

Cells Unit lesson planning

Grade: MS grade 7

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Lesson # 1

Standard(s)

MS- LSI-1 conduct an investigation to provide evidence that living things are unicellular or Multicellular and may have different cell types

Learning Targets (lesson #1)

The student will be able to state that cells are the basic building blocks for all organisms.

Students will be able to arrange organizational structures from smallest to largest (cell, tissue, organ, system).

The student will be able to describe the differences/ Compare between plant and animal cells

Students should be able to decide the type of cell they are observing by observing them using a microscope

Bloom's Taxonomy Cognitive Level:

Remember, understand, and analyze

Pre-assessment: Students will participate in a Kahoot quiz to assess their pre-knowledge (10 min)

Engage:

- Have the students sit in their groups of 3 in a random manner. I will try to assign students who are more confident with the content with less proficient students so that **peer- tutoring** will take place.
- Present the thinking prompt (wait time) / discussion about it (the pictures are below) **(5 min)**

Observing the pictures on the board what is in common between each two pictures on the same row? (Through group discussions students will get to that cells are the basic building blocks in all organisms just like the brick is being the basic building block in a building) and they will understand that a tissue is made of a group of similar cells an organ is made of several tissues and a group of organs make the different body systems.

- **Then ask the following questions and let students discuss in groups then each group will share:**
 - Are all organisms made of many cells? Yes/ No (give examples. Some might say yes some might say no then ask for examples. **(present a picture of different unicellular bacteria cells** and state that these are microscopic organisms made of one cell that's why they are called unicellular). Do all cells look the same in our body? Do they have the same function? Can you think of a certain special cell that has a specific function? **(show pictures** of red blood cell, neuron, plant root cell)

Explain: (15 min)

- Present the cell theory/ a simple explanation to the difference between prokaryotic cells and eukaryotic cells
- Present to the different groups' pictures of **a plant cell and an animal cell** with all the organelles labeled.
(an organelle is a small structure inside the cell that do a specific function)
- Have all the students do a Venn- diagram to compare these cells (a graphic organizer for each group)/teacher will be walking around to assist by asking students questions.

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- when all the students are done working in their group (3-5 min) the teacher will label the major differences, students will write them on their notebook.
- (A question to discuss and research for the groups who finish their work earlier) why do you think plant leaf cells need to have a cell wall were as human body cells do not need a cell wall?

Explore / End of class Formative Assessment: (15 min)

Each group will be given a **chart to fill the correct type of cell** and write an evidence to their answer based from what they observed in the different microscopes. Students will be observing different types of cells (animal cell red blood cell slide/ plant leaf cell / bacteria cell) in the microscope and then decide at each station which type of cell this is based on its physical appearance we discussed earlier. (In groups/ each student will fill a row in the form)

- Observe the student work (throughout the lesson) and while using the microscope observation they will fill out a form (a form for each group). Have the students hang their work on the wall and let them compare their answers to each other with the teacher's observation and interaction. This process will help students to get in class feedback.
- A Reading material will be assigned for students during this chapter p. 70 -79 in their textbook (Biology/ Holt McDougal / chapter 3.1- 3.2)

Consideration for Back-up Plan: in case there was no power pictures are printed and presented/

In case the microscope was not working have the students look up some pictures of these different cells (plant leaf cell, red blood cells, bacteria cells). Then describe their appearance on the form provided

Reflection (What went well? What did the students learn? How do you know? What changes would you make?)

I think students will be able to identify the three different kinds of cells found in the three different slides based on the physical appearance of the cell (the plant cell will appear more rectangular and have a ridged shape because of the cell wall, the red blood cells will appear round and without nucleus on the inside, were are the bacteria cells will be identified based on the different shapes of bacteria they observed in class. Allowing the students to review their work and share it with the class will help the students to get feedback on their work and their understanding. This feedback is needed right after they finish their work.

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End of lesson 1(lab- activity using microscopes)

Names in group: _____

Date:

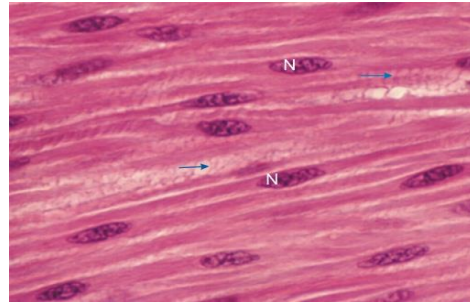
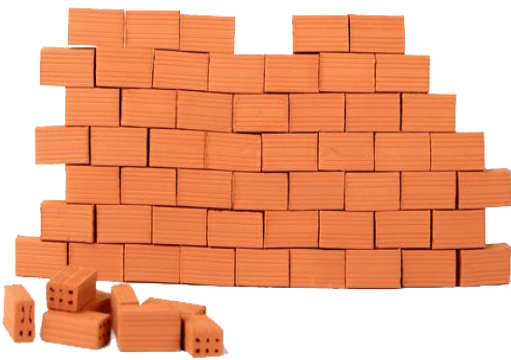
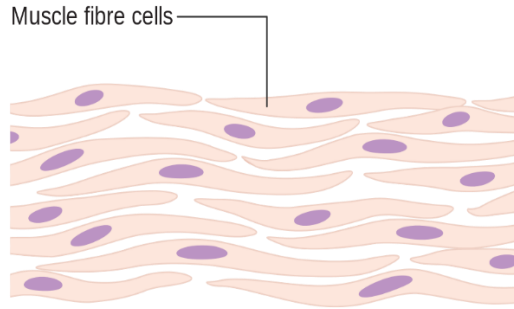
Grade/ section: _____

Fill out the table below with your observation. Identify the different kinds of cells provided.

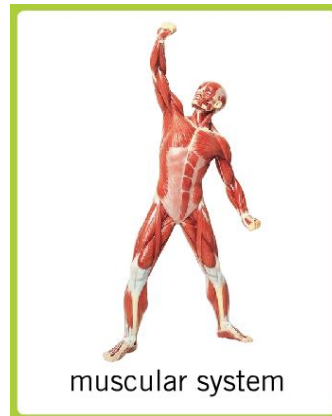
MICROSCOPE #	Draw the Shape of the cells you are observing	Identify the different kind of cells (plant leaf cell, red blood cells -animal cells, bacteria cells) write some description/evidence to justify your answer
1		
2		
3		

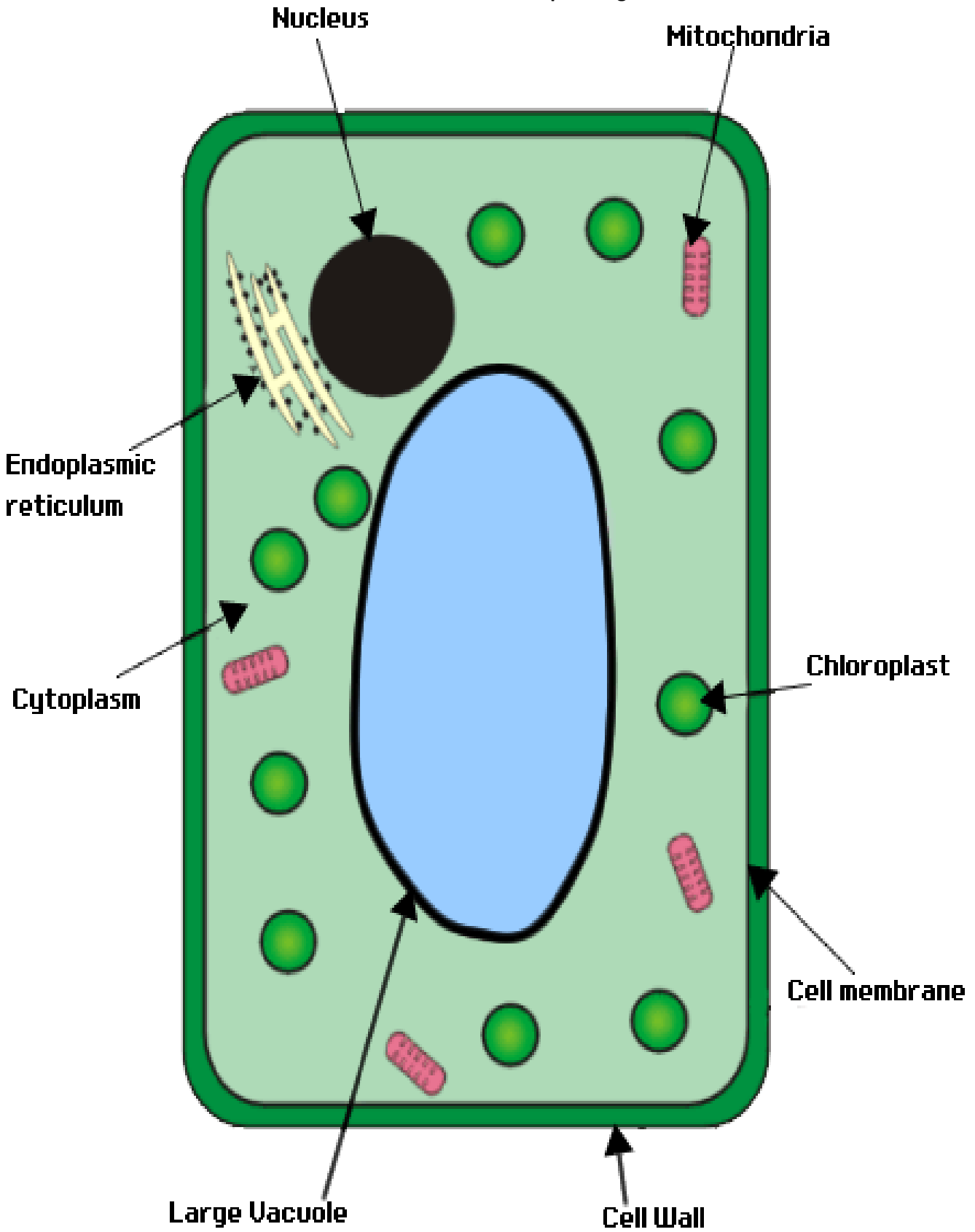
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Thinking prompts (1)

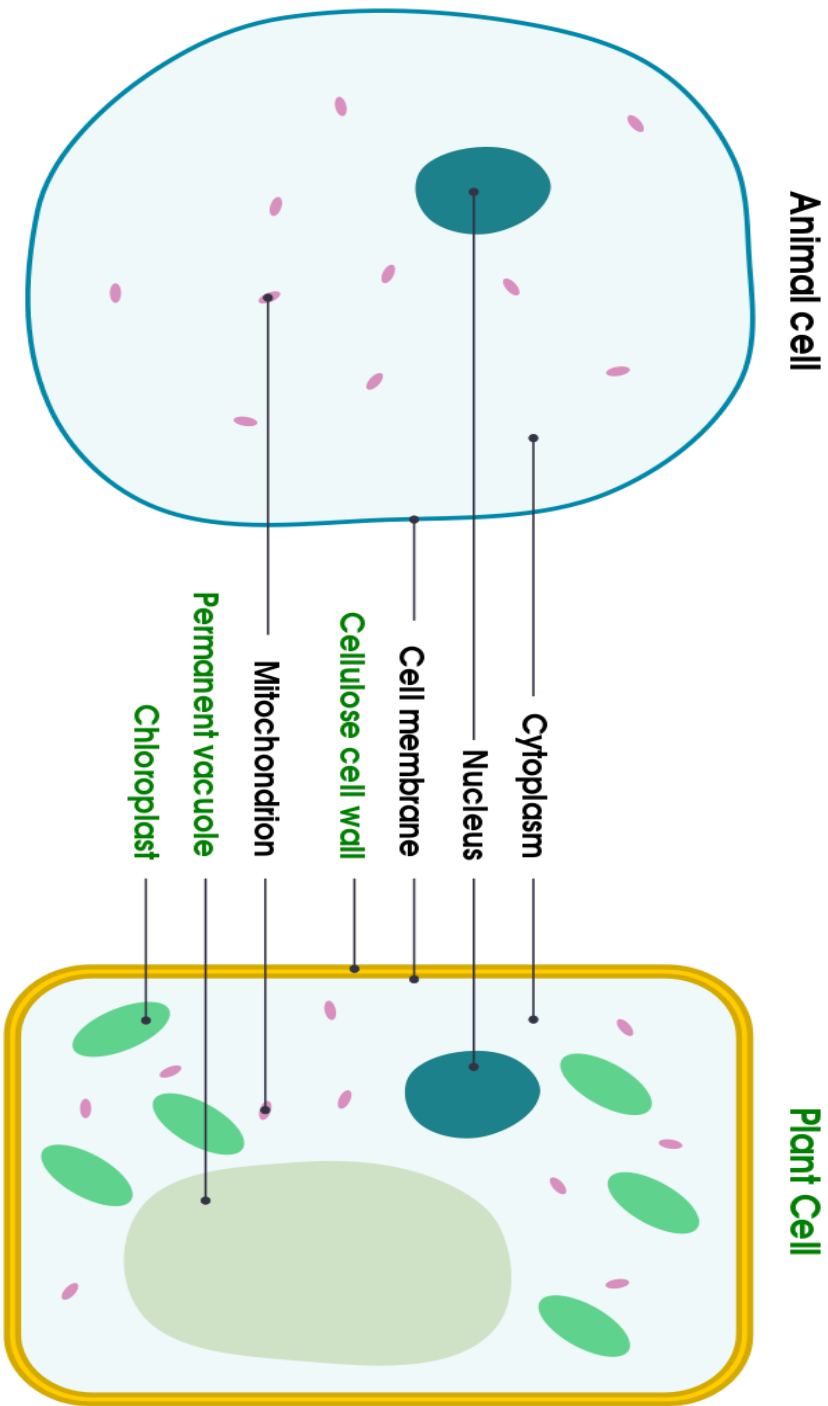


Muscle tissue



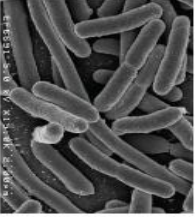

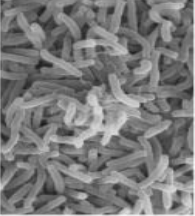

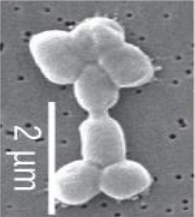

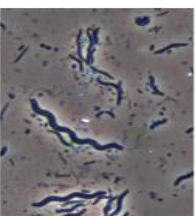





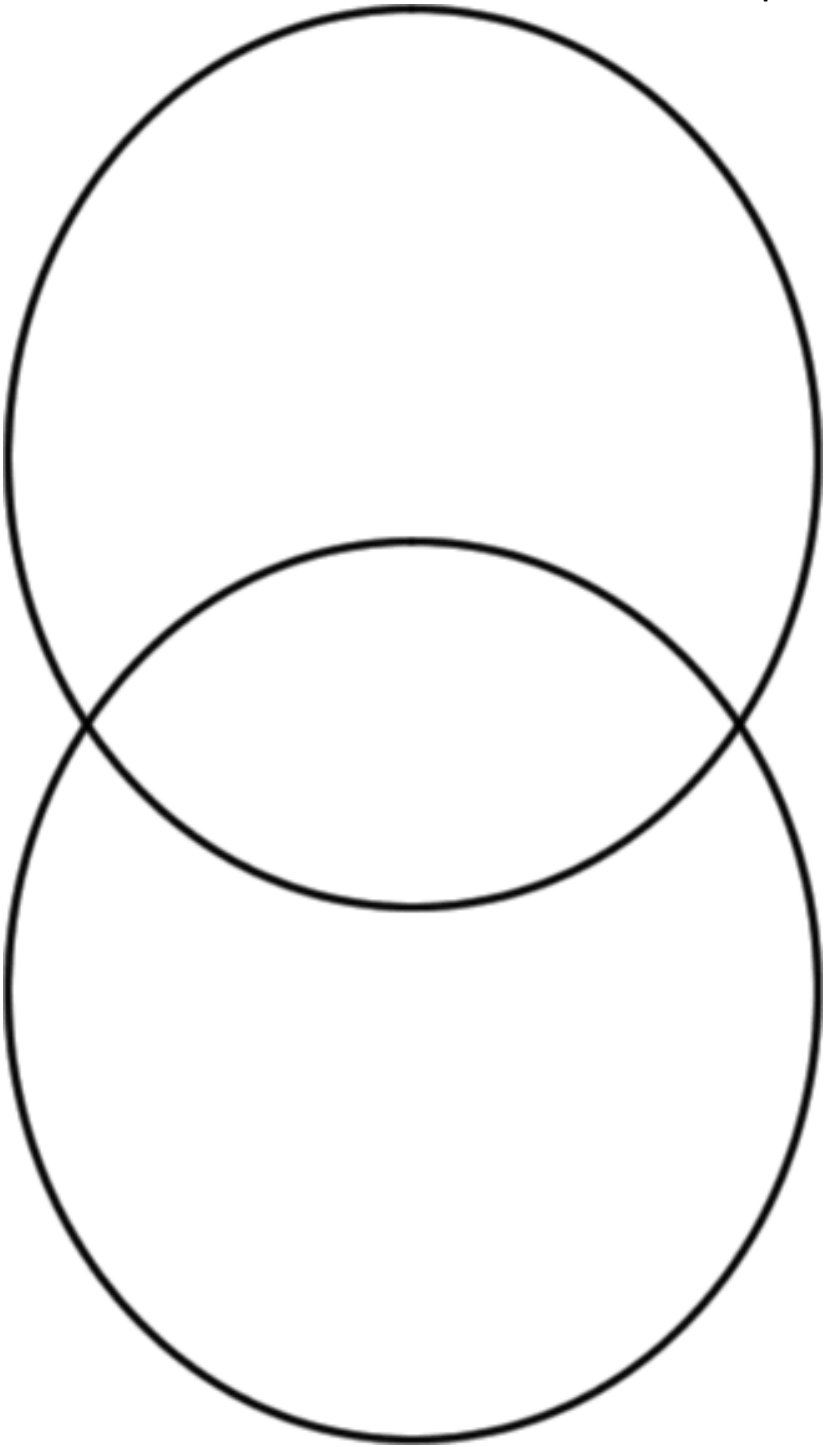


Plant leaf cell



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Coccus		
Bacillus		
Vibrio		
Cocci bacillus		
Spirillum		
Spirochete		



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Lesson plan (lesson # 2)	
Standard(s) MS-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways cell parts (organelles) contribute to the cell functions.	
Learning target: Differentiate between structure and function in plant and animal cell organelles including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole. (it's a more specified target than last lesson) Know the major function/s for certain major organelles/ cell structures (Nucleus, mitochondria, chloroplast, vacuole, cell membrane, cytoplasm, ribosomes)	
5 min	Engage: <ul style="list-style-type: none"> - Show a picture (thinking prompt/ if organelles can talk) on the power point. Ask students if they could identify the function of each organelle based on what they are seeing in the picture.
15 min	Explain: explain not the students that they will be learning the difference between an animal cell and a plant cell in structure and organelles, they will also be learning about the organelle's functions. (lesson target) <ul style="list-style-type: none"> - Students will be divided into pairs. Students will be asked to choose between a pizza or a hotdog. (a pizza student will be paired with a hotdog student. Instructions for the students are provided in the PowerPoint. - Students will watch a video: (All About Cells and Cell Structure: Parts of the Cell for Kids – FreeSchool/ youtube) and then answer questions on a form (provided below)
25	Explore part: <p>(Jigsaw activity/ Learning structure) before watching the video the teacher will give out forms for the students to fill after watching the video and will model the Jigsaw activity for them.</p> <p>During the video each pair will fill a part of the form provided (ex: hotdog will fill the first 4 rows and pizza will fill the second 4 rows and one optional extra row to be filled for extra points)</p> <p>Each pair will share the missing blanks after the video. Then a hotdog student in each pair will pair with another hotdog student and share their findings, write down any missing information, and a pizza student will pair with another pizza student as well and write down any missing information.</p> <p>Then the original pair of hotdog and pizza pair again and share any new info. (Teacher will be moving between groups and checking their answers.)</p> <p>After this activity, the teacher will go over the slides provided in the power point to further explain the different functions of the different organelles. Each pair have three cups (red, green, yellow) (red: they are stuck, green: are done, yellow: still working)</p>
	Review: Students will share their work with their peers
	Reflection:

Cells Unit lesson planning

Name: _____

Unit: _____

Date: _____

Grade/ Section: _____

Cell structure and Organelle	Function	Draw how it looks like inside of the cell
Cell wall		
Cell Membrane		
Mitochondria		
Chloroplast		
Nucleus		
Cytoplasm		
Vacuole		
Ribosomes		

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Grade: MS 7 lesson # 3

Standard(s)

MS-LS1-3 Use evidence to model how the body is a system of interacting subsystems composed of groups of cells.

learning Targets (for the first lesson)

The student will be able to differentiate between (cells, tissue, organs, system)

Explore the different organs in the different Body Systems

Bloom's Taxonomy Cognitive Level:

Knowledge, apply, create

- Students will be divided into groups of 3 based on their interest inventories that was done at the beginning of the school year.
- Each group will research a different body-system. (one student will do the drawing and labeling, one student will write major functions for each organ and the system, one student will present the body system to the class.)
- **Materials** such as colored cardboard, markers, personal computers for search
- Students will be given time to work on one assigned body system (15 -20min)
- The body systems that will be covered (respiratory, digestive, nervous, excretory, skeletal and muscular, and circulatory systems).
- Students must cover in their presentation Major organs in the system such as (brain -cerebrum/ cerebellum -, spinal cord, nerves, nose, lungs-alveoli is extra- , windpipe, esophagus, stomach, liver, intestines, kidneys, ureters, bladder, heart muscle, blood vessels, blood, bones, muscles, ligaments, tendons.
- Teacher will be checking group work around the class
- 3 cups will be given to each group. Green(done), yellow (still working), red (need help) cups will be given to each group.
- Any group who completed their task can should research (more fun facts/ tips to keep the system healthy and add it to their poster)
- Then each group will present after (25)

Exit ticket: Each student has to write down names of three systems mention the names and functions of three organs that was not researched in his/her group (this assessment is graded)

Summative Assessment: End of unit assessment will be scheduled

Reflection:

Will be filled out after teaching the lesson

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A group formative assessment Instructions:

- A group of three students will be given time to work on one assigned body system poster presentation / power point presentation (15 -20min)
- The body systems which will be covered are the respiratory, digestive, nervous, excretory, skeletal and muscular, and circulatory systems
- **In your presentation you should mention:**
 - The name and the function of the major organs in the system (such as brain -cerebrum/ cerebellum -, spinal cord, nerves, nose, lungs, windpipe, esophagus, stomach, liver, intestines, kidneys, ureters, bladder, heart muscle, blood vessels, blood, bones, muscles, ligaments, tendons.)
 - Fun facts/ tips to keep the system healthy.
- **Each group will get to present their system.**

Points	Proficiency
5 points	Presenting a visual for the body system
10 points	Presenting a visual with labeling all the major organs in this body system, the function of the system in general.
15 points	Presenting a visual with labeling all the major organs in this body system, the function of the system in general and including the functions of each organ.
2 extra points	For mentioning fun facts and how to keep the system healthy

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Exit ticket

Total point /15

Name: _____
Date: _____

- Each student must write down the names of any three body systems mentioned in the students' presentations, name two major organs in each system and write down one function of one major organ for each system.
- You should not include the names of the systems you researched in your group.

Name of systems (3 points)	(1) _____	(2) _____	(3) _____
Name of 2 major organs for each system you named (2 points for each)			
Function of 1 major organs for each system (2 points for each function)			

A total of 15 points will be granted for this assignment

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A Celebration of Learning Lesson (In class review activity) **(Cubing activity)**

Lesson #4 Students will be offered time to add on or modify their presentations from last class. Students posters will be hanged in class. Students will choose to be joining different groups based on their learning preference. Then students will enjoy a cubing activity related to their learning preference. Snacks will be offered (popcorn and lemonade)

Group 1: Musical, Interpersonal, kinesthetic

1. Make a song about the cell organelles and their major functions.
2. Act out the roll of two organelles in the cell
3. Instruct your group how to act like a cell wall vs a cell member
4. Make a rhyming poem / song to connect an organelle with its function ex (a nucleus? Has a DNA yes!)
5. Run around the hallway reciting the organelles and their related functions.
6. As a group write a short story about the different organelles

Group 2: Interpersonal, linguistic, logical

1. Research and find out the estimate number of cells in your body.
2. Do a Venn diagram comparing two organelles.
3. Describe the difference between plant and animal cells.
4. Research a specialized cell. Explain how it is designed to a specific function.
5. Write a letter to your friend telling them what you have learned about the different kinds of organelles you learned about.
6. Find out and present other organelles that we have not covered yet in the class

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In class Revision before the unit assessment:

Go over the lecture slides and your notes before completing this review sheet form.
Students will fill out this review sheet at home then bring it to class to discuss their answers.

Question 1: The cell theory states that the cell is the most basic unit of life, all organisms are made of cells, and all cells are made from cells. What makes the cell theory a scientific theory?

- a) It is based on a scientific publication that is read by scientists worldwide.
- b) It is based on the work of many scientists and leads to accurate predictions.
- c) It is based on ideas that have been proven true and that are not subject to revision.
- d) It is based on preliminary evidence but still needs to be confirmed with experiments.

Question 2: Which of the following pairs incorrectly.

- a) Cell wall: protection and shape
- b) Mitochondria: energy supply
- c) Vacuole: storage
- d) Cell membrane: protein synthesis

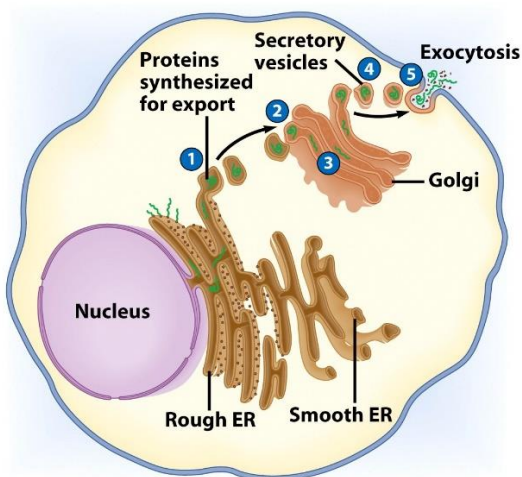
Question 3: Which of the following is a function for the cytoplasm:

- a) Protein synthesis
- b) Protein packaging
- c) Allowing certain molecules to get in or out of the cell (selective permeability)
- d) Capturing solar energy
- e) Building energy molecules

Question 4: Mention the differences between plant and animal cells.

Question 5: Arrange the following structures from smallest to largest
System, tissue, organ, cell

Question 6: Explain how the Golgi apparatus work by looking at this diagram.



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Study Guide List

Students must review the following

- Review the cell theory
- Know the difference between prokaryotic cells and eukaryotic cells
- Know the difference between plant and animal cells
- Know the name of each organelle we discussed in class and in the lecture slides
- Know the different major roles for each organelle or cell structure.

Grade 7

This unit will be divided into several lessons. Each will have a lesson plan along with the activities.

Unit: From Molecules to Organisms: Structure and Processes		
Students should know	<ul style="list-style-type: none"> • Living things are made of cells. • There are unicellular and multicellular living things • Plant cells have similarities and differences to animals' cells • Different organelles have different functions. • Specialized cells have specific form to do specific functions. • In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for a particular body function 	<p>MS-LS1-1 Conduct an investigation to provide evidence that living things are unicellular or multicellular and may have different cell types.</p> <p>MS-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways cell parts (organelles) contribute to the cell functions.</p> <p>MS-LS1-3 Use evidence to model how the body is a system of interacting subsystems composed of groups of cells.</p>
Students should understand	<ul style="list-style-type: none"> • That cells are the basic building blocks in our body. • We have many organelles and cell structures in common between animals and plants. • Studying the body systems and how they interact with one another is important because it promotes health, and well-being. • Studying how precise and well-structured the human body will generate a positive appreciation for this marvelous creation. 	

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Students will do	<ul style="list-style-type: none">• Differentiate between plant cells and animal cells by appearance and organelles• Develop a cell model labeling the different organelles• Create a system model in groups labeling the major organs and highlighting their functions	
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Attendance will count for 10% of the grade	Assignments and formative assessments will count for 50% of the total grade	The summative assessment will count for 40 % of the grade
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