

Review Sheet/NYS Regents Lab Activity #2 Making Connections (Union-Endicott CS review sheet revision)

Important Terms

Pulse Rate	Dependent variable
Muscle fatigue	Control
Homeostasis	Trial
Hypothesis	Sample size
Independent variable	Histogram

Key Points I

1. In order to find a hypothesis, one looks for **patterns**. For example, we did not see a connection between pulse rate and height, but we did see a connection between pulse rate and exercise.
2. Graphs and data tables present data in a clear, **organized** way that is easy to understand.
3. Pulse rate **increases** during exercise because the cells need to be provided with more **food and oxygen** and more wastes are produced which need to be transported to the **lungs** (CO₂) and the kidneys (urea).
4. Muscles become fatigued, tired, due to waste products building up in them. The waste product **lactic acid** produces muscle fatigue.
5. Organ systems interact in order to maintain homeostasis.

Procedure I

1. Students found their average **pulse rates** after three trials.
2. Class results were graphed in a connected bar graph called a **histogram**.
3. Pulse rates were found to **increase** after exercising.
4. A clothespin was squeezed rapidly for one minute. The number of times that it was squeezed was recorded.
5. The clothespin was squeezed the same way for another minute. The second time produced a lesser number of squeezes for most people due to **muscle fatigue**.

Analysis:

1. Organ systems interacted to maintain homeostasis during exercise. For example:
 - a. The **respiratory** system takes in oxygen, which is transported to cells by the **circulatory** system. As cells use oxygen at a higher rate, an increased heart rate would get the oxygen to the cells more **quickly**
 - b. As muscle cells increase their activity, they produce waste products at a higher rate. These wastes are carried to the **excretory** system by the blood (circulatory system) more efficiently when the heart rate increases.
2. A reliable way to test a hypothesis or a claim is to do an **experiment**.

Key Points II:

1. Know how to design an experiment and how to interpret an experiment's design.

[Steps of an experiment]

Problem/Purpose

Hypothesis

Materials

Procedure

Results/Data

Conclusion

2. **Independent variable:** The variable that the scientist changes. Only one of these in an experiment. This is put on the **x-axis** in a graph.
3. **Dependent variable:** The variable that is influenced by the independent variable. The results. Only one of these in an experiment. This is put on the **y-axis** in a graph.
4. **Control:** The experimental setup without the independent variable. The control serves as a basis to compare the results obtained by manipulating the independent variable.
5. Increasing the number of trials increases the **validity** of the experiment.
6. You should be familiar with constructing a data table and a graph (line and bar).

Procedure:

1. An experiment was designed to determine the effect on exercise on squeezing a clothespin using the "Guidelines for Designing a Controlled Experiment." These guidelines are in your packet, and they were also a part of your independent investigation project.
2. You did the experiment following your **design**.
3. The data was included in a data table.
4. You determined if your data accepted or rejected your **hypothesis**.
5. Suggestions for improvement and further research were included in the final report.