

Learn Biological Sciences and Mathematics through cellular respiration, photosynthesis and primary productivity.

Learning Objectives

1. Students will learn what is cellular respiration, photosynthesis and primary productivity.
2. Students will learn how to collect, organize, represent, visualize and analyze data.

Teaching

Students will be taught cellular respiration, photosynthesis and primary productivity using text and visual aid resources for example resources from HHMI Biointeractive – Cellular respiration <https://www.biointeractive.org/taxonomy/term/311> and Photosynthesis <https://www.biointeractive.org/classroom-resources/photosynthesis> and energy <https://www.biointeractive.org/classroom-resources/exploring-biomass-pyramids>

Learning

1. Each student will open, observe and play the below simulation for 10 min and identify the component of left box & graph axis and interpret their function as they observe.

<https://www.biologysimulations.com/cell-energy-sim>
2. Each student will then discuss the function of each component (variable on the left box next to graph) and the below graph to their peer student and share out to classroom.
3. Instructor will then play the simulation asking students in group to predict the outcome of experiment and then ask student to observe the outcome, discuss the observed outcome with their peers and finally reflect on the outcome on Google doc.
4. Observe the graph on simulation by varying the variable and ask students to participate in See think wonder activity.
5. Students will develop a testing hypothesis, play the simulation to collect the data by changing the variables to collect, organize, visualize, represent and analyze data using Google and MS Sheet constructing & calculating central tendencies - mean, median and mode. Further creating Z-distribution and apply statistical test to test the hypothesis and explore correlation & regression and dependency of data.
6. At the end asking students to share the response on Padlet as What you used to think and what you think now.
7. Students on Google Slides / Microsoft Power point will create a power point slides to evaluate the results and select a group leader to elaborate the relationship between cellular respiration, photosynthesis and primary productivity in context & interface of biology and mathematics.

Assessment

Constructive response questions are available as worksheet from below link

<https://drive.google.com/drive/folders/1JvYsJoiR6AdE1SEs52Uw1IBUYwVYRgoR?usp=sharing>

