The Leo Junior High Science Fair Planning Guide

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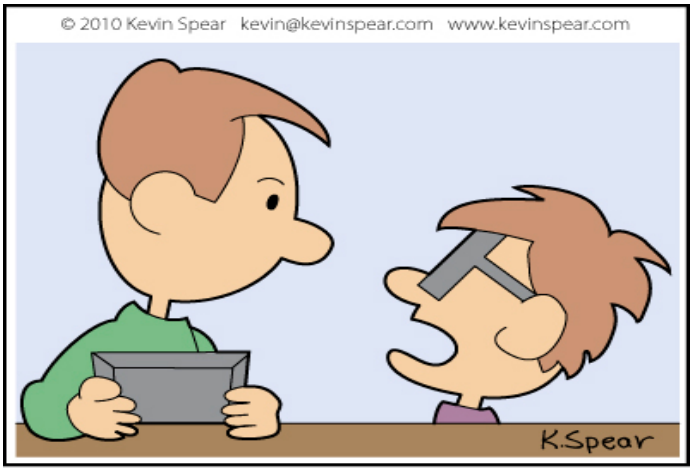
Just follow these easy steps and you, too, can create a wonderful award winning science project!!

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 anything!!

My adult's name is _____

From this point forward you are now…A SCIENTIST!!



"Can I get some uranium-235?
Or do I have to settle for plain, old 238?"

Questions? Tracy Brooks (tlbrooks@manchester.edu or 615-5539)
or
ask your Science Teacher

FORWARD

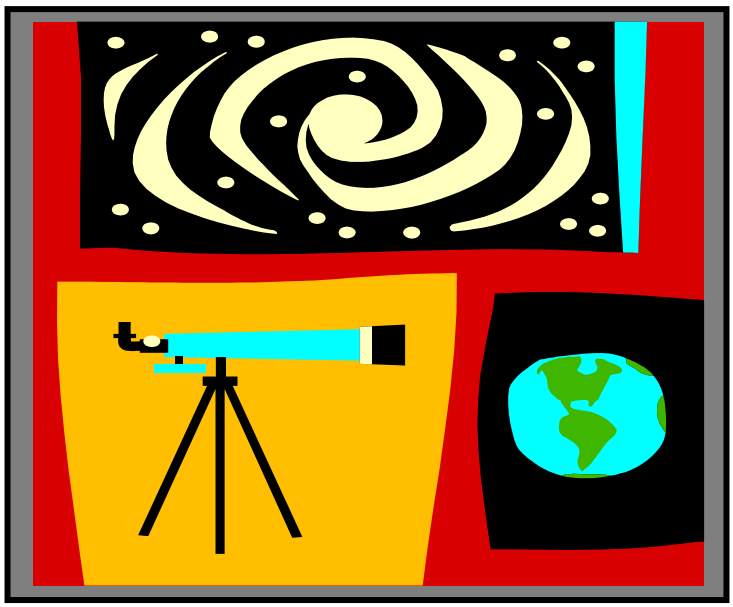
Science Rocks!

Science isn't just for "nerds" or "eggheads." It is not mysterious or difficult. It is a fun way of trying to gain, organize, apply, and convey knowledge about the world within which we live. It is trying to understand the patterns that are around us. It's comprehension; it's literacy…it's science. That's it…….it's that simple. Of course, science is also a process. It follows a logical sequence of investigational events. It is organized. It sometimes can be…yawn…tedious. It requires clear thinking, checking and rechecking, planning, doing, analyzing, interpreting, summarizing, and publishing your results. In other words it is a method, a scientific method. Through this method, our culture and society has flourished!

Our future in America depends on the continuous works of scientists, engineers, and mathematicians, who investigate, analyze, and design natural and man-made environments and interpret their work for society. America once led the world in scientific discoveries, but now is falling behind in the number of scientists, engineers, and mathematicians entering the work force each year. One reason is that we do not require or encourage students to study and master basic and advanced studies of science and math like other countries.

It is proven that students are motivated by participation in independent study projects. This Science Fair was developed to encourage students to accomplish and display their investigations.

This handbook was designed to provide assistance and guidelines to teachers who have students who are going to participate in the Leo Elementary Science Fair. This handbook will help teachers/coaches with information on the rules/regulations, forms, and submission deadlines.



MISSION STATEMENT

The Leo Junior High Science Fair's mission is to:

- Motivate and stimulate the interests of all students in the fields of science, technology, engineering, and mathematics.
- Recognize outstanding effort and scientific achievement by students through their science fair projects.
- Provide guidance and an educational experience for all students

RULES AND REGULATIONS

The Leo Junior High Science Fair believes that all students have the right and opportunity to compete fairly for all awards. The following regulations will keep projects uniform for judging, ensure that they abide by federal, state, and local laws, and follow Northeast Indiana Regional Science and Engineering Fair (NEIRSEF) regulations. For these reasons, the following will be strictly enforced:

In general, the display of anything that could be hazardous to the public is PROHIBITED, including the following:

- Anything that is ALIVE (animals, plants, molds, etc)
- Plant materials in their raw state (living or dried)
- Taxidermy specimens or parts; preserved vertebrate or invertebrate animals (dead bugs, rabbit's foot); Human/animal parts or body fluids
- Food items (people or pet food, etc)
- Containers filled with water or any other kind of liquid
- Sharp items (needles, knives, syringes) including glass or glass objects
- Small, loose pieces sitting on the table that could be picked up by a child (choking hazard) or fall to the floor posing a tripping/slipping hazard to members of the public.
- Photos of people, including the student's family, without their (and if a minor, their parent's) written consent to be displayed.
- Soil, sand, or rock samples except in a sealed Petri dish or baggie securely affixed to the display board
- All chemicals (laboratory/household), cleaners, poisons, toxic substances
- Drugs or controlled substances; hazardous substances or devices (ie firearms)
- Dry ice or other sublimating solids
- Flames, fire, highly flammable materials
- Any apparatus deemed unsafe including empty tanks that previously contained combustible liquids or gases.
- Batteries with open top cells
- Projects with moving parts that have unprotected belts and pulleys
- Class 3 and 4 lasers; Class 2 lasers must follow rules in ISEF handbook

RULES

1. All exhibits should be sturdily constructed and self-supporting.
2. Size limits are 30” deep front to back; 48” side to side; 108” floor to top
3. A place at a table is provided for all entries unless floor space has been requested on the registration form.
4. All electrical wiring must be of an approved, insulated type. Electric cords are the responsibility of the exhibitor.
5. Students may work individually or up to 3-member teams
6. Experiments are recommended over collections and models
7. Display must be self-standing of reinforced cardboard, plywood, or other materials. The project cannot lean on the table, wall, or other projects. Nail, glue, or tape cannot be placed on the tables. No items should be attached to the display board except for paper and photographs (no 3-dimensional items, lights, aluminum foil, fabric, etc).
8. Each project must have an entry form prominently displayed on the back of the project’s display board.

*Although Leo Jr/Sr High will take precautions to protect the exhibits, there will be no assumed responsibility for any items lost or damaged during the fair. Valuable material and equipment should be simulated or pictured. Note: it is advisable to have extra copies of notebooks and other printed materials.

**Ethics Statement: Scientific fraud and misconduct is not condoned at any level of research or competition. Plagiarism, use or presentation of another researcher’s work as one’s own and fabrication or falsification of data will not be tolerated. Fraudulent projects will fail to qualify for competition.

Important Information for 7th graders!

1. If your science fair project involves human subjects or animals - - it MUST have a pre-experiment review done by the IPFW Scientific Review Committee (SRC) to be eligible to participate in the Regional Science Fair.

Please ask your science teacher for the Pre-Experimentation Review Forms. They need to be filled out and returned to your science teacher by 1-22-14.

2. If your project is chosen for the Regional Science Fair - - you will need to write a 250 word abstract. Tracy Brooks (tlbrooks@manchester.edu) will help you with this and register you for the Regional Science Fair.

3. If you would like to use photos of friends/relatives/helpers in your science fair project, you have to fill out the "consent to have photos displayed" paper, have the people sign it, and affix it to the back of your display. The form is found at http://sites.ipfw.edu.scifair/ or from your science teachers.

*****Thursday February 20, 2014**
3:30-5pm in the Middle School Gym

Leo Junior High Science Fair Registration Form

Deadline is: 2-7-14

Turn into your Science teacher

Tracy Brooks (tlbrooks@manchester.edu)
10627 Diebold Rd
Fort Wayne, IN 46845

Student Name: _____

Teacher: _____ Grade: _____

Address: Street_____ Apt. _____

City: _____ State: _____ Zip: _____

Telephone: _____ Email: _____

Project Title and/or Hypothesis: _____

_____

_____.

Individual Project ☐ Team Project ☐

List Partners' Names Below:

_____

_____

ELECTRICAL OUTLETS MAY BE AVAILABLE

Would your project require one? **Y N**

Please circle

***All team members need to fill out his/her own Registration Form**

The above student wishes to participate in the Leo Science Fair. As his/her parent or guardian, I do hereby release all responsibility or liability EACS and hold them harmless for any incident or injury which may be incurred before, during, or following such competition.

Student Signature _____ Date: _____

Parent/Guardian's Signature _____ Date: _____

JUDGING STANDARDS

The following criteria will be used to judge the projects (see attached rubric and scoring sheet):

Creativity of Design

Creativity of Interpretation

Scientific Method

Interpretation of Data

Completeness

Display and Oral Presentation

Independence

Two independent Judges will judge each project. If there is a large disparity between the scores, a third judge will review the project. Students will remain with their projects during the judging to explain their study. **All others (teachers, parents, and other students) are not permitted in the project area while judging is in progress. Any violations of this policy can result in the disqualification of the project.**

Scores from the two judges will be added together to arrive at the total score. If a student is not present during the judging, he/she will receive a zero in the "Display and Oral Presentation" criteria. Judging sheets and students' scores will not be released.

All participants will receive a certificate of participation.

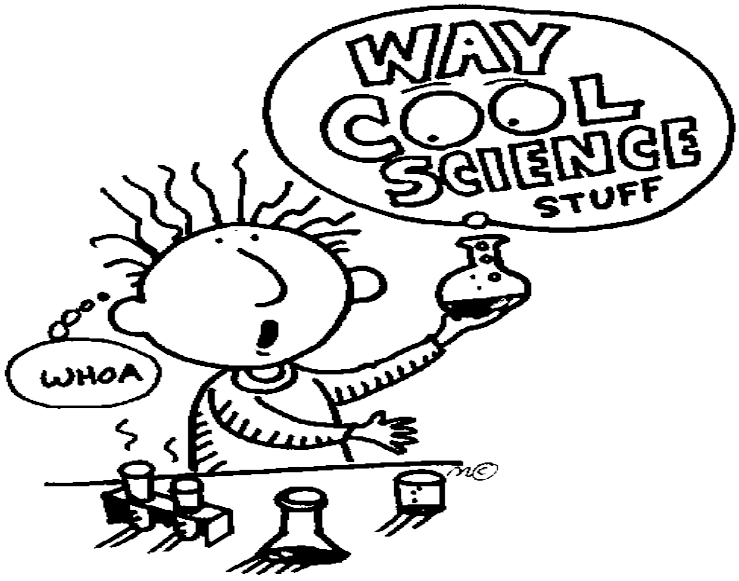
The participatants chosen to advance to the Regional Science Fair will be awarded trophies.

What you should do the day of the Science Fair

Relax, smile, and have fun! Remember, you are the expert, and you had fun doing the project. But, if you are a little nervous, here is the stuff you need to do during the fair:

Helpful hint: Look sharp, feel sharp, and you will be sharp. Dress nice that day, be polite, and speak clearly.

- Stand to the side of your display
- Introduce yourself, point out the title of your display and why you chose to study this. State your problem that you studied (your question) and your hypothesis (what you think might happen)
- Talk about the sources (books, websites, and interviews) that helped you understand your topic
- Tell about your experiment (the steps you took to do it)
- Be sure to show you tested your experiment at least 3 times. Show your data (graphs and charts)
- Be sure and explain what your data means. Were you surprised by your results or did you know what would happen because you studied it
- Make sure you sound like an expert at your topic
- Were you right about your hypothesis? What did you conclude about your problem? Did you find another problem to investigate based on what you learned?
- Include real life connections



Science Fair Tips for Parents – Some Helpful Dos and Don'ts

Here are some tips to keep your sanity, keep order in the house, and to help your would-be scientists do a really good project, and perhaps even win an award. The goal is to have your willing and exuberant involvement help your child to avoid a stressful experience and instead have an exciting learning experience.

- DON'T do the research for your student. Let your child find the project that he/she just cannot resist doing
- DON'T do any of the work for your child, but DO give him/her guidance, encouragement, and support whenever needed.
- DON'T stress the award factor. The most important aspect of the entire exercise is discovery, excitement, and learning.
- DON'T let your child do a project that uses dangerous chemicals, or is otherwise unsafe.
- DO make certain that your child allows enough time from start to finish. Six weeks is a good idea.
- DO make sure that your child follows the "scientific method". This will include such topics as research, problem, hypothesis, experiment, and conclusion.
- DO make sure that your child has learned how to make the presentation (PRACTICE!!!)
- DO make certain that the child knows it is his/her project
- DO give your child the help they need in going to libraries, getting available computer time, making funds available for materials and the like
- DO volunteer to help with the science fair
- DO instill a sense of pride and accomplishment to your child for their efforts, but DON'T be afraid to give your child constructive criticism
- Be aware of the "perfect project" syndrome; allow yourself and your child to make mistakes

Repeat Your Mantra: "It's my child's project, not my project. It's my child's project, not my project…" ☺

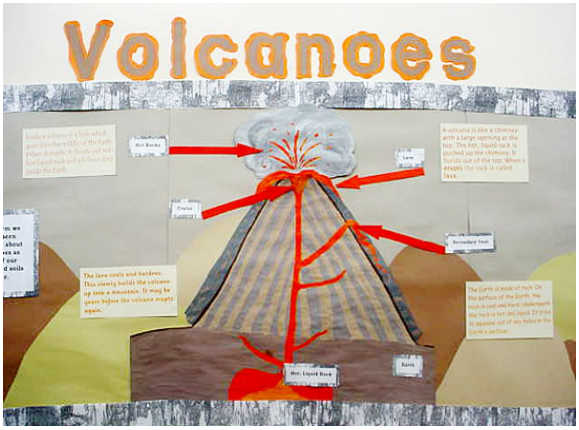
A Science Fair Project – "What it is and isn't"

There are two types of science projects: Models and Experiments.

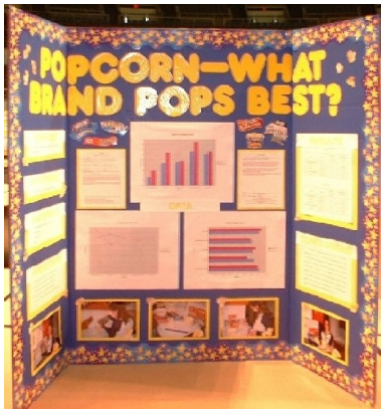
A model, display or collection:

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

Examples of these include:
The Solar System, Types of Dinosaurs, Types of Rocks, How an Electric Motor Works.



Boring!!!!! Don't do this →



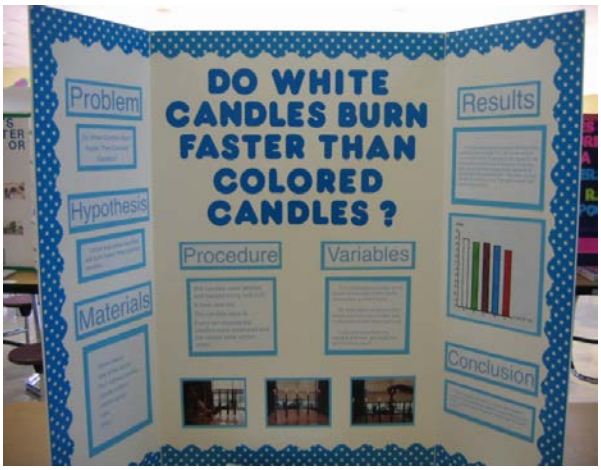
Beware of "Consumer Reports"

These projects are not recommended. These types of projects have difficulty in developing a valid hypothesis and library research is poor. Examples of these include: Which paper towel absorbs the most water? Which is the best soap for killing germs? Which brand of diaper absorbs the most liquid?

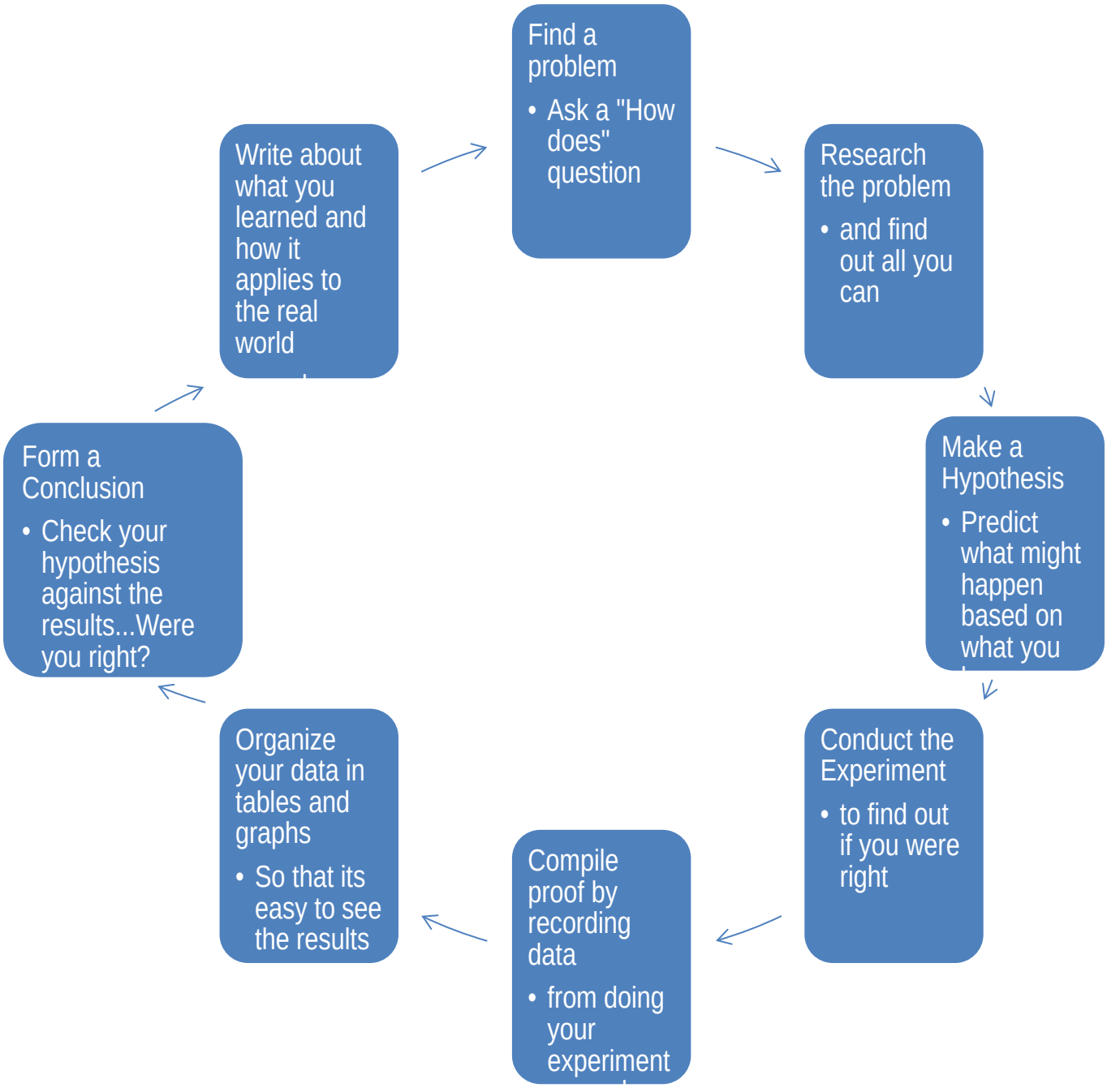
An Experiment:

An attempt to answer a question by designing and conducting an experiment. A systematic approach to solving a problem using the Scientific Method.

Cool!!! Interesting…Do This →



So, What is the Scientific Method?



SIX KEY ASPECTS OF A SUCCESSFUL PROJECT

1. Choosing a category that interests you…

Here are 3 general categories:

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, it is against Science Fair Rules to intentionally hurt an animal during an experiment. Life sciences also includes studying behaviors, so it's a perfect category to try taste tastes, opinion surveys, animal behavior training, etc.

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 you might question, "How does it work and what if I do this to it, will it still work?" Physical science also includes the composition of matter and how they react to each other. These are scientific experiments that may have bubbling and oozing going on, like figuring out what is an acid and what is a base.

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 is the topic 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, or Earth and Space Science)

I want to do an experiment involving

_____

_____

_____

2. Coming up with a Good Question…

A good question is clear and direct and helps you see what experiment to do to answer it. Here are some "fill in the blank" examples:

The Effect Question:

What is the effect of _____ on _____?

sunlight	the growth of plants
eye color	pupil dilation
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) _____?

foods	do	meal worms prefer
liquid	makes	plants grow best
salt	dissolves	ice the fastest

Now it's your turn:

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

_____

_____

_____

_____

3. Doing the Research and Forming the Hypothesis:

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. Make a list of all the books and articles you read.

YOU DISCUSS!!! Talk about it with your parents. Talk about it with your teachers. Talk about it with experts in the field (Veterinarians, Doctors, Weathermen, etc).

WHEW!!!!

Now, you are ready to WRITE A HYPOTHESIS

Now it is 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. Just answer this very simple question:

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

Now it's your turn….

Write down the problem and create a hypothesis based on what you have researched:

Problem: _____

_____

Research:

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)

_____

_____

_____

_____

_____

_____

4. Testing your hypothesis by doing an experiment

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:

1. Gather up your materials. Make a list.

2. Write a procedure. Make a list of steps that you did to run the experiment.

3. Identify your variables. Variables are any factor that can change in an 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 dirt, same type of plant, same type of location, same amount of sunlight, etc). The only variable that you would change from plant to plant would be the amount of water it received. This is called the independent variable or manipulated variable. The results of the test that you do are called the dependent or responding variables.

4. Test, Test, Test. The judges expect your results to be consistent in order to be a good experiment. You need to do the experiment more than once in order to test it properly. More is better!

5. Collect your DATA. Write down the results of the experiment every time you test it. Be sure to organize it in a way that it is easy to read the results. You may use tables, graphs, and other organizers to show your results.

    a. Keep a science journal – to record observations, collect research, draw and diagram pictures, and jot down any additional questions you might have for later.

    b. Have the right tools to do the job – have the right tools to take accurate measurements, like rulers, thermometers, graduated cylinders, or measuring cups that measure volume. The recommended standard of measurement in science is METRIC (meters, liters, Celsius, grams, etc).

    c. Tables, charts, and diagrams

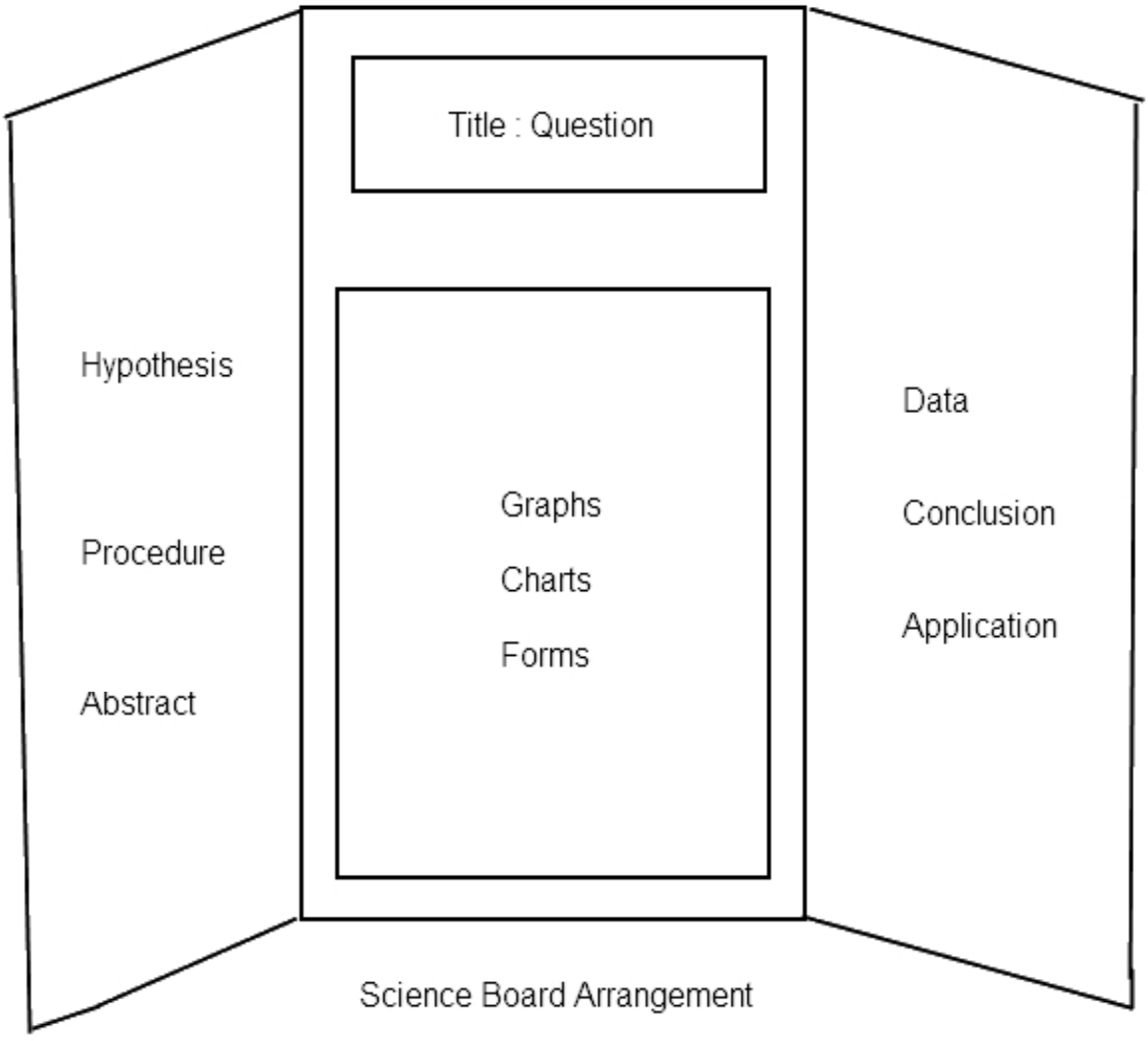
Plant	Amount of Water per day (ml)	Size it grew in two weeks (cm)
(controlled variable)	(independent variable)	(responding variable)
Plant A	None	0.5
Plant B	5	2
Plant C	10	5
Plant D	20	7

6. 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 have completed your experiment. And most of all, TELL WHAT YOU LEARNED FROM DOING THIS.

7. Understand its Application. How can this experiment be used in real life??

5. The Presentation…

Your display board is kind of like an advertisement for all your hard work. HOWEVER, keep in mind a Science Fair Project is not an ART PROJECT. It should be neat and legible, but the emphasis should be on understanding and applying the scientific process.



Science Board Arrangement

Items to include with each project: Please do not display your name on the front of the display

1. List of materials used in your experiment (include how much, what kind, etc. Use metric units)
2. Title (as a header at the top of the display board)
3. Hypothesis
4. Procedure or Method
5. Results
6. Conclusions
7. Science Journal (where you record all observations, collect research, draw and diagram pictures, etc.) Be sure you date each entry in the journal. Begin your journal when you start your project (at the very beginning). EVERYTHING you do or think of concerning your project should be entered into your journal. Put your name on the inside cover