

Carbon dioxide
oxygen animals are
producing consuming
essay sample

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Carbon Dioxide/ Oxygen Animals are Producing/ Consuming Essay Sample

Introduction

Every cell needs a source of energy in order to perform their daily functions. However the process to get this energy is different for plant and animal cells. Plants cells undergo a process called photosynthesis where light energy from the sun is used to convert carbon dioxide and water into glucose and oxygen. For animal cells, the process is known as cellular respiration by which cells break down complex molecules, such as sugars, to release carbon dioxide. The complex chemical reactions of photosynthesis and cellular respiration help meet the energy needs of living things. (Cellular Respiration) In this experiment you will be testing the amount of carbon dioxide and oxygen produced or consumed during photosynthesis and cellular respiration. The weight of each of the insects was also a factor in determining the rate of respiration. Our hypothesis was that the rate of respiration/ amount produced or consumed would be greater with the insects of greater weight because they require more energy.

Materials

LabQuest2

2 Vernier Gas Sensor

2 250mL bottles (Biochambers)

Small insects

Forceps

Electronic balance

Procedure

The independent variable would be the different insects (cricket, grasshopper, and superworm), the dependent variable, which is measured, would be the amount of time in the biochambers, and the controlled variables would be the size of the biochambers. Now that we are aware of the variables, the mass of each group of insects was measured using gloves and by placing them in their container on the balance. Then each group of animals was placed into different biochambers where we inserted the gas sensor in order to find our calculations. The insects sat with the sensor in the bottle for ten minutes then the Labquest collected the data for each insect after the ten minutes had expired. If using the same biochamber and gas sensor we made sure to fan them for a minute in order to allow them to cool down to determine next measurements. For each type of insect, we then divided the slope of the line by the mass in order to determine the rate of respiration per gram of the body mass. After safely removing the insects from the chambers and returning them to their correct storage container, we rinsed and dried the chambers to complete this lab experiment.

Results/ Observations

1. In this table the mass, slope, and rate of respiration of the animal are shown. The negative numbers in the slope and rate columns refer to the biological significance is that oxygen is consumed during cellular respiration. This causes the concentration of oxygen to decrease as glucose is oxidized for energy.

2. This data was recorded from the labquest after removing the gas sensor. These numbers refer to Graph 1 and show the amount of gas consumed by each insect. Table 2. Oxygen Produced/ Consumed by Small Animals

1. This graph shows the amount of oxygen consumed by the insects and their rate of respiration. The rate of respiration was found by dividing the slope of the line (m) by the mass of the animal. Graph 1. Oxygen consumed in given time

Discussion/ Conclusion

The purpose of this experiment was to calculate the amount of oxygen consumed by the insects during cellular respiration. From this we can conclude that our hypothesis the rate of respiration/ amount produced or consumed would be greater with the insects of greater weight because they require more energy. The data from the tables and graphs prove this to be false, because the rate of respiration was the same for two insects. Errors could have possibly occurred during our experiment such as the time needed to calculate, moving the sensor around along with the insects inside. Errors occur in experiments often, so the probability that errors occurred in this one is a very high chance. This experiment applies to the real world because plants and animals are going through photosynthesis and cellular respiration all the time, just at different rates as we learned through this experiment. With each plant or animal different factors apply as to how much is consumed or produce, however we know that the energy required to determine the rate is needed and comes from photosynthesis and cellular respiration.

References

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