Feel the Beat Lab

Feel The Beat

Factors That Affect Pulse Rate

Background
You have probably noticed that when you walk or run up the stairs at school to get to a class upstairs, you get “out of breath” and your heart beats faster. Why does this happen? Are there other conditions that cause your heart to beat faster or slower?

Your Task
In this investigation, you and your partners will design and conduct experiments to explore how activity can change how your heart beats under different conditions.

Explore
1. Explore the sound of a heart beating using the stethoscope. See if you can detect heartbeats by holding the stethoscope to the neck, back, wrist and ankle. Do the heartbeats sound the same at different places?

2. Think about your observations. Work with your partners to list factors that may affect heart rates.

Experiment: Effect of Movement on Pulse Rate
In this investigation, you will explore how different movements (e.g., jumping rope, running, climbing steps, or jumping jacks) for varying durations affect pulse rate. You will compare that to your pulse rate at a resting stage. Keep a detailed and organized record of your experimental design, data collection and analysis.

Methods For Measuring Pulse Rate
You can count heartbeats by feeling the pulse caused each time the heart pumps blood. Pulse is measured in **beats per minute** (bpm). You should sit quietly for several minutes before measuring your “resting” pulse rate.

Wrist Method: With the palm of your partner’s hand facing up, place the tips of your first two fingers on the fleshy part of your partner’s thumb. Slide your fingers about 2 inches toward the wrist, stop, and press firmly to feel the pulse of blood which each heart beat sends through the artery.

Neck Method: Place the tips of your first two fingers on either side of your windpipe, near the lump, called an Adam’s apple, in the middle of your neck. Press gently until you can feel a pulse.
PROBLEM
Identify the question you will investigate. The problem should be written as a question.

HYPOTHESIS
Predict, based on your experiences, which activity will have a greater effect on pulse rate. Should be written as If ... then... statement.

MATERIALS
- List all the materials needed for your experiment.
- Include the amount needed for each item.
- Should be written in bulleted or numbered sequence.

PROCEDURE
- Design a procedure to collect data to answer your research question.
- Include enough detail so that you or someone else could repeat your experiment.
- Should be written in bulleted or numbered sequence.

VARIABLES
Identify the independent and dependent variables, the constants and the control group in your experiment.

DATA TABLE

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Create a data table to record data related to your experiment. Be sure to have proper column heading and units, title, etc.

Do your experiment and record your findings in your data table. Remember to take a resting pulse count after sitting quietly for 5 minutes.

SOURCES OF ERROR
Think about the data you have collected. Do the data for each trial seem generally consistent? If not, do you need to repeat any trials to correct any errors?
CALCULATIONS
Analyze the data. You have collected pulse rate data for several trials. This is called “raw data”. Do some calculations (average the data) that will help you answer your experimental question? Show an example of each calculation and explain how you made that calculation and why.

GRAPH
Create an appropriate style graph that will help you make sense of your data.

CONCLUSIONS
Interpret the data. What conclusions can you make about the effect of different movements on pulse rate? Did anything surprise you?
Provide data from you lab to support/not support your hypothesis.

VALIDITY
Discuss the validity of your data and your experimental design. Mention possible sources of error. Discuss how improvement could be made to the experiment.

APPLICATION TO REAL WORLD
Discuss the findings of your results and relate them to real life situations.