

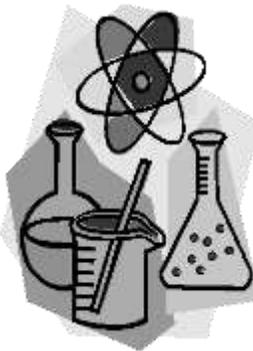
Okay, now get to work on your project!!
What's that? You still need help getting started?



Introducing:
The Most Fabulous, Scientific, All Helpful,
Kid Friendly and Most Excellent Science Fair
Project Planner Known to Kid Kind:

Elementary Science Fair Planning Guide

Just follow these easy steps and you too can create a wonderful
award winning science project, thought up entirely by you!!!



VERY IMPORTANT: Before you turn this page, recruit an
adult to help you. They come in very handy, especially if you
are nice to them and tell them you won't blow up any-
thing....

My adult's name is _____

From this point forward you are now... **A SCIENTIST!!**

The Elementary Science Fair Planning Guide

By Lora Holt (a science lab teacher, pretty cool, for an adult)
With help from Tim Holt (a very smart science and technology dude)
Inspired by past EPISD science packets. [Thank you Margaret Johnson and all past EPISD Science Gurus]
Translated by Morayma Esquivel and Alma Veronica Ortega
(two very awesome science teachers who also happen to speak Spanish)

Table of Contents

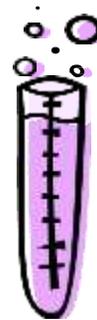
-Or-

What is inside this packet in case you are impatient and you want to jump around

Types of Science Projects (The Good, the Bad and the Scientific Method).....	Page 2
So What the Heck is the Scientific Method?.....	Page 3
Choosing a category that interests you	Page 4
Step One: Coming up with a good question	Page 5
Step Two: Doing the research and forming a HYPOTHESIS	Page 6
Now its your turn: you find the sources and write the hypothesis	Page 7
Step Three: Testing the hypothesis by doing the EXPERIMENT	Page 8
Time Out: How do you collect DATA??.....	Page 9
Now its your turn: Science Project Organizer worksheet.....	Pages 10-11
Step Four: Presentation, (or why you needed all those pictures)	Page 12
What those not so scary judges are looking for/What you should do at science fair Pk-3.....	Page 13
What those not so scary judges are looking for/What you should do at science fair 4-5.....	Page 14
Science Fair Rules and Regulations	Page 15
Website Resources.....	Page 16



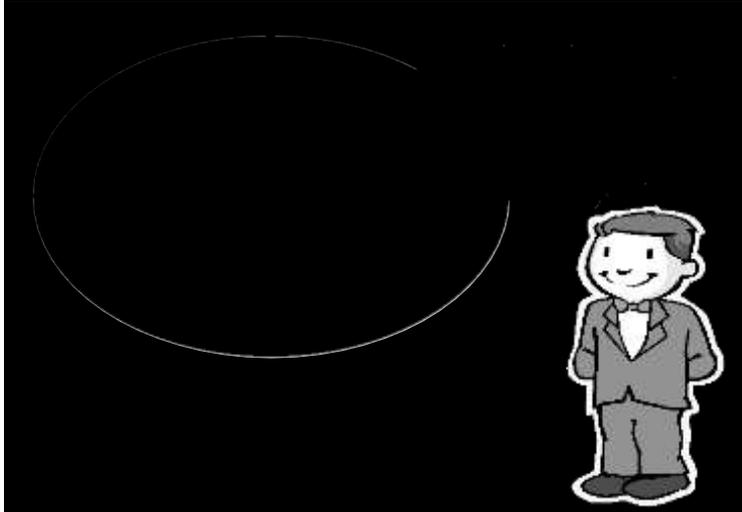
Schedule of Assignments



Due Date	Assignment
Thursday, September 21	*Science Fair packets go home with students where parents will review with students and choose a topic.
Tuesday, September 26	*Topic choice is due
Tuesday, October 3	Assignment #1 is due: Problem/Question & Hypothesis (<i>science grade</i>)
Tuesday, October 10	Assignment #2 is due: Materials & Procedures (<i>science grade</i>)
Tuesday, October 17	Assignment #3 is due: Data, Results & Conclusion (<i>science & math grade</i>)
Tuesday, October 24	Assignment #4 is due: Written Report (<i>science & ELA grade</i>)
Tuesday, October 25	Assignment #5 is due: Background Research/Resources & Bibliography (<i>science & ELA grade</i>)
Tuesday** October 31 by 8:00am	Assignment #6 is due: Final Project-Oral Presentation
Tuesday** October 31 by 8:00am	Assignment #7 is due: Final Project-Display Board
Wednesday, November 8	Project Judging Complete
Thursday, November 9	Science Fair Night - Winners Announced

Types of Science Projects:

There are two types of science projects: Models and Experiments. Here is the difference between the two:



← BORING !!!!!
DON'T DO THIS.....

A Model, Display or Collection:

Shows how something works in the real world, but doesn't really test anything

Examples of display or collection projects can be: "The Solar System", "Types of Dinosaurs", "Types of Rocks", "My gum collection..." Examples of models might be: "The solar system" or "How an Electric Motor Works", "Tornado in a Bottle"

COOL!!!! DO THIS →

An Experiment:

Lots of information is given, **but it also has a project that shows testing being done and the gathering of data.**

Examples of experiments can be: "The Effects of Detergent on the Growth of Plants", "Which Paper Towel is more Absorbant" or "What Structure can Withstand the Most Amount of Weight"

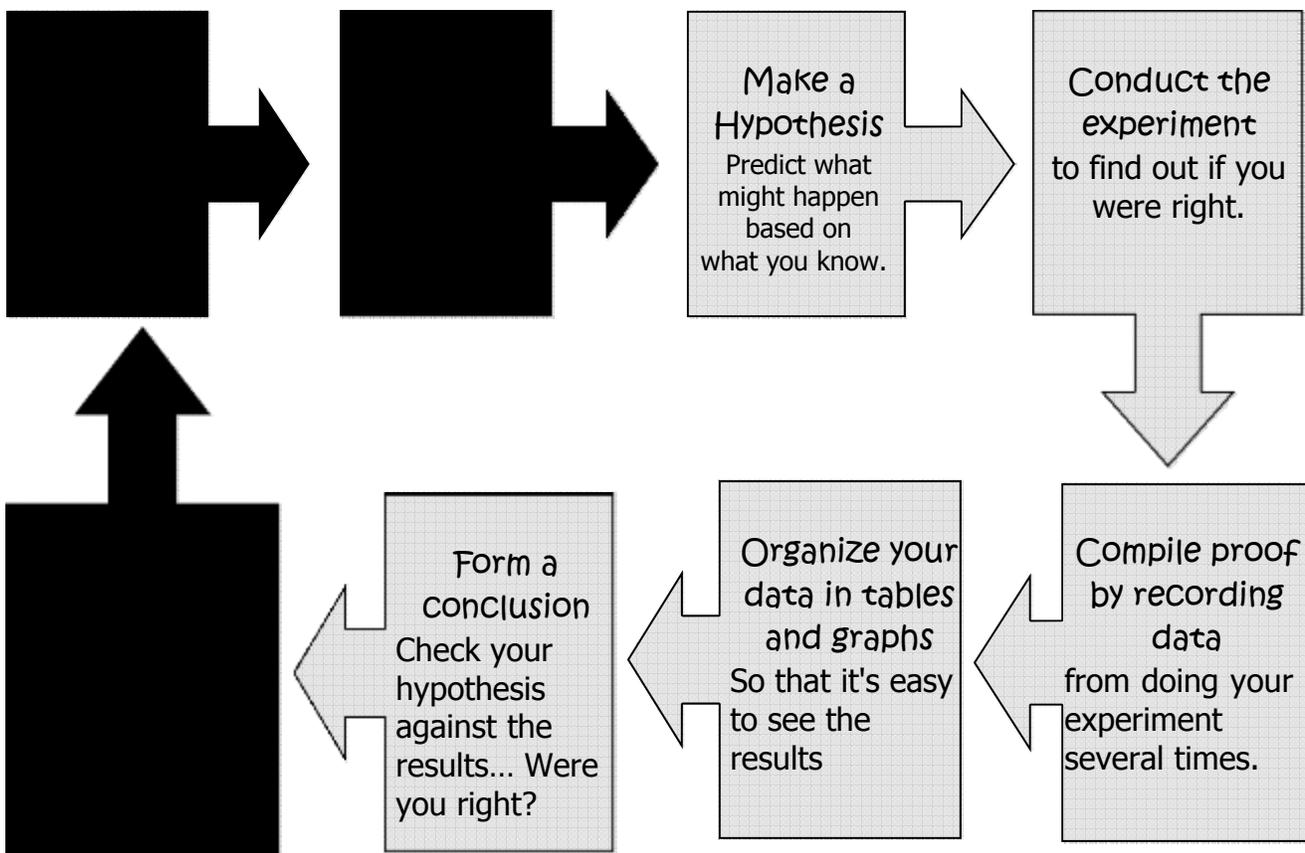
You can tell you have an experiment if you are testing something several times and changing a variable to see what will happens. We'll talk about variables later....



So What Type of Project Should You Do?

Even though you can learn a lot from building a model or display, we recommend that you do an **Experiment!!!** Why? Well, they are fun, they are more interesting and most of all, they take you through the **SCIENTIFIC METHOD**, which is the way real scientists investigate in real science labs. Besides that, the **scientific method** is what the judges are looking for!!

So What the Heck is the Scientific Method?



Choosing a Category that interests you...

All Great Projects start with great questions but before you get started on a great question you need to pick a subject or topic that you like. There are three different categories of the Science Fair to choose from. They are:

Life science: This category deals with all animal, plant and human body questions that you might have and want to do an experiment about. Remember that it is against Science Fair Rules to intentionally hurt an animal during an experiment. If you are dealing with animals, please let an adult assist you. It is okay to do experiment on plants, as long as they don't belong to someone else, like don't do an experiment on your mom's rose bushes unless you ask her first.....

Life science also includes studying behaviors, so it's a perfect category to try taste tests, opinion surveys, animal behavior training (or even training behavior in humans...like baby brothers or sisters...)

Physical Science: If you like trying to figure out how things work, then this is the category for you! It includes topics about matter and structure, as well as electricity, magnetism, sound, light or anything else that you might question, "How does it work and what if I do this to it, will it still work?" But remember, you always need to ask an adult first (and always make sure there is one of those adult guys with you when you try it.)

Physical Science also includes the composition of matter and how it reacts to each other. These are the science experiments that may have bubbling and oozing going on, like figuring out what is an acid and what is a base. It is a perfect category to try to mix things together to see what will happen. Again, if you are experimenting with possibly dangerous things, you need to recruit an adult to help you out.

Earth and Space Sciences: This category is really awesome because it covers all sorts of topics that deal with the Earth or objects in space. This includes studying weather, Geology (which is the study of everything that makes up the Earth, like rocks, fossils, volcanoes, etc.), and the study of all that is in space, including the stars, our sun and our planets. Unfortunately this topic is also where most kids mess up and do a collection or model project instead of an "Experiment," so be careful!!!

Now It's Your Turn:

Write down your favorite Science Fair Category and what it is you want to learn more about:

My favorite Category was _____
(Life Science, Physical Science, Earth and Space Science)

I want to do an experiment involving

Step 1: Coming up with a Good Question...

Now that you have picked out a topic that you like and that you are interested in, it's time to write a question or identify a problem within that topic. To give you an idea of what we mean you can start off by filling in the question blanks with the following list of words:

The Effect Question:

What is the effect of _____ on _____?

sunlight	on the growth of plants
eye color	pupil dialation
brands of soda	a piece of meat
temperature	the size of a balloon
oil	a ramp

The How Does Affect Question:

How does the _____ affect _____?

color of light	the growth of plants
humidity	the growth of fungi
color of a material	its absorption of heat

The Which/What and Verb Question

Which/What _____ (verb) _____?

paper towel	is	most absorbent
foods	do	meal worms prefer
detergent	makes	the most bubbles
paper towel	is	strongest
peanut butter	tastes	the best

Now its your turn:

Create your Science Fair question using either the "Effect Question", the "How does Affect Question" or the "Which/What and Verb Question":

Step 2: Doing the Research and forming a Hypothesis

So you've picked your category and you've chosen a topic. You even wrote a question using our cool fill in the blank template. Now it is time to research your problem as much as possible. Be-coming an expert at your topic is what real scientists do in real labs.

So, how do you become an expert?



YOU READ!!!!

READ about your topic. READ encyclopedias. READ magazine articles and books from the library. READ articles from the internet. Take note of any new science words you learn and use them. It makes you sound more like a real scientist. Keep Track of all the books and articles you read. You'll need that list for later.

YOU DISCUSS!!

Talk about it with your parents. Talk about it with your teachers. Talk about it with experts like Veterinarians, Doctors, Weathermen or others who work with the things you are studying. Sometimes websites will give you e-mail addresses to experts who can answer questions.... But again, do not write to anyone on the internet without letting an adult supervise it. (*hint: take pictures of yourself interviewing people)



Whew.....

Then, when you think that you can't possibly learn anymore and the information just keeps repeating itself, you are ready to.....

Write a Hypothesis

This is the time to PREDICT what you think will happen if you test your problem. This type of "SMART GUESS" or PREDICTION is what real scientists call A HYPOTHESIS. Using this fancy word will amaze your friends and will have you thinking like a full-fledged scientist.

So, how do you begin? Well, just answer this very simple question:

What do you think will happen,
(even before you start your experiment)?

Example Problem: Which Paper Towel is more absorbent?

Example Hypothesis: I think Brand X will be more absorbent because it's a more popular brand, it is thicker and the people I interviewed said that the more expensive brands would work better

(This hypothesis not only predicts what will happen in the experiment, but also shows that the "Scientist" used research to back up his prediction.)

Now, it's your turn:

Write down the problem and create a Hypothesis based on what you have researched.

Problem: _____

Research: My problem is about this subject: _____

(sample topics could be magnetism, electricity, buoyancy, absorbency, taste, plant growth, simple machines or other scientific topics that relate to your problem. If you are having problems finding out what the topic is, ask your teacher or an adult to help you on this one....)

Books I found in the library on my topic are:

Title:

Author:

Internet sites that I found on my topic are:

People I talked to about my topic are:

Some important points that I learned about my topic are

Hypothesis: I think that _____

(will happen) because (my research shows...) _____

Step 3: Testing your Hypothesis by doing an experiment



Now we've come to the good part. The part that all scientists can't wait to get their grubby little hands on... you guessed it... The EXPERIMENT!

Designing an experiment is really cool because you get to use your imagination to come up with a test for your problem, and most of all, you get to prove or disprove your Hypothesis.

Now Science Fair Rules state that you cannot perform your experiment live, so you'll have to take plenty of pictures as you go through these seven very simple steps.

First: Gather up your materials: What will you need to perform your experiment? The safest way to do this is get that adult you recruited to help you get the stuff you need. You will need to take pictures or draw pictures of your materials. This will come in handy when you are making your board display.

Second: Write a PROCEDURE. A procedure is a list of steps that you did to perform an experiment. Why do you need to write it down? Well it's like giving someone a recipe to your favorite dish. If they want to try it, they can follow your steps to test if it's true. Scientists do this so that people will believe that they did the experiment and also to let other people test what they found out. Did we mention to take pictures of yourself doing the steps?

Third: Identify your variables. The variables are any factors that can change in an experiment. Remember that when you are testing your experiment you should only **test one variable at a time** in order to get accurate results. In other words, if you want to test the affect that water has on plant growth, then all the plants you test should be in the same conditions, these are called **controlled variables:** same type of dirt, same type of plant, same type of location, same amount of sunlight, etc. The only variable you would change from plant to plant would be the amount of water it received. This is called the **independent or manipulated variable.** The independent variable is the factor you are testing. The results of the test that you do are called the **dependent or responding variables.** The responding variable is what happens as a result of your test. Knowing what your variables are is very important because if you don't know them you won't be able to collect your data or read your results.

Fourth: TEST, TEST, TEST. Remember that the judges expect your results to be consistent in order to be a good experiment, in other words, when you cook from a recipe you expect the outcomes to be the same if you followed the directions or **procedure** step by step. That means you need to do the experiment more than once in order to test it properly. We recommend five times or more. More is better! Don't forget to take pictures of the science project being done and the results.

Fifth: Collect your DATA. This means write down or record the results of the experiment every time you test it. Be sure You also need to organize it in a way that it is easy to read the results. Most scientists use tables, graphs and other organizers to show their results. Organizing makes the results easy to read, and much easier to recognize patterns that might be occurring in your results. (Besides, it impresses the judges when you use them.) But don't make a graph or table because we asked you to, use it to benefit your project and to help you make sense of the results. There is nothing worse than having graphs and tables that have nothing to do with answering the question of a science project.

Time out: How Do You Collect Data?!?

- ❑ **Keep a science journal:** A science journal is a type of science diary that you can keep especially if your experiment is taking place over a long period of time, especially if your experiment lasts over a period of a week or more. In your journal you can record observations, collect research, draw and diagram pictures and jot down any additional questions you might have for later.
- ❑ **Have the right tools to do the job:** make sure you have the stuff you need to take accurate measurements like rulers, meter tapes, thermometers, graduated cylinders or measuring cups that measure volume. The recommended standard of measurement in science is metric so if you can keep your measurements in meters, liters, Celsius, grams, etc, you are doing great!

- ❑ **Tables, charts and diagrams** are generally the way a good scientist like you would keep track of your experiment trials. Remember you are testing at least 5 times or more. A table is organized in columns and rows and **ALWAYS** has labels or headings telling what the columns or rows mean. You will probably need a row for every time you did the experiment and a column telling what the **independent variable** was what you tested and the **responding variable** the result that happened because of the independent variable.

Plant	Amount of water per day	Size it grew in two weeks
(controlled variable)	(independent variable)	(responding variable)
Plant A	none	.5 cm
Plant B	5 ml	2 cm
Plant C	10 ml	5 cm
Plant D	20 ml	7 cm

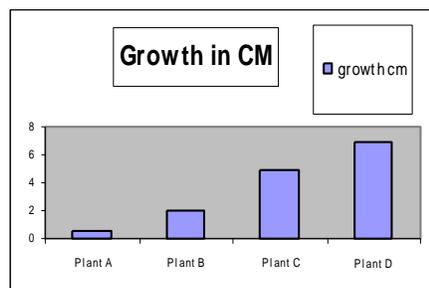
- ❑ **Be accurate and neat!** When you are writing your tables and charts please make sure that you record your data in the correct column or row, that you write neatly, and most of all that you record your data as soon as you collect it **SO YOU DON'T FORGET WHAT HAPPENED!!!!** Sometimes an experiment might be hard to explain with just a table, so if you have to draw and label a diagram (or picture) to explain what happened, it is recommended that you do.

- ❑ **Use the right graph for your experiment.** There is nothing worse than a bad graph. There are all types of graph designs, but these seem to be easy to use for science fair experiments.

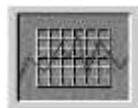
- ❑ **Pie graphs** are good to use if you are showing percentages of groups. Remember that you can't have more than 100% and all the pieces need to add up to 100%. This type of graph is great if you are doing surveys



- ❑ **Bar graphs** are good to use if you are comparing amounts of things because the bars show those amounts in an easy to read way. This way the judges will be able to tell your results at a glance. Usually the bars go up and down. The x axis (or horizontal axis) is where you label what is being measured, (like plant A, B, C and D) and the y axis (or vertical axis) is labeled to show the unit being measured (in this case it would be centimeters that the plant grew)



- ❑ **Line graphs** are good to use if you are showing how changes occurred in your experiments over time. In this particular case you would be using the x axis to show the time increments (minutes, hours, days, weeks, months) and then you would use the Y axis to show what you were measuring at that point in time.



...And now, back to the Experiment Steps

Sixth: Write a Conclusion: tell us what happened. Was your hypothesis right or wrong or neither? Were you successful, did it turn out okay? Would you change anything about the experiment or are you curious about something else now that you've completed your experiment. And most of all, **TELL WHAT YOU LEARNED FROM DOING THIS.**

Seventh: Understand its Application. Write about how this experiment can be used in a real life situation. Why was it important to know about it?

Now it's your turn

Materials: (take pictures!)

List the Materials that you will need for your science experiment here:

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

Variables:

List the variables that you will control, the variable that you will change and the variables that will be the results of your experiment:

My controlled variables are (the stuff that will always stay the same): _____

My independent variable is (this is the thing that changes from one experiment to the next, it is what you are testing): _____

My responding variables might be (in other words, the results of the experiment)

Procedure: (the steps.... Don't forget to take pictures)

List the steps that you have to do in order to perform the experiment here:

- 1st.... _____
2nd _____
3rd _____
4th _____
5th.... _____

Design a table or chart here to collect your information

(Did we mention that you needed to take pictures of you doing the actual experiment?)

Use the Graph paper at the end of this booklet to make a graph of your results from your table.

Conclusion:

Now tell us what you learned from this and if you were able to prove your hypothesis. Did it work? Why did it work or why didn't it work? What did the results tell you? Sometimes not being able to prove a hypothesis is important because you still proved something. What did you prove?

Application:

(How does this apply to real life?)

It's important to know about this experiment because.....

Step 4: The Presentation or “Why you needed all those pictures....”

But first, a school Fable....

Sammy and Sally both baked cakes for the bake sale with the same cake mix and by following the same directions. When Sammy got his cake out of the oven, he carefully took it out of the pan, smoothed the chocolate frosting neatly and decorated his cake so that it looked delicious. Sally on the other hand, smashed her cake slightly when getting it out of the pan and globbed the frosting on parts of the cake. As you may have already guessed, everyone wanted some of Sammy’s cake and no one wanted Sally’s. Sally couldn’t figure out why, because she tasted both and they both tasted the same...

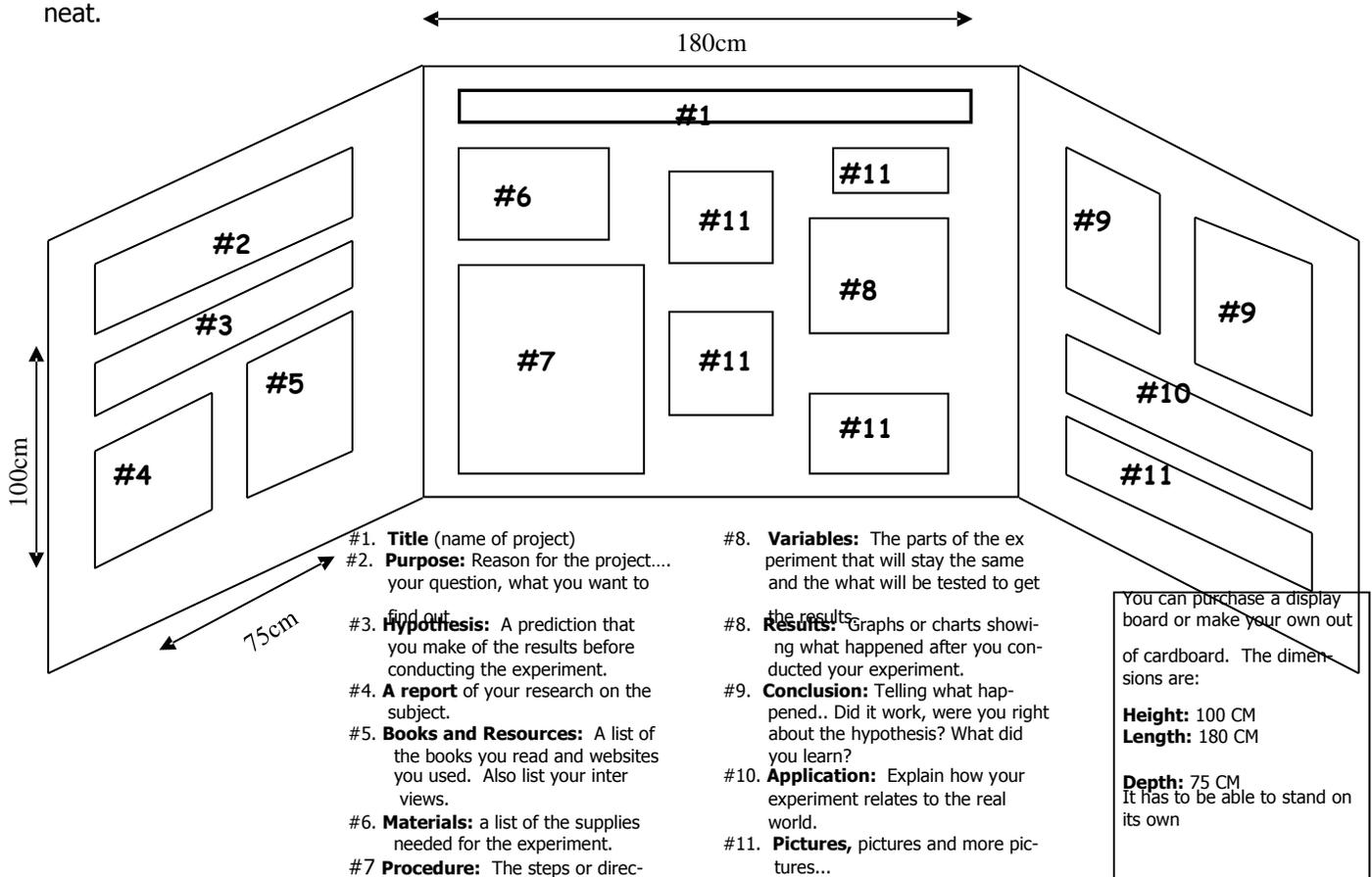


A good display is a Piece o’cake

You may have become the leading expert of your topic and had the most interesting experiment results, but if you don’t make your science project look delicious for the judges eyes to see, well, your chances of winning sweepstakes will crumble like Sally’s cake. Your display board is kind of like an advertisement for all your hard work. So take our advice: **BE NEAT!!** The judges like to see a nice, easy to read display, that has neat writing, easy to read graphs and tables and you guessed it... lots and lots of pictures!! (Did you remember to take pictures?)

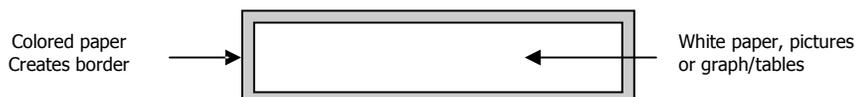
MAKING A MOUTH WATERING DISPLAY

This is an example of a neat looking Science Fair Display Board. It is just an example. Depending on your information and the amount pictures, tables and graphs, you may have a different layout. Just make sure it is neat.



Display Beauty Secrets:

- Use a computer to type out your information, but if you can't, write out your information in your best writing. Printing the titles is usually best. If you are using a computer, make sure the fonts are readable and only use one or two type faces.
- Use spray adhesive or glue stick to paste up your papers. It is less messy
- Mount white paper, pictures, graphs and tables on colored papers (making sure the colored paper is larger so it creates a border for the white paper.) Do not





What those not so scary Judges are looking for

What you should do the day of the Science Fair

A lot of kids are scared of talking to a judge. Just imagine the judge as a fellow scientist who just wants you to share what you learned... But just so it's not such a mystery, we've listed all the stuff that is on the judges form that they want you to do:

Relax, smile and have fun, remember you are the expert and you had fun doing the project. But, if you are a little nervous, we listed the stuff you need to do during the presentation to meet the criteria of the judge's form.

Helpful Hint: Look sharp, feel sharp and you will be sharp. Dress nice that day, be polite and speak clearly and you will show the judges that you have confidence. Don't forget to look them in the eyes, they really are quite nice.

Criteria	Worth how many points?	
1. Display well organized	2 points	→ Stand to the side of the display so that the judge can see it
2. Clearly stated title, purpose and reasonable hypothesis	2 points	→ Introduce yourself, point out the title of your display and tell the judge why you chose to study this. State your problem that you studied (your question) Also tell them about your hypothesis (what you think might happen)
3. Background information on science topic with at least 3 sources cited	2 points	→ Hand a copy of your report to the judge so that they can review your research. Talk about the sources (books, websites and interviews) that helped you understand your topic. To get top marks you need to have at least 3 sources.
4. Clearly explained experimental procedures	3 points	→ Tell about your experiment, the steps you took to do it . Use all those fancy science words you just learned.. They love that.
5. Measurable data that includes 3 or more trials	3 points	→ Be sure to show them that you tested your experiment at least 3 times. Show them all of the cool graphic organizers that you made, like your tables and charts.
6. Effective analysis of data clearly stated results (graphs charts and tables)	3 points	→ Be sure and explain what your data means. Make sure you can read your graphs and tables. Let them know if you were surprised by the results, or if you knew what would happen because you studied about it.
7..In-depth knowledge base of topic with use of related vocabulary at grade level	3 points	→ Make sure you sound like an expert at your topic. Always use the appropriate vocabulary especially by using words from the Scientific Method like: Problem, Hypothesis, Procedure, Results and Conclusion.
8. Well elaborated conclusion based on results	3 points	→ Let the judge know if you were right about your hypothesis. What did you conclude about your problem? Did you find another problem to investigate based on what you learned?
9. Stated real life connections.	2 points	→ Judges love this one, because it gives a real world purpose to your topic. It makes you sound like a real scientist in a real lab... which you are!! "My experiment about paper towel absorbancy could help people save money by buying the right type of paper towels"
10. Effective closure of presentation	2 points	→ Nothing makes a judge feel worse than to make a kid so nervous that they repeat themselves or they stop their presentation before they are really done. If you get lost or forget where you are, look at your display and follow it piece by piece. It is better to discuss everything than to forget to tell the judge something. When you are done, shake hands with the judge and thank them for their time, remember that they are volunteers who care about you!

**Total possible points 25 Points
24-25 points= Sweepstakes!!!!**



What those not so scary Judges are looking for

What you should do the day of the Science Fair (4th & 5th grade)



A lot of kids are scared of talking to a judge. Just imagine the judge as a fellow scientist who just wants you to share what you learned... But just so it's not such a mystery, we've listed all the stuff that is on the judges form that they want you to do:

Relax, smile and have fun, remember you are the expert and you had fun doing the project. But if you are a little nervous, we listed the stuff you need to do during the presentation to meet the criteria of the judges form.

Helpful Hint: Look sharp, feel sharp and you will be sharp. Dress nice that day, be polite and speak clearly and you will show the judges that you have confidence. Don't forget to look them in the eyes, they really are quite nice.

Criteria	Worth how many points?	
1. Clearly stated title, purpose and reasonable hypothesis	2 points	→ Introduce yourself, point out the title of your display and tell the judge why you chose to study this. State your problem that you studied (your question) Also tell them about your hypothesis (what you think might happen)
2. In depth report on science topic	2 points	→ Hand a copy of your report to the judge so that they can review your research. Talk about what you learned while researching your topic
3. 3 or more resources cited	2 points	→ Talk about the sources (books, websites and interviews) that helped you understand your topic. To get top marks you need to have at least 3 sources.
4. Thoroughly stated procedures and materials	2 points	→ Tell about your experiment, the steps you took to do it . Be sure to mention all the materials involved and point out all of those lovely pictures!
5. Clearly stated variables and controls	2 points	→ Point out the controlled variables, independent variable and responding variables to the experiment, (you know the stuff you kept the same, the thing you tested and the results)
6. Measurable data that includes 3 or more trials or when testing human subjects, 10 people or more	3 points	→ Be sure to show them that you tested your experiment at least 3 times. Show them all of the cool graphic organizers that you made, like your tables and charts. Remember to point out the labeled parts of your graph or table to show that you know what it represents.
7. Effective analysis of data clearly stated results (graphs charts and tables)	3 points	→ Be sure and explain what your data means. Make sure you can read your graphs and tables. Let them know if you were surprised by the results, or if you knew what would happen because you studied about it.
8. In-depth knowledge base of topic with use of related vocabulary at grade level	3 points	→ Make sure you sound like an expert at your topic. Always use the appropriate vocabulary especially by using words from the Scientific Method like: Problem, Hypothesis, Procedure, Variables, Results and Conclusion.
9. Well elaborated conclusion based on results	3 points	→ Let the judge know if you were right about your hypothesis. What did you conclude about your problem? Did you find another problem to investigate based on what you learned? The conclusion is all about what you learned from doing this.
10. Stated real life connections.	2 points	→ Judges love this one, because it gives a real world purpose to your topic. It makes you sound like a real scientist in a real lab... which you are!! For example, "My experiment about paper towel absorbency could help people save money by buying the right type of paper towels" See how useful that sounds?
11. Effective closure of presentation	2 points	→ Nothing makes a judge feel worse than to make a kid so nervous that they repeat themselves or they stop their presentation before they are really done. If you get lost or forget where you are, look at your display and follow it piece by piece. It is better to discuss everything than to forget to tell the judge something. When you are done, shake hands with the judge and thank them for their time, remember that they are volunteers who care about you!

**Total possible points 25 Points
24-25 points= Sweepstakes!!!!**



Science Fair Rules and Regulations

Aw!, you mean there are rules? Of course there are, silly, this is made by adults!

Safety Rules First

1. Number one rule... think safety first before you start. Make sure you have recruited your adult to help you.
2. Never eat or drink during an experiment and always keep your work area clean.
3. Wear protective goggles when doing any experiment that could lead to eye injury.
4. Do not touch, taste or inhale chemicals or chemical solutions.
5. Respect all life forms. Do not perform an experiment that will harm an animal.
6. All experiments should be supervised by an adult!
7. Always wash your hands after doing the experiment, especially if you have been handling chemicals or animals.
8. Dispose waste properly.
9. Any project that involves drugs, firearms, or explosives are not permitted.
10. Any project that breaks district policy, and/or local, state or federal laws are not permitted.
11. Use safety on the internet! Never write to anyone without an adult knowing about it. Be sure to let an adult know about what websites you will be visiting, or have them help you search.
12. If there are dangerous aspects of your experiment, like using sharp tools or experimenting with electricity, please have an adult help you or have them do the dangerous parts. That's what adults are for, so use them correctly. (Besides, it makes them feel important!)

Science Fair Rules

1. Only one student per entry, you can't work in a team of two until you get to middle school, sorry.
2. Adults can help, in fact we want them to get involved. They can help gather materials, supervise your experiment and even help build the display. They just can't be with you during the judging. (So parents, no peeking!)
3. Experiments are recommended over collections and models. You will not score very high unless you do an experiment, so save the models and collections for a class project. You will be judged on the use of the Scientific Method (we told you that on page 2.)
4. You cannot bring the materials of your experiment for the display or perform the experiment live. You will only be judged on your presentation and board. You can however, mount things on your board in a type of 3D display, but remember that your board has to be able to stand by itself, so don't get carried away. If you do mount things on the board, try not to mount something expensive that you bought and make sure you have things mounted securely so they don't fall off. **YOU MAY NOT MOUNT ANY FOOD OR ORGANIC MATERIALS!**
5. Displays must be on display boards or can be made with cardboard. They can be no longer than 100cm in height, 180 cm in length and 75cm deep. They must stand alone. See the display making page if you need a diagram.
6. Limit your presentation to 12 minutes at the most, 5-7 minutes on speaking and the rest for the judges to ask questions.
7. No recording or transmitting devices are permitted.. (no tape recorders or secret walkie-talkies, cell phones or other James Bond toys.)
8. Respect all adults involved in the fair... especially the judges!
9. All decisions of the judges and science fair committee are final.
10. All Sweepstakes winners are eligible for entry in the district wide science fair. If you do win sweepstakes, you are responsible for maintaining your presentation board and getting yourself and the board to the district competition.

Sweepstakes Research Requirements:

All Sweepstakes winners are required to have a research paper written according to the following guidelines:

Title Page: This contains the title, the name of the student, grade level and date.

Table of Contents: list all the pages of your research paper and what they contain.

Introduction: Background research to your project. (See step 2) One to three pages long.

A Works Cited and Acknowledgement page is at the end listing all the research sources such as books, authors, websites and people interviewed for the project.

If you completed everything in this packet you probably have a terrific Science Fair project, and you are now a real scientist! Good Job!

However, if you still need more ideas, here is a list websites that you can check out about science fair projects to give you even more ideas.

Websites

Internet Public Library

<http://www.ipl.org/div/kidspace/projectguide/>

Are you looking for some help with a science fair project? If so, then you have come to the right place. The IPL will guide you to a variety of web site resources, leading you through the necessary steps to successfully complete a science experiment.

Discovery.com: Science Fair Central

<http://school.discovery.com/sciencefaircentral/>

"Creative investigations into the real world." This site provides a complete guide to science fair projects. Check out the 'Handbook' which features information from Janice VanCleave, a popular author who provides everything you need to know for success. You can even send her a question about your project.

Science Fair Idea Exchange

<http://www.halcyon.com/sciclub/cgi-pvt/scifair/guestbook.html>

This site has lists of science fair project ideas and a chance to share your ideas with others on the web!

Cyber-Fair

<http://www.isd77.k12.mn.us/resources/cf/welcome.html>

This site has one-sentence explanations of each part of a science fair. One of the steps described is presenting your project to judges. This may or may not be a part of your science fair. The site also has an explanation of what makes a good project and an explanation of how to come up with your own science fair project.

Try Science

<http://tryscience.com>

Science resource for home that gives you labs to try and 400 helpful links all related to science

The Yuckiest Site in the Internet

<http://yucky.kids.discovery.com/>

Brought to you by Discovery Kids, this site gives you lots of ideas on how to do the messiest yuckiest experiments

Experimental Science Projects: An Introductory Level Guide

<http://www.isd77.k12.mn.us/resources/cf/SciProjIntro.html>

An excellent resource for students doing an experiment-based science fair project. There are links on this page to a more advanced guide and an example of an actual experiment-based project.

Gateway to Educational Materials: Science Fair Projects

<http://members.ozemail.com.au/~macinnis/scifun/projects.htm>

The Gateway to Educational Materials extensive and detailed step-by-step guide to doing a science fair project.

Science Fair Primer

<http://users.rcn.com/tedrowan/primer.html>

A site to help students get started and run a science fair project.

Science Fair Project Guidebook

http://www.energy.sc.gov/K-12/science_fair.htm

The State of South Carolina publishes a K-12 science fair guidebook. It can be viewed using Adobe Acrobat Reader.

Science Project Guidelines

<http://www.thesciencefair.com/guidelines.html>

The scientists at the Kennedy Space Center have participated in judging local school science fairs for many years and have some great suggestions for student research projects. This information by Elizabeth Stryjewski of the Kennedy Space Center is now provided on a commercial site.

The Ultimate Science Fair Resource

<http://www.scifair.org/>

A variety of resources and advice.

What Makes A Good Science Fair Project

http://www.usc.edu/CSSF/Resources/Good_Project.html

A website from USC that gives a lot of good tips and ideas to think about regarding what makes a good science fair project. Advice for students as well as teachers and parents is included.

Mr. McLaren's Science Fair Survival Page

http://www.ri.net/schools/East_Greenwich/Cole/sciencefair.html

Tips from Archie R. Cole Junior High school on what makes a good project.

Neuroscience for Kids: Successful Science Fair Projects

<http://faculty.washington.edu/chudler/fair.html>

Site made by Lynne Bleeker a former science teacher, science fair organizer, and judge. Gives a thorough and de-tailed description of the steps to a successful science fair project

Science Fair Project Ideas

1

- What is the best home insulator?
- Regeneration in planaria
- Colors effect on heat absorption
- Wing design for balsa planes
- What is the best chemical battery?
- How can you prevent iron from rusting?
- Electroplating
- Distillation of alcohol
- Building a homemade hygrometer
- Conductivity of various substances
- Comparison of reaction time
- Effects of temperature on density
- Effects of ultraviolet light on bacteria
- Kite design and aerodynamics
- PH comparisons of antacids
- Best design for reduced wind drag
- Does color effect memory?
- Which is best smoke detection system?
- Does sound affect plant growth?
- Mineral content of drinking water
- Probability
- Percent of body fat
- Taste sensitivity of smokers/non-smokers?
- Which bleach works best?
- Testing for nutrients
- How does lack of sleep affect behavior?
- Design of robotics equipment
- Testing for ESP
- Earthworm distribution in a field
- How different paints hold up to weathering
- Social behavior of ants
- Best nose cone shape for model rockets
- Is it possible to learn while sleeping?
- Does temperature affect crystal growth?
- Making fabrics fire resistant
- Getting the viscosity of liquid using a sphere
- How acids affect metals
- Which detergent works best?
- Designing a solar engine
- Which is better front or rear wheel drive?
- Does oil stain or oil paint provide better protection?
- Does cigarette smoke affect house plants?
- Solar distillation
- Porosity of soils
- Sugar content of food
- Effect of light on reproductive growth of paramecia
- Comparison of blood pressure variation
- Effects of fertilizers on earthworms
- Plant tolerance to salt
- Fat content of margarines
- What material is best for road construction?
- How does television viewing effect behavior?
- Are rats social animals?
- How are seeds affected by radiation?
- Suspension bridge design
- Flammability testing of household goods
- Color preferences of gerbils
- Paper recycling
- Temperature's effect on seed germination
- Which soil type is best for plant growth?
- Design of color blindness test
- Purifying water
- Spider web construction
- Comparison of biodegradable detergents
- Airplane wing design for greatest lift
- Does magnetism effect seed germination?
- Does TV change kid's moods?
- Optical illusions
- Desalting water
- Are dogs colorblind?
- Do soap bubbles last longer on cold or warm days?
- Are hot air balloons different from blimps?
- What is the best method, other than heat, to melt ice?
- What effect does oil have on water plants?
- Do aquarium chemicals really do their job?



Science Fair Project Ideas

How can a tomato plant be grafted onto a potato plant?

How is sound obtained from a compact disk?

How does a nuclear reactor work?

How is a 2-yr old infant's talk different from ours?

How does burning gasoline make a car move?

How do we tell how far away a star is from Earth?

What soils are best to build a house on?

How do plants react to different kinds of music, light, or/and colors?

What is the best way to dispose of paper?

Do plants move?

Regeneration in Clam Worms

Predator/prey interactions

Small ecosystem succession

Enzyme activity studies

Growth spurts in children

Are cats right pawed?

Gender differences in memory tests

How to clean up oil spills

Is there really a difference between Coke and Pepsi?



WRITTEN REPORT RUBRIC

	Exceeds Expectations 10 Points	Adequate 8 Points	Needs Improvement 6 Points	Inadequate 4 Points
Title Page	*Exceeds Expectations	*Neatly includes name, grade, title *Correct spelling *Legible	*Missing item(s) *Messy, Illegible *Misspelled words	*Hand written or missing information *Missing item(s) *Messy, Illegible *Misspelled words
Table of Contents	*Exceeds Expectations	*Neatly lists all sections with correct page numbers *Correct spelling *Legible	*Lists sections with page numbers (1-2) *Messy, Illegible *Misspelled words	*No page numbers *Missing section(s) *Messy, Illegible *Misspelled words
Introduction and Purpose	*Exceeds Expectations *Uses statements to get the attention of the reader *Clearly states why topic was chosen and why interested *On a separate page alone *Correct spelling *Legible	*Clearly states why topic was chosen and why interested *On a separate page alone *Correct spelling *Legible	Somewhat states why topic was chosen, or not on a separate page *Messy, Illegible *Misspelled words *Incorrect grammar	*Unclear statement *Not on separate page *Messy, Illegible *Misspelled words *Incorrect grammar
Posing Question	*Exceeds Expectations *Stated the problem in question form: How does ____ affect ____? How will ____ affect ____? *Correct spelling *Easy to understand	*State the problem *Correct spelling *Variables are present, but are incorrect or incomplete	*Stated the question using incorrect form *Messy, Illegible *Misspelled words *Incorrect grammar	*Not titled *Incorrect question or doesn't use correct format *Not clearly stated *Messy, Illegible *Misspelled words *Incorrect grammar
Hypothesis	*Statement shows extensive thought and planning by the student *Answers the question in a complete sentence *Is an educated guess *Correct Spelling *Legible	*Answers the question in a complete sentence *Applies directly to the question *Correct grammar *Legible	*Answers the question in a complete sentence *Does not apply to the question *Messy, Illegible *Misspelled words *Incorrect grammar	*Not a complete sentence. *Does not apply to the question *Messy, Illegible *Misspelled words *Incorrect grammar
Background Research	*Exceeds Expectations *3 or more paragraphs focusing on topic of research *Bibliography contains at least : 3 sources (gr 6-8) 2 sources (gr K-5) *Correct grammar *Correct Spelling *Legible *Not internet pasted	*3-5 paragraphs that focus on the topic of research *Bibliography contains less than the number of required sources : 3 sources (gr 6-8) 2 sources (gr K-5) *Correct Grammar *Correct Spelling *Legible *Not internet pasted	*Less than 3 paragraphs that are loosely related to the topic of research *No Bibliography *incorrect Grammar *Incorrect Spelling *Illegible *Evidence of internet pasted and/or not personalized	*Less than one paragraph that is loosely or not related to the topic of research *No Bibliography *incorrect Grammar *Incorrect Spelling *Illegible *Evidence of internet pasted and/or not personalized
Materials	*Exceeds Expectations *Complete and extensive list of materials *No misspelled words	*Complete list of materials *No misspelled words	*List of materials is messy or incomplete *Misspelled words	*Missing list of materials

Procedure	<ul style="list-style-type: none"> *Exceeds Expectations *Procedures are detailed and complete *All variable information is present *Used complete sentences, no fragments *No misspelled words *Neat and organized 	<ul style="list-style-type: none"> *Procedures are complete *All variable information present *Used complete sentences, no fragments *No misspelled words 	<ul style="list-style-type: none"> *Missing variable information *Procedures are incomplete *Fragments in steps of progress *Misspelled words 	<ul style="list-style-type: none"> *Missing variable information *Missing procedures
Results and Data	<ul style="list-style-type: none"> *Exceeds Expectations *Completed results with a graph/data table or both to support the explanation of results *Easy to read graphics *Used complete sentences, no fragments *No misspelled words *Neat and organized *Correct grammar 	<ul style="list-style-type: none"> *Completed results with a graph/data table and explanation *Easy to read graphics *Stated in complete sentences, no fragments *No misspelled words *Neat and organized 	<ul style="list-style-type: none"> *An explanation is provided, but without a graph/data table *Confusing graphs/data table or missing information *Graph/data table with no explanation *Sentence fragments *Misspelled words *Incorrect grammar 	<ul style="list-style-type: none"> *No graph/data table *No accompanying paragraph
Conclusion	<ul style="list-style-type: none"> *Exceeds Expectations *Conclusion is related to the hypothesis *Correct wording and format *Stated in complete sentences, no fragments *No misspelled words 	<ul style="list-style-type: none"> *Conclusion is related to the hypothesis as the answer to the problem or question *Used correct grammar and sentence structure. 	<ul style="list-style-type: none"> *Not related to the problem *Not written in correlation to the hypothesis *Incomplete sentences, fragments *Misspelled words *Incorrect grammar 	<ul style="list-style-type: none"> *Incomplete sentences, fragments *Misspelled words *Incorrect grammar
Points Earned	Points: _____	Points: _____	Points: _____	Points: _____

TOTAL POINTS: _____

ORAL PRESENTATION RUBRIC

	Excellent 10 points	Proficient 8 points	Basic 6 points	Below Basic 4 points
Organization	<ul style="list-style-type: none"> *Accurate Introduction and Conclusion *Sequenced material within the body *Cohesive presentation content 	<ul style="list-style-type: none"> *Accurate Introduction and Conclusion *Sequenced material within the body *Cohesive presentation content 	<ul style="list-style-type: none"> *Accurate Conclusion *Sequenced material within the body is inconsistent 	<ul style="list-style-type: none"> *Specific Introduction and Conclusion *No sequence in material
Language	<ul style="list-style-type: none"> *Enhances the effectiveness of the presentation *Correct grammar *Appropriate to audience 	<ul style="list-style-type: none"> *Supports the effectiveness of the presentation *Correct grammar *Appropriate to audience 	<ul style="list-style-type: none"> *Not interesting *Partially supports the effectiveness of the presentation *Correct grammar *Appropriate to audience 	<ul style="list-style-type: none"> *Unclear *Minimally supports the effectiveness of the presentation *Occasional mistakes in grammar *Appropriate to audience
Delivery	<ul style="list-style-type: none"> *Good posture *Eye contact with the audience most of the time *Appropriate gestures and expressions *Delivered with confidence *Full group participation 	<ul style="list-style-type: none"> *Good posture *Frequent eye contact with the audience *Appropriate gestures and expressions *Almost full group participation 	<ul style="list-style-type: none"> *Intermittent good posture *Occasional eye contact with the audience *Appropriate gestures and expressions *Partial group presentation 	<ul style="list-style-type: none"> *Poor posture *Seldom eye contact with the audience *Not enough or too much gesture and expression *One person presentation
Content	<ul style="list-style-type: none"> *Student discusses the reasons for the support of the chosen organization in great details *Student describes in detail about their findings *Evident what student has learned 	<ul style="list-style-type: none"> *Student discusses the reasons for the support of the chosen organization with some details *Student outlines their findings *Student shows what they have learned 	<ul style="list-style-type: none"> *Student discusses the reasons for the support of the chosen organization with some details *Student does not outline their findings *Student's misconceptions are still seen 	<ul style="list-style-type: none"> *Student discusses the reasons for the support of the chosen organization with very minimal details *Student does not outline what they have learned *Student still sounds confused on this topic
POINTS EARNED	_____ Points	_____ Points	_____ Points	_____ Points

TOTAL POINTS _____

NINE SECTIONS.

Your scientific paper will contain at least nine sections: (1) Title page, (2) Table of Contents, (3) Summary, (4) Introduction, (5) Experimental, (6) Discussion, (7) Conclusions, (8) Credits, and (9) References. But cheer up; only two of these sections are very long!

THE TITLE IS THE BEGINNING.

You have already picked a good title for your project. Use the same one on your paper. Center the title near the middle of the page. Towards the lower right hand corner, place your name, your home address, the name of the school you attend and your grade level.

THE SUMMARY IS AN OVERVIEW.

As strange as it might seem, the first part of your paper is the part you write last. Your summary is an extremely short section. It contains clear, brief statements which summarize: (a) the problem or questions you are studying, (b) the action that you took in your investigation, (c) the results of your experiments, and (d) your most important conclusions based on the result of YOUR work.

THE INTRODUCTION TELLS WHAT YOU ARE GOING TO DO.

The first part of the Introduction tells the reader your understanding of the subject when you started the project. Next, you might want to tell how you became interested in your project, or describe any "common knowledge" or "old wives tales" you want to prove or disprove. Tell some items that you found as you studied about your subject, such as: historical and scientific background, what similar experiments have been already done by other people, and any contradictions or unanswered questions you may have found. Wrap up this section with a few precise statements that: (1) describe exactly what you want to prove or disprove, (2) tell why this proof should be done, and (3) detail the information that you need to obtain from your experiment so you can answer your question. As you clearly can see, the time to

write the initial version of the introduction is while you are planning and starting your project.

THE EXPERIMENTAL PROCEDURE TELLS HOW YOU DID YOUR EXPERIMENT.

The experimental procedure gives all the details of how the experiment was conducted. It is so precise that someone could repeat your work without additional communication with you! Apparatus constructed should be photographed and discussed. Sketches and diagrams are very useful. Answer questions that apply to your project, such as:

- What was measured and how?
- For which variables were data collected?
- How was your control experiment run?
- What chemicals, plants, or animals were used?
- How or where were you supplies mixed, made, or grown?
- What equipment was used or built?

If laboratory equipment is used, it should be described, its function discussed and manufacturer and model number given.

THE DISCUSSION TALKS ABOUT YOUR DATA.

The discussion of your project is the heart of your paper. It usually contains several subsections. Begin by presenting all of your observations and data, in both the as-collected and processed forms. Discuss how and why your data was processed. Explain anything you assumed to process the data. Tables, charts, and graphs are very helpful. All graphics should be placed in the paper near the paragraphs in which they are discussed. An area needing extra attention is the labeling of graphs, charts, diagrams, and tables. Each must have its own descriptive title. All columns, axes, and data must be labeled clearly and identified.

Make comparison with theoretical values, published data, commonly held beliefs and/or expected results. Your conclusions and implications should flow smoothly and logically from your data. Be



thorough. Let your readers know exactly what you did. Let them follow your train of thought.

A complete paper will include a discussion of possible errors. How did the data vary between repeated observations of similar events? How were your results affected by uncontrolled events? What are sources of possible error and how large were these errors? What would you do differently if you were to repeat this project? What other experiments remain to be conducted?

The results and conclusions from your experiments should appear smoothly and logically throughout this discussion of your data, your method, your comparisons, and your errors.

THE CONCLUSION IS A SUMMARY OF YOUR RESULTS.

The conclusion restates briefly the findings and results detailed in your discussions. No new topics or speculations are to be mentioned unless they were first justified back in the discussion. Remember that these conclusions are based on your work and experiments, not drawn from news articles and textbooks.

GIVE CREDIT WHERE CREDIT IS DUE.

The last two sections of your paper give credit to other people for their work and assistance. First, a list of credits recognizes the aid given to you by people, businesses, and institutions. Second, a list of references recognizes the information taken from the work and writings of other people. There are standard forms of references. See your English teacher for help.

THE FIRST-CLASS LOOK.

Carefully put together your first draft. Check for correct spelling. Since you are familiar with your project, it is easy to leave out important details. Let your teacher and another adult read your paper. If they have trouble understanding your paper, maybe you left something out. Subheadings help the reader follow the flow of the paper. Type the final

draft with double-spaced lines. If you can't type, get help from someone who can. Use one inch margins all around. Add your tables and graphs, and number all pages except the title page. Complete the Table of Contents. You may want to add a cover to protect your pages. Then have your paper proofread a final time. Take a deep breath and smile. You've done a fantastic job!

