

ACS Science Fair Timeline 2008-09

Wednesday, Oct 15 th	Pick a final topic
Monday, Oct 27 th	1 st set of Research Info Due (½ Quiz Grade)
Monday, Nov 3 rd	2 nd set of Research Info Due (½ Quiz Grade)
Monday, Nov 10 th	Initial Research paper review (50% of Test grade)
Friday, Nov 21 st	Research Paper Due with corrections made (50% of Test grade) Start the experiment (7weeks)
Tuesday, Dec 16 th	1 st set of results due (Quiz grade) Continue experimenting
Friday, Jan 9 th	Final Results due/Experiment data turned in Composition Book (Quiz grade)
Wednesday, Jan 21 st	Table and Graphs due Initial conclusion due (50% Test Grade)
Friday, Jan 23 rd	Conclusion completed with revisions made/ Final paper due (50% Test grade)
Wednesday, Jan 28 th	Initial Abstract due
Friday, Jan 30	Final Biblical abstract due
Tuesday, Feb 10	Initial Display due (50% test grade)
Friday, Feb 13 th	Final board due (50% test grade)
Tues - Thurs, Feb 17-19	Oral Presentations (Quiz grade)
FRIDAY, FEBRUARY 20 th	ACS SCIENCE FAIR Parent Signature _____

PICKING A TOPIC FOR YOUR SCIENCE FAIR PROJECT

One of the purposes of a science fair is to have you work through the scientific method and do research on your own. When scientists are looking at doing research they first decide what they are going to study. This starts by asking a question. Your research will begin the same way, by asking a question. "Remember that the objective of a science project is to learn more about science. Your project doesn't have to be highly complex to be successful."

There are various ways that you can find a topic for your science fair project. Here are just a few:

1. Look at the world around you. Use your everyday experiences. Do you ever wonder why something happens. Now could be the time to find out. Think about the things around your house, the things you or family members use. Is there a better product? Is there a better way of doing something?
2. Look in magazines or newspapers for topics. Is there something that interests you that you could turn into a question to study?
3. There are many books and websites that offer different project. However, some of the best projects are the ones that are original and not just something you can duplicate. They may however start as a springboard to your own original topic.
4. There are a few restrictions on the topic you may use. You may not use plants. The time restraint is too limited for any measurable results. Also, no live animals, explosives or hazardous chemicals. If you are

considering a topic that requires people to participate, you must have them fill out forms, which you can get from me.

Science Fair Topic Worksheet

What to expect

1. Selecting a topic:

Pick a topic that interests you. Narrow this topic down as much as possible.

BE VERY SPECIFIC.

Example:

Drugs	too general
over-the-counter-drugs	
cold remedies	
Aspirin	
dissolved aspirin	very specific

2. Stating the question:

Put the topic in the form of a question.

Many project titles follow one of these forms:

How will _____ affect _____?
variable result

The Effects of _____ on _____.
variable result

Will _____ when _____?
variable result

3. Definition of terms:

THE VARIABLE is the one factor you wish to change (or use in different amounts) in the experiment. Everything else is controlled. In a controlled experiment everything is given the exact same conditions except for one factor. This factor is your variable.

THE RESULT is the outcome of your experiment. It is what happens because of your variable. You must have measurable results, something that can be counted or measured in order to provide you with DATA. It requires numbers and is measured in units.

Example: Which color of bird seed will birds prefer?

The variable is the color of seeds.

The result is the number of seeds eaten.

(Seeds can be counted to provide data).

4 Definition of a Good Science Fair Topic:

You have a good topic if you can answer YES to these questions:

1. Is my topic realistic? Is it something I can do?
2. Is my topic interesting to me?
3. Can I investigate my topic by experimenting and collecting data?
4. Can I afford what I will need to investigate my topic?

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Name _____ Date _____ Class _____

TITLE: _____

Science area _____

Topic _____

Key Words to research:

_____	_____
_____	_____
_____	_____

Names of reference books I might use:

_____	_____
_____	_____
_____	_____

Supplies that I will need to get:

[] _____	[] _____
[] _____	[] _____
[] _____	[] _____

QUICK SKETCH OF MY PROJECT/EXPERIMENT: May continue on the back of the page

The Research Paper

“What is a science research paper?”

- * It is a well-organized report.
- * It contains information derived from study and reading.
- * It is a blend of the writer’s thoughts and ideas and thoughts and ideas of those authors he reads.
- * It is the result of careful investigation of a scientific topic.
- * It presents the findings of the research in a theme.

Why write a research paper?

- * To learn the skills of gathering information from written sources.
- * To learn to think critically
- * To learn to express oneself clearly and concisely.
- * To learn self-discipline in planning and accomplishing a long-term project.

You have chosen your topic. What’s next?

- * Prepare your science work schedule.
- * Select your working bibliography.
- * Prepare a tentative outline.
- * Research your subject.
- * Write your first draft of your paper.
- * Revise and rewrite the final copy.
- * Refer to the checklist to make sure that your paper meets all the requirements.

What is a working bibliography?

It is a collection of books, magazines, and other source materials that contain information about your topic.

The information is written in your comp book.

Use the sample bibliography to determine where and what information is to be included in your paper. Note the punctuation.

Resources Found at the Library

- * Reader’s Guide to Periodical Literature: Can help you locate magazine articles quickly
- * Card Catalogue: Used to locate books dealing with your topic. They are usually set up by author, title, and subject.
- * The Librarian: Can show you any new resources and help with locating more information.

Checklist of Requirements for Research Information

25 Pieces of research information

Sources:

3 Books

Other: Internet sources

Total Words 700

Grading Sheet for Research Information

_____ Total number of reference information (30 pts)

_____ Total number of sources used (10pts)

_____ Total number of words (30pts)

_____ Correct bibliographic information, a quote from the text, and the page number the information was found. (30pts)

_____ **FINAL GRADE WORTH A QUIZ GRADE**

How to Make an Outline for the Research Paper

First make a tentative outline by thinking of questions you need to answer in your paper. This will help you to determine what kind of information you need to gather and will give you a general idea of what your paper is going to be about. You may need to gather some information before you write this or while you are writing to make sure that you have all the important information.

What does an outline do?

It should tell you where to begin your writing.

It should determine what you write.

It should determine in what order you relate information.

It should determine what material you take notes on as you do research.

It should organize your thoughts and direct your work.

Sample Topical Outline

Reaction to Light by Plants

- I. Why they bend
 - A. Photosynthesis defined
 - B. Photosynthesis needs
- II. How they bend
 - A. Affected by leaf arrangement
 - B. Petiole movement
 - C. Phototropism
- III. Early phototropism experimenters
 - A. Darwin
 - B. Boysen-Jensen
 - C. Went
- IV. Natural or artificial light

Other Outline Requirements

- ⇒ Has three main points
- ⇒ Has at least two subpoints for each main point. If you have an A you must have a B.
- ⇒ The outline should NOT be in sentence form, it should be topical.
- ⇒ Maintain correct spacing. Make sure the Roman numerals line up in one column and the A.B.C. are lined up in another column.

Write an introductory paragraph telling what your paper is about.

Use at least 10 quotes in your paper. Use scientific notation to give credit to the source that you found the information in. After placing the quote inside the quotation marks, in parentheses add the number of the source quoted and the page number from which it came from.

You are not responsible for coming up with all original ideas, but you are responsible for giving credit to the source from which it came.

Follow the Research Paper Check List to make sure you have all the details.

The Science Research Paper Checklist (check each item as it is completed)

General Information (10pts)

1. Type your final copy, use 12 or 14 pt copy
2. Double space
3. Check for spelling error
4. Use correct grammar
5. Proofread before you hand it in
6. Parents need to proofread before you hand it in
7. Parent Signature _____

Report Cover (5pts)

1. Use a clear report cover
2. Have the first page as the title page

Title Page (5pts)

1. Have the title centered in the middle of the page ½ way down
2. On the bottom right hand corner write your name
3. Under your name write your school
4. Under your school write your grade
5. Under your grade write Class and teacher
6. Under your grade write the date

Table of Contents Page (3 pts)

1. Label the top of the page with Table of Contents
2. First, list The Project Abstract
3. Second, list page of the Main Body
4. Third, list the page of the Acknowledgements
5. Last, list the page of your bibliography

Outline Page (12 pts)

1. Label the top of the page with Outline of _____ Paper
2. Write the main points of your paper with Roman Numerals
3. Use capital letters as subpoints
4. Make sure to have at least 3 main points
5. Make sure that each of the main points have 2 subpoints

Main Body of the Paper (20pts)

1. Follow the outline
2. Number each page of the report
3. One section needs to explain a brief discussion of the procedure as it applies to what you are trying to accomplish
4. Use the final paragraph to summarize your report
5. Include 10 quotes

Bibliography (5 pts)

1. Label the top of the page "Selected Bibliography"
2. Use only the sources that you quoted in the paper itself
3. Copy the information from the bibliography card into the list
4. Skip lines between entries
5. List in alphabetical order

Performing the Experiment

To set up a scientific experiment you need to have a general understanding about the subject you are testing. It requires some planning and detailed record keeping. The first thing you need to do is to formulate your hypothesis. This is the question that you will be answering. It should be in an if ... then statement. After you have your hypothesis, then you need to come up with a step by step procedure. Think of it as a recipe for your project. It will include all the materials required along with a numbered set of actions required for your experiment.

You need to determine several factors before you start your experiment. Define all the variables. What is going to change in your experiment and what is going to stay the same. You will need to determine how to set up a control experiment.

The reason for the experimenting serves a few purposes. It is going to support or disprove your hypothesis. Either of these outcomes is ok as long as there is enough data to support your conclusion. Throughout the experiment you will be making observations that will be critical to your final conclusions. You will be recording the results of your experiment in a data table, in your comp book. **RESULTS WILL BE RECORDED IN TERMS OF NUMBERS**, and also general observations.

Come up with the methods and the materials that you will need and have your plan approved by the teacher. Once you have the ok, start the experiment. You will need to repeat your experiment 4 times. The more results you have the better you will be able to draw conclusions. You may have to modify your process as you go along. Make sure that you only have one variable that changes and all the rest of the process is kept the same.

Keep good notes of the things you have tried and plan to include even the “didn’t works” and “mess ups” in your project report. Be sure start your experimenting early. **DO NOT** wait to the last minute.

As you are going through your experiment, take pictures. Not only do they add to your presentation, but they can help explain some of what you do.

EVERYTHING GETS RECORDED IN YOUR COMPOSITION BOOK

Variables

1. Manipulated Variable
2. Responding Variable
3. Controlled Variable

Environmental Variables

- | | |
|----------------------|---------------------------|
| 1. Exposure to Light | 3. Air Temperature |
| 2. Air Movement | 4. Amount of Water in Air |

Name _____ Class _____ Date _____

Experiment Procedure Worksheet

Hypothesis: _____

Manipulated Variable: _____

Responding Variable: _____

Controlled Variables: _____

Control Test: _____

What do I put in my composition book?

Your composition book is the record of everything that you do concerning your science fair project. It will include all of your data, your results and any of your observations. It is a “working” document. That means that it is not going to look perfect. You will probably write things down that you won’t need and may make a mistake. That is ok. Every time you work on your science fair project, I want a date and a summary of what you accomplished.

NEVER TEAR OUT PAGES OR ERASE IN YOUR LOG BOOK

Check list for Composition Book

Name on the outside of the cover
Pages numbered inside, 1st page - #1 etc.

Table of Contents

Scientific Question

Hypothesis

Variables: Manipulated, Responding, Controlled

Materials

Procedure

Drawing of the apparatus constructed for experimentation

Daily entries: include date and what was accomplished

Data tables with results (responding variable)

Graphs

Any calculations made, like averages

Any observations that are part of the experiment – big or small, they may come in handy when you are writing your conclusion and explaining your results. Write something down after each experiment, describing that trial.

You should have 5 paragraphs, 1 for each trial.

25 research quotes and bibliographical references. Bibliography - Use the proper format to list books, encyclopedias, and articles you researched.

Conclusions - What did you prove or find out? Was your hypothesis correct? Compare your initial hypothesis to your actual results. Make a statement on how you interpreted the results. How did it compare to the research you found? Was it similar?

Recommendations

Pages are not to be ripped out of the book, no white out, no big scribbles. Just put a line through any mistakes and begin on a new page. You will not run out of pages.

Display

Sturdy cardboard or foam board make good display boards. In your display you need to state your title, hypothesis, procedure, results, and conclusions. Charts, graphs, tables, or photographs make your display more appealing. When people (parents, other students, the judges) come to our science fair, be prepared to answer any questions they may ask about your science fair project.

The Science Fair Nitty-Gritty

- ❖ Type and double space your papers. Margins- Right 1”, Left 1 1/2”
- ❖ Include a page number on the bottom of each page, this will be important for the table of contents
- ❖ Use metric measurements when recording results
- ❖ Table of contents will list out each section of your report and the page that you find it
- ❖ You may want to include an acknowledgement page to thank those that helped you
- ❖ “Whatever you do, do as if working for the Lord” this includes your science fair. Attention to detail, neatness and a desire to work for excellence will give you an outstanding science fair.

Tips for Completing Work with the Least Amount of Stress

Start early, work on the project every day, every week; make a schedule for your work and stick to it. When the research is done, start the experiment. When that is done, work on gathering your results and finishing your paper or your display. You do not have to wait for the deadline to come and go before you begin the next step.

Work in smaller chunks of time. If you schedule all of Saturday to work on your project you will feel overwhelmed. Use smaller amounts of time or break your larger time slots into smaller manageable segments.

When preparing for your oral presentation, take the time to practice, either in front of a mirror timing yourself, or in front of your family.

On the day of the ACS science fair, make sure that all your material is set up for the display, including your tri-fold board, report, comp book, and any display items that you want to include.