

SCIENCE FAIR - Guidelines

I. Title/Question

Everyone needs a title (the name of your project). It can be in the form of a question. It should be carefully worded and catchy.

II. Purpose

In your purpose you must do three things:

1. **Restate your question.** For example, let's say your question is, "Do fifth grade boys have a different resting heart rate from fifth grade girls?" The first sentence of your purpose should be something like, *"The purpose of this experiment is to determine if gender affects resting pulse rate."*
2. **How did you become interested in this topic?** A sample answer to this might be: *I became interested in this idea because my father's job requires him to take the pulses of adults and this has caused me to think about pulse rates of people my age. I have also been interested in the heart for sometime because I know some people who have heart problems.*
3. **Why is your project important/useful to others?** A sample answer could be: *The information gained from this experiment could assist doctors in knowing healthy pulse rate levels in young male and female adults (about 11 years of age). If a teenager's pulse rate was a lot higher or lower than expected, it might indicate problems the doctor could help with.*

III. Hypothesis (and Background Research)

In your hypothesis, you should discuss two things:

1. **Include some background information.** What did you find out from books or other sources (internet, interviews etc.)? Be sure that these sources are listed in your bibliography.
2. **State what you think is going to happen.** This should be based on your research.

For example, a sample hypothesis is: My hypothesis is that fifth grade girls' pulse rates will be higher than the boys' pulse rates. I base my hypothesis on a statement made in the book, The Circulatory System, "Women's hearts usually beat faster than men's."

IV. Materials

Please include a complete **list** of the materials you used for the project.

V. Procedure

Your procedure should state exactly how you will perform your experiment. It should be very detailed. Anyone should be able to replicate your experiment just by reading through your procedure. Here is a sample procedure:

1. *Obtain permission slips from each test subject.*
2. *Gather materials for experiment.*
3. *Bring one test subject to the testing area.*
4. *Give the subject 3 minutes of seated rest.*
5. *At 3-minute mark take their pulse for 15 seconds*
6. *Record pulse*
7. *At 4-minute mark take 15 second pulse*
8. *Record pulse*
9. *At 5-minute mark take pulse for 15 seconds*
10. *Record pulse*
11. *Calculate the mean of three trials*
12. *Multiply result by 4 (to get the pulse per minute)*
13. *Repeat steps 3-12 for remaining test subjects*
14. *Calculate the mean for each gender*

VI. Data/Charts

Your data should be presented on a well-organized and neat chart or table. Everything should be labeled!! Don't forget units!! For example, is temperature in degrees Celsius?? Is distance in feet or meters or miles? Is time in seconds or hours or minutes or milliseconds?

VII. Results

Your results will describe what happened and what you observed. Below is a sample. In addition to a written statement, you may also want to create a graph of some sort (bar graph, pie graph, line graph, percent circle) to help.

"The original purpose of this experiment was to determine if gender affects resting pulse rate. The results of the experiment were that the bpm of the females was in fact higher than the male bpm by six beats. The overall female average was 85 bpm and the overall for males was 79 bpm."

Conclusion

The conclusion is an explanation and interpretation of your results. What did you find out from the experiment? In order to answer this question you will need to look over your observations and data and think about what it shows. Was your hypothesis (what you expected to happen) correct? Don't be afraid to say that you might have made a mistake. (It's okay if your hypothesis was incorrect.)

You should feel free to write your opinions in the conclusion. Also, be sure to state the limitations of your project. For example, if your project was to find out if dogs were colorblind and you used your dog in the experiment, you can say, "My dog did seem to be colorblind BUT this might not be the same for all other dogs." (You can't say that all dogs would behave the same as yours because you didn't experiment with ALL dogs.)

Here is a sample conclusion:

"My hypothesis was that the girls' pulse rates would be higher than the boys' pulse rates. The results indicate that this hypothesis is correct because the female overall average was 85 bpm and the overall average for males was 79 bpm. This indicates that, on average, the female resting pulse rate is 6 beats higher than the male resting pulse rate.

Because of the results of this experiment, I now wonder how male and female athletes' pulse rates compare. I wonder if the difference in bpm would be higher, the same, or lower than in this experiment.

If I were to conduct this project again, I would have a larger sample size so I could improve the accuracy of this experiment."

VII. References/Bibliography

List of books, articles, pamphlets, people you talked to and any other sources you used for researching your idea and writing the project.

Examples:

Jones, Thomas A., "Monitoring Heart Rates" The Human Body Magazine, June 1999, Vol. 16:27-34.

Peranno, Laura, Telephone Conversation, April 15, 2006.

Silverstein, Alvin Dr., et al, The Circulatory System Canada; Fitzhenrey and Whiteside Ltd. 1994