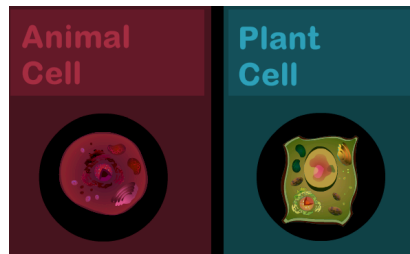


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UNIT OBJECTIVE In this unit, you will be identifying and describing the structure and function of organelles within a eukaryotic cell. *In other words, you will be able to label and explain the parts of the cell and what each part does.*

ADDITIONAL OBJECTIVES: You will also explore the scale and size of cells and the history of cell discovery. You will also work on scientific writing.

STANDARDS:

[Standard 1: Cell Sizes](#)

[Standard 2: Cell history and Cell Theory](#)

[Standard 3: Cells obtain water and nutrients](#)

[Standard 4: Cells make energy](#)

[Standard 5: Cells store and package objects](#)

[Standard 6: Cells have and use directions](#)

[Standard 7: Cells have protection](#)

[Standard 8: Animal and plant cells are similar and different](#)

ASSESSMENTS: This unit will be different from others in terms of assessments. Instead of having a big test, you will be performing tasks throughout the unit to demonstrate when you met the standards.

Tasks you may have to do:

- make a timeline
- write a lab report
- make a model of a part of the cell from weird objects
- write an extended analogy

Instead of points or grades, you may see **standards-based** comments, such as:

exceeding standard	meeting standard	approaching standard	not meeting standard
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You will have **multiple** times to show that you met the standard. Notice that these are all in the present tense, to show that learning is progress. **You might not meet the standard on the first try, and that is okay.** you have multiple tries, but by the **end of the unit you will show that you met the standard** for every standard.

Now, let's show some exCELLent effort for this unit!

STANDARD 1: CELL SIZES

- NGSS CCC: Scale, proportion, and quantity. In considering phenomena, it is critical to recognize what is relevant at different measures of size, and to recognize how changes in scale affect a system's structure or performance.

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Learning activities	Size Line Classwork Size Line Interactive Nano Ted-Ed
Three important ideas I learned from the learning activity	<ol style="list-style-type: none"> Cells are measured in small units (millimeter, micrometer, nanometer, and picometer) Cells are bigger than atoms Cells are made of parts called organelles
Practice activities	Size Line Homework Size Line Socratic Practice (in class only)
An idea I need to work on before I do the assessment task	<ul style="list-style-type: none"> the order of the measurements an atom nucleus is much smaller than a cell nucleus
What are the key vocabulary words for the information covered in this standard?	<u>Write definition in your own words:</u> <ul style="list-style-type: none"> <input type="checkbox"/> millimeter (mm): 1/1000 of a meter <input type="checkbox"/> micrometer (μm): 1/1000 of a millimeter <input type="checkbox"/> nanometer (nm): 1/1000 of a micrometer <input type="checkbox"/> picometer (pm): 1/1000 of a picometer
Check for Understanding Bold your answers	<ol style="list-style-type: none"> What are two things cells are larger than? organelles, atoms What are two things cells are smaller than? salt, sand Are all cells the same size? Give two examples. Egg cells are bigger than skin cells
Assessment tasks	Cell Size and Measurement Card Sorting
Exceeding Standard	None
Self Assessment (Pick one)	<ul style="list-style-type: none"> <input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard
Teacher Assessment	<ul style="list-style-type: none"> <input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard

STANDARD 2: CELL HISTORY AND CELL THEORY

Learning activities	Wacky History of Cell Theory Ted-Ed
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	Video Screen Shot Captions
Important ideas I learned from the learning activity	<p>Cell Theory:</p> <ul style="list-style-type: none"> a. All organisms are made of cells b. cells is the basic unit of structure and function in organisms c. cells come from other cells <p>Microscope is an important invention that will continue to be important in cell discoveries</p>
Practice activities	Cell Theory Textbook Homework
An idea I need to work on before I do the assessment task	<ul style="list-style-type: none"> • What happened in the 1600 (invention of the microscope) that made discoveries in the 1800 possible (the cell theory)
What are the key vocabulary words for the information covered in this standard?	<p><u>Practice defining in your own words:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Schleiden: said all plants are made of cells <input type="checkbox"/> Schwann: said all animals are made of cells (“swan”) <input type="checkbox"/> Virchow: said cells are made from other cells (stole infor from Remak) <input type="checkbox"/> Hooke: saw cells in cork and named them cells, like rooms <input type="checkbox"/> Leeuwenhoek: made his own weird microscope, discovered bacteria <input type="checkbox"/> Remak: work that cells come from other cells was stolen by Virchow <input type="checkbox"/> Cell Theory: 3 parts <ul style="list-style-type: none"> <input type="checkbox"/> all living things are made of cells <input type="checkbox"/> cells are the basic unit of structure and function in living things <input type="checkbox"/> cells come from other cells
Check for Understanding Bold your answers	<ol style="list-style-type: none"> 1. What was Hooke’s role in cell history? He named the cells while looking at cork under the microscope 2. What did Schleiden and Schwann theorize? All living things are made of cells 3. What was the controversy over Remak’s research? He work was stolen by Virchow without credit
Assessment tasks	Cell History Timeline
Exceeding Standard	More than 6 relevant events on timeline
Self Assessment	<input type="checkbox"/> exceeding standard

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(Pick one)	<input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard
Teacher Assessment	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard

STANDARD 3: CELLS OBTAIN WATER AND NUTRIENTS

- MS-LS1-2. Develop and use a model to describe the ways parts of cells contribute to key cellular functions of obtaining nutrients and water from its environment, disposing of waste; e. the cell membrane enables nutrients to enter the cell and wastes to be expelled*

Learning activities	Balloon and Vanilla Demo Standing in the corner molecule demo Transport within the Cell Membrane Notes BrainPop Passive Transport BrainPop Active Transport
Three important ideas I learned from the learning activity	<ol style="list-style-type: none"> 1. Molecules move from an area of high to low concentration without energy, called passive transport 2. Movement of just water molecules passively is called osmosis. (not water? -->diffusion) 3. When cells need to move big things or move them from a high to higher concentration using energy, called active transport
Practice activities	Gummy Bear Osmosis Lab Transport within the Cell Membrane Homework
An idea I need to work on before I do the assessment task	<ul style="list-style-type: none"> • Diffusion vs. osmosis • How is the gummy bear a model of cell? • Active vs passive transport
What are the key vocabulary words for the information covered in this standard?	<u>Practice defining in your own words:</u> <ul style="list-style-type: none"> <input type="checkbox"/> cell membrane: protective covering that has holes (permeable) <input type="checkbox"/> pore: holes in the membrane <input type="checkbox"/> osmosis: movement of water molecules from high to low concentration without energy <input type="checkbox"/> diffusion: movement of molecules from high to low concentration without energy <input type="checkbox"/> active transport: movement of across the cell membrane with energy <input type="checkbox"/> equilibrium: when molecules on either side of the membrane are at the same concentration

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Check for Understanding Bold your answers	<ol style="list-style-type: none"> 1. What is the difference between active and passive transport? Active transport uses energy to move molecules across a membrane, passive transport does not 2. What is the difference between diffusion and osmosis? diffusion is a type of passive transport, but osmosis is specifically the movement of water molecules 3. Why might a cell not want molecules to reach equilibrium? If a plant cell was in a root, it might need to keep the water in if the soil is dry
Assessment tasks	Gummy Bear Osmosis Lab Report
Exceeding Standard	None
Self Assessment (Pick one)	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard
Teacher Assessment	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard

STANDARD 4: CELLS MAKE ENERGY

- *MS-LS1-3 Describe that food molecules, including carbohydrates, proteins and fats, are broken down and rearranged through chemical reactions forming new molecules that support growth and/or release of energy.*
- *MS-LS1-7. Describe that food molecules, including carbohydrates, proteins and fats, are broken down and rearranged through chemical reactions forming new molecules that support growth and/or release of energy.*

Learning activities	Looking at chloroplasts slide(Lesson 66 and 67) Kitchen comparison slides (Lesson 66 and 67) Cell Craft & Log Book [mitochondria, chloroplast, ATP, glucose]
Three important ideas I learned from the learning activity	<ol style="list-style-type: none"> 1. photosynthesis: carbon dioxide and water (sunlight) → sugar (glucose) and oxygen 2. chloroplast is an organelle where photosynthesis happens, with pigment chlorophyll 3. respiration happens in the mitochondria 4. In respiration: sugar and oxygen-->carbon dioxide, water, ATP/Energy

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Practice activities	Chloroplast and Mitochondria Practice BrainPop Photosynthesis and Respiration Socrative
An idea I need to work on before I do the assessment task	<ul style="list-style-type: none"> ● Output of photosynthesis is the same as the input for respiration ● Output of respiration is the same as the input for photosynthesis (except for the form of energy)
What are the key vocabulary words for the information covered in this standard?	<p><u>Practice defining in your own words:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Chlorophyll: green pigment <input type="checkbox"/> Chloroplast: organelle that does photosynthesis in plants <input type="checkbox"/> Photosynthesis: process by which plants (and other autotrophs) make their own food <input type="checkbox"/> Respiration: sugar and oxygen-->carbon dioxide, water, ATP/Energy (mitochondria) <input type="checkbox"/> ATP: fuel/energy for cell <input type="checkbox"/> Mitochondria: Organelle where respiration happens
Check for Understanding Bold your answers	<ol style="list-style-type: none"> 1. Where does photosynthesis take place in the cell? the chloroplast Respiration?the mitochondria 2. What goes into the cell for photosynthesis? carbon dioxide, water, and sunlight Products? sugar and oxygen 3. What goes into the cell for respiration? sugar and oxygen Products?carbon dioxide, water, and energy/ATP
Assessment tasks	Photosynthesis and Respiration Velcro Boards
Exceeding Standard	Knowing the chemical formulas for photosynthesis and respiration
Self Assessment (Pick one)	<ul style="list-style-type: none"> <input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard
Teacher Assessment	<ul style="list-style-type: none"> <input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard

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STANDARD 5: CELLS STORE, PACKAGE, AND MOVE OBJECTS

- MS-LS1-2. Develop and use a model to describe the ways parts of cells contribute to key cellular functions of disposing of waste: d. vacuoles store materials, including water, nutrients and waste.

Learning activities	Cookie and Fridge analogy
Three important ideas I learned from the learning activity	<ol style="list-style-type: none"> Cells make proteins and move them around using organelles Cells need to store water and food There are difference in vacuoles between animals and plant cells
Practice activities	Storage and Movement Homework
An idea I need to work on before I do the assessment task	<ul style="list-style-type: none"> differences between animal and plant cell vacuoles differences between vacuoles and vesicles differences between endoplasmic reticulum and golgi body how to say “endoplasmic reticulum” with confidence
What are the key vocabulary words for the information covered in this standard?	<p>Practice defining in your own words:</p> <ul style="list-style-type: none"> <input type="checkbox"/> golgi body: repackages and sorts proteins and sends them inside and outside of the cell <input type="checkbox"/> vesicle: transports molecules inside and outside of the cell <input type="checkbox"/> endoplasmic reticulum: organelles next to the nucleus that produces vesicles and sends proteins to the golgi body
Assessment tasks	Use images of the organelles to tell the cookie story
Exceeding Standard	None
Check for Understanding Bold your answers	<ol style="list-style-type: none"> What is the difference between vacuoles in an animal cell and vacuoles in a plant cell? Animal cells have lots of little ones, plant cells have one big vacuole (like the water bottles in the refrigerator) Where does the golgi body send proteins after they have been “packaged”? Sends them outside of the cells, holds for later, or sends them within the cells Where is the endoplasmic reticulum located in the cell? Around the nucleus

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Self Assessment (Pick one)	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard
Teacher Assessment	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard

STANDARD 6: CELLS HAVE AND USE DIRECTIONS

- *MS-LS1-2. Develop and use a model to describe the ways parts of cells contribute to key cellular functions: a. the nucleus contains genetic information (DNA) which regulates a cell's activities.*

Learning activities	Lesson 70 : videos and recipe analogy Cell Craft Logbook -nucleus
Three important ideas I learned from the learning activity	1. 2. 3.
Practice activities	DNA/RNA Practice
An idea I need to work on before I do the assessment task	<ul style="list-style-type: none"> • Shape of RNA vs. DNA • Which (RNA or DNA) can leave the nucleus? • Ribosome function
What are the key vocabulary words for the information covered in this standard?	<u>Practice defining in your own words:</u> <input type="checkbox"/> nucleus <input type="checkbox"/> DNA <input type="checkbox"/> RNA <input type="checkbox"/> ribosomes
Check for Understanding Bold your answers	1. What is the function of the nucleus? 2. Which (RNA or DNA) can leave the nucleus? 3. RNA is read by which organelle?
Assessment tasks	retelling translation/transcription process of protein synthesis (turkey story-with real organelle pictures)
Exceeding Standard	none
Self Assessment (Pick one)	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard

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	<input type="checkbox"/> not meeting standard
Teacher Assessment	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard

STANDARD 7: MITOSIS

- *MS-LS3-2. Develop and use a model to describe how asexual reproduction results in offspring with identical genetic information*

Learning activities	Mitosis App Mitosis Screenshot Captions
Three important ideas I learned from the learning activity	<ol style="list-style-type: none"> 1. 2. 3.
Practice activities	Mitosis Practice
An idea I need to work on before I do the assessment task	•
What are the key vocabulary words for the information covered in this standard?	<u>Practice defining in your own words:</u> <input type="checkbox"/> chromosome <input type="checkbox"/> mitosis <input type="checkbox"/> centrosome <input type="checkbox"/> nuclear membrane
Check for Understanding Bold your answers	<ol style="list-style-type: none"> 1. Describe the two cells produced from mitosis. 2. What must break down before the cell can reproduce? 3. What form does the DNA take during mitosis?
Assessment tasks	Mitosis phases image & description card sort
Exceeding Standard	Knowing the names of each of the phases of mitosis
Self Assessment (Pick one)	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard

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Teacher Assessment	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard
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STANDARD 8: TYPES OF ANIMAL CELLS

- MS-LS1-3. Develop an argument supported by evidence that the body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.*

Learning activities	Lesson 73
Three important ideas I learned from the learning activity	<ol style="list-style-type: none"> 1. 2. 3.
Practice activities	Types of Animal Cells Practice
An idea I need to work on before I do the assessment task	<ul style="list-style-type: none"> •
What are the key vocabulary words for the information covered in this standard?	<u>Practice describing in your own words:</u> <ul style="list-style-type: none"> <input type="checkbox"/> Smooth muscle <input type="checkbox"/> Skeletal muscle <input type="checkbox"/> cardiac muscle <input type="checkbox"/> Bone cell <input type="checkbox"/> Skin cell <input type="checkbox"/> Neuron <input type="checkbox"/> Red blood cell <input type="checkbox"/> White blood cell <input type="checkbox"/> egg cell <input type="checkbox"/> sperm cell <input type="checkbox"/> stem cell
Check for Understanding Bold your answers	<ol style="list-style-type: none"> 1. What is the structure of a muscles cell? Why is that helpful to its function? 2. What is a stem cell? 3. Why do sperm and egg cells only have half as many chromosomes as any other cell?
Assessment tasks	picture cell name match
Exceeding Standard	None
Self Assessment (Pick one)	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard

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	<input type="checkbox"/> not meeting standard
Teacher Assessment	<input type="checkbox"/> exceeding standard <input type="checkbox"/> meeting standard <input type="checkbox"/> approaching standard <input type="checkbox"/> not meeting standard

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Cell Standards Badges

Badge Name	Character/Icon	Standards
Minion-Master	Minion	Cell Size Microscopic measurement comparison
Gunk Gawker	Character with open mouth	Cell History Cell Theory Scientists Inventions
Move it! Move it!	Character with hands	Energy Production Osmosis Diffusion Active Transport
Gummy Grower	Gummy bear	Acquiring Nutrients Mitochondria Chloroplasts
Pack Rat	Rat	Cell Storage Vacuoles Vesicles Golgi Bodies Endoplasmic Reticulum
Are you Siri-ous?	Smartphone	Cell Directions Nucleus DNA RNA Ribosomes
CELLS! CELLS!	Animal cell diagram	Animal Cell Types Comparison of blood, bone, muscle, skin, reproductive, and brain cells.
Copypasta	Character with glasses	Mitosis Cell division Chromosomes

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