CCPS Science Unit Plan

Grade	9-12	**Subject**	Science	**Unit #**	1
Unit Name	Cells		**Timeline**	6 Weeks	
How to use the Framework	This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards. Please see the hyperlinked abbreviation document to ensure understanding all abbreviations used with this framework.				
Unit Overview	The Cells unit provides students with a foundational understanding of cells, focusing on their structure, function, and interactions. Students explore cell organelles, cellular processes like respiration and photosynthesis, macromolecules, and mechanisms of cellular regulation. Emphasis is placed on real-world applications and critical thinking skills, preparing students to understand the complexities of living organisms at the cellular level. Through laboratory investigations and inquiry-based learning, students develop scientific literacy and an appreciation for the interconnectedness of biological systems. ***Students and their parents must review, sign, and submit the following safety acknowledge form prior to the first lab.**				
Lesson Plan guidance document and template	Department of Science Guidance Document Lesson Plan Template Week View GADOE Science Updates				

3Dimensional Instruction

GSE	Science and Engineering Practices	Crosscutting Concepts
SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.	Developing and Using Models Constructing Explanations and Designing Solutions Using Mathematics and Computational Thinking Scientific Investigations Asking Questions and Defining Problems	Energy and Matter Structure and Function Stability and Change Systems and System Models

NGSS Alignment

NGSS Alignment to Disciplinary Core Ideas

Weekly Lesson Tasks

Week 1	
GSE: SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.	**Focused Concept: SB1c.** **Construct arguments supported by evidence to relate the structure of macromolecules (carbohydrates, proteins, lipids, and nucleic acids) to their interactions in carrying out cellular processes. (Clarification**

		statement: The function of proteins as enzymes is limited to a conceptual understanding.)			
SEP Constructing Explanations and Designing Solutions			**CCC:** Energy and Matter		
Phenomenon: What do bacteria do in your Intestines? (unit long)			**DQ: How do structures work together in cell systems? Pgs. 148-149**		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Learning Target	**Students will be able to construct an argument using evidence showing how the structure of macromolecules helps them function to carry out the cellular processes.**	**Students will be able to construct an argument using evidence showing how the structure of macromolecules helps them function to carry out the cellular processes.**	**Students will be able to construct an argument using evidence showing how the structure of macromolecules helps them function to carry out the cellular processes.**	**Students will be able to construct an argument using evidence showing how the structure of macromolecules helps them function to carry out the cellular processes.**	**Students will be able to conceptualize the function of proteins as enzymes.**
Opening **(5-7 minutes)** **<u>Essential Vocabulary this week:</u>** **amino acid** **ATP** **carbohydrate** **cellulose** **DNA** **glucose** **glycogen** **lipid** **monomer** **nucleotide** **nucleic acid** **polymer** **protein** **starch** **activation energy** **catalyst** **chemical reaction** **enzyme** **equilibrium** **product** **reactant** **substrate**	**• Show students the phenomenon and reading passage on pages 108-109.** **• Use the See-Think-Wonder protocol to guide student thinking.** **• Teachers should provide students with opportunities to share observations and develop questions.** **-The students can record questions in whole groups or small groups.** **(This log can be created using Padlet or something similar)**	**• Show students the phenomenon and reading passage on pages 108-109.** **• Use the See-Think-Wonder protocol to guide student thinking.** **Ask the students the following question.** **You went to the doctor to get a prescription for an antibiotic for an illness. Why did the doctor give you an antibiotic?** **Have the students do a Turn and Talk, then have a group or two report out.** **Plan to discuss. Use TB 109 (teacher ed.)**	**• Show students the phenomenon and reading passage on page 126.** **• Use the See-Think-Wonder protocol to guide student thinking.** **• Teachers should provide students with opportunities to share observations and develop questions.** **-The students can record questions in whole groups or small groups.** **Connect to the phenomena with the questions.** **The teacher should ask how this relates to the bacteria in your intestines.**	**• Show students the phenomenon and reading passage on page 126.** **• Use the See-Think-Wonder protocol to guide student thinking.** **Ask the students the following question.** **Both sugar and plastic consist mainly of carbon, hydrogen, and oxygen atoms. Why do you think sugar and plastic have very different properties even though they are made of the same elements?** **Have the students do a Turn and Talk, then have a group or two report out.** **Plan to discuss. Use TB 126 (teacher ed.)**	**• Show students the phenomenon and read the passage on page 136 in the Textbook. The "Video 1" aligned to visual is available in Media Library Chapter 5** **• Use the See-Think-Wonder protocol to guide student thinking.** **• Teachers should provide students with opportunities to share observations and develop questions.** **-The students can record questions in whole groups or small groups.** **Connect to the phenomena with the questions.** **Using your new knowledge. How would you explain what bacteria do in your**

					intestines?
Guided Practice/ Transition	**TTW, show the microbe found on the biology ebook platform. Break the class into groups of 3 and give each person a reading section on page 110. Have each group write a headline for the main idea of the paragraph. Have them share out. Discuss the Thinking Critical question as a class.**	**TTW, show the Explorer at Work video, then have students write a summary of what they believe bacteria are doing in their intestines. Have some of the students share out.**	**TTW, provide of direct instructions.** **Use the objectives below for your direct instruction.** **Lecture notes are provided in online teacher resources.** **Relate monomers, polymers, and hydrocarbons.** **Describe the structure of carbohydrates and their functions in organisms.**	**TTW, provide of direct instructions.** **Use the objectives below for your direct instruction.** **Lecture notes are provided in online teacher resources.** **Describe the structure of lipids and their functions in organisms.** **Explain the relationship between nucleotides and nucleic acids.** **Explain the relationship between amino acids and proteins.**	**TTW, provide of direct instructions.** **Use the objectives below for your direct instruction.** **Lecture notes are provided in online teacher resources.** **Explain the process of chemical reactions in biological systems.** **Describe how energy in organic molecules is released during chemical reactions and used for cellular processes.** **Characterize a reaction reaching equilibrium.** **Summarize how catalysts affect the rate of reactions.**
Independent Practice ****Lab Prep is needed this week.**	**Divide your class into 8 groups. Two groups for each macromolecule. Have the students create a poster using pages 126-134 in the textbook. Give the students one of the macromolecules and a sheet of poster paper. The groups will make a poster with the structure (monomers, polymers, and elements), function, picture, and where they are found.**	**(Day two) After the posters are complete and verified by the teacher, the students will rotate the posters. The students will complete their graphic organizer and answer the summary questions. The rotations will be on day 2. Students can use the attached graphic organizer.**	**Graphic organizers are complete. Now assign each student one macromolecule and have them construct an argument using the information on their graphic organizer, explaining why their molecule is better than the others.** **The students will pair and share with a student with a different molecule. This can be completed twice for deeper comparison and understanding.**	**Graphic organizers are complete. Now assign each student one macromolecule and have them construct an argument using the information on their graphic organizer, explaining why their molecule is better than the others.** **The students will pair and share with a student with a different molecule. This can be completed twice for deeper comparison and understanding.**	****Start the Enzymes and Lactose Intolerance investigation.** **(This investigation can be split into three days to ensure thought-provoking questioning. Still complete opening and transition on each day)** ***Use day one as the introduction to the investigation. Review safety, key terms and have them develop their procedures for the investigation.** ****This is the alternative investigation if the required materials have not been acquired for the above investigation. The Need for Speed: A Look**

					at Enzyme Activity
Assessment Summary (5-7 minutes)	**For the closing question, use page 134 to answer question #3.**	**For the closing question, use page 131 to answer the SEP "Construct an Explanation".**	**For the closing question, use page 132, have the students answer and discuss the CCC "structure and function question".**	**For the closing question, use page 133 to have the students answer and discuss the CCC "structure and function question".**	**For the closing question, use page 141 to have the students answer and discuss the CCC "structure and function question".**

Week 2					
GSE: SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.		**Focused Concept: SB1a,c,d.** **-Construct an explanation of how cell structures and organelles (including nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, Golgi, endoplasmic reticulum, vacuoles, ribosomes, and mitochondria) interact as a system to maintain homeostasis.** **-Construct arguments supported by evidence to relate the structure of macromolecules (carbohydrates, proteins, lipids, and nucleic acids) to their interactions in carrying out cellular processes. (Clarification statement: The function of proteins as enzymes is limited to a conceptual understanding.)** **-Plan and carry out investigations to determine the role of cellular transport (e.g., active, passive, and osmosis) in maintaining homeostasis.**			
SEP **Developing and Using Models** **Constructing Explanations and Designing Solutions** **Using Mathematics and Computational Thinking** **Connections to Nature of Science: Scientific Investigations Use a Variety of Methods**			**CCC:** **Energy and Matter** **Structure and Function** **Stability and Change**		
Phenomenon: What do bacteria do in your intestines? (Weeklong)			**DQ: How do structures work together in cell systems? pg. 148-149**		
	Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
Learning Target	**Students will be able to conceptualize the function of proteins as enzymes.**	**Students will be able to conceptualize the function of proteins as enzymes.**	**The students will construct an explanation of how cell structures and organelles interact.**	**The students will construct an explanation of how cell structures and organelles interact.**	**The students will construct an explanation of how cell structures and organelles interact as a system to maintain homeostasis.**
Opening (5-7 minutes)	**• Show students the phenomenon image.**	**• Show students the phenomenon image.**	**• Show students the phenomenon image on page 148.**	**• Show students the phenomenon image on page 148.**	**• Show students the phenomenon image**

	•Use the See-Think-Wonder protocol to guide student thinking in conjunction with the "Bacteria in your Gut" on page 147. Ask students question #1 in that section. Have the students do a Turn and Talk, then have a group or two report out. Plan to discuss. Use TB 147 (teacher ed.)	Ask students "what other questions do you have about the role of the gut bacteria in promoting human health?" Have the students use Padlet or another technique to log questions. Plan to discuss. Use TB 147 (teacher ed.)	• Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students with opportunities to share observations and develop questions. -The students can record questions in whole groups or small groups.	• Use the See-Think-Wonder protocol to guide student thinking. • Use prior observations and questions for this phenomenon. Read the "About the photo" passage on page 148 (teacher ed.) and then ask the questions "How are the structures supporting the function of the Alga?	• Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students with opportunities to share observations and develop questions. -The students can record questions in whole groups or small groups.
Guided Practice/Transition	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Explain the process of chemical reactions in biological systems. Describe how energy in organic molecules is released during chemical reactions and used for cellular processes. Characterize a reaction reaching equilibrium. Summarize how catalysts affect the rate of reactions.	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Characterize a reaction reaching equilibrium. Summarize how catalysts affect the rate of reactions.	TTW, have the students complete the case study on page 149 (Artificial Cell Technology). Have the students write their response to the prompt "Ask Question" on post-it notes to stick in a center location for all students to see. Have a few students share their responses.	TTW, have the students revisit the case study on page 149 (Artificial Cell Technology). Then, discuss the "describe" on page 150 with them.	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Identify components of all cells. Explain the Endosymbiont theory. (you can incorporate the 6.1 video)
Independent Practice **Lab Prep is needed this	**Continue the Enzymes and Lactose Intolerance investigation.	**Continue the Enzymes and Lactose Intolerance investigation.	Have the students use their textbooks to research information	Have the students use their textbooks to research information	SW be placed in groups of four, and each member takes one topic

week.	**(This investigation can be split into three days to ensure thought-provoking questioning. Still complete opening and transition on each day)** ***Use day one as the introduction to the investigation. Review safety, key terms and have them develop their procedures for the investigation.** ****This is the alternative investigation if the required materials have not been acquired for the above investigation. The Need for Speed: A Look at Enzyme Activity**	**(This investigation can be split into three days to ensure thought-provoking questioning. Still complete opening and transition on each day)** ***Use day one as the introduction to the investigation. Review safety, key terms and have them develop their procedures for the investigation.** ****This is the alternative investigation if the required materials have not been acquired for the above investigation. The Need for Speed: A Look at Enzyme Activity**	**about the assigned organelle and complete the Cell match-up activity.**	**about the assigned organelle and complete the Cell match-up activity.**	**and completes a summary of the main points.** **Component of cells (include connection) pages 150-151** **prokaryotic cells (components of prokaryotic cells) pages 151-152** **Eukaryotic cells pages 153- 157** **Endosymbiont Theory Page 158** **Have them group up with all other members with the same topic and have them discuss their summaries and make any adjustments to unify the summary.** **Then, have them report back to their groups to share the summaries with the group members.** **All group members should write what they learned from all the summaries.**
Assessment/Summary (5-7 minutes)	**For the closing questions, use page 147 to have the students answer #15.**	**For the closing questions, use page 147 to have the students answer #1 of "Math and ELA Connection".**	**Closing questions: Answer questions 1 & 13 on page 178-179.**	**Closing questions: Answer questions 2 & 15 on page 178-179.**	**Closing questions: Answer the CCC question on page 153**
Small Group Tasks (TBA)					

Week 3					
GSE: SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.		**Focused Concept: SB1a,d.** **-Construct an explanation of how cell structures and organelles (including nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, Golgi, endoplasmic reticulum, vacuoles, ribosomes, and mitochondria) interact as a system to maintain homeostasis.** **-Plan and carry out investigations to determine the role of cellular transport (e.g., active, passive, and osmosis) in maintaining homeostasis.**			
SEP **Developing and Using Models** **Constructing Explanations and Designing Solutions** **Using Mathematics and Computational Thinking** **Connections to Nature of Science: Scientific Investigations Use a Variety of Methods**			**CCC:** **Energy and Matter** **Structure and Function** **Stability and Change**		
Phenomenon: What do bacteria do in your intestines? (Weeklong)			**DQ: How do structures work together in cell systems? pg. 148-149**		
	Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
Learning Target	**The students will construct an explanation of how cell structures and organelles interact as a system to maintain homeostasis.**	**The students will construct an explanation of how cell structures and organelles interact as a system to maintain homeostasis.**	**The students will construct an explanation of how cell structures and organelles interact as a system to maintain homeostasis.**	**The student will plan and conduct investigations to determine cellular transport's role in maintaining homeostasis.**	**The student will plan and conduct investigations to determine cellular transport's role in maintaining homeostasis.**
Opening **(5-7 minutes)** **<u>Essential Vocabulary:</u>** **cell membrane** **chloroplast** **cytoskeleton** **endosymbiont theory** **eukaryote** **mitochondria** **nucleus** **prokaryote** **endocytosis** **exocytosis** **facilitated diffusion** **fluid mosaic model** **homeostasis** **osmosis** **selective permeability**	**• Show students the phenomenon image** **• Use the See-Think-Wonder protocol to guide student thinking.** **• Use the prompt "Cell membrane & bacteria" to guide the students' thoughts.**	**• Show students the phenomenon image** **Opening questions:** **Answer the "Bacteria in your gut" questions on page 152. (Revisiting the anchoring phenomenon)**	**• Show students the phenomenon image** **• Use the See-Think-Wonder protocol to guide student thinking.** **Health connection:** **TTW read the "Cross Curricular Connections" on page 152 to have a quick discussion with the students.**	**Show the student the 6.2 video. This is found in the Media Library.** **• Use the See-Think-Wonder protocol to guide student thinking.** **• Teachers should provide students with opportunities to share observations and develop questions.** **-The students can record questions in whole groups or small groups.**	**Show the student the 6.2 video. This is found in the Media Library.** **Ask the students about the new information obtained** **What do bacteria do in your intestines?**

**Use the "Revisit the anchoring phenomenon" sections in the unit to help explain the phenomenon's connection to the standard. Example: see page 129 TE					
Guided Practice/Transition	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Identify components of all cells. Explain the Endosymbiont theory. (you can incorporate the 6.1 video)	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Describe the structure and function of components in prokaryotic cells. Describe the structure and function of components in eukaryotic cells.	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. See page 157 teacher note "Address Misconceptions" of Mitochondria & Chloroplasts.	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Describe the structure of the cell membrane and how proteins function within it. Textbook page 162. Analysis. "Like a room with a window and window screen, what are some reasons a cell might need to control what materials can enter and exit?"	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Describe the structure of the cell membrane and how proteins function within it. Textbook page 162. Analysis. "Like a room with a window and window screen, what are some reasons a cell might need to control what materials can enter and exit?"
Independent Practice **Lab Prep is needed this week.	TSW be in groups of four, and each member takes one topic and completes a summary of the main points. Component of cells (include connection) pages 150-151 prokaryotic cells (components of prokaryotic cells) pages 151-152 Eukaryotic cells pages	Students will complete the "Looking at the Data (Microbiota of the Human Body)" Textbook page 159.	Students will complete the "Looking at the Data (Microbiota of the Human Body)" Textbook page 159.	Lab investigation options: **ADI - Osmosis and Diffusion: Why Do Red Blood Cells Appear Bigger After Being Exposed to Distilled Water? OR ADI-Swimming in the Dead Sea	Lab investigation options: **ADI - Osmosis and Diffusion: Why Do Red Blood Cells Appear Bigger After Being Exposed to Distilled Water? OR ADI-Swimming in the Dead Sea

	153- 157 **Endosymbiont Theory** **Page 158** **Have them group up with all other members with the same topic and have them discuss their summaries and make any adjustments to unify the summary.** **Then, have them report back to their groups to share the summaries with the group members. All group members should write what they learned from all the summaries.**				
Assessment/Summary (5-7 minutes)	**Closing questions:** **Answer the SEP question on page 158.**	**Closing question:** **List the structure and function of two organelles and describe what would happen if the cell did not have these organelles.**	**Closing question:** **Draw a conclusion: Why are some bacteria important to the human body? (based on the activity today)**	**Closing questions:** **Identify two organelles and explain how they interact to aid the cell in maintaining homeostasis.** **or** **Describe how cells maintain homeostasis.**	**Closing questions:** **Summarize the different modes of transport across the cellular membrane.**
Small Group Tasks (TBA)					

Week 4	
GSE: SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.	**Focused Concept: SB1.b,e** **-Develop and use models to explain the role of cellular reproduction (including binary fission, mitosis, and meiosis) in maintaining genetic continuity.** **-Ask questions to investigate and provide explanations about the roles of photosynthesis and respiration in the cycling of matter and flow of energy within the cell (e.g., single-celled alga). (Clarification statement: Instruction should focus on understanding the inputs, outputs, and functions of photosynthesis and respiration and the functions of the major sub-processes of each, including glycolysis, Krebs cycle, electron transport chain, light reactions, and Calvin cycle.)**

SEP: Asking Questions and Defining Problems Developing and Using Models Constructing Explanations and Designing Solutions			**CCC:** Systems and System Models Structure and Function		
Phenomenon: What do bacteria do in your intestines? (Weeklong)			**DQ: How do cells divide and grow?**		
	Day 16	**Day 17**	**Day 18**	**Day 19**	**Day 20**
Learning Targets	**The student will plan and conduct investigations to determine cellular transport's role in maintaining homeostasis.**	**The student will plan and conduct investigations to determine cellular transport's role in maintaining homeostasis.**	**Students will ask questions to investigate and explain the roles of photosynthesis and respiration in the cycling of matter and the flow of energy within the cell.**	**Students will ask questions to investigate and explain the roles of photosynthesis and respiration in the cycling of matter and the flow of energy within the cell.**	**Students will ask questions to investigate and explain the roles of photosynthesis and respiration in the cycling of matter and the flow of energy within the cell.**
Opening **(5-7 minutes)** **Essential Vocabulary:** cellular respiration electron transport chain fermentation photosynthesis apoptosis binary fission cytokinesis interphase mitosis homologous chromosome sister chromatid cell differentiation stem cell	• Show students the phenomenon image. Have them read the caption. • Use the See-Think-Wonder protocol to guide student thinking. Use the Science background to guide the students in understanding the specialized cells. This would be a short discussion before continuing the investigation.	• Show students the phenomenon image. Use the "On Assignment" suggestions to help generate questions and discussion. This would be a short discussion before continuing the investigation.	Show the students the video 6.3 - Media Library. • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students with opportunities to share observations and develop questions. -The students can record questions in whole groups or small groups.	Show the students the video 6.3 - Media Library. • Use the See-Think-Wonder protocol to guide student thinking. Use the following prompt for better understanding. "What drives the photosynthetic pathway?"	• Show students the phenomenon image Opening questions: Answer the "Bacteria in your gut" questions on page 170. (Revisiting the anchoring phenomenon) • Teachers should provide students opportunities to share observations and develop questions. The teacher should record students' questions.
Guided Practice/Transition	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Explain homeostasis and the involvement of the cell membrane in its	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Explain homeostasis and the involvement of the cell membrane in its	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Explain the importance of cells' energy usage.	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Have the students read the introduction on page	TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources. Describe the processes

	maintenance. **Summarize the different modes of transport across the cellular membrane.** **Revisit the gummy bear demo.**	**maintenance.** **Summarize the different modes of transport across the cellular membrane.** **Revisit the gummy bear demo.**		**169 and discuss with their neighbor the "Explain"**	**involved in cellular respiration and ATP synthesis.** **Summarize the stages of photosynthesis and the light-dependent and light-independent reactions.** **Identify other energy conversion pathways available to cells.**
Independent Practice ****Lab Prep is needed this week.**	**Lab investigation options:** ****ADI - Osmosis and Diffusion: Why Do Red Blood Cells Appear Bigger After Being Exposed to Distilled Water?** **OR** **ADI-Swimming in the Dead Sea** **You can wrap up with the "Crossing membrane" simulation. See on page166**	**Lab investigation options:** ****ADI - Osmosis and Diffusion: Why Do Red Blood Cells Appear Bigger After Being Exposed to Distilled Water?** **OR** **ADI-Swimming in the Dead Sea** **You can wrap up with the "Crossing membrane" simulation. See on page166**	**Have the students complete the Photosynthesis vs. Respiration POGIL.** **The teacher should time the sections between the stops of the Pogil to check for understanding (CFU)**	**Have the students complete the Photosynthesis vs. Respiration POGIL.** **The teacher should time the sections between the stops of the Pogil to check for understanding (CFU)**	**Have the students complete the organizers and answer the following questions.** **Photosynthesis Teacher copy:** **Have the students complete the CER - Photosynthesis**
Assessment/Summary (5-7 minutes)	**Closing question:** **Answer #2 on page 167 Review.**	**Closing questions:** **Which types of transport require no energy input?**	**Closing questions:** **Answer the question on page 174 SEP: "Use a model."**	**Closing questions:** **Answer the question on Page 175 SEP: Construct an Explanation.**	**Closing questions:** **Answer the question on page 171 SEP "use a model"** **Suggested HW: page 176 Thinking Critically**
Small Group Tasks (TBA)					

Week 5	
GSE: SB1. Obtain, evaluate, and communicate	**Focused Concept: SB1.b,e**

information to analyze the nature of the relationships between structures and functions in living cells.	**-Develop and use models to explain the role of cellular reproduction (including binary fission, mitosis, and meiosis) in maintaining genetic continuity. -Ask questions to investigate and provide explanations about the roles of photosynthesis and respiration in the cycling of matter and flow of energy within the cell (e.g., single-celled alga). (Clarification statement: Instruction should focus on understanding the inputs, outputs, and functions of photosynthesis and respiration and the functions of the major sub-processes of each, including glycolysis, Krebs cycle, electron transport chain, light reactions, and Calvin cycle.)**				
SEP: **Asking Questions and Defining Problems** **Developing and Using Models** **Constructing Explanations and Designing Solutions**			**CCC:** **Systems and System Models** **Structure and Function**		
Phenomenon: What do bacteria do in your intestines? (Weeklong)			**DQ: How do cells divide and grow?**		
	Day 21	**Day 22**	**Day 23**	**Day 24**	**Day 25**
Learning Targets	**Students will ask questions to investigate and explain the roles of photosynthesis and respiration in the cycling of matter and the flow of energy within the cell.**	**Students will develop and use models to explain the role of cellular reproduction in maintaining genetic continuity.**	**Students will develop and use models to explain the role of cellular reproduction in maintaining genetic continuity.**	**Students will develop and use models to explain the role of cellular reproduction in maintaining genetic continuity.**	**Students will develop and use models to explain the role of cellular reproduction in maintaining genetic continuity.**
Opening (5-7 minutes)	**• Show students the phenomenon image Opening questions: Answer the "Bacteria in your gut" questions on page 170. (Revisiting the anchoring phenomenon) • Teachers should provide students opportunities to share observations and develop questions. The teacher should record students' questions.**	**Show the students the 7.1 video. - Media Library. • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students with opportunities to share observations and develop questions. -The students can record questions in whole groups or small groups.**	**Show the students the 7.1 video. - Media Library. • Use the See-Think-Wonder protocol to guide student thinking. Use the following prompt to guide understanding. "Why does this species divide so quickly?"**	**Show the students the 7.2 video. - Media Library. • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students with opportunities to share observations and develop questions. -The students can record questions in whole groups or small groups.**	**Show the students the 7.2 video. - Media Library. Read as a class and discuss Cancer on page 185. Connect the reading to the opening video. Using prior questions from yesterday to help make a connection.**
Guided Practice/Transition	**TTW, provide 10 minutes of direct instructions.**	**TTW, provide 10 minutes of direct instructions. Use the objectives below**	**TTW, provide 15 minutes of direct instructions. Use the objectives below**	**TTW, provide 10 minutes of direct instructions. Use the objectives below**	**TTW, provide 10 minutes of direct instructions. Use the objectives below**

	Use the objectives below for your direct instruction. **Lecture notes are provided in online teacher resources.** **Describe the processes involved in cellular respiration and ATP synthesis.** **Summarize the stages of photosynthesis and the light-dependent and light-independent reactions.** **Identify other energy conversion pathways available to cells.**	**for your direct instruction.** **Lecture notes are provided in online teacher resources.** **Compare and contrast the prokaryotic and eukaryotic cell cycle.**	**for your direct instruction.** **Have students look at page 181 and read the passage.** **Have the students engage in a "Partner Talk" using the reading.**	**for your direct instruction.** **Lecture notes are provided in online teacher resources.** **Explain the importance of eukaryotic cell cycle regulation.** **Include Cell death and Apoptosis as you move into Mitosis.**	**for your direct instruction.** **Lecture notes are provided in online teacher resources.** **Show video 7.3** **Have a student read the introduction on page 188, Mitosis. Then, have the students answer the "Infer" questions.**
Independent Practice	**Have the students complete the organizers and answer the following questions.** **Photosynthesis Teacher copy:** **Have the students complete the CER - Photosynthesis**	**Have the students create a side-by-side graphic organizer. Using pages 182 and 183, models of binary fission, mitosis, and meiosis.** **Draw and explain the difference between the Prokaryotic and Eukaryotic cell cycles.**	**Have the students create a side-by-side graphic organizer. Using pages 182 and 183, models of binary fission, mitosis, and meiosis.** **Draw and explain the difference between the Prokaryotic and Eukaryotic cell cycles.**	**Teachers can prep and have students complete chapter investigation A "Plant growth through mitosis". Split into two days.** **or** ****Mini Lab "Modeling Mitosis". Two-day activity. pg. 192**	**Teachers can prep and have students complete chapter investigation A "Plant growth through mitosis". Split into two days.** **or** ****Mini Lab "Modeling Mitosis". Two-day activity. pg. 192**
Assessment/Summary (5-7 minutes)	**Closing question:** **Answer the question #4 on page 175 (6.3 Review)**	**Closing question:** **Answer the question on page 182, "Analyze"**	**Closing question:** **Answer the question on page 183 SEP, "Construct an explanation"**	**Closing question:** **Explain genetic continuity and how it is seen in binary fission.** **Suggested HW: Have students read page 191, Stages of Mitosis and the cell cycle, and answer the CCC "Structure and Function question.**	**Closing question:** **Answer question #1 on page 191, (7.2 Review).**
Small Group Tasks					

(TBA)					

Week 6					
GSE: SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.		**Focused Concept: SB1.b,e** **-Develop and use models to explain the role of cellular reproduction (including binary fission, mitosis, and meiosis) in maintaining genetic continuity.** **-Ask questions to investigate and provide explanations about the roles of photosynthesis and respiration in the cycling of matter and flow of energy within the cell (e.g., single-celled alga). (Clarification statement: Instruction should focus on understanding the inputs, outputs, and functions of photosynthesis and respiration and the functions of the major sub-processes of each, including glycolysis, Krebs cycle, electron transport chain, light reactions, and Calvin cycle.)**			
SEP: **Asking Questions and Defining Problems** **Developing and Using Models** **Constructing Explanations and Designing Solutions**			**CCC:** **Systems and System Models** **Structure and Function**		
Phenomenon: What do bacteria do in your intestines? (Weeklong)			**DQ: How do cells divide and grow?**		
	Day 26	**Day 27**	**Day 28**		
Learning Targets	**Students will develop and use models to explain the role of cellular reproduction in maintaining genetic continuity.**	**Students will develop and use models to explain the role of cellular reproduction in maintaining genetic continuity.**	**Students will develop and use models to explain the role of cellular reproduction in maintaining genetic continuity.**		
Opening **(5-7 minutes)**	**• Show students the phenomenon image** **Opening question: Answer the "Bacteria in your gut" questions on page 182. (Revisiting the anchoring phenomenon)** **• Teachers should provide students opportunities to share observations and develop questions. The teacher should record**	**• Show students the phenomenon image** **Opening question: Explain how bacteria is beneficial to humans.** **Students can "Turn and Talk".**	**• Show students the image** **Create a three cell connection and explain how they work together to maintain and support the human body.** **(You can you Padlet to capture answers)**		

	students' questions.				
Guided Practice/Transition	**TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources.** **Describe chromosomes and the structure of DNA. Sequence the stages of mitosis and cytokinesis.**	**TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources.** **Complete an overview summary of "What do bacteria do in your intestines?"**	**TTW, provide 10 minutes of direct instructions. Use the objectives below for your direct instruction. Lecture notes are provided in online teacher resources.** **Complete an overview summary of "What do bacteria do in your intestines?"**		
Independent Practice ****Lab Prep is needed this week.**	**Teachers can prep and have students complete chapter investigation A"Plant growth through mitosis. Split into two days. or Mini Lab "Modeling Mitosis two-day activity.**	**Teachers can prep and have students complete chapter investigation A"Plant growth through mitosis. Split into two days. or Mini Lab "Modeling Mitosis two-day activity.**	**Teachers can prep and have students complete chapter investigation A"Plant growth through mitosis. Split into two days. or Mini Lab "Modeling Mitosis two-day activity.**		
Assessment/Summary (5-7 minutes)	**Using figures 7-11, explain what happens in the stages of mitosis and state how the cells maintain genetic continuity.** **Suggested HW: Students create a public service announcement. See page 185 TB (teacher ed.)**	**Closing question: Answer question #3 on page 186.**	**Closing question: Answer question #6 on page 200.**		
Small Group Tasks (TBA)					

Week

GSE:		Focused Concept:			
Phenomenon:			DQ:		
	Day	Day	Day	Day	Day
Opening					
Guided Practice/Transition					
Independent Practice					
Assessment/Summary					
Small Group Tasks (TBA)					

Week					
GSE:		Focused Concept:			
Phenomenon:			DQ:		
	Day	Day	Day	Day	Day
Opening					
Guided Practice/Transition					
Independent Practice					
Assessment/Summary					
Small Group Tasks (TBA)					

Week					
GSE:		**Focused Concept:**			
Phenomenon:			**DQ:**		
	Day	**Day**	**Day**	**Day**	**Day**
Opening					
Guided Practice/ Transition					
Independent Practice					
Assessment Summary					
Small Group Tasks (TBA)					

Assessment Prep

Prepare students for assessment by reviewing the following Assessment Prep Presentation.

Provide the following guidance:
Ask the students to use what they know about the tasks completed to answer the provided assessment prep question.

- What is the question asking you?
- What do you know about the vocabulary or concept in the question?
- Is this question similar to any investigations or tasks we've completed?
- How can what you've done help you answer this question?
- Just view the assessment question: What is the question asking you?

Guide students to think about how their experience connects to the question.
Using the answer choices provided, ask the students the following:

- Identify a wrong answer: How do I know this answer is incorrect?
- Identify the right answer: How do we know this answer is correct?

Allow the students time to discuss in collaborative groups.

TEACHER NOTE: If students struggle with the question, review it the next day. Do not rush to the next question; instructional time is the only time they

have to prepare for the end-of-year assessment.

Labs / Investigations		
Mandatory Labs	**Explore Learning Gizmo**	**Pivot Interactives/Phet**

Additional Resources/Tasks	
Supplemental Resources	