

National Science Olympiad 2011

Experimental Design

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Background: Your pulse or heart-rate is the number of times that your heart beats every minute. To find your heart-rate place two fingers on your neck just to the left of your trachea and press gently. Count each beat that you feel. The average heart-rate for a resting adult is 60-80 beats per minute.

Task: You are to design and conduct an experiment which explores the relationship between heart-rate and exercise. You have 50 minutes to conduct, write up and clean up your experiment station.

Materials you may use:

The people in your group and a time piece.

You may use the following if brought:

Timepiece, Non-programmable calculator, ruler

Your write-up must include the following parts:

(Rubric points are given in parenthesis):

1. Statement of Problem (2)
2. Hypothesis (4)
3. Variables: dependent (3), independent (3), constants (4)
4. Experimental Control (2)
5. Materials (3)
6. Procedure: including diagrams (6)
7. Qualitative results and observations (4)
8. Data Table (6)
9. Graph (6)
10. Statistics: You must quantify some portion of your experiment; may include average, mean, median, mode, range, line of best fit, etc. (2)
11. Analysis of results and interpretation. (4)
12. Experimental Errors (3)
13. Conclusion: Why your results do or do not support your hypothesis (4)
14. Recommendations for further experimentation (4)
15. Clean/up and Safety: Goggles must be worn during this event. Up to 4 points may be deducted for infractions.

Total points possible = 60

Clean up directions:

Return the stopwatch to me (you can keep your team members). Stack your pages in the correct order and staple. ***Make sure that your name, school, and team number are on EACH page. YOU MUST BE FINISHED WITH YOUR EXPERIMENT, WRITE UP AND HAVE YOUR STATION CLEANED UP IN 50 MINUTES, NO EXCEPTIONS!***

Good Luck