

SINGLE SUBJECT CREDENTIAL PROGRAM SCIENCE LESSON PLAN TEMPLATE

Revised 4.15

For directions on how to complete this form, see EDSC Lesson Plan Directions and Scoring Guide in the SSCP Handbook at www.sscphandbook.org.

Name		CWID		Subject Area	
Survivors- Brittany Bt, J Leroy L, Maria K				Biology	
Class Title	Lesson Title	Unit Title	Grade Levels	Total Minutes	
Biology	Making and Using Energy	Surviving the Extreme	9-10	45 minutes/day	



Next Generation Science Standards	Common Core State Standard Connections
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<p>HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.</p> <p>HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.</p> <p>HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere</p>	<p>CCSS.ELA-LITERACY.RST.9-10.2. Determine the central ideas of conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</p> <p>CCSS.ELA-LITERACY.RST.9-10.5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).</p> <p>CCSS.ELA-LITERACY.RST.9-10.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.</p>
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Lesson Objective(s)	Evidence
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<p>Student Learning Objective: Using their models, SWBAT explain the processes of photosynthesis and cellular respiration and how it relates to each other.</p>	
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Type	Purpose/Focus of Assessment	Implementation	Feedback Strategy	How Informs Teaching
EL	Assess for learning	Students engage in conversations with partners and group, the teacher will walk around the room and engage the students in their groups	informal, verbal	A lot of opportunities to work in groups. The teacher can give ELs the questions he/she will ask ahead of time so they have time to prepare verbal responses
SSN	Assess for learning	Students work on hands-on projects and modeling. The teacher will verbally ask students questions and listen to responses	informal, verbal	Students are given graphs and data tables to fill out, students are given written and verbal instructions



Instructional Strategies

modeling, investigation, literacy or negotiation of expository text

Lesson Introduction/Anticipatory Set

Time	Teacher Does	Student Does
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<p>Day 1 Photosynthesis</p> <ol style="list-style-type: none"> 1. Teacher greets students. 2. Teacher asks students to think about how they think they obtain energy and students are given 20 seconds. 3. Teacher tells students to share their thoughts with their seat partner, and they share for 1 minute. 4. Teacher then asks students where they think plants obtain their energy from. 5. Teacher allows students to again, think and share their thoughts with their seat partner. 6. Teacher facilitates discussion questions, having students contribute using the thoughts they talked about in their think-pair-share. <p>Day 2 Photosynthesis</p> <ol style="list-style-type: none"> 1. Teacher asks facilitative questions to discuss previous day's lesson and answers questions from the previous day's exit slips. 2. Teacher has students discuss their initial models and the revisions they implemented, from the previous day. 3. Teachers facilitate a discussion about students' initial model and review their revisions. <p>Day 3 Cellular Respiration</p> <ol style="list-style-type: none"> 1. When class begins, the teacher will provide tennis balls to each student. The teacher will instruct students to grip the balls as many times as they can in a span of 10 seconds and record their numbers. Students will record results, rest for 10 seconds, and repeat the whole process 8 times. 2. When students finish, the teacher will ask the students to observe their data and see if they can identify a pattern. Students should see a drop off in squeezes each round until it levels off. 3. The teacher will then facilitate classroom discussion by asking why students' number of squeezes decreased each round, where and how we get energy, why we get tired, etc. 4. The teacher will assess students' prior knowledge and determine whether or not pedagogy needs to be adjusted. The teacher will also identify any misconceptions that the students may have and clarify them. 5. The teacher will guide students towards the driving question of the day which is: how are food and oxygen molecules broken down to form energy for the body? 6. The teacher will have students make connections about their own body and how food and oxygen plays a role in their daily lives to make the learning more meaningful. <p>Day 4 Cellular Respiration</p> <ol style="list-style-type: none"> 1. The teacher will have students talk to the person next to them to discuss what they learned the previous days. Students will have 3 minutes to do this. 2. The teacher will then facilitate class discussion in which they will go in greater depth about the process. The teacher will check for understanding and try to clarify any remaining misconceptions. 3. The teacher will also ask students to connect the concept to the students' daily lives and how cellular respiration may affect them. This will make the lesson more meaningful for students resulting in better comprehension of the learning content. 4. The teacher will then instruct students that they will go back to their initial models, and using the new evidence, they will have to revise the models to make them scientifically consistent. 	<p>Day 1</p> <ol style="list-style-type: none"> 1. Students have a seat and give attention to the teacher. 2. students think about how they think they obtain their energy for 20 seconds. 3. Students share for 1 minute what their thoughts were, with their seat partner. 4. Students think about where they think plants obtain their energy from. 5. Students talk to their partners about their thoughts. 6. Students participate in a whole class discussion, talking about what they discussed in their partner groups. <p>Day 2</p> <ol style="list-style-type: none"> 1. Students participate in a discussion reviewing the previous day's lesson and listen to discussion regarding exit slips from previous day. 2. Students discuss their initial models and their initial revisions, with their peers. 3. Students participate in a class discussion about their initial models. <p>Day 3</p> <ol style="list-style-type: none"> 1. Each student will grab a tennis ball and squeeze it as hard as they can for as many times as they can in a span of 10 seconds. Students will record their results, rest for 10 seconds, and repeat process 8 times. 2. Students will recognize that the number of squeezes will decrease each round until it levels off. 3. Students will become interested and engage in classroom discussion regarding why they became fatigued, where energy comes from, how energy is created, etc. <p>Day 4</p> <ol style="list-style-type: none"> 1. Students will engage in think-pair-share of previous day's lesson. 2. Student will participate in classroom discussion regarding concept of cellular respiration. 3. Students will ask questions to clarify any misconceptions and to increase comprehension. 4. Students will think about how cellular respiration affects their daily lives. For instance, how it affects their performance in sports. This will help students connect with the lesson, making it more meaningful for students to learn. <p>Day 5</p> <ol style="list-style-type: none"> 1. Students take their seats and take out their notebooks. 2. Students work on the question of the day. When they are called upon they answer the question. 3. The students listen as the teacher puts all the information together. This is a simple review of the previous content. The students contribute to class discussion by sharing what they know about carbon in the atmosphere.
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Lesson Body		
Time	Teacher Does	Student Does

<p>Day 1 Photosynthesis</p> <ol style="list-style-type: none"> 1. Teacher has students draw an initial model of what they think photosynthesis looks like. 2. Teacher has students share their models with each other. 3. Teacher facilitates a class discussion, having student volunteers to show and talk about their model. 4. Teacher will play the video https://youtu.be/ujx8Zx0KU to show explanation of photosynthesis. 5. Teacher will facilitate a discussion on what was seen in the video and then have students revise their initial model based on what they learned.. 6. Teacher will have students talk about their revisions and why they revised them the way they did, then she/he will further discuss the process of photosynthesis, using diagrams and vocabulary words. <p>Day 2 Photosynthesis</p> <ol style="list-style-type: none"> 1. Teacher gives instructions to student for creating their assessment model. 2. Teacher gives students poster paper, colored pencils, and markers, and puts them into groups of 3. 3. Teacher has students create an accurate model of photosynthesis, using the information and evidence they obtained through peer and class discussions, and the diagrams and videos shown. 4. Teacher circulates the room while students work, monitoring progress and keeping them on task. Teacher is able to assist struggling students and ensure learning goals are being met. <p>Day 3 Cellular Respiration</p> <ol style="list-style-type: none"> 1. The teacher will engage students in collaborative learning and use flexible grouping to form groups of 4 students. English learners and special needs students will be grouped with students that are proficient in both English and science. 2. The teacher will instruct students to create an initial model to illustrate cellular respiration in the breakdown of food molecules resulting in energy. 3. As the students work in their groups, the teacher will walk around the classroom to check for understanding. The teacher will focus on English learners and special needs students to make sure they are on pace with the class. 4. When students finish their initial models, the teacher will instruct each group to present their models to another group. Students will take notes on similarities and differences. 5. Once the students are done sharing their models, the teacher will show a video on the process of cellular respiration: https://www.youtube.com/watch?v=r24HIRHTgVo <p>Day 4 Cellular Respiration</p> <ol style="list-style-type: none"> 1. The teacher will have students go back into their groups to revise initial models. 2. Students will use the new evidence they received from the video and classroom discussions to make their models scientifically consistent with the concept. 3. As students work in their groups, the teacher will walk around the classroom to check for comprehension. The teacher will help with groups that seem to be struggling. The teacher will guide struggling groups in the write direction to meet learning goals. 4. The teacher will also determine if there are any 	<p>Day 1</p> <ol style="list-style-type: none"> 1. Students will draw an initial model diagram of what they think photosynthesis looks like. 2. Students will then share their models with their seat partners. 3. students will participate in a class discussion and volunteer to show their model. 4. Students will watch the video https://youtu.be/ujx8Zx0KU 5. Students will participate in a discussion about what was seen in the video and then revise the model diagrams they created, based on their new evidence. 6. Students talk about their revisions and their reasoning. They participate in a class discussion about the process of photosynthesis, looking at the diagrams. <p>Day 2</p> <ol style="list-style-type: none"> 1. Students listen to their instructions for the assignment for the day. 2. Students receive poster paper, colored pencils, and markers. They are put into groups of 3. 3. Students are to use the information they obtained through discussions, diagrams, and videos, and create a poster illustrating photosynthesis. It should be scientifically accurate, using the obtained evidence. 4. Students are to stay on task and utilize teacher assistance when necessary. <p>Day 3</p> <ol style="list-style-type: none"> 1. Students will be divided into flexible groups. Each group will have 4 students in which English learners and special needs students will be grouped with students proficient in English and science. 2. The student will work together to create an initial model of cellular respiration. 3. Once done, each group will compare their initial models with another group and identify any similarities or differences. 4. Students will watch video pertaining to cellular respiration. Students will receive new information and make connections to their initial models. They will reflect on how consistent their models are and will make mental notes on what changes need to be done. <p>Day 4</p> <ol style="list-style-type: none"> 1. Students will go back into their groups to begin revision of initial models. 2. Students will use new evidence gained from video and discussions to make models scientifically consistent with concept. 3. If any questions or misconceptions remain, students will clarify with the assistance of the teacher. 4. When final models are completed, each group will briefly share their models to the class. <p>Day 5</p> <ol style="list-style-type: none"> 1. Students read along as the teacher reads out loud. Then the students close read on their own and highlight, circle and underline any concepts or words they like or don't understand. They are engaged during discussion. 2. Students watch the video and contribute to the question, "How would elevated temperatures affect earth?" 3. Students work in groups to create their Carbon cycle model. They compare notes with two other
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Lesson Closure				
Time	Teacher Does	Student Does		
	<p>Day 1 Photosynthesis</p> <ol style="list-style-type: none"> 1. Teacher reviews what has been discussed throughout the lesson including discussions, models, and the video. 2. Teacher explains to students that they will be completing a final model the following day, using what they have learned today. 3. Teacher has students complete an exit slip asking what they learned and what questions they still have. <p>Day 2 Photosynthesis</p> <ol style="list-style-type: none"> 1. Teacher discusses what should be incorporated in the final model. 2. Teacher has a couple groups volunteer to show their model poster and facilitates discussion about what was learned. 3. Teacher explains what will be discussed tomorrow. <p>Day 3</p> <ol style="list-style-type: none"> 1. The teacher will then facilitate classroom discussion about the process of cellular respiration in relation to food and oxygen breakdown. Key vocabulary will also be discussed. 2. The teacher will ask students to reflect on their models to see if they are scientifically consistent with the process that they just learned. 3. The teacher will also inform students that they will be using the newly acquired information to go back to revise initial model to make it scientifically consistent. 4. The teacher will then ask the students to complete an exit slip, stating what they learned today. <p>Day 4</p> <ol style="list-style-type: none"> 1. The teacher will reinforce the concept of cellular respiration and go over main points of the models. 2. The teacher will have students reflect on their models to see how consistent they are to the actual concept. Students will also determine if they have met the learning goals of the lesson. <p>Day 5</p> <p>The teacher facilitates a whole class discussion to get a class consensus model on carbon cycling.</p>	<p>Day 1</p> <ol style="list-style-type: none"> 1. Students participate in a discussion reviewing the day's ideas. 2. Students listen to what tomorrow's lesson will entail. 3. Students complete an exit slip on what they learned, and any questions they have still. <p>Day 2</p> <ol style="list-style-type: none"> 1. Students listen to what is expected in the final model. 2. Groups volunteer to show their final model and explain what they created. 3. Students listen to what will be discussed tomorrow. <p>Day 3</p> <ol style="list-style-type: none"> 1. Students will engage in classroom discussion about the video of cellular respiration. Key vocabulary will be analyzed to help increase academic language. 2. Students will complete exit slip stating what they learned during the lesson. <p>Day 4</p> <ol style="list-style-type: none"> 1. Students will listen to the teacher as they reinforce main concept of the lesson 2. Students will reflect on their models to determine if they met learning goals. 3. Students will apply concept learned to real life applications. <p>Day 5</p> <p>The students contribute their ideas and work together to create a class consensus model on carbon cycling</p>		
Instructional Materials, Equipment, and Multimedia				
Co-Teaching Strategies				
DIFFERENTIATION				
English Learners	Striving Readers	Students with Special Needs	Advanced Students	
Students will be given a vocabulary list beforehand.	Teacher will read first, and then allow students time to read on their own. The teacher will work with struggling readers as a separate group.	Students are working in groups that will allow for optimal performance.	Students are working in groups that will allow for optimal learning and challenging conversations.	
REFLECTION: SUMMARY, RATIONALE, AND IMPLEMENTATION				

