Unit I – Basics of Biology

Chapter 22 The Circulatory & Respiratory Systems

Lab # 22 Circulatory & Respiratory Systems

Introduction

Note to Teacher: *While students are engaged in their lab setting, have them listen to the music track and then the actual song of "Pump It Up. Brain research indicates that when we listen to something different while we are learning something new, neurons will be connected which will help us remember the information more efficiently.*

Background

On this lab dealing with the Circulatory System, we will refer back to Lecture Three dealing with the steps of Scientific Analysis. We are including the steps of the scientific method again so this way, everything will be easier for you. You will
use this type of analysis to conduct this lab.

In most lab manuals, the scientific method is made up of the following steps:
1.) State the Problem.
2.) Create a hypothesis.
3.) Conduct an experiment.
4.) Collect and Analyze the data.
5.) Form a conclusion.

In today's rhythmic world, it is easier to create a mnemonic like PHAT CAC. I will put into perspective how PHAT CAC fits the steps of the Scientific Method perfectly.

1.) State the Problem is represented by the letter P.
2.) Create a hypothesis is represented by the letter H.
3.) Conducting an experiment can be divided into two other subtopics which are arrange the equipment for the experiment represented by the letter A and test the hypothesis which is represented by the letter T.
4.) Collect and Analyze the data is represented by the letters C and A respectfully.
5.) Form a conclusion is represented by the letter C.

In using the scientific method, we are observing three variables. Those variables are the Independent, Dependent, and Control Variables. The Independent Variable is the manipulating variable, the Dependent Variable is the responding variable, and the Control Variable is the norm. For example in the lab demo we do during this lecture, the Independent Variable is the number of minutes our subject is exercising with the stationary bike. Our Independent Variable is five minutes. We have two dependent variables which respond to our independent variables. Those two dependent variables are the heart rate and blood pressure readings of the subject. The control variable is the norm. Our subject's resting heart rate is 70 and the blood pressure reading is 110/69. These readings are the control. The readings for heart rate and blood pressure are all

dependent variable readings.

Strategy

You will conduct an exercise lab for five minutes using either the stairs to your school or a section of the hall. You will need to work in partners.

Teacher's Note: In this exercise, pair up a left brain child with a right brain. This challenges the class to work in a real world scenario. This activity should take approximately 50 minutes. With some students, this activity may take longer.

You will graph the readings of your exercise lab. Use the same format used in the lecture.
You will conduct the challenge activity at the end of the lab.

Materials

six stop watches
six heart rate monitors if available
six stethoscopes
six sphygmomanometers
ezel
poster board

Score:_____

Name:_____ Date:_____
Class/Teacher:_____ School:_____

Procedure

1.) Pair up in partners given by your teacher.
2.) One person will time the exercise, take blood pressure reading, and heart rate. The other person will do the walking up the stairs or running down the hall in time intervals.
3.) As soon as the time intervals are recorded in your lab journal, the person exercising must continue exercising. On the other hand, if you have an exercise bike in your school, use it because this will give you more accurate results on your time intervals and the exercise does not have to stop.
4.) As soon as you record five minutes of exercise, report to your teacher. In the meantime, plug the numbers into your table below.

Analysis

1.) Use Graph One to graph the results of your exercise lab.
2.) Use the x axis to be your independent variable.
3.) Use the y axis to be your dependent variable.
4.) Remember you have two dependent variables the heart rate and blood pressure readings. In your blood pressure readings you will have a systolic and diastolic reading. For this reason you will have three graphs, heart rate to minutes, systolic pressure to minutes, and diastolic pressure to minutes.

Teacher's Note: *Go to timeline 6:58 on Lecture Twenty Two, "Circulatory & Respiratory Systems" . This will help your students to mimic what is being done on the set so that they will have success conducting this lab. You can run the timeline from 6:58 to 8:35.*

As they are conducting the experiment, put the music track to "Pump It Up" in the background. Also put the lyrics to the song on the projector. Let the students roll with the music as they conduct the experiment. This will give them an opportunity to internalize the information. Don't be surprised if a student decides to rap all of their findings on this experiment back to you.

Questions & Conclusions

1.) The Independent Variable in the lab is
_____.

2.) The Dependent Variables are the _____ and
_____.

3.) What is the relationship of blood pressure readings to heart rate readings? Be specific.

4.) Discuss Cardio-Pulmonary Circulation. Be specific. You use an illustration to give your answer.

5.) Discuss Coronary Circulation. Be specific.

6.) Discuss Systemic Circulation. Be specific.

7.) Did your experiment confirm your hypothesis? If the answer is yes, explain. Be specific.

Challenge

You are expected to go to the creative or synthesis level to actually excel in this lab. Your challenge now is to create your own lab using this lab as a model. You can do your lab on exercise, or pH of liquids, or pH of soil. These are just examples of a lab you can create. You must get with your teacher to do the challenge. For those of you who learn easier thru music, your challenge is to create your own version of the "Pump It Up" song that is on the Virtual Science University Lecture 22. You can also use other genres of music like Hip-Hop, Rock, Country, Tejano, Norteno, Folk, and Smooth Jazz. The sky is the limit when it comes to genres of music. Check again with your teacher for this part of the assignment. If you create your own song, contact us at contact@virtualscienceuniversity.com Once we evaluate your song, we may want you to appear on our on-line Inter-Net Show. You may be able to perform with Professor Paul live at Virtual Science University.

Reference:

Gardner, H. (1991). The unschooled mind: How children think and how schools should teach. New York: Basic.

McCarthy, B. (1987). The 4Mat system: Teaching to learning styles with right/left mode techniques. Barrington IL: EXCEL.

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