Science Fair Packet

Do Not Lose!

MOUNT PLEASANT
ELEMENTARY SCHOOL

Science Fair Project

Time Line

Make a schedule for yourself. It will keep you on task at a reasonable rate and help eliminate a last-minute rush. Generally, four to five weeks should be plenty of time to complete most projects. Then think of how relaxed you will be when it is done!!

Check off when Complete **Due Date**

_____ **Brainstorm (1-2 Weeks)** _____

- Choose an area of science
- Choose a question
- Identify the problem

_____**Research (1 Week)** _____

- Identify research variables, gather information using books, magazines, internet, and experts in the field.
- Write bibliography, including names of experts (authors, etc.)

_____**Write the Science Fair Proposal for teacher approval** _____

- Write "the question" you will investigate
- Write the types of questions you investigated in your research or will investigate
- Write a hypothesis (based on the research)
- Write down the materials you will need

_____**Do the Project (1-3 Weeks, longer if using plants)** _____

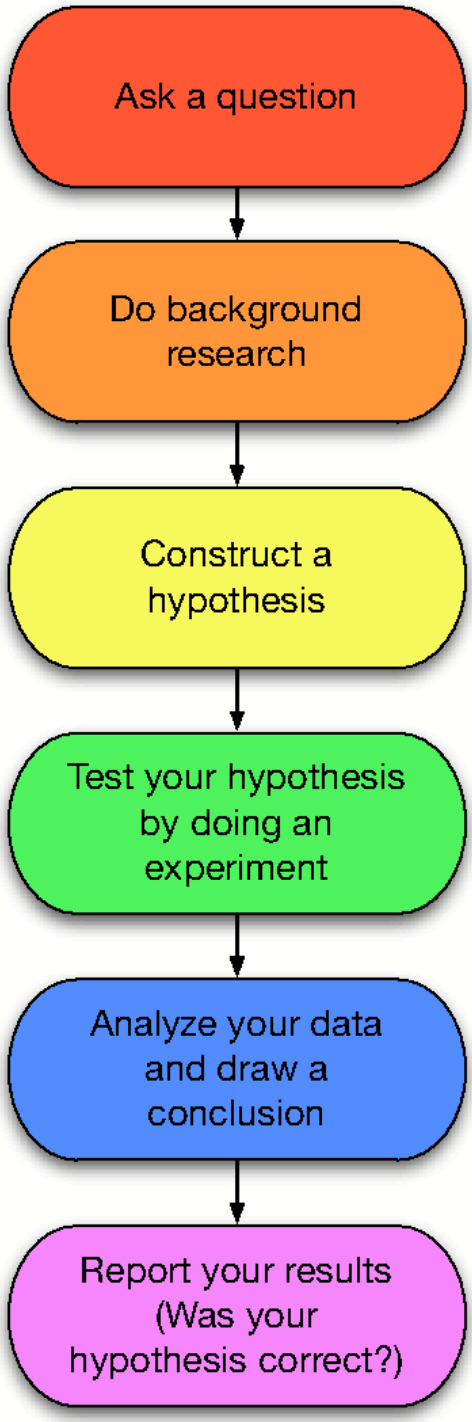
- Gather materials for experiment
- Conduct experiment using the procedure you wrote
- Collect and organize data in more than one way (graph, chart, diagram, andphotographs)
- Write final procedure, background research, hypothesis, conclusions, and etc.

_____**Finalize Your Project (3-5 days) and Turn It In** _____

- Put together your display board

_____**My Oral Presentation in Class** _____

The Scientific Method

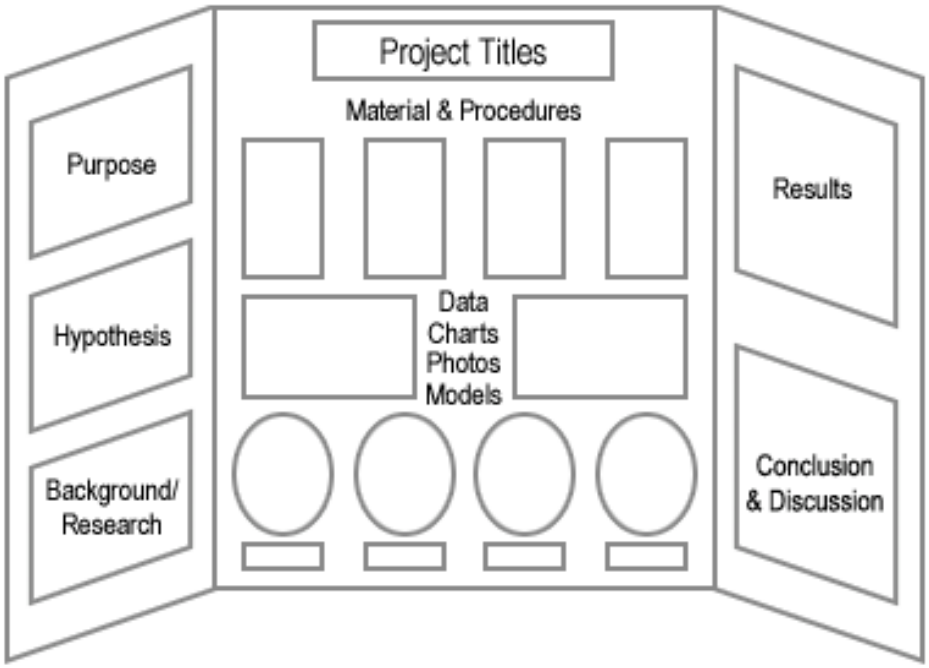


THE SCIENTIFIC METHOD

The Scientific Method is an organized way of figuring something out. There are usually six parts to it.

1. **Purpose/Question**- What do you want to learn? An example would be, "What doorknob in school has the most germs?" or "Do girls have faster reflexes than boys?" or "Does the color of a light bulb affect the growth of grass seeds?"
2. **Research**- Find out as much as you can. Look for information in books, on the internet, and by talking with teachers to get the most information you can before you start experimenting.
3. **Hypothesis**- After doing your research, try to predict the answer to the problem. Another term for hypothesis is 'educated guess'. This is usually stated like " If I...(do something) then...(this will occur)" An example would be, "If I grow grass seeds under green light bulbs, then they will grow faster than plants growing under red light bulbs."
4. **Experiment**- The fun part! Design a test or procedure to find out if your hypothesis is correct. In our example, you would set up grass seeds under a green light bulb and seeds under a red light and observe each for a couple of weeks. You would also set up grass seeds under regular white light so that you can compare it with the others. If you are doing this for a science fair, you will probably have to write down exactly what you did for your experiment step by step.
5. **Results/Data**- Record what happened during the experiment. Also known as 'data'. As you observe your experiment, you will need to record the progress of your experiment. Data can be whatever you observe about your experiment that may or may not change during the time of the experimentation. Examples of data are values in pH, temperature, a measurement of growth, color, distance, and etc. Data should be shown in *more than one way*. Examples of ways to show date; graphs, tables, charts, models, pictures, realia, and etc.
6. **Conclusion**- Review the data and check to see if your hypothesis was correct. If the grass under the green light bulb grew faster, then you proved your hypothesis, if not, your hypothesis was wrong. It is not "bad" if your hypothesis was wrong because you still discovered something! Your conclusion should also include next steps.

The Project Board



You should have the following components on your board

TITLE and QUESTION - The title can be the question in a "catchy" form. If your title is different than your question, then make sure you also include your question.
Ex. Your question might be, "Which bath soap cleans the best?" but your title might be "Splish Splash I Was Taking A Bath."

RESEARCH - You have to include a short paragraph that gives the background information on which you based your hypothesis.

HYPOTHESIS - This is your educated guess based on your research.

EXPERIMENT - This is the procedure you followed to do your experiment. It should follow the scientific method and include:

Materials – Everything you used!

Procedure –Exactly what you did step by step. It should be so clear that someone else could repeat your experiment just by following your steps. Be sure to explain your constants and variables.

DATA - These are your results displayed in a way that your audience can understand. It is usually displayed in a table, graph, or photographs. It is an "analysis" of what you have done. You should show your data *in more than one way*!

CONCLUSION - This is a statement of whether your hypothesis was right or not; if it wasn't right, why you think it turned out the way it did, and what you would do differently next time.

EXTRAS: You should at least do one of the following: ILLUSTRATIONS - These can be photographs that you took or took off the web, that enhance your project. They can also be containers or labels of products you used in your project. ACTUAL MODEL OR EXPERIMENT - This is the actual experiment you did at home or a model of your topic. Ex. If your question was "Does age affect lung capacity?" you might make a model of the human lung or have the actual equipment you used to test this experiment.

COLORS AND TEXT: 1. You can use the labels that you create on your own. Labels created on the computer can be very effective. Try using a different font or color for each of the labels. 2. Use colors that are appealing. They should contrast with your board color. If you have a white board, make your text a bright color(s). Try backing your text with colored paper to make your words come alive. 3. Type your text or print it neatly. Use stencils or premade letters if you prefer. Make your letterings large enough for everyone to see. If you print it, use pencil first and draw guidelines to make sure your writing is neat. Go over your writing with permanent marker and make sure you erase your guidelines.

DISPLAY YOUR DATA: You may display your data in a table or graph. Make sure your graph reflects the kind of data you have collected.

- A line graph demonstrates change over time.
- A bar/picture graph demonstrates a comparison between two or more things.
- A circle/pie graph compares parts to the whole.

Graphs and tables should be neatly done. Use computer generated graphs and tables or make them yourself. Use a ruler ,colored pencils, or markers to make them really eye appealing.

FINISHING TOUCHES:
Make sure you proofread all your written work.
Use rulers.
Don't use pencils. It looks unfinished.
Erase all pencil guidelines.

SAMPLE LAYOUTS:
There is no one correct way to set up your board. It must, however, make sense and follow the steps of the scientific method. Remember:

- If you use a title, you still need the question (or problem).
- Read from left to right and from top to bottom. Group topics that go together like question, research, and hypothesis; materials and procedures; and analysis and conclusion.
- Put pictures and graphs where they fit best and make the most sense.
- Make sure you proofread any written work.

Sample Elementary Science Fair Questions:

- What color of candle burns the fastest?
- What kind of paper can float the longest?
- What shape of clay boat holds the most pennies before sinking?
- What happens to cookies when you leave out one ingredient?
- Which kind of cola do people really like the best? (blind taste test)
- Which kind of detergent washes the most stains out?
- What liquids in my house fizz when I add baking soda?
- What cleans a penny?
- How do different amounts of baking soda affect cookies?
- What food does my pet like best?
- How many seeds do different types of fruit produce?
- How do different style pencils or grips affect writing fatigue?
- What factors affect seed germination?
- What medium is best for seeds to sprout?
- What time of day does a hamster go through a maze faster?
- What type of food or type of birdfeeder attracts the most birds?
- How does smell affect taste?
- Is the heart rate of different animals and people the same after exercise?
- Which gum lasts the longest?
- What product works best to stop stinky feet?
- What temperature makes bread mold grow faster?
- How does egg substitute (or sugar substitute) change recipes?
- Which detergent is best for removing stains?
- What type of paper makes the best paper airplane?
- What is the best type of cup to keep drinks hot? or cold?
- Which type of chocolate melts fastest under a hot light?

What Makes a Good Science Fair Topic?

Ask these questions:

Is my topic realistic? Is it something I can do? Is my topic interesting to me? Can I investigate my topic by experimenting and collecting data? Can I afford what I will need to investigate my topic? Do I have enough time to complete the experiment?

Tips on Science Fair Project Success

Science fairs are a great opportunity for students to show off what they know about science with engaging, well-researched projects that clearly answer a specific hypothesis. All students want their science fair projects to succeed, and by following a few simple tips and ideas, they can be off to a promising start.

Choose a Good Topic

- Choosing the right topic is the first step toward a successful science fair project, since it determines the course of the entire project. Don't just pick the first topic that comes to mind; do your homework and find out if your topic has been researched before and what similar projects have been done, and try to determine what difficulties you might face in trying to complete the project. Choose a topic that's simple enough to complete successfully, but demonstrates your ability to take on a challenge.

Make a Schedule

- Creating a schedule for your science fair project is essential to keeping everything progressing smoothly and giving yourself enough time to complete all the necessary steps. The last thing you want to do is run out of time before the project is completed. Remember to set aside extra time for possible mistakes and re-dos of your experiment, and always budget for more time than you think you'll need. You can never predict everything that will happen with a science fair project, but with some planning, you can make sure you have enough time to deal with it.

Get Expert Help

- Although your science project should be your own work, there's no reason not to get a little help with the more difficult aspects. Finding an expert in your project's topic and asking for his advice can actually improve your project and demonstrate that you were willing to go more in-depth with your subject than required. You may want to contact an expert in your topic during the research phase of your science fair project and include his expertise as part of your background research.

Presentation

- The way you present your science fair project often determines a significant portion of your grade, so don't neglect the presentation after all your hard work is done. Create an engaging project display that clearly demonstrates what your project is and explains your results. Practice your oral presentation until you feel comfortable saying it by heart, and remember to slow down and make good eye contact with your audience when it's your turn to present.

Science Experiment Scoring Rubric

Scientific Method-(1/2 of grade)

4. All parts of the scientific method were clearly represented and followed in doing the experiment. Research was evident

- Statement of problem was clear, measurable, and was the focus of the experiment.
- Hypothesis was an educated guess offering an explanation based on scientific concepts.
- Procedure was clear, detailed, step-by-step directions which could be used to repeat the experiments. Variables were controlled. (A fair test was run.) Multiple tests were run.
- Data collections were highly organized and clearly presented in more than one way. Detailed observations were also included.
- Conclusions clearly stated the findings and offered an in-depth scientific explanations based on the experiment and research as to why the results were obtained.
- Next steps or further questions resulting from the experiment were included.

3. All parts of the scientific method were clearly represented and followed in doing the experiment.

- Statement of Problem was clear, measurable, and was the focus of the experiment.
- Hypothesis was an educated guess offering an explanation based on scientific concepts.
- Procedure was fairly clear step-by-step directions, which included some details. May be somewhat difficult to repeat experiment. Most variables were controlled. (A fair test was run.) Multiple test may or may not have been run.
- Data collections were for the most part organized and presented in more than one way. Observations were included.

2. Most Parts of the scientific method were represented. Little research was evident.

- Statement of problem was somewhat measurable.
- Hypothesis was included.
- Some materials were listed.
- Procedure was somewhat organized. Steps may be missing. Experiment is probably not repeatable for these directions. Variables may or may not have been controlled.
- Conclusion was offered; May not be based on scientific concepts.

1.Many parts of the scientific method are missing. Overall the project lacks organization and scientific basis.

_____ x 2 = _____

Score Total Score on Sci. Method

Science Experiment Scoring Rubric (Continued)

Oral Presentation (1/4 of grade)

4. Presenter's presentation was thorough, well organized, and interesting. The speaker was prepared and delivered his/her 2-4 minute presentation with enthusiasm, poise, clearness (clarity), appropriate volume & pace, and frequent eye contact. The speaker referred often to his/her project and was able to answer questions regarding it.

3. Presenter's presentation was organized, interesting and approximately 2-4 minutes. The speaker was fairly prepared and for the most part delivered the presentation with appropriate volume and pace, some eye contact, and was understandable. The speaker referred occasionally to the project and was able to answer questions regarding it.

2. Presenter's presentation was somewhat organized and interesting. The speaker was somewhat prepared and usually used appropriate volume and pace. The presenter occasionally made eye contact and for the most part was understandable. The speaker may have referred occasionally to the project and was able to answer some questions regarding it.

1. Presenter's presentation lacked organization. The speaker's delivery was difficult to hear and understand, and had little or no eye contact. Speaker did not refer to his/her project and was unable to answer questions regarding it.

_____
Presentation Score

Display Board (1/4 of grade)

4. The proper size display board was neat, creative, and eye-catching. It was well organized with detailed data displayed in more than one way. Clear, appropriate titles, and examples/samples were included. Spelling and grammar were final copy quality.

3. The proper-size display board was neat and creative. It was organized with data displayed in more than one way. Titles were evident. An example/sample may have been included. Most spelling and grammar were final copy quality.

2. The display board was somewhat neat and organized. Data was included and most parts had a title. Many spelling and grammar errors were noticeable.

1. The display board was not organized or neat and had parts missing. Spelling and grammar were poor quality.

_____
Display Score

_____ + _____ + _____ = _____

Total Sci. Method **Presentation** **Display** **Final Score**

Science Experiment Proposal **This paper is due _____**

Students: Complete the proposal and submit to your teacher for approval. Be as complete and specific as possible.

Statement of Problem: (must be clear, measurable, and have a focus of the experiment)

_____
_____
_____

My Research will be on: (What kinds of questions will you investigate?)

_____
_____
_____

Hypothesis: (an educated guess based on scientific concepts)

_____
_____
_____

Materials:

_____
_____
_____

Procedure: (clear, detailed, step-by-step directions, control variables {run a fair test})

_____
_____
_____
_____
_____
_____

Submitted by: _____ Grade_____

Teacher's Comments

____ O.K. as is ____restate problem _____give more details on procedure

_____focus your research on an aspect of your problem

_____please see me (bring this with you)

Parents:

I understand my child has a science fair project due on _____. I understand this project will be a big part of their grade in science for this trimester. I understand failing to do this project will lower their grade in science and in oral speaking. I have read the science fair packet with my child and we understand the requirements for this project.

_____ _____

Parent's Signature Date