Unit Plan Part II Template

Use the table below to complete part 1 of your Unit Plan Assignment.

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| Objective | Possible Teaching Strategies | Final Choice | Rationale |
| 1. List 3 types of organic compounds our bodies use for energy. | * Teacher directed lecture * “Who stole Jerell’s iPod” lab activity exploring the characteristics of organic compounds. | “Who stole Jerell’s iPod” lab activity exploring the characteristics of organic compounds. | Instead of simply telling the students the major classes of organic compounds, they will discover their characteristics on their own. |
| 1. Describe the general process of cellular respiration | * Teacher directed lecture explaining the process of cellular respiration * Cellular Respiration animation video | Brief overview lecture of cellular respiration with an animated video to illustrate abstract concepts | Cellular respiration is a difficult process to simulate in a lab, and the video would accommodate for this difficulty |
| 1. Recall the general equation of cellular respiration | * Teacher directed powerpoint | Teacher directed powerpoint | The cellular respiration equation is extremely basic. Anything of this nature at the knowledge level can simply be displayed in a powerpoint. |
| 1. Describe the various phases of cellular respiration, including the reactants and products | * Teacher directed lecture * Online simulation | Online simulation | The phases of cellular respiration are very complex, so it would be best for students to explore the phases on an interactive website. (ex: khan academy). |
| 1. Compare the process of fermentation to the general process of aerobic respiration | * Teacher directed lecture * Fermentation Lab (Root Beer, yeast, etc) | Fermentation Lab (Root Beer, yeast, etc) | Students would be much more engaged in the “making root beer” than listening to lecture. The pre-lab and post-lab will also contain any other needed components. |
| 1. Explain the process of alcoholic fermentation, including the reactants and products. | * Teacher directed lecture * Fermentation Lab (Root Beer, yeast etc) | Fermentation Lab (Root Beer, yeast etc) | Students would be much more engaged in the “making root beer” than listening to lecture. The pre-lab and post-lab will also contain any other |
| 1. Explain the process of lactic acid fermentation, including the reactants and products. | * Teacher directed lecture * Also mentioned in Fermentation Lab * Running video | I would show a video that explains lactic acid fermentation in the context of running. This would complement the fermentation lab. | Videos and labs are much more engaging than lecture. |
| 1. Explain the process of the Krebs cycle | * Teacher directed lecture * Lotzer’s Krebs Cycle Locomotion activity | Lotzer’s Krebs Cycle activity | Lotzer’s activity is a great, new way to teach the Krebs cycle that really engages students |
| 1. Identify the main function of the electron transport chain | * Teacher directed powerpoint * ETC animation video | ETC animation video following a powerpoint | The ETC is very complex and for the purposes of freshman biology, a simple video will suffice. |
| 1. Identify the 3 ATP stores in muscles | * Teacher directed lecture * Also mentioned in Fermentation Lab * Running video | Lecture and running video following the lab day | The connection to sports will engage the students and help them understand the concept |
| 1. Explain “oxygen debt” in relation to running | * Teacher directed lecture * Also mentioned in Fermentation Lab * Running video | Lecture and running video following the lab day | The connection to sports will engage the students and help them understand the concept |
| 1. Compare and contrast the process of photosynthesis and the process of cellular respiration | * Teacher directed lecture * Spark Lab: measure O2 production in plants. | SPARK lab | The spark labs are more interactive than a normal lecture and allow the students to use science literacy skills. |
| 1. Distinguish which organisms use photosynthesis and which organisms use cellular respiration | * Teacher directed lecture * Spark Lab: measure O2 production in plants. * Also mention Fermentation Lab (Root Beer, yeast, etc) | This concept is covered both in the fermentation lab as well as the spark lab | This concept is covered both in the fermentation lab as well as the spark lab |

Use the table below to complete part 2 of your Unit Plan Assignment.

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| Objective | Possible Assessment Strategies | Final Choice | Rationale |
| 1. List 3 types of organic compounds our bodies use for energy. | * Turn in lab packet for a grade * Science skills check during lab | * Turn in lab packet for a grade. Instructor checks lab skills during lab. | This is the most appropriate assessment for the work that the students are putting into the lab. |
| 1. Describe the general process of cellular respiration | * Guided movie notes worksheet * Pop quiz * Partner checks throughout lecture | Partner checks throughout the lecture in which partners discuss the most recent point and quiz each other. | This is a quick way to assess student knowledge and it allows them to repeat the information verbally. |
| 1. Recall the general equation of cellular respiration | * Pop quiz * Worksheet | Pop quiz at the beginning of next class | The equation is a simple knowledge question that the students should be able to memorize. |
| 1. Describe the various phases on cellular respiration, including the reactants and products | * Guided worksheet with online simulation * Quiz | Simulation Worksheet | A worksheet will not only keep the students on task but ensure that they have covered the correct information |
| 1. Compare the process of fermentation to the general process of aerobic respiration | * Hand in lab packet for a grade * Check lab skills | I would assess the fermentation lab the same way as the organic compound lab | This is the most appropriate assessment for the work that the students are putting into the lab. |
| 1. Explain the process of alcoholic fermentation, including the reactants and products. | * Hand in lab packet for a grade * Check lab skills | This objective would be assessed along with the previous objective | Knowledge of alcoholic fermentation is best assessed along with the lab activity. |
| 1. Explain the process of lactic acid fermentation, including the reactants and products. | * Video notes sheet * Pop quiz at the end of the video | Video note sheet | A guided video note sheet is an easy way for the students to show that they have paid attention, and it leaves them with their own record of the information. |
| 1. Explain the process of the Krebs cycle | * Demonstration * Worksheet | Group demonstration (reenactment) of the Krebs cycle for the instructor | This allows the students to demonstrate what they know and the instructor to take a formative assessment. |
| 1. Identify the main function of the electron transport chain | * Questions throughout lecture * Worksheet | Questions throughout lecture | This is a process that is best discussed in a lecture setting where students can ask questions as a class. |
| 1. Identify the 3 ATP stores in muscles | * Questions throughout lecture * Pop quiz | Pop quiz (Half sheet of paper at the end of class. Not for a grade) | A quick concept check quiz would ensure that the instructor knows if the students have grasped the information. |
| 1. Explain “oxygen debt” in relation to running | * Essay on unit exam * Essay on guided note sheet for video | Essay on notes sheet and unit exam | Essay questions can be tough for students, so I would want them to think through this process twice. |
| 1. Compare and contrast the process of photosynthesis and the process of cellular respiration | * Spark lab packet * Unit exam | Both spark lab packet and unit exam | This is an important concept in biology and should be thoroughly stressed. |
| 1. Distinguish which organisms use photosynthesis and which organisms use cellular respiration | * Spark lab packet * Fermentation lab packet * Unit exam | Both lab packets and unit exam | This is an important concept in biology and should be thoroughly stressed. |

Use the table below to complete part 3 of your Unit Plan Assignment.

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| Science Laboratory Skill | Related Objective(s)? | Teaching Strategy? |
| Use of indicators | 1 | Organic Compound Lab |
| Measuring liquids | 1, 5, 6, 12 | Organic Compound, Fermentation and SPARK lab |
| Use of SPARK equipment | 12 | SPARK lab |
| Calculating averages/percent | 12 | SPARK lab |

Use the table below to complete part 4 of your Unit Plan Assignment.

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| --- | --- | --- |
| Science Literacy Skill | Related Objective(s)? | Teaching Strategy? |
| Make predictions | 1,5,6,12 | Organic Compound, Fermentation and SPARK lab |
| Evaluate scientific information | 1,5,6,7, 12 | Running Video, Organic Compound, Fermentation and SPARK lab |
| Pose and evaluate arguments | 1,5,6,8,12 | Krebs Activity, Organic Compound, Fermentation and SPARK lab |

**Unit Plan Overview (Part 5)**

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| **Day** | **Objective** | **Teaching Strategy** | **Assessment Strategy** | **Notes** |
| 1 | 1. List 3 types of organic compounds our bodies use for energy. | “Who Stole Jerell’s iPod” Lab day 1 | Lab skill check | Materials for Organic compound lab |
| 2 | 1. List 3 types of organic compounds our bodies use for energy. | “Who Stole Jerell’s iPod” Lab day 2 | Hand in Lab packet | Materials for Organic compound lab |
| 3 | 1. Describe the general process of cellular respiration 2. Recall the general equation of cellular respiration 3. Describe the various phases of cellular respiration, including the reactants and products | Lecture, Animation, and Online simulation | Partner checks, pop quiz, and Simulation Worksheet | Computer lab, animation video |
| 4 | 1. Compare the process of fermentation to the general process of aerobic respiration 2. Explain the process of alcoholic fermentation, including the reactants and products. | Fermentation Lab Day 1 | Lab skill check | Materials for Fermentation lab |
| 5 | 1. Compare the process of fermentation to the general process of aerobic respiration 2. Explain the process of alcoholic fermentation, including the reactants and products. | Fermentation Lab Day 2 | Hand in Lab packet | Materials for Fermentation lab |
| 6 | 1. Explain the process of lactic acid fermentation, including the reactants and products. 2. Identify the 3 ATP stores in muscles 3. Explain “oxygen debt” in relation to running | Running video | Video notes sheet and pop quiz | Running video |
| 7 | 1. Explain the process of the Krebs cycle | Krebs cycle activity | Demonstrate for instructor | Lotzer’s Kreb Cycle demo kits |
| 8 | 1. Identify the main function of the electron transport chain | ETC animation video following a powerpoint | Questions throughout lecture | ETC video |
| 9 | 1. Compare and contrast the process of photosynthesis and the process of cellular respiration 2. Distinguish which organisms use photosynthesis and which organisms use cellular respiration | SPARK lab day 1 | Concept check | SPARK units and lab setups |
| 10 | 1. Compare and contrast the process of photosynthesis and the process of cellular respiration. 2. Distinguish which organisms use photosynthesis and which organisms use cellular respiration | SPARK lab day 2 | Hand in lab packet | SPARK units and lab setups |

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| --- | --- | --- | --- | --- |
| 11 | ALL | Review game | Game | Nerf gun (for review game) |
| 12 | ALL | na | Unit Exam | Testing materials |