

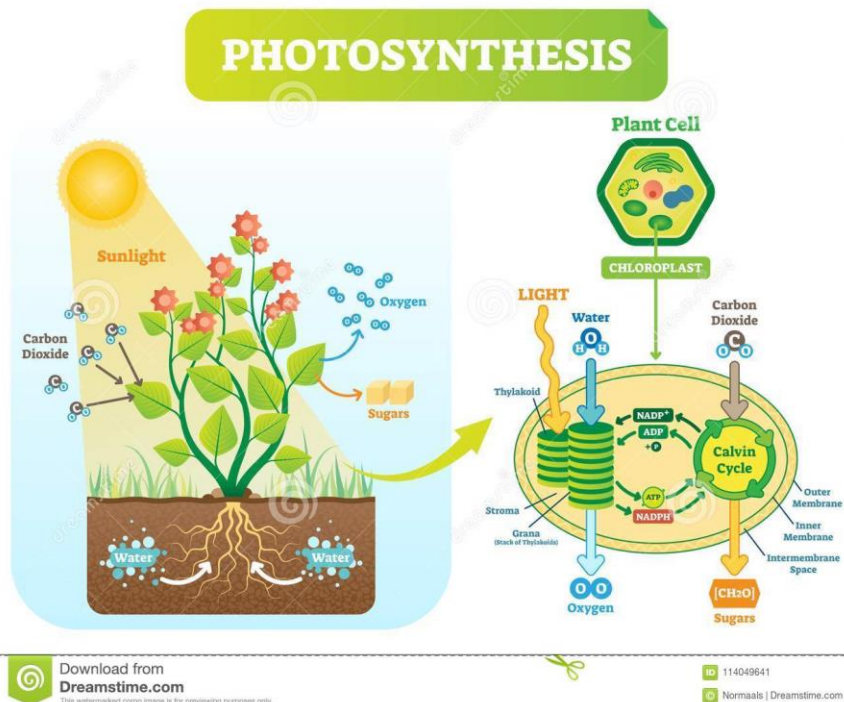
## Week 3

### 1. Photosynthesis

<b>Grade:</b> 7 <sup>th</sup> -8 <sup>th</sup>		<b>Subject:</b> Science	
<b>Materials:</b> homework worksheet, textbook, lab materials		<b>Technology Needed:</b> PowerPoint system, computer, projector	
<b>Instructional Strategies:</b> *Direct instruction                      * Peer teaching/collaboration/ *Guided practice                            cooperative learning *Learning Centers                         *Visuals/Graphic organizers *Lecture                                        *Discussion/Debate *Technology integration		<b>Guided Practices and Concrete Application:</b> *Large group activity                      *Hands-on *Independent activity                       *Technology integration *Pairing/collaboration *Simulations/Scenarios	
<b>Standard(s)</b> Standard 4: Students understand the basic concepts and principles of life science.		<b>Differentiation</b> <b>Below Proficiency:</b> If a student identifies as below proficiency I would put them into groups or with a partner to aid them.  <b>Above Proficiency:</b> If a student identifies as above proficiency I would have them look further into the topic by researching on the computer the functions of different cell types.  <b>Approaching/Emerging Proficiency:</b> If students are emerging proficiency they should be able to complete and understand the homework.  <b>Modalities/Learning Preferences:</b> I encourage students to move around the classroom, interact with students, and ask questions.	
<b>Objective(s)</b> 7.4.1 Explain the functions of the cell (e.g., growth, metabolism, reproduction, photosynthesis, response) 9-10.4.12. Compare and contrast photosynthesis and cellular respiration  <b>Bloom’s Taxonomy Cognitive Level:</b> Application, Analysis			
<b>Classroom Management- (grouping(s), movement/transitions, etc.)</b> During the lecture students will be arranged in tables with 3 to 4 students. It’s the students’ responsibility to take notes during the lecture and participate in group activities. I will create a positive environment by engaging the students in an activity. I will provide instruction for moving around the room during transition times.		<b>Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)</b> I expect students to sit through the lecture and ask questions as we go through the content. I will regain students’ attention and assign homework for the evening.	
<b>Minutes</b>	<b>Procedures</b>		
<b>30</b>	<b>Set-up/Prep:</b> Create PowerPoint notes/group activity/worksheet. Set up PowerPoint before class. Print worksheets.		
<b>5</b>	<b>Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)</b> I will start class by accessing students’ prior knowledge to photosynthesis. I will ask questions regarding cellular movement and the components of cellular respiration and photosynthesis. I will start the lesson by showing an interesting video of photosynthesis from YouTube to engage the student. <a href="https://youtu.be/yHVhM-pLRXk">https://youtu.be/yHVhM-pLRXk</a>		
<b>20</b>	<b>Explain: (concepts, procedures, vocabulary, etc.)</b> The main concepts and components of photosynthesis and cellular respiration will be explained. I will use the PowerPoint lecture to guide and build on the cell. I will break down the steps of each process, so students are able to grasp the information. The important terms will be discussed deeply and relevant to students’ prior knowledge. I will ask questions to promote student engagement and provide real world examples to help students connect with the content. I will make sure to explain all the pictures.		

20	<p><b>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</b></p> <p>After the lesson is taught I will ask student to research components that increase and decrease the effect of photosynthesis. After they have a stronger understanding I will ask the students to diagram the process of photosynthesis and cellular respiration. They need to include major components listed in the notes and label important structures.</p>
5	<p><b>Review (wrap up and transition to next activity):</b></p> <p>I will ask students if they have any remaining questions and have them clean up/pack up for their next class.</p>
<p><b>Formative Assessment: (linked to objectives)</b></p> <p><b>Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</b></p> <p>What do you need for photosynthesis to start? Where does cellular respiration take place?</p> <p><b>Consideration for Back-up Plan:</b> I have prepared an additional worksheet for the students. I also have created vocabulary games to help study for the test.</p>	<p><b>Summative Assessment (linked back to objectives)</b></p> <p><b>End of lesson:</b> As you can see Photosynthesis produces oxygen and glucose, and cellular respiration produces CO<sub>2</sub> and water. Without those components these processes could not take place.</p> <p><b>If applicable- overall unit, chapter, concept, etc.:</b> NA</p>
<p><b>Reflection (What went well? What did the students learn? How do you know? What changes would you make?):</b></p> <p>To be reflected after lesson is taught.</p>	

**Assessment:** Students will label and draw a diagram showing the important components and structures needed for photosynthesis and cellular respiration to take place. They must include the chemical formulas and important plant structures in additions to the mitochondria associated with cellular respiration.



## 2. Inquiry Research a Current Science Topic

<b>Grade:7-8th</b>	<b>Subject: Science</b>
<b>Materials: Current Magazines, journals, note taking materials</b>	<b>Technology Needed: laptop-internet</b>
<b>Instructional Strategies:</b> *Direct instruction                  *Peer teaching/collaboration/ cooperative learning *Guided practice *Technology integration        *Visuals/Graphic organizers *PBL	<b>Guided Practices and Concrete Application:</b> *Independent activity                *Hands-on *Pairing/collaboration            *Technology integration  Explain: Students will work with partners to research a current topic in science.
<b>Standard(s)</b> Standard 2: Students use the process of science inquiry.  <b>Objective(s)</b> 7.2.1. Communicate the results of scientific investigations using an appropriate format (e.g., journals, lab reports, diagrams, presentations, discussions)  <b>Bloom’s Taxonomy Cognitive Level:</b> Evaluating and Creating	<b>Differentiation</b> <b>Below Proficiency:</b> If a student identifies as below proficiency I would put them into groups or with a partner to aid them.  <b>Above Proficiency:</b> If a student identifies as above proficiency I would have them look further into the topic by conducting an interview first hand.  <b>Approaching/Emerging Proficiency:</b> If students are emerging proficiency they should be able to complete and understand the homework.  <b>Modalities/Learning Preferences:</b> I encourage students to move around the classroom, interact with students, and ask questions.
<b>Classroom Management- (grouping(s), movement/transitions, etc.)</b> Students are required to sit in their desks with their laptops. They must work with their partner and can ask me for questions. Student must demonstrate proper internet/computer use.	<b>Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.)</b> As I lecture for a few short minutes I expect students to be attentive and participate in discussion. During the activity, I encourage students to maintain an inside voice and be respectful while everyone works.
<b>Minutes</b>	<b>Procedures</b>
<b>15</b>	<b>Set-up/Prep:</b> I will research current science topics to give students ideas for their research.
<b>10</b>	<b>Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.)</b> I will start off class by explaining students’ expectations. Students will be divided into heterozygous partners where they will be given the choice to research any current science related topic. They must get my approval before they commit to their research. They will research for the remainder of the day. After they have gathered enough information the students will have the choice on how they want to present the information. Students can create a paper, poster, and a presentation.
<b>40</b>	<b>Explain: (concepts, procedures, vocabulary, etc.)</b> Students should focus on new scientific advancements that are being used to improve our society. Is the scientific advancement benefiting society in the long run? Or is it creating another problem? Explain the method of study and the results. Students will use this time to research their topic. I am available to answer questions and suggest topics. <b>Literature Circles</b>
<b>0</b>	<b>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions)</b> This time is used for researching and for the students to decided how they want to compile their information.

0	<b>Review (wrap up and transition to next activity):</b> Research time	
<b>Formative Assessment: (linked to objectives)</b> <b>Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</b> What new information are you finding? How has it evolved? Does it relate to modern science? <b>Consideration for Back-up Plan:</b> If students are having a hard time finding sites to research I will walk them through on how to find creditable and readable sites.	<b>Summative Assessment (linked back to objectives)</b> <b>End of lesson:</b> Students will use their research skills and new sources such as journals and magazines to find information on a current science topic. <b>If applicable- overall unit, chapter, concept, etc.:</b> <b>NA</b>	
<b>Reflection (What went well? What did the students learn? How do you know? What changes would you make?):</b> To be reflected after lesson is taught.		

Assessment: Students have the choice of a paper, presentation, or PowerPoint.

## Performance Assessment for Photosynthesis

After the lesson on photosynthesis is delivered, I will explain to the students instead of a unit paper and pencil test we will be conducting a performance assessment. The students will be creating a diagram that describes the processes and components needed for photosynthesis to take place. Students will be given a list of words/key concepts that need to be on the diagram. They will be given a time limit, and materials to work with. Students are not allowed to use any notes or textbook. Students will be arranged into partners. Students will be given about 20 minutes to brainstorm and develop a plan on how they want to create their photosynthesis diagram. It is the student's responsibility to study the key components and know how the process works before they come to class the next day. During the performance assessment class period, students will have 50 minutes to create their diagram with the help of their partner. The students are being graded on quality of the product, their understanding of the photosynthesis process, how well they work together, and how well they use their time.

### Diagram Requirements/Rules

1. Students must include the following words in their diagram with either creating it or labeling it. Word bank: glucose, water, light energy, ATP, CO<sub>2</sub>, O<sub>2</sub>, chloroplast, and, mitochondria.
2. Photosynthesis chemical equation is visible on diagram.
3. Student will have 50 minutes to create the diagram.
4. Students can only discuss with their partner.
5. Diagram is stable enough to move to a new location.
6. Example listed below (this will not be shown to students)



## Photosynthesis Diagram Rubric

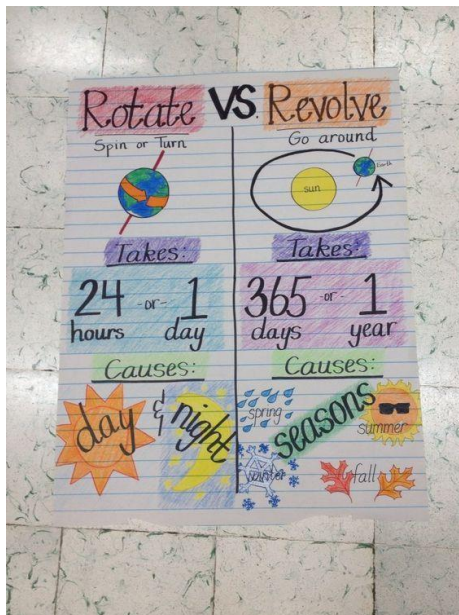
	<b>4. Distinguished</b>	<b>3. Proficient</b>	<b>2. Apprentice</b>	<b>1. Novice</b>
<p><b>Content-Quality of Information:</b> Relates to topic, detailed, and accurate</p>	All information was clear and came from reputable sources. Extensive details and relevant examples were used to support the content.	Used relevant information. Included many details and strong examples that came from reputable sources.	Information related to the topic, but project needed more details and examples to fully support ideas.	Information did not include details or examples that related to the topic. Information did not come from a reliable source.
<p><b>Organization-Overview:</b> Ready for classwork</p>	Every assignment complete, accurate, and on time. Always prepared with paper, pencil, notes, and textbook. Used time well. Work was turned in early or on time. Created a list or calendar to track progress. Modified work habits to finish project on time.	Finished assignments on time. Came prepared with paper, pencil, notes, and textbook. Most work was done on time. Monitored progress frequently. Completed all required tasks on schedule.	Most assignments finished on time. Usually had paper, pencil, notes, or textbook. Some work was not done on time.	Rarely finished assignments on time. Often did not have paper, pencil, notes, or textbook. Did not use time well. Little or no work was done on time.
<p><b>Teamwork-Contribution:</b> Ideas and assistance</p>	Actively participated in all group discussions and activities. Shared ideas freely. Located additional information or resources.	Shared ideas in every group discussion. Attempted to locate additional resources or materials.	Participated in most group discussions. Shared a few ideas.	Did not participate in most group discussions. Rarely shared ideas.
<p><b>Organization-Time Management:</b> Uses time wisely</p>	Used time well. Work was turned in early or on time.	Most work was done on time.	Some work was not done on time. Monitored progress occasionally. Did not change work habits or schedule accordingly. Worked frantically to finish project on time.	Did not use time well. Little or no work was done on time. Did not monitor progress adequately. Project was not completed on time.

**7. Modified version for a student who has an intellectual disability** (autism, Down syndrome, Fragile X syndrome, Fetal Alcohol Spectrum Disorder)

Review activity for special education student.

- 1) The idea of the review game I have created is to play memory and match the term to the definition. For a student with a disability I could have them work in groups or with a partner. I also could have the student try a different activity of writing their vocabulary words independently. The student is required to write vocabulary words in their lab manual. They must describe each term with a similar meaning, picture, and use it in a sentence. For the student with the disability I would break down the work load by having them do 5 to 6 words a week rather than all of them at once. Therefore, they will have more time to look up and understand the meaning of the word.

I also like the idea of having a show and tell for vocabulary words. Each week one student picks one vocabulary word to take home. They discuss the word with their parents and the internet to create a small 8x10 poster displaying the meaning. They could also bring in an item that is associated with that word or shows similar meaning. This allows the student with a disability more time to prepare and they have needed assistants. As the teacher I would give the disabled student a vocabulary word I know they could master.



## Study Guide

### 1. Cells and Life

- A. **Cells** are the basic building blocks to life.
- B. Cell Theory: “states that all living things are made of one or more cells, the cell is the smallest unit of life, and all new cells come from preexisting cells.”

### 2. Cellular Composition

- A. Cells are considered **macromolecules** which are many small molecules that join together to form one large molecule.
- B. Four types of Macromolecule
  - 1) **Nucleic Acids**-contain genetic material
  - 2) **Proteins**-responsible for transportation, communication, and breakdown in the cell
  - 3) **Carbohydrates**- energy storage, structural support
  - 4) **Lipids**- protective membrane, energy storage

### 3. Cell Shape and Movement

- A. **Cell Membrane** is a flexible covering that protects the inside of a cell from the environment outside a cell.
- B. **Cell Wall** : is a stiff structure outside the cell membrane. (Found in fungal, bacteria, plants, protists)

### 4. Cell Accessories

- A. **Flagella**- are long tail like appendages that whip back and forth and move a cell
- B. **Cilia**- are short, hair like structures that help the cell move.
- C. **Cytoplasm**- a fluid inside a cell that contain salts, molecules, and organelles.
- D. **Cytoskeleton**- is a network of threadlike proteins that are joined together that form a framework inside the cell.
- E. **Organelles**-structures inside the cell that have specific functions.
- F. **Nucleus**- contains the cell’s genetic material and control cell activities
- G. **Mitochondria** converts energy or sunlight into ATP to be used by the cell. (Powerhouse).
- H. **Chloroplast** use light energy to make food in the process of photosynthesis.
- I. **Golgi Apparatus**-process and packages materials throughout the cell.

### 5. Different Cell Types

- A. PROKARYOTIC
- B. EUKARYOTIC

### 6. Cellular Movement



A. **Passive Transport** -is the movement of substances through a cell membrane without using energy.

B. **Diffusion** is the movement of substance from an area of higher concentration to an area of lower concentration.

C. **Osmosis** –is the diffusion of water molecules through a membrane.

D. **Facilitate Diffusion** is the process of when molecules pass through a cell membrane using special proteins called transport proteins.

E. **Active Transport** is the movement of substances through a cell membrane while using energy. It moves particles from areas of low concentration to area of higher concentration.

F. **Endocytosis** – process during which a cell takes in a substance by surrounding it with the cell membrane.

G. **Exocytosis** is the process during which a cell's vesicles release their contents outside the cell.

## 7. Cells and Energy

A. **Cellular Respiration** is a series of chemical reaction that convert the energy in food molecules into a usable form of energy called ATP.

B. **Photosynthesis**- series of chemical reaction that convert light energy, water, and CO<sub>2</sub> into food energy and give off oxygen.

C. **Glycolysis**- breaks down sugars (Glucose)

D. **Fermentation** is a reaction that cells use to obtain energy for food when oxygen levels are low.

**8.End-of-Unit Assessment (modified for a student with a Visual Impairment.**

Name: \_\_\_\_\_

True or False. Circle T or F for the correct answer.

- 1.T or F. Diffusion requires energy.
- 2.T or F. The Nucleus contains the genetic material and controls the cell.
- 3.T or F. The cell is the smallest unit of life.

Multiple Choice-Circle the correct answer.

4. Glycolysis is the breakdown of \_\_\_\_\_?
  - A. Lipid
  - B. Sugars
  - C. Salts
- 5.Osmosis is the diffusion of \_\_\_\_\_.
  - a. water
  - b. pigments
  - c. CO<sub>2</sub>
- 6.Which correctly describes the function of the Golgi apparatus?
  - a. powerhouse of the cell
  - b. process and packages materials
  - c. creates new proteins

Fill in the Blank

(work bank- protein, lipid, sugar, low, high, medium, ATP)

7. Facilitated Diffusion requires a \_\_\_\_\_ to transport material through the cell membrane.

8. Passive transport is the movement of materials from areas of \_\_\_\_\_ concentration to areas of \_\_\_\_\_ concentration.

9. The mitochondria converts \_\_\_\_\_ into usable energy.

Short answer (Come talk with the teacher)

13. Explain the process of cellular respiration. You may use pictures to draw the cycle.

14. Explain the process of photosynthesis. You may use pictures to draw the cycle.

