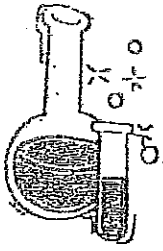
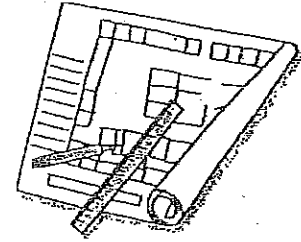


Name: _____

Due Date: _____



Science Fair and



Invention Convention

Choose one of the following to complete:

- Conduct a scientific experiment.
- Design and build your own invention.

Projects must be done according to the following guidelines:

➤ **Science Experiment**

Conduct a science experiment using the scientific method. Science projects should involve an experiment where the result can be guessed but won't be known for sure until the experiment is completed. Science projects are not demonstrations. New information needs to be discovered. Showing how a volcano works or how electricity is conducted is a great demonstration, but is not an experiment. No new information is discovered.

Your experiment must have the following: Title, Purpose, Question, Hypothesis, Materials, Procedure, Results & Data, Conclusion. (See attached sheet for explanation of these terms.)

Make a poster to explain your experiment. The poster must contain all the above information. Plan on also displaying any journals, logs, pictures or items used in your experiment.

Be prepared to explain your experiment and demonstrate it if possible.

➤ **Invention**

Create and build your own invention. It should be an original idea that will serve some useful purpose or help to solve a problem.

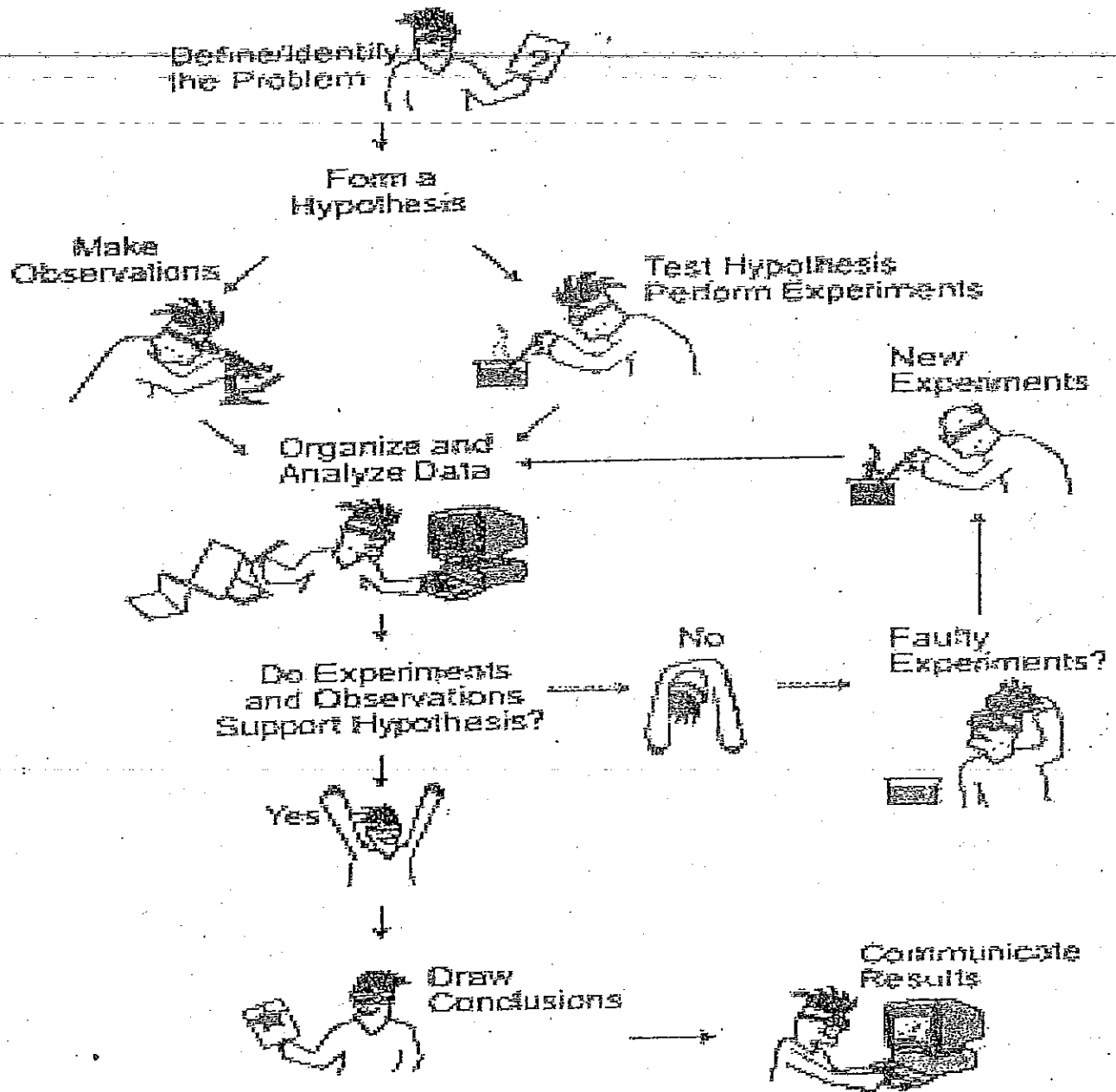
Your invention must include the following: Name of the invention, Problem to be Solved or Need for the Invention, How you got the idea, Materials used, Drawings or pictures of original designs, How it works, Conclusion (See attached sheet for an explanation of terms.)

Make a poster to explain your invention. The poster must contain all the items stated above. Be prepared to explain and demonstrate your invention.

You must supply all materials for experiments and inventions. Once you have decided upon your project, it is recommended that you have your teacher approve it

- No live animals
- No open flames
- If your project requires a power source, batteries must be used.

Scientific Method Flowchart



1. Define/Identify the Problem
2. Form a Hypothesis
3. Make Observations or Test Hypothesis and Perform Experiments
4. Organize and Analyze Data
5. Do Experiments and Observations Support Hypothesis?
 - o If No, Perform New Experiments and Repeat Step 4
6. Draw Conclusions
7. Communicate Results

Science Experiment Terms

- TITLE:** Your title should be "catchy" or an "interest-grabber". It should also describe the project well enough that people reading your experiment can quickly figure out your topic.
- BACKGROUND or PURPOSE:** This is the section where you include information that you already know about your subject. It tells your readers why you chose the project you did. What were you hoping to find out from your experiment?
- QUESTION:** This is where you will decide the question that will guide your experiment. Make it simple and to the point. Remember it should be a testable question about your subject. Example; "How will different amounts of light affect the height of a plant?" This tells your readers right away that you are going to be testing the amount of light plants get and how it affects its height.
- HYPOTHESIS:** Your hypothesis is a statement that tells what you believe will happen as a result of your testing. It is an educated guess based upon what you already know about your topic. Write your hypothesis before you begin your experiment. It is perfectly fine if your hypothesis does not end up matching your results.
- MATERIALS:** A list of all materials used in your experiment.
- PROCEDURE:** Design an experiment to test your hypothesis. Make a step-by-step list of what you will do to answer your question.
- Select only one thing to change in your experiment. Things that can be changed are called variables. In the previous plant example, all the plants you use should be the same. They should all be fed and watered identically. The only variable that should be changed is the different amount of light that each plant gets.
 - Change something that will help you test your hypothesis.
 - Your procedure must tell how you changed this one variable.
 - Your procedure should tell how you would measure any change that occurs.
 - Each type of experiment needs a control, for example: a plant that was grown normally. This is what you will compare with the other plants.
 - Some experiments may benefit by repeating the procedure more than once, just to make sure the results are accurate.
- RESULTS & DATA:** This is the section where you tell your readers the actual numbers or other data that you got while doing your experiment. Examples: the height that the plant grew or the height the ball bounced. You might also want to draw a graph or make a table. Don't interpret the data. That's for the conclusion.
- CONCLUSION:** This is where you tell your readers what you discovered about your experiment or what your data means. This is where you answer your original question and decide where you were able to prove your hypothesis to be correct. Remember, finding out that you could not prove your hypothesis is just as important to scientists.

Remember to include:

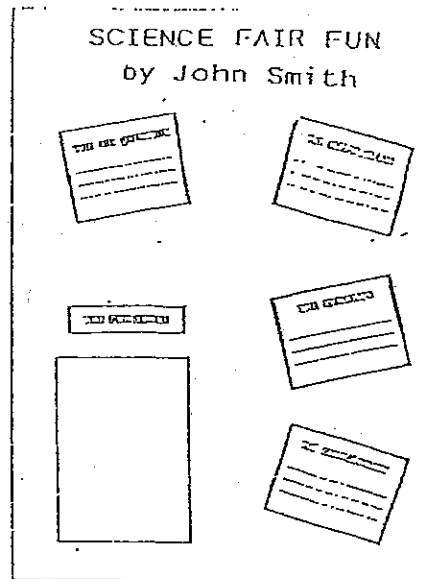
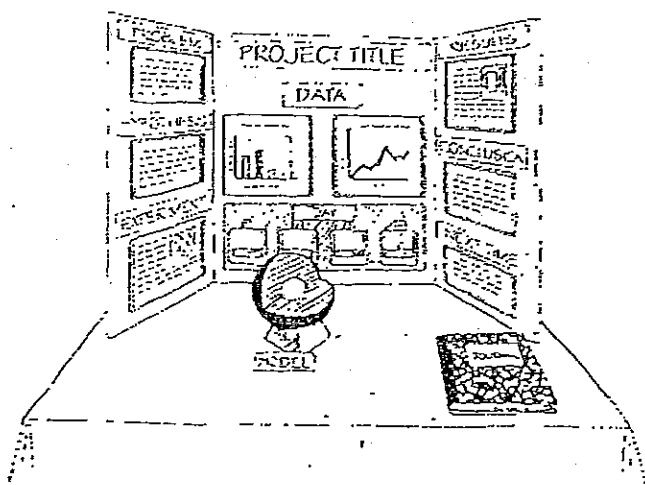
1. Where you able to prove or disprove your hypothesis?
2. What did you learn?
3. What problems did you have or what would you do differently next time?

Science Experiment Ideas

Here are some ideas that may help you choose a topic. You may need to do a little research to help you get ideas for experiments.

- On which foods does fungus grow best?
- Which kind of soil is best for holding water?
- Which fruit or vegetable has the most water in it?
- How does temperature affect the uptake of water in celery plants?
- Does the type of water affect the growth of plants?
- Does music affect plant growth?
- Are safe homemade cleaners as good as commercial ones?
- Which soap works better?
- Which fertilizer makes plants grow healthier?
- Which soil makes plants grow better?
- Does sight have an effect on taste?
- Which glass cleaner works best?
- Does moisture affect the growth of mold on food?
- Which color will fade the fastest on clothes?
- How is the thickness of insulation affecting how well it keeps heat in / cold out?
- On what kind of bread will mold grow fastest?
- Will temperature affect the bounce of a ball?
- What kind of wood can withstand the most pressure?
- Which battery lasts longer?
- Does keeping your battery in the refrigerator really make it last longer?
- Which dish detergent lasts longer?
- Which diaper is more absorbent?
- Does saccharine attract ants like sugar does?

Remember that these are just ideas. You can try your own ideas. Try thinking of something that may interest you. You may want to check the Internet, science fair books, or research books.



Examples of a Good Display

Invention Terms

NAME: Give your invention a name. It can be a catchy name or something that would make it easy for people to remember. The name should have something to do with your invention's function.

PROBLEM THE INVENTION WILL SOLVE / NEED FOR THE INVENTION: In this section you will need to describe the problem or need that occurs that needs some new invention to solve. Describe the situation in which an invention would be needed or helpful.

HOW YOU GOT THE IDEA: Describe how you got the idea for the invention. Here is where you tell how you decided what invention would best solve your problem or need.

MATERIALS: A list of materials used for your invention

DRAWINGS AND PICTURES: Here is where you can put and pictures or drawings of your original ideas as well as pictures taken during the actual inventing. You should include a drawing of your invention with its parts labeled.

HOW IT WORKS: In this section you will need to describe how your invention works and what it is expected to do.

CONCLUSION: Here you will describe how successful your invention was in solving your problem.

Be sure to include:

- Where there any problems that occurred?
- Did you have to make any changes? Why?
- Are there any improvements that you would want to add to your invention?

Ideas for Inventions

It is thought that necessity is the mother of invention. Most inventions come about because of a need for something or an improvement to something already existing.

Ways to get ideas:

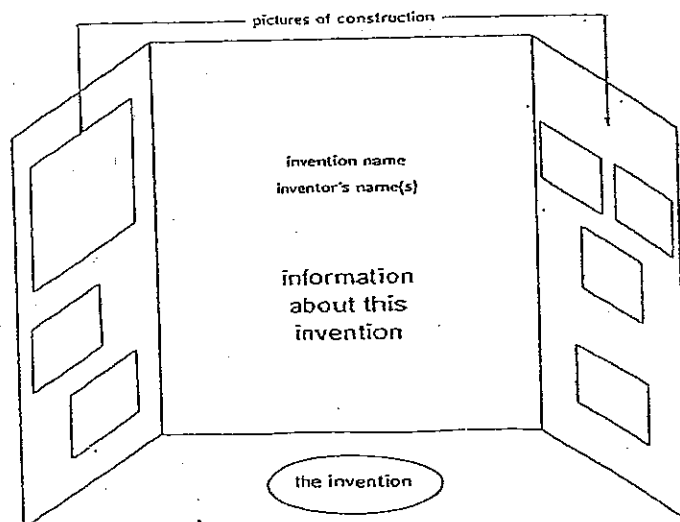
- Ask people if they need anything
- Brainstorming
 - think of an object
 - think of things that are wrong with that object
 - find a way to correct the problem
 - the ideas for solving the problem are a big step toward inventing something

Things to keep in mind when planning:

- What can I read about that will help me with my invention?
- What materials will I need?
- What steps should I follow?
- How can I test my invention?

Testing:

Follow your plans to create your invention. You may have to make adjustments to your plans. Make sure to test your invention several times to make sure it works. If your invention doesn't work, keep trying different things until you overcome the problem.



Science Fair Experiment : Science Experiment

Student Name: _____

CATEGORY	4 (Advanced)	3 (Proficient)	2 (Beginning)	1 (Novice)
Idea AND Hypothesis Development	Independently identified a question which was interesting to the student and which could be investigated. Independently developed a hypothesis well-substantiated by a literature review and observation of similar phenomena.	Identified, with adult help, a question which was interesting to the student and which could be investigated Independently developed a hypothesis somewhat substantiated by a literature review and observation of similar phenomena.	Identified, with adult help, a question which could be investigated. Independently developed a hypothesis somewhat substantiated by a literature review or observation of similar phenomena.	Identified a question that could not be tested/investigated or one that did not merit investigation. Needed adult assistance to develop a hypothesis or to do a basic literature review.
Description of Variables AND Procedures	Independently identified and clearly defined which variables were going to be changed (independent variables) and which were going to be measured (dependent variables). Procedures were outlined in a step-by-step fashion that could be followed by anyone without additional explanations. No adult help was needed to accomplish this.	Independently identified which variables were going to be changed (independent variables) and which were going to be measured (dependent variables). Some feedback was needed to clearly define the variables. Procedures were outlined in a step-by-step fashion that could be followed by anyone without additional explanations. Some adult help was needed to accomplish this.	With adult help, identified and clearly defined which variables were going to be changed (independent variables) and which were going to be measured (dependent variables). Procedures were outlined in a step-by-step fashion, but had 1 or 2 gaps that require explanation even after adult feedback had been given.	Adult help needed to identify and define almost all the variables, Procedures that were outlined were seriously incomplete or not sequential, even after adult feedback had been given.
Display	Each element in the display had a function and clearly served to illustrate some aspect of the experiment. All items, graphs etc. were neatly and correctly labeled. There were no spelling or grammatical errors.	Each element had a function and clearly served to illustrate some aspect of the experiment. Most items, graphs etc. were neatly and correctly labeled. There were only one or two spelling or grammatical errors.	Each element had a function and served to illustrate some aspect of the experiment, although it may have been unclear. Some items, graphs etc. were correctly labeled. There were several spelling or grammatical errors.	The display seemed incomplete or chaotic with no clear plan. Many labels were missing or incorrect. The experiment was not readable due to many spelling and grammatical errors.
Conclusion/Summary	Student provided a detailed conclusion clearly based on the data and related to previous research findings and the hypothesis statement(s).	Student provided a somewhat detailed conclusion clearly based on the data and related to the hypothesis statement(s).	Student provided a conclusion with some reference to the data and the hypothesis statement(s).	No conclusion was apparent OR important details were overlooked.

COMMENTS:

Name: _____

Invention Project Rubric

Category	Advanced (Exemplary) (4)	Proficient (Accomplished) (3)	Basic (Developing) (2)	Novice (Beginning) (1)	Score
Originality & Usefulness	<ul style="list-style-type: none"> <input type="checkbox"/> Approach is original, appropriate, & engaging. <input type="checkbox"/> Written response demonstrates that surveys were conducted on possible solutions. <input type="checkbox"/> Written response shows that extensive feedback was collected on the final solution and/or product. 	<ul style="list-style-type: none"> <input type="checkbox"/> Approach is original & appropriate. <input type="checkbox"/> Written response demonstrates that a survey was conducted on a possible solution. <input type="checkbox"/> Written response shows that some feedback was collected on the final solution and/or product. 	<ul style="list-style-type: none"> <input type="checkbox"/> Approach is unoriginal yet appropriate. <input type="checkbox"/> Written response demonstrates that an internal (team) survey was conducted on possible solutions. <input type="checkbox"/> Written response shows little evidence that feedback was collected on the final solution and/or product. 	<ul style="list-style-type: none"> <input type="checkbox"/> Approach is unclear, unoriginal and not appropriate. <input type="checkbox"/> Written response shows no evidence of a survey conducted on possible solutions. <input type="checkbox"/> Written response shows no evidence that feedback was collected on the final solution and/or product. 	
Written Description	<ul style="list-style-type: none"> <input type="checkbox"/> Name identified <input type="checkbox"/> Problem clearly defined <input type="checkbox"/> Clear explanation of origins of the idea <input type="checkbox"/> Detailed and clear explanation of how invention works 	<ul style="list-style-type: none"> <input type="checkbox"/> Name identified <input type="checkbox"/> Problem clearly defined <input type="checkbox"/> Clear explanation of origins of the idea <input type="checkbox"/> Clear explanation of how the invention works 	<ul style="list-style-type: none"> <input type="checkbox"/> Name identified <input type="checkbox"/> Problem defined <input type="checkbox"/> Origin of the idea unclear <input type="checkbox"/> Brief and unclear explanation of how the invention works 	<ul style="list-style-type: none"> <input type="checkbox"/> Name not identified <input type="checkbox"/> Problem not defined <input type="checkbox"/> Origin of the idea unclear <input type="checkbox"/> Brief and unclear explanation of how the invention works 	
Knowledge of Subject	<ul style="list-style-type: none"> *All parts of the invention project can be explained clearly *Problem or need for invention can be explained *How the invention works can be clearly explained and demonstrated 	<ul style="list-style-type: none"> <input type="checkbox"/> Most parts of invention are clear *Need for invention is somewhat clear *How the invention works in somewhat clear 	<ul style="list-style-type: none"> <input type="checkbox"/> Some parts of invention are clear *Need for invention is unclear *How the invention works is confusing 	<ul style="list-style-type: none"> <input type="checkbox"/> Parts of the invention are unclear *Need for invention is not stated *Invention is not functional 	
Display	<ul style="list-style-type: none"> <input type="checkbox"/> Easily understood <input type="checkbox"/> Labeled <input type="checkbox"/> Pictures and drawings are neat • no spelling or grammar mistakes 	<ul style="list-style-type: none"> <input type="checkbox"/> Understandable • most parts are labeled • pictures and drawings are clear • one or two spelling or grammatical errors 	<ul style="list-style-type: none"> <input type="checkbox"/> somewhat confusing • some labels missing • pictures and drawings are hard to understand • several spelling and grammatical errors 	<ul style="list-style-type: none"> <input type="checkbox"/> very confusing • parts are not labeled • pictures and drawings are unclear or there are none • project cannot be read because of spelling and grammatical errors 	

Comments: _____

Total Score: _____

April 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Begin Exploring Topics

Experiment/Invention Selected

Begin Working

May 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 Gather Materials Begin Talking Data	2	3	4	5
6	7	8	9	10	11	12
13	14 Begin creating Poster	15	16	17	18	19
20	21	22	23	24 Experiment /Invention Due!	25	26
27	28	29	30	31		