



Lakeside High	School		
	Weekly Compo	nents	
Teacher: Co-Teacher/Para:	Pastirik	Date – Week of:	Monday 9/18/17 – Friday 9/22/17
Course:	Biology I	Unit Name:	Biology, Unit 1 From Molecules to Organisms: Structure and Processes
Priority Standards: (content specific)	Standards and Guiding Practices: I SB1. OBTAIN, EVALUATE, and COM of the relationships between struct SB1c. CONSTRUCT arguments supporter macromolecules (carbohydrates, p interactions in carrying out cellular function of proteins as enzymes is SB1e. ASK questions to INVESTIGATE photosynthesis and respiration in t the cell (e.g., single-celled alga). (c on understanding the inputs, output respiration and the functions of the glycolysis, Krebs cycle, electron tr	IMUNICATE informures and functions in ed by evidence to RE roteins, lipids, and man processes. (Clarific limited to a conceptu and PROVIDE expl he cycling of matter Clarification stateme ts, and functions of p major subprocesses	ELATE the structure of ucleic acids) to their ation statement: The ual understanding.) lanations about the roles of and flow of energy within nt: Instruction should focus photosynthesis and of each including
Supporting Standards: (content specific)	Standards and Guiding Practices: Supporting . SB1a. Construct an explanation of how cell structure cell wall, chloroplasts, lysosome, Golgi, endop interact as a system to maintain homeostasis. SB1b. Develop and use models to explain the role of meiosis) in maintaining genetic continuity. SB1d. Plan and carry out investigations to determine in maintaining homeostasis. Crosscutting Concepts & Science and Engineer Crosscutting Concepts (All Daily) Patterns, Similarity, & Diversity Cause & Effect Scale, Proportion, & Quantity Systems & System Models Energy & Matter Structure & Function Stability & Change Science & Engineering Practices: #1, 2, & 6 (D	es and organelles (including lasmic reticulum, vacuoles, cellular reproduction (inclu e the role of cellular transpo ring Practices	ribosomes, and mitochondria) Iding binary fission, mitosis, and





	Asking Questions (Science) and Defining Problems (Engineering)
	Developing & Using Models
	Planning and Carrying Out Investigations
	Analyzing & Interpreting Data
	Using Mathematics & Computational Thinking
	Constructing Explanations (Science) & Designing Solutions (Engineering)
	Engaging in Argument from Evidence
	Obtaining, Evaluating, & Communicating Information
Non-Content Standards:	Students will as necessity:
(WIDA; interdisciplinary	Read, write, interpret graphs, and present material.
standards, literacy, etc.)	Students will work cooperatively.
	Students will learn the anatomy of cells and the processes associated with cell
Learning Targets:	
(what learners will be able to do	processes.
at the end of the learning activity)	
	1. How can we explain how cell structures and organelles interact as a system to
	maintain homeostasis?
Essential Question(s):	
(address philosophical	2. What arguments supported by evidence can be used to relate the structure of
foundations; contain multiple	macromolecules to their interactions in carrying out cellular processes?
answers; provoke inquiry)	3. What are the roles of photosynthesis and cellular respiration in the cycling of
	matter and flow of energy within the cell?
	1. Each cell structure plays a particular role in the maintenance of the internal
	conditions through the use of feedback mechanisms even when external
Big Ideas(s):	conditions change.
(address philosophical	2. The process of photosynthesis converts light energy, carbon dioxide and
foundations; contain multiple answers; provoke inquiry)	water into glucose and oxygen that is then converted in cellular respiration
	to provide the chemical and thermal energy needed to support maintenance
	of the cells.
	Create
	Generalize
	Justify
	Assess
	Select
	Conclude
	Apply
	Explain
	Describe
	Explain
	Analyze
Academic Vocabulary:	Extend
Academic vocabulary.	
	Classify
	Arrange
	Construct
	Substrate
	Lock-and-key mechanism
	Activation energy
	Carbohydrates
	Lipids Proteins
	Nucleic Acids
	Nucleic Acids ATP





	Photosynthesis
	Light reaction
	Calvin Cycle
	Cell Respiration
	Glycolysis
	Kreb cycle
	Electron Transport
	Chain
	Selective permeable
	÷
	Homeostasis
	Diffusion
	Osmosis
	Facilitated Diffusion
	Active Transport
	Endocytosis
	Exocytosis
STEM/STEAM/	
Interdisciplinary	We will do our best to include a physical project during this unit
Integration:	we will do our best to include a physical project during this diff
	During the course of the unit, three – four of the following four Engaging
	Performance Scenarios will be the lesson of the day (or days) during the first unit
	1 enormance scenarios will be the lesson of the day (of days) during the first unit
	Engaging Performance Scenario: Task 1
	Engaging Scenario
	Directions: Incorporate the five elements of effective scenarios: current situation;
	student challenge; student role; intended audience; product, or performance.
	Suggested Dhanomana: Chamicals can influence call function
	Suggested Phenomena: Chemicals can influence cell function
	Science and Engineering Practices: Asking Questions, Planning and Carrying Out
	Investigations, Constructing Explanations, Engaging in Argument from Evidence,
	Obtaining, Evaluating and Communicating Information
Engaging Performance	
Scenario:	Imagine that you are a doctor for a hospital in the Philippines. Parents are carrying
	in their sick and dying children. By the end of the night over 100 children were sick
	and 27 children had died. All of the children attended the San Jose School in Bohol
	Island's Mabini Town. After interviewing patients and their parents it was
	discovered that all patients became ill after snack time. One child told her parents
	she was given some deep-fried caramelized cassava by a classmate who bought it
	from a vendor outside the school. The patients suffered severe stomach pain,
	vomiting and diarrhea. Some patients were still vomiting nearly 12 hours after
	eating the snack. During this unit you will be tasked with asking questions,
	planning experiments, and engaging in arguments from evidence to help you solve
	this mystery. You will be given clues along the way to find out what caused the
	children's deaths.
	Performance Task Synopses
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Directions:
Brainstorm three or four possible Performance Tasks. Write a brief synopsis (1–2 sentences) for each selected task and list the tasks in a "learning progressions" sequence. Include the standards code for each task. Task 1: Using a real-world cyanide poisoning case study, the students will work collaboratively to engage in arguments based on evidence to construct an explanation of what caused the illness that has resulted in the death of several school children.
Task 2: SB1c. Using oil (lipid) and water, yeast and various sugars (carbohydrates), and potato catalase (enzyme), students will develop an argument and individually construct a written explanation for how macromolecules function in terms of matter and energy.
Task 3: SB1a. Using a real world analogous system, students will construct an explanation of how the parts of the system compare to how cell structures and organelles interact as a system to maintain homeostasis.
Task 4: SB1d. Using solutes and solvents, students will explain the role of cellular transport in maintaining homeostasis.
Task 5: SB1e. Using an aquatic plant and selected materials, students will plan and design an experiment to investigate the relationship between photosynthesis and cellular respiration.
Performance Task 1 In Detail
Directions: Describe the task in full detail making the connection to the overall engaging scenario. Check that the task directly reflects the level of rigor for each targeted skill and related concept(s).
Suggested Phenomena: Chemicals can influence the functioning of cellular processes
Associated Standards: SB1. Obtain, evaluate, and communicate information to analyze the nature of the relationships between structures and functions in living cells.
SB1a. Construct an explanation of how cell structures and organelles interact as a system to maintain genetic continuity.
SB1c. Construct arguments supported by evidence to relate the structure of macromolecules to their interactions in carrying out cellular processes. SB1e. Ask questions to investigate and provide explanations about the role of photosynthesis and respiration in the cycling of matter and flow of energy within the cell.
Task 1 Student Directions:





Engage:

Part1: The Symptoms	Part1	: T	he	Sy	/m	pl	tom	15
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Imagine that you are a doctor for a hospital in the Philippines. Parents are carrying in their sick and dying children. By the end of the night over 100 children were sick and 27 children had died. All of the children attended the San Jose School in Bohol Island's Mabini Town. After interviewing patients and their parents it was discovered that all patients became ill after snack time. One child told her parents she was given some deep-fried caramelized cassava by a classmate who bought it from a vendor outside the school. The patients suffered severe stomach pain, vomiting and diarrhea. Some patients were still vomiting nearly 12 hours after eating the snack. During this unit you will be tasked with solving this mystery. You will be given clues along the way to find out what caused the children's deaths. Teacher Notes: The above scenario will be introduced at the beginning of the unit. After introducing the scenario allow students to spend 5-10 minutes in small groups discussing if all of the cases are linked. As a whole group discuss the following questions with the class. Are there any similarities or connections between the 27 children? What questions would you want to ask the families to answer the questions? In your opinion are the 27 deaths related? Why or why not? **Student Directions:** Explore Part II: Autopsy Report (Give students this information after completing Performance Tasks 2 and 3.) Immediate cause of death was hypoxia (suffocation or lack of oxygen). Tissue sections from heart, lung, kidney, and liver all show massive cell death. Staining with specific dyes showed major mitochondrial damage within the affected tissues. Oxygen levels in the patients' blood were approximately 110 mm Hg (normal range is 75 - 100 mm Hg). Teacher Notes: Allow students to spend 5-10 minutes in small groups discussing the questions listed below. Afterwards, discuss questions as a whole group. Recalling your knowledge of the function of organelles, what function of the cells was interrupted in these patients? Could this loss of function lead to the death of these individuals? Why or why not? Given the data in the autopsy, were there any reports that seemed inconsistent with the immediate cause of death? Student Directions: Explain Part III: Subcellular Metabolite Analysis (Give students this information after completing Task 4 and 5) Detailed analysis of the damaged cells showed that ATP levels in the mitochondria were very low. Levels of pyruvate and acetyl coenzyme A (CoA) were normal. You begin to suspect a malfunction of a specific cellular metabolic pathway and so you request a more detailed analysis of the sub-cellular





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	components of the affected cells from the autopsy. The levels of key metabolites are reported below:
	Average Metabolite Levels
	Allow students to spend 5-10 minutes in small groups discussing the questions listed below. Then discuss questions as a whole group.
	Using the table above, describe the role of each metabolite in cellular respiration. Are the metabolites substrates or products? What are their main functions? Are there any abnormalities in the levels of these metabolites in the victims? Develop a hypothesis about which pathway may be affected based on these abnormalities.
	Explain your reasoning for your hypothesis. Student Directions:
	Extend Part IV – Role of Cyanide (Give students this information at the end of the Unit) You are now convinced that you know the cause of death for these victims and quickly report it back to the police as this is a very dangerous situation. After realizing that the electron transport chain was no longer functioning, you started to suspect poisoning and ran a blood test for various poisons that you knew affected electron transport. The test for all twenty-seven patients came back positive for cyanide. Cyanide irreversibly binds to a specific enzyme of the electron transport chain and prevents the transfer of electrons to oxygen, the final electron acceptor.
	Teacher Notes: Allow students to spend 10-15 minutes in small groups discussing the questions listed below. Afterwards, discuss questions as a whole group. Share the article after whole group discussion for students to read about the actual event. The article explains how the children were poisoned with cyanide.
	http://www.chinadaily.com.cn/english/doc/2005-03/10/content_423641.htm
	Evaluate
	What affect would cyanide have on the electron transport chain and the production of ATP? Explain your answer. Given what you now know about the action of cyanide on cellular respiration, explain why the patients died of lack of oxygen while their blood oxygen levels were normal? Would artificial respiration or oxygenation have saved these people? Why or why not?





School District	Focus on Teaching and Learning
	Looking back at the information you have about the people before they got sick, can you suggest a possible source of the cyanide poisoning? How should public health officials and police respond to this tragedy? This scenario was adapted/modified from the The Mystery of the Seven Deaths: A Case Study in Cellular Respiration by Michaela A. Gazdik Biology Department Ferrum College, Ferrum VA, and the National Center for Case Study Teaching in Science, University at Buffalo, State University of New York.
	Crosscutting Concepts: Cause and Effect, Scale, Proportion and Quantity, Energy and Matter, Structure and Function, Stability and Change

	Engaging Performance Scenario: Task 2 Engaging Scenario
	Directions: Incorporate the five elements of effective scenarios: current situation; student challenge; student role; intended audience; product, or performance.
	Suggested Phenomena: Chemicals can influence cell function
	Science and Engineering Practices: Asking Questions, Planning and Carrying Out Investigations, Constructing Explanations, Engaging in Argument from Evidence, Obtaining, Evaluating and Communicating Information
	Imagine that you are a doctor for a hospital in the Philippines. Parents are carrying in their sick and dying children. By the end of the night over 100 children were sick and 27 children had died. All of the children attended the San Jose School in Bohol Island's Mabini Town. After interviewing patients and their parents it was discovered that all patients became ill after snack time. One child told her parents she was given some deep-fried caramelized cassava by a classmate who bought it from a vendor outside the school. The patients suffered severe stomach pain, vomiting and diarrhea. Some patients were still vomiting nearly 12 hours after eating the snack. During this unit you will be tasked with asking questions, planning experiments, and engaging in arguments from evidence to help you solve this mystery. You will be given clues along the way to find out what caused the children's deaths.
	Performance Task Synopses
	Directions:
	Brainstorm three or four possible Performance Tasks. Write a brief synopsis (1–2 sentences) for each selected task and list the tasks in a "learning progressions" sequence. Include the standards code for each task. Task 1: Using a real-world cyanide poisoning case study, the students will work
	collaboratively to engage in arguments based on evidence to construct an





explanation of what caused the illness that has resulted in the death of several school children.

Task 2: SB1c. Using oil (lipid) and water, yeast and various sugars (carbohydrates), and potato catalase (enzyme), students will develop an argument and individually construct a written explanation for how macromolecules function in terms of matter and energy.

Task 3: SB1a. Using a real world analogous system, students will construct an explanation of how the parts of the system compare to how cell structures and organelles interact as a system to maintain homeostasis.

Task 4: SB1d. Using solutes and solvents, students will explain the role of cellular transport in maintaining homeostasis.

Task 5: SB1e. Using an aquatic plant and selected materials, students will plan and design an experiment to investigate the relationship between photosynthesis and cellular respiration.

Performance Task 2 In Detail

Directions: Describe the task in full detail making the connection to the overall engaging scenario. Check that the task directly reflects the level of rigor for each targeted skill and related concept(s).

Task 2 Standards:

SB1c. Construct arguments supported by evidence to relate the structure of macromolecules to their interactions in carrying out cellular processes

Suggested Phenomena: Chemicals can influence the functioning of cellular processes

Task 2 Student Directions: Engage:

Students gather information about how water and oil behave in a mixture by mixing 5 ml of oil to 20 ml of water to a beaker or flask. Cover then shake for 2 seconds. Wait 5 minutes. Record observation. Explore:

Students plan and carry out investigations to obtain evidence and answer questions about how phospholipids are involved in cell formation by adding an egg yolk droplet to the oil/water mixture. Add a small drop of egg yolk to the oil water mixture. The principal component of egg yolks is phospholipids, which are amphiphilic, or are composed of polar and non-polar ends. Observe and record observations Draw and label a phospholipid. How does a phospholipids rearrange itself on the surface of the water? Sketch your result below. Label the hydrophobic and hydrophilic parts of the phospholipids. Shake for 2 seconds. Record observations.





Explain:

Students gather information (through a provided reading or online resource) on how the structure of the phospholipid relates to the function of the cell membrane. Elaborate:

Students develop a model to visualize and describe how a system's function depends on shapes, composition and relationships among its parts. Evaluate:

Students individually use their models to describe how phospholipid structure relates to its function in the cell.

Teacher Notes:

While students are waiting for the oil to return to the top, crack open an egg in a small bowl. Students predict what will happen when egg yolk is added to a wateroil mixture. The principal component of egg yolks is phospholipids, which are amphiphilic, or are composed of polar and nonpolar ends. These molecules have a water-liking end and the water-disliking end to represent the polar and nonpolar ends, respectively. Students will be introduced to the idea that egg yolk contains molecules that have a polar end and a nonpolar end. They will predict what happens if egg yolk is added to an oil/water mixture and explain the observed behavior. Prior to introduction of egg yolk to the mixture, students observe that the water-oil mixture separates into two layers. Oil, which is water-disliking, does not mix with water. Since oil is less dense than water, oil forms the upper layer. They should come to the conclusion that in water layer, an inverse micelle will be formed, and in the oil layer a micelle will be formed. This experiment allows students to visually see self-assembly and to predict the forces responsible for the event. Students should use an eyedropper, plunge the eyedropper about halfway into the egg yolk like a syringe. Remove a sample, then add one drop to the oil and water mixture. Adding too much can cause the oil to form such small droplets it becomes a colloid, like milk. The mixture will form small phospholipid bilayer vesicles.

Task 1 Student Directions:

Suggested Phenomena: Monosaccharides are used as immediate source of chemical energy by the cell.

Engage

Students obtain information about how simple carbohydrates are used as energy by the cell by observing a demonstration of a closed jar with yeast and sucrose solution.

Explore

Students plan and carry out investigations to answer questions about how simple sugars are used as immediate energy for cells.

Add a small amount of yeast to 10 ml of sucrose solution, starch solution, oil, and egg white in four flask. Record observation. . Explain





Students construct explanations of the results of their experiment. Teacher Notes: Students construct an explanation for the use of simple sugars for the source of immediate energy for the cell. Students use evidence to support the argument that sugar structure relates to its function in the cell. Use baking yeast for this experiment as the only use simple sugars for cellular respiration. Create a 50% glucose solution and add .5 grams of yeast. After several minutes the students should see a reaction occurring in the test tube with the glucose solution and not in the other tubes.
Task 1 Student Directions: Suggested Phenomena: Enzyme active sites bind with a specific substrate
Engage Students gather information about how enzymes react with a substrate by observing a small potato cube and 3% hydrogen peroxide in a beaker provided by the teacher.
Explore Students plan and carry out investigations to answer questions about how enzyme active sites bind with a specific substrate by using 3 potato cubes, 3% hydrogen peroxide, 3% sodium chloride solution and tap water.
Explain Students construct an explanation for the use of enzymes in catalyzing reactions in the cell using evidence from their experiment.
Elaborate Students use evidence to support the argument that enzyme structure relates to its function in the cell.
Evaluate Student groups share evidence that supports that enzyme structure relates to its function in the cell.
Teacher Notes: How do living cells interact with the environment around them? All living things possess catalysts, or substances within them that speed up chemical reactions and processes. Enzymes are molecules that enable the chemical reactions that occur in all living things on earth. In this catalase and hydrogen peroxide experiment, we will discover how enzymes act as catalysts by causing chemical reactions to occur more quickly within living things. Using a potato and hydrogen peroxide, we can observe how enzymes like catalase work to perform decomposition, or the breaking down, of other substances. Catalase works to speed up the decomposition of hydrogen peroxide into oxygen and water. We will also test how this process is affected by changes in the temperature of the potato.
Crosscutting Concepts: Cause and Effect, Scale, Proportion and Quantity, Structure and Function





Directions: Incorporate the five elements of effective scenarios: current situation; student challenge; student role; intended audience; product, or performance.	
Suggested Phenomena: Chemicals can influence cell function	
Science and Engineering Practices: Asking Questions, Planning and Carrying Out Investigations, Constructing Explanations, Engaging in Argument from Evidence, Obtaining, Evaluating and Communicating Information	
Imagine that you are a doctor for a hospital in the Philippines. Parents are carrying in their sick and dying children. By the end of the night over 100 children were sick and 27 children had died. All of the children attended the San Jose School in Bohol Island's Mabini Town. After interviewing patients and their parents it was discovered that all patients became ill after snack time. One child told her parents she was given some deep-fried caramelized cassava by a classmate who bought it from a vendor outside the school. The patients suffered severe stomach pain, vomiting and diarrhea. Some patients were still vomiting nearly 12 hours after eating the snack. During this unit you will be tasked with asking questions, planning experiments, and engaging in arguments from evidence to help you solve this mystery. You will be given clues along the way to find out what caused the children's deaths.	
Performance Task Synopses	
Directions:	
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Task 3: SB1a. Using a real world analogous system, students will construct an explanation of how the parts of the system compare to how cell structures and organelles interact as a system to maintain homeostasis.	





Task 4: SB1d. Using solutes and solvents, students will explain the role of cellular transport in maintaining homeostasis. Task 5: SB1e. Using an aquatic plant and selected materials, students will plan and design an experiment to investigate the relationship between photosynthesis and cellular respiration. Performance Task 3 In Detail Directions: Describe the task in full detail making the connection to the overall engaging scenario. Check that the task directly reflects the level of rigor for each targeted skill and related concept(s). Task 3 Standards: SB1a. Construct an explanation of how cell structures and organelles interact as a system to maintain homeostasis. Suggested Phenomena: Organelles perform functions in the cell as to other systems in nature Task 3 Student Directions: Engage: You work for a technology app company. Your team specializes in developing apps to help students extend science learning outside of the classroom. You have been given an assignment to design a biology educational app that uses analogies to help students learn how cell organelles work together in a system to maintain homeostasis. The content part of the app must be submitted for approval before the technology part of the app is created. Explore: Your assignment is to choose a real world system and relate it to how cell structures and organelles of a eukaryotic cell interact as a system. Choose a real world working system and decide how each organelle of the eukaryotic cell can be compared to the components and functions of the real world system. Explain: Design and draw a pictorial display of your analogy. Label the parts of the real world system and put the cell organelles that are represented in parenthesis. The following organelles must be in your display; nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, Golgi, endoplasmic reticulum, vacuoles, ribosomes, mitochondria. Elaborate: Create a chart that includes the cell organelle, real world analogous structure and a statement that justifies the analogy. Give a creative title to your design that will encourage a student to choose your app from the education category of the App Store.

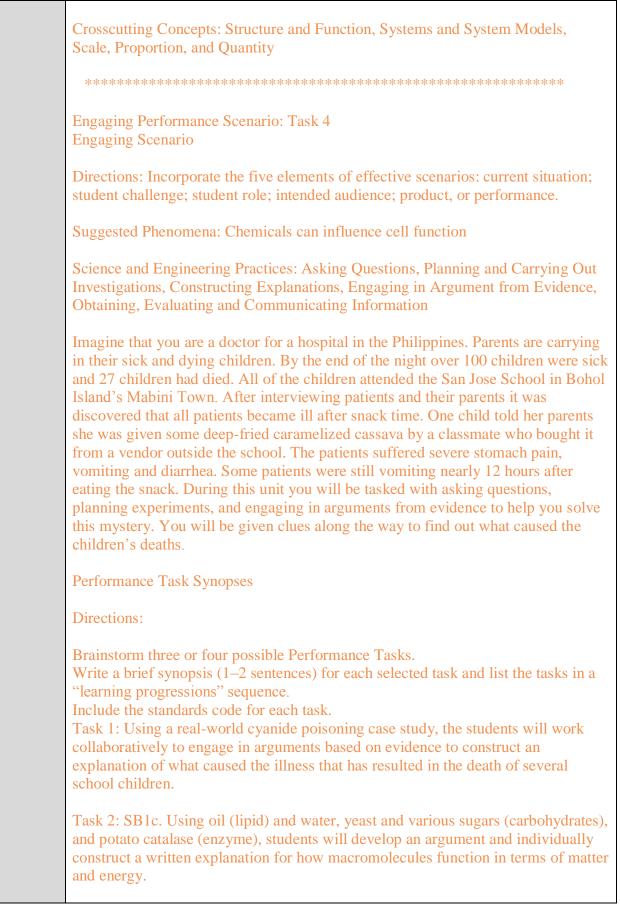




Evaluate: Summary: As a summary to this assignment respond to the following questions by writing a short response: In regards to a eukaryotic cell system: What is the output of the eukaryotic cell system? What input would this system have to receive for it to work? Where ultimately does the energy come from? What would happen if there is a malfunction in the tiny capsule-shaped mitochondrial structure? Describe how the functioning of this system would change if one of the parts wears out. Why do we think of the cell as a system? Teacher Notes: Use this as a formative assessment to facilitate students in their understanding of how cell structures and organelles interact as a system to maintain homeostasis. Based on time constraints students can design a pictorial display rather than actually draw their designs. Note that the scoring guide should emphasize student understanding of how the cell organelles work together as a process. It is important for students to be able to answer the summary questions effectively. See highlights on the scoring guide. Short Response Answer Key: What is the output of the eukaryotic cell system? Answer: It produces proteins that aid the cell in functioning pro. What input would this system have to receive for it to work? Where ultimately does the energy come from? Answer: Energy, Sun What would happen if there is a malfunction in the tiny capsule-shaped mitochondrial structure? Answer: Cells that have no mitochondria or malfunctioning mitochondria are unable to convert oxygen into energy, which is found in the form of adenosine triphosphate (ATP). Therefore disease could result in the cell/organism Describe how the functioning of this system would change if one of the parts wears out. Answer: If one of the organelles in a eukaryotic cell wears out, specific functions of the cell such as energy production, building of membranes, photosynthesis, and respiration would be affected. Because most of the organelles are sites of biochemical reactions, worn out or malfunctioning organelles could lead to disease. A worn out nucleus could lead to cell death because it is the location of the cell's DNA. Chloroplasts and mitochondria play an important role in the conversion of energy. Why do we think of the cell as a system? Answer: Cell organelles work together in a system to maintain homeostasis in the cell. Each organelle has a role (function) in the process. Optional Extension: Students can use their designs to create their own apps. Direct them to code.org and appinventor.mit.edu.











School District	
	Task 3: SB1a. Using a real world analogous system, students will construct an explanation of how the parts of the system compare to how cell structures and organelles interact as a system to maintain homeostasis.
	Task 4: SB1d. Using solutes and solvents, students will explain the role of cellular transport in maintaining homeostasis.
	Task 5: SB1e. Using an aquatic plant and selected materials, students will plan and design an experiment to investigate the relationship between photosynthesis and cellular respiration.
	Performance Task 4 In Detail
	Standards: SB1d. Plan and carry out investigations to determine the role of cellular transport (e.g., active, passive, and osmosis) in maintaining homeostasis.
	Suggested Phenomena: Solvents (water) move through a membrane from a low concentration of solute to an area of high concentration, in an effort to reach equilibrium.
	Task 4 Student Directions: Engage: Students gather information about how solvents move through a membrane by observing a demonstration of a zip lock bag containing starch solution is place in a beaker with iodine provided by the teacher.
	Explore: Students gather information (through a provided reading or online resource) on how osmosis affects cells in various solutions. Students plan and carry out investigations to answer questions about how solute concentration affects cells using 3 grapes, 20% NaCl solution, water, beakers, labels and a scale.
	Explain: Students construct an explanation for the changes in the mass of the grapes.
	Elaborate: Students gather information (through a provided reading or online resource) on how cellular transport assists cells in maintaining homeostasis.
	Evaluate: Students provide explanations to determine the role of cellular transport in maintaining homeostasis.
	Extend: Students provide explanations of how salt water fish are able to withstand living in a hypertonic ecosystem.
	Teacher Notes:





In this activity, students will demonstrate osmosis with grapes, salt and water. For teacher demonstration, at the beginning of class, fill a plastic baggie with a teaspoon of corn starch and a half a cup of water tie bag. Fill a beaker halfway with water and add ten drops of iodine. Place the baggie in the cup so that the cornstarch mixture is submerged in the iodine water mixture. Students will notice the color change after the iodine has moved into the bag it will turn blue. This will open up a discussion about diffusion and osmosis. The students should then gather information about osmosis, including hypertonic, isotonic and hypotonic concentrations, in order to make predictions about what will occur in the experiment that they design. Sample experiments include finding the initial mass of the three grapes, placing them in at least 100ml of each solution in beakers. The students will return during the next class period to collect the final mass by using a towel and gently rolling the grapes to ensure the grape is dry but all liquid inside the grape is maintained. Students should find that the mass of the grapes placed in a hypotonic solution or hypertonic solution will change. The students must demonstrate their understanding that the water is moving to the area of the most concentration of solutes in their explanations. A possible extension to this activity would be to allow students to redesign their investigation to further examine a variable of their choice using household items.

Crosscutting Concepts: Cause and Effect, Structure and Function

	In the a	areas below, place	an	"X" in the	box(es) to i	ind	dicate the selected s	stra	tegie	s and resourc	es.		
		OPENING: Engaging Instructional Activity		Activate Prior Knowledge Prefix/suffix o Questions fro yesterday Provide Feedb	f the c m	lay		Questioning (Raises questions) Scaffold Instruction		Less	ify Previous on ate Interest	Phenomenon Other:		
Inst	earch-Based ructional Strategies: kly strategies chosen to	WORK PERIOD: Exploring,		Facilitate Lear Engaging ques	stionss			Academic Discussions		Lear	perative ning	Other:		
	e teaching and learning)	Explaining, Extending, and Elaborating	-	Demonstrate/ Model Explain/Apply concepts and	/Exter	ıd		Generating and Testing Hypotheses High-Level Questioning	-	Lear	ependent ming rdisciplinary ting	Other: Other:		
											<u> </u>			
				Summarize Le	sson			Provide Alternate Explanations		Resp	oond to EQs	Other:		
		CLOSING: Evaluating		Allow student their own lear		sess	_	Quick Write		3-2-	1/K-W-L	Other:		
21 st	Century	Teamwork and Collab	ora	tion	x	Innova	atic	on and Creativity		x	Accessing and A	nalyzing Information	x	
	rning Skills: kly strategies chosen to	Initiative and Leadersh	hin v				ical Thinking and blem Solving			x	Effective oral an Communication	d Written	x	
guide	e student engagement)	Curiosity and Imaginat	tior	ion x Flexibility and Adaptability				x	Other:		x			
				Int	erve	ntion	St	rategies						
	Intervention Strat (Tiers 1, 2, 3) Additional Support in)		•	•	•		nstruction for on Students		Strat	egies for Engli	sh Language Learne	ers	
х	Re-Voicing		х	Conferencin	g				х	Visu	als/Realia			
х	Explaining		х	Additional ti	me				х		nt-loading			
х	Prompting for Participation		x	Small group					х		oing/Choral respor	ise		
	x Challenging or countering			x Modify quantity of work				х	Color-coding					
-			х						1	<u> </u>				
х	Asking "Why?" "How"		x	Take studen	ťs dici	tation	_		х			different media		
-					ťs dict ormatio	tation on			1	Pair-	tiple exposures in -share deling	different media		

DCSD RCD Aligned Lesson Plan Template





x Ausing technology x Consistent ward system x Language scriftions: a periaded consistent complex systems x Texa of manipulatives x Assistent technology x Language scriftion: a periaded consistent complex systems x Collboarder work: x Assistent technology x Language scriftion: a periaded consistent complex systems x Foreidad France stander total work: x Manipulatives x Assistent technology x X	Sch	ool District										
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40 index cards for Monday 9/15/17 - today - working on chapter 6 flashcards WOD: hapl(o), hemi
Check on Coloring assignment
Work on completing the remainder of the Chapter 6 Flashcards $(21 + 18 = 39 \text{ total}; \text{ p. } 174)$
chapter 6 flashcard quiz onSeptember 22nd ********************************
WOD: hem(o), herb/a(i)
1/2 period given to work on the remainder of chapter 6 vocabulary words - the remainder are to be completed for homework - checked tomorrow
Started Lab Gummy Bears (Isotonic, Hypertonic, Hypotonic solutions, semi- permeable/selectively permeable membranes, solutes, osmosis and diffusion
Notes on chapter 6 started; some questions from the textbook
chapter 6 flashcard quiz onSeptember 22nd

September 20, 2017; Wednesday
WOD: heter/o hom(e)/o
Notes on chapter 6 continued; some questions from the textbook
chapter 6 flashcard quiz onSeptember 22nd

DCSD RCD Aligned Lesson Plan Template Components of this lesson plan may change according to the needs of the students.





School District	rocus on reaching and reaching	

	September 21, 2017; Thursday	
	WOD: hom, hydr/o	
	Check on Lab: Mealworm Metamorphosis	
	chapter 6 flashcard quiz onSeptember 22nd	
	PPT covering Chemistry in Biology - questions included time permittng!	

	September 22, 2017; Friday	
	WOD: inter, intra, is/o, jug; WOD sheet distributed.	
	check on Lab: Mealworm Metamorphosis	
	check on Lab. Wearworth Wetamorphosis	
	chapter 6 flashcard quiz onSeptember 22nd - today	
Opening (ENGAGE):		
(introduces the lesson;	Opening Details:	
summarizes previous lesson; clarifies misconceptions)	TWin order to SWin order to	
Work Period		
(EXPLORE/EXPLAIN/	Work Period Details:	
EXTEND/ELABORATE): (contains the mini lesson; allows	TWin order to SWin order to	
students to practice concept;		
assess student learning) Closing (EVALUATE):		
(summarizes lesson; ensures	Closing Details:	
understanding; clarifies misconceptions)	TWin order to	
	SWin order to	
	Daily Lesson Plan for Tuesday	
Pre-Instructional Activity:		
Opening (ENGAGE):	Opening Details:	
,	TWin order to SWin order to	
Work Period	Work Period Details:	
(EXPLORE/EXPLAIN/	TWin order to	
EXTEND/ELABORATE):	SWin order to	

DCSD RCD Aligned Lesson Plan Template





Closing (EVALUATE):	Closing Details:
closing (LVALOATL).	TWin order to
	SWin order to
	Daily Lesson Plan for Wednesday
Pre-Instructional Activity:	
Opening (ENGAGE):	Opening Details:
Opening (LNGAGE).	TWin order to
	SWin order to
Work Period	Work Period Details:
(EXPLORE/EXPLAIN/	TWin order to
EXTEND/ELABORATE):	SWin order to
Closing (EVALUATE):	Closing Details:
	TWin order to
	SWin order to
	Daily Lesson Plan for Thursday
Pre-Instructional Activity:	
	Opening Details:
Opening (ENGAGE):	TWin order to
	SWin order to
Work Period	Work Period Details:
(EXPLORE/EXPLAIN/	TWin order to
EXTEND/ELABORATE):	SWin order to
Closing (EVALUATE):	Closing Details:
	TWin order to
	SWin order to
	Daily Lesson Plan for Friday
Pre-Instructional Activity:	
	Opening Details:
Opening (ENGAGE):	TWin order to
	SWin order to
Work Period	Work Period Details:
(EXPLORE/EXPLAIN/	TWin order to
EXTEND/ELABORATE):	SWin order to
Closing (EVALUATE):	Closing Details:
	TWin order to
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