:

- How the process begins
- What enzymes are involved
- Detailed steps
- How the process ends (including end result)
- Label key vocabulary!

Complimentary Nitrogen Bases

- DNA Polymerase
- Double Helix
- Nucleotide
- Helicase
- Double Strand
- Template Strand

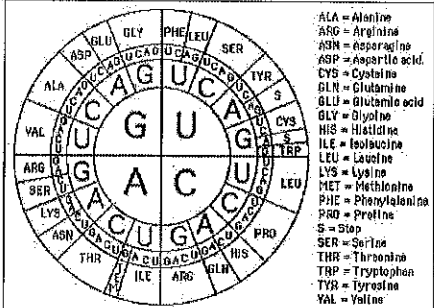
Sugar Phosphate Backbone

Protein Synthesis Brochure Project

Objective: To demonstrate your knowledge of protein synthesis the construction and completion of an informative brochure. Someone reading your brochure should gain a better understanding of this complicated process.

Project Directions: Use the directions below as a guide to your work. Be sure to give each section a title page, include a relevant picture and complete all required information. The guiding questions should give you an idea of the type of information which should be included on that page. Feel free to include more, but not less. Be sure to keep both the directions and rubric in mind as you work on this assignment. *Where can you find this information?* Textbook, video lectures, links from the protein synthesis webquest, and any additional research you conduct using reputable resources.

SIDE ONE...

<p style="text-align: center;">PROTEINS</p> <p style="text-align: center;">Include a relevant picture.</p> <p style="text-align: center;"><i>This section of your brochure should include general information on the very important protein macromolecule.</i></p> <p style="text-align: center;">Guiding Questions: What are proteins? Why are proteins so important? How do we get proteins? What are some common proteins?</p> <p style="text-align: center;">Terms to include and define:</p> <p style="text-align: center;">Protein Amino Acid Gene</p>	<p style="text-align: center;">FROM GENE TO PROTEIN</p> <p style="text-align: center;">Include a relevant picture.</p> <p style="text-align: center;"><i>The goal of this section is to demonstrate how one protein is made from a single gene. You will do this by making up your own protein!</i></p> <ol style="list-style-type: none"> 1. Make up a DNA sequence which will code for 10 amino acids. 2. Break up the sequence into codons. 3. Transcribe the DNA sequence into an mRNA sequence. 4. Use the sequence chart/wheel to determine the amino acids being signaled. <div style="text-align: center;">  </div>	<p style="text-align: center;">PROTEIN SYNTHESIS TITLE PAGE</p> <p style="text-align: center;">Include a relevant picture.</p> <p style="text-align: center;"><i>Make this section pleasing to the eye because it is the first thing your reader will see!</i></p> <p style="text-align: center;">Term to include and define:</p> <p style="text-align: center;">Protein Synthesis</p> <p style="text-align: center;">Your Name _____ Period _____</p>
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SIDE TWO...

BIG IDEA	TRANSCRIPTION	TRANSLATION
<p>Include a relevant picture.</p> <p><i>This section of your brochure should include information on the overall process of protein synthesis, without getting too detailed.</i></p> <p><u>Guiding Questions:</u> What is protein synthesis? What is the central dogma of biology? What are some differences between DNA and RNA?</p> <p><u>Terms to include and define:</u></p> <p>Central Dogma Protein Polymer or Macromolecule Amino Acid Monomer Gene</p>	<p>Include a relevant picture.</p> <p><i>The goal of this section is to inform the reader of the process of transcription.</i></p> <p><u>Guiding Questions:</u> What is transcription? Why is it necessary? Where does this process take place?</p> <p><i>Give an example of a DNA sequence being transcribed.</i></p> <p><u>Terms to include and define:</u></p> <p>Transcription DNA Messenger RNA (mRNA) Codon</p>	<p>Include a relevant picture.</p> <p><i>The goal of this section is to inform the reader of the process of translation.</i></p> <p><u>Guiding Questions:</u> What is translation? Where does this process take place? What signals for an amino acid? What ensures that the correct amino acid is brought to the ribosome? How do you know when a protein is complete?</p> <p><u>Terms to include and define:</u></p> <p>Ribosomes Codon Amino Acid Transfer RNA (tRNA) Anticodon Peptide Bond Polypeptide Chain/Protein</p>