Name: _____ Class: _____

What are the Respiratory and Circulatory Systems' Response to Exercise?

Background Information: When exercising, the body must coordinate a series of responses to enable us to perform. Two major responses include a change in heart rate and breathing rate. Depending on the intensity of exercise, recovery time and individual levels of fitness, these major responses differ greatly between people.

Testable Question: How do heart rate and breathing rate change in response to exercise intensity?

Pre-Lab:

Identify the variables in this experiment:

Independent variable: _____

Dependent variable(s): _____

Controlled variables: _____

Hypothesis: *write a justified hypothesis – explain what you think will happen to the heart rate and breathing rate and give reasons for your predictions using an IF, THEN, BECAUSE statement.*

Lab Procedure:

Method:

1. Measure your resting heart rate and resting breathing rate and record in the table. Use the following methods to calculate:
    a. Resting Heart Rate
        i. Sit down and rest for 2 minutes.
        ii. Turn your wrist so your palm is facing up.
        iii. Feel for a pulse at thumb side of your wrist or at your neck using two fingers
        iv. Once you feel it, count how many times you feel a beat in 30 seconds. Then double it.
    b. Resting Breathing Rate:
        i. Sit down and rest for 2 minutes.
        ii. Count how many breaths you take in 30 seconds. Then double it.
2. Predict your maximum heart rate using the formula: Max HR = (220 – Age).
3. Test A:
    a. Perform 20 squats
    b. Record heart rate and breathing rate: immediately, 30s, 1min & 2min after completing the exercise by measuring each parameter for 15 seconds then multiplying by 4
4. Test B:
    a. Perform 1 minute of maximal effort jumping jacks
    b. Record heart rate and breathing rate: immediately, 30s, 1min & 2min after completing the exercise by measuring each parameter for 15 seconds then multiplying by 4

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Results: Copy the following table into your notebook to record your initial results

Test	Resting Rate		Immediately after		30s after		1 min after		2 min after	
	HR	**BR**	**HR**	**BR**	**HR**	**BR**	**HR**	**BR**	**HR**	**BR**
A: Squats										
B: Jumping Jacks										

Conclusion:

Write a conclusion that answers the question "How do heart rate and breathing rate change in response to exercise intensity?". **Support your answer using data from the experiment**. Use the rubric below to check your work. Your conclusion will be formatively assessed on this rubric.

Rubric for Conclusion:

Level / Criteria	Exemplary	Well Done	Proficient	Developing
Student provides a well supported and thoughtful argument to answer the question	Student provides a **thoughtful argument** i**ncluding several specific lab data results** to support their conclusion. Supplied reasoning demonstrates that the student has a **strong understanding** of the relevant background knowledge.	Student provides a **detailed argument** that **includes specific lab data results** to support their conclusion. Supplied reasoning demonstrates that the student has a **proficient understanding** of the relevant background knowledge.	Student provides a **basic argument** that **includes general data results** to support conclusion. Supplied reasoning demonstrates that the student has a **developing understanding** of the relevant background knowledge.	Student provides a **limited argument** that does **not include accurate data results** to support their conclusion. Supplied reasoning is incomplete and demonstrates that the student has a **beginning understanding** of the relevant background knowledge.