

Biology
Unit 4
Aerobic vs. Anaerobic Activity

Name _____
Date _____
Hour _____

Objective: Students will observe the effects of anaerobic respiration through a “hands-on” activity involving repeated stimulation of muscles.

Materials Needed:

- Stopwatch
- Biology book
- Lab

Introduction: Cellular respiration is the process of breaking down the glucose molecule and in the process removing the energy from the bonds that were holding it together and using it to convert ADP into ATP. ATP is a form of free energy that allows our body to do work. We are able to most efficiently do this process when oxygen is present, thus the reason we breathe. We call this aerobic respiration. When we continue an activity for an extended period of time, cells run low on oxygen and have to break apart glucose without oxygen. We call this process anaerobic respiration. In today’s lab, we will be investigating the negative effects that anaerobic respiration can have on our bodies.

Procedure:

1. You and a partner will work together to complete this lab. Each member of the group will need to record their own data.
2. With one person starting as the subject and the other the timekeeper, the subject will hold a Biology book out to their side with one arm. As the experiment begins, the timekeeper will time how long the subject can hold the book out at a nearly horizontal position.
3. Record this time in seconds in the chart provided below.
4. Rest for 60 seconds between each trial.
5. Repeat this process for 4 more trials for a total of 5 times.
6. Find the mean or average for your trials.
7. Switch roles and repeat 5 trials for your partner.

Trial 1	
Trial 2	
Trial 3	
Trial 4	
Trial 5	
Average	

Questions:

1. What is the main difference between aerobic and anaerobic respiration? _____

2. Why do we break apart glucose? _____

3. How many ATP molecules can be made from one glucose molecule when oxygen is present? _____
4. How many ATP molecules can be made from one glucose molecule when oxygen is not present? _____
5. What are the waste products of aerobic respiration? _____

6. What is the waste product of anaerobic respiration? _____

7. What causes the burning sensation you felt during this experiment? _____

8. Why do you think your times got shorter for each trial? _____

9. Graph your results in the space below.

