

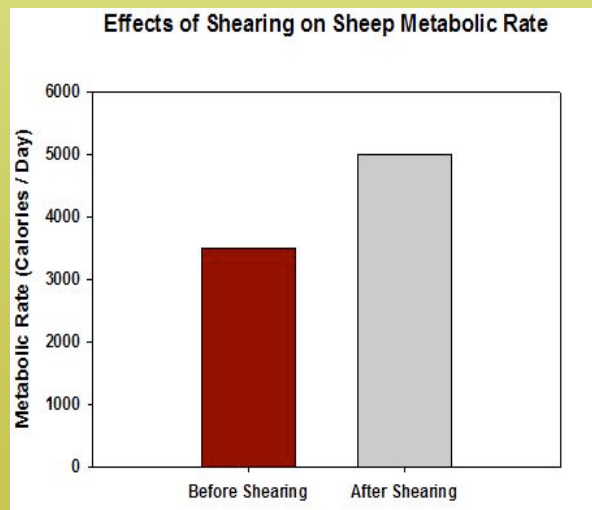
HOW DO I COLLECT DATA AND REPORT RESULT?

COLLECTING DATA

- Maintain a current lab notebook that contains all protocols and raw data
- Consistency is key for accurate, reproducible experiments

CREATING TABLES & GRAPHS

- Any data that shows a strong trend should be graphed
- If exact numbers are important or if the data has no trend, use a table
- Draw out graphs or tables by hand prior to using a graphing program
- Provide a clear, informative title for each graph and table



WHAT SHOULD BE IN MY FINAL REPORT AND ON MY DISPLAY BOARD?

FINAL REPORT CHECKLIST

- Title Page
- Abstract
- Table of Contents
- Questions, Variables, Hypothesis
- Research paper
- Materials list
- Procedures
- Data analysis
- Conclusions
- Acknowledgments
- Bibliography

DISPLAY BOARD LAYOUT

- Use a three-panel display board

Left Panel

- Abstract
- Background research

Middle Panel

- Project title
- Question
- Materials
- Procedures

Right Panel

- Data
- Graphs
- Conclusions
- Analysis

SRA SCIENCE FAIR

Everything you need to know for a successful science fair experience.

GRADES 6th & 9th

Students will be required to complete a science fair project as part of their science grade. They will also be required to participate in the Regional Science Fair in Cheyenne, the school will cover entry fee for the fair.

GRADE 5

Students will complete the preliminary background research and planning for a project.

GRADES 7 & 8

Participation is optional.

If you have additional questions that are not answered by this brochure please contact Mrs. Suter @ 754-9930 or ssuter@acsd1.org

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HOW DO I CHOOSE A QUESTION?

Testable means that you have to do an experiment to find the answer.

- Not a preference question – “Which is more awesome, dogs or cats?”
- Not a judgment question – “Which is the best?”
- Rework this question by defining what “the best” might be. For example, “the best” detergent would be the one that removes the most dirt from dirty clothing for equal amounts of detergent used.

Starts with question words such as How, What, When, Which or Where.

Asks about specific characteristics of what you are testing. For example, Which detergent makes the most bubbles? Which detergent is the thickest?

After coming up with a question, think of how you will make an experiment to test it.

- Can your experiment measure a change in a number, such as the height of bubbles? -OR-
- Can your experiment measure if a change has happened or not?

If you cannot come up with a simple experiment, go back to your question and think how to re-ask it so that you can make an experiment to test it.

- Make a list of characteristics of what you are studying.
- Use these characteristics to make a question that can test one of them.
- For example:
 - Detergent makes bubbles
 - It is used in water
 - Water can be hot, cold or room temperature
 - New question: How does water temperature affect the amount of bubbles made by a detergent?

WHAT IS BACKGROUND RESEARCH?

Your background research paper should be a summary of all information you learn about your chosen topic. It should include:

- Answers to who, what, when, where, why and how questions about your project. (some of your questions can be about the best way to carry out your experiment but most should have to do with information about your topic in general)
- Definitions of all important words and concepts related to your project, especially those that the general public will not be familiar with.
- A history of similar experiments or inventions, it is ok if an experiment like yours has been done before, it gives you something to compare your results too. Just make sure you don't copy someone else's results.
- Any mathematical formulas that you will need to use in your experiment and calculation of results.
- A bibliography listing every reference you used. This includes any pictures and graphics you use.

WHAT IS AN ABSTRACT?

An abstract is a shorter version of your final report. It needs to be less than 250 words and should contain

- An introduction
- Your hypothesis
- Procedures
- Results, and
- Conclusion.

HOW DO I MAKE A HYPOTHESIS & WHAT ARE VARIABLES?

HYPOTHESIS

- Your **hypothesis** is an educated guess of what you think the answer to your question is.
- A hypothesis is sometimes also a prediction of what you think your results will be.
- Often phrased as an “if... then....” statement.
- Example: “**If** I add fertilizer to a potted plant, **then** it will grow taller than a potted plant without fertilizer.”

VARIABLES

- The **independent** variable is the factor that you manipulate in your experiment.
- The **dependent** variable is the factor that you observe to see how it responds to changes you make with the independent variable. *The dependent variable is dependent on the independent variable.
- All other factors (variables) that could affect the outcome of the experiment should be kept constant.
- A good experiment has an **experimental** group, in which you add or manipulate the independent variable, and a **control** group in which you don't manipulate anything. The control group is a standard of reference to compare with the experimental group.
- Example: in the potted plant experiment above, the independent variable is the fertilizer and the dependent variable is the amount of plant growth. Other variables that could affect plant growth and should be kept constant might include sunlight, water, and temperature. A control group could be a potted plant without fertilizer and an experimental group would be a potted plant with fertilizer added.