

Cell Respiration Lab Rubric

Lab Topics	Points Possible	Points Earned
<p>Pre-Lab Assignment</p> <ol style="list-style-type: none"> 1. What are 3 ways that cellular respiration can be measured? 1 2. What happens to the volume of the gas being measured (O₂ consumption or CO₂ production) when the temperature or pressure changes during the experiment? If pressure and temperature remain constant, will the volume of gas in the respirometer increase or decrease? Explain your answers 2 3. Why is it necessary to add beads to the respirometer with the non-germinating peas? 2 4. Why is it necessary to correct the readings of the respirometers containing seeds with the readings taken from the respirometers containing only glass beads? 2 5. What is the purpose of the KOH in the bottom of the respirometer? 1 6. How long do you let the respirometers equilibrate out of the water and then in the water before starting the timed experiment? 2 		
<p>Complete the Following in Your Lab Notebook</p> <ul style="list-style-type: none"> • Question – write a question to represent the experiment that was conducted (the crickets will be a bonus study and not a part of the question) 5 • Hypothesis – write an “If, then” statement that is based on the question 5 • Variables: independent, dependent, control, and constants 8 • Pea volume listed 2 • Data chart for your lab group and class mean data 8 • Graph: title (2pts), correct labeled axes with correct scale and units (6pts), correct data points and key provided (4pts) 12 <p>Discussion Questions</p> <ol style="list-style-type: none"> 1. Write a hypothesis for the effect of temperature change on cell respiration. 2 2. Draw a graph to represent the effect of temperature change ranging from 0°C to 50°C. Label the axes and give the graph a title. Explain your reasoning for the shape of the graph. 5 3. Describe the relationship between the amount of O₂ consumed and time. 4 4. Calculate the rate of O₂ consumption of the germinating, dry peas, and crickets using time 0 and 20 minutes. Recall that rate = $\Delta y / \Delta x$ (slope calculations). 6 5. Explain the effects of germination on pea seed respiration. 5 6. How would respiration be impacted if the peas were allowed to germinate for 48 hours before the start of the lab instead of just 24 hours? 4 		

7. Why did the vial have to be completely sealed around the stopper? Your explanation should include the gas laws.	4	
8. Explain why water moved into the respirometers' pipettes.	4	
9. If you used the same experimental design to compare the rates of respiration of a 25g reptile and a 25g mammal at 10°C, what results would you expect? Explain your reasoning.	4	
10. You then repeated the experiment from question 9, but at a temperature of 22°C instead. Predict how these results would differ from the measurements made at 10°C, and justify your prediction.	4	
11. Again, you repeat the experiment, but use the 25g mammal at 22°C and a 25kg mammal at 22°C. What results would you expect? Explain your reasoning.	4	
12. Describe the difference in respiration between the peas and the crickets.	4	

Total = 100