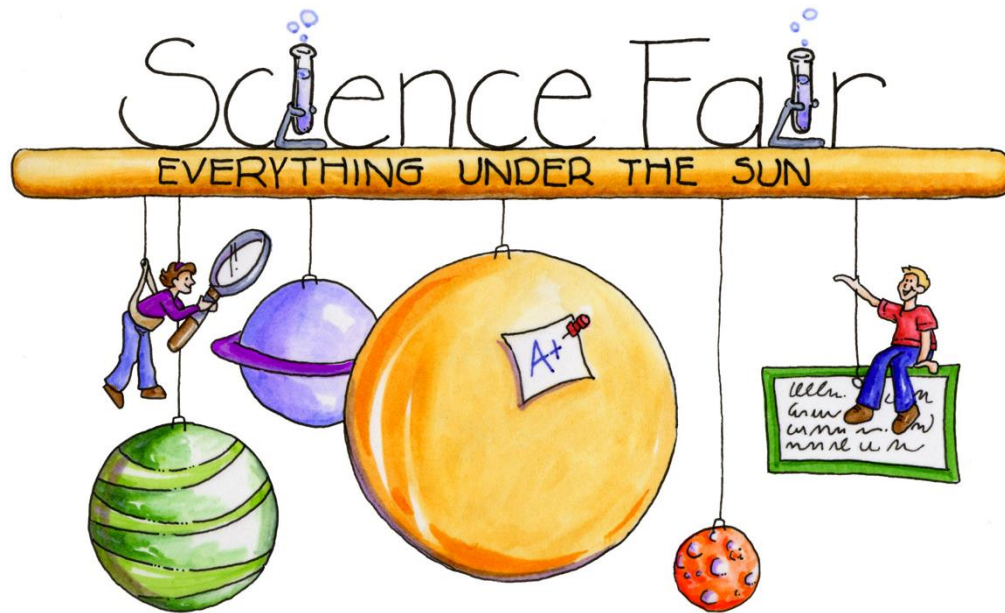


# TAG Science Fair 2019



Name \_\_\_\_\_

*Please note that this booklet is for planning only. It contains all the requirements and provides a place for you to plan and record data about your experiment. Only your project board will be graded. The Problem Question Sheet is due **Wed., December 19**. You will bring in your science fair presentation board and any artifacts on the **TAG Science Fair Day, which is Wed., January 23**.*



# SCIENCE FAIR PROJECT GUIDELINES

***Each part of the scientific method needs to be neatly and clearly shown on your display board. This booklet is considered your “sloppy copy” where you will plan, take notes, and record data. You will not turn in this booklet.***

## **Problem Question**

This is the problem or question that you would like to answer. The question should be something that is testable. There are hundreds of ideas on [mrscolessupersciencesite.com](http://mrscolessupersciencesite.com). The yellow problem question sheet is due **Wednesday, December 19**.

## **Research**

Do some research to learn about your topic. This is also a good place to explain why you chose this topic and/or why it is interesting to you. Include any background information that you may know about the topic and any interesting facts you learned along the way. Also, include where you found your information. For this project you need to cite the titles and authors of the books you used, and for online references include entire website addresses.

## **Hypothesis**

Make a prediction about what you think will happen based on your research and background knowledge. You need to explain your reasoning behind your hypothesis. Predictions are not valuable unless they include why you made them.

## **Experiment**

List your materials and explain how you conducted your experiment. Be specific. Include the experimental variable (what you changed), the control variables (what needs to stay the same in order for the experiment to be a fair test), and the dependent variable (what you measure in the experiment). Also include your observations. See the information below for help.



**Variables in Experiments—**  
Experiments demand control. If more than one variable changes at a time, the cause and effect is unclear.

**Control Variables**—the variables that you control (don't change) in an experiment. The control variables are all other variables than the experimental variable.

*Example:*  
If you want to know how speed affects gas mileage, then speed is the only variable that should change. The car, tires, road, wind speed need to stay the same—be controlled. They are control variables.

**Experimental Variable**—the variable that you are studying (changing) in an experiment. It is the only variable you change.

*Example:*  
If you are studying how salt affects boiling temperature, then salt is the experimental variable. By only changing the salt you will be able to learn how it works.

*(Note: Experimental variable can also be called independent variable.)*

**Dependent Variable**—  
A **dependent variable** is what you measure in the experiment and what is affected during the experiment.

*Example: If you are studying how different colored light affects plant growth, you will measure the height of the plants. The height is the dependent variable.*

## **Results**

Record and explain what happened during the experiment. Organize and present this data in some type of chart, graph, table, etc.

## **Conclusion**

Explain how your results relate to your hypothesis. In this section you are telling us whether or not your hypothesis was correct. It is not bad if your hypothesis was wrong, because you still discovered something. Explain why you think you had the results that you did.

## **Reflection**

What further questions do you have about your topic and/or experiment? Explain what you may do differently if you were to conduct the experiment again. (Saying that you do not have questions and/or would not change anything is not an option.)

# SCIENCE FAIR PROJECT IDEAS



A **SCIENCE DEMONSTRATION** is a quick little science “show” that explains a science concept like building a model volcano and watching it erupt. It shows how something works, but it is not a true experiment. While demonstrations can be valuable and interesting, this is not what you will be doing for your science fair project.

A **SCIENCE EXPERIMENT** is more involved and in most real experiments you compare results. An example would be, “What fertilizer works best on plants?” or “What is the strongest brand of paper towel?” In these examples, you ask a question and then perform an experiment to get the answer. This is what you will be doing for your science fair project.

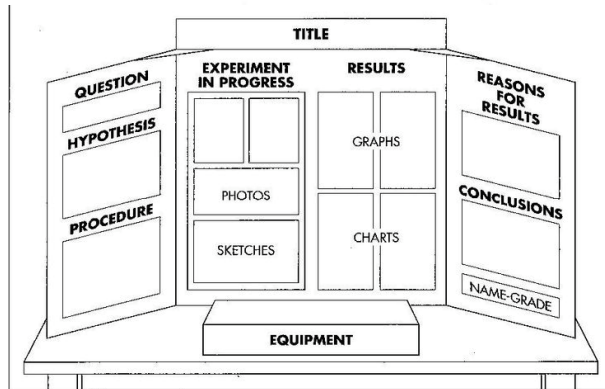
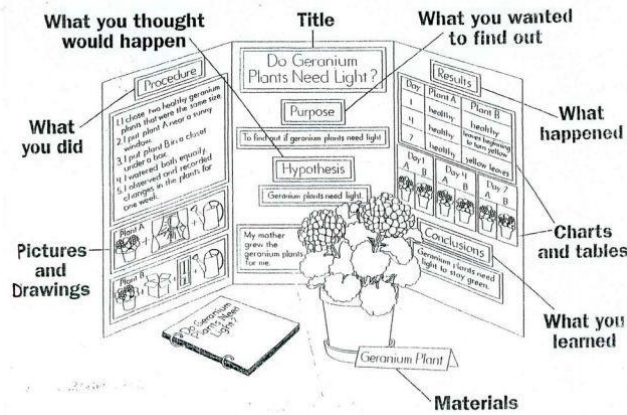
Here are some other ideas:

- How does the type of material affect how long a shirt takes to dry?
- How does the temperature of water affect the time it takes to freeze into ice cubes?
- Does the flavor of gelatin affect the amount of time it takes to set?
- Under what color light do plants grow best?
- How can you speed up the ripening of a tomato?
- How does the color of a shirt affect the amount of heat it absorbs?
- What melts ice the fastest?
- What effects do freezing and thawing have on rocks?
- How effective are different forms of insulation?
- How does the shape of a boat affect its speed?

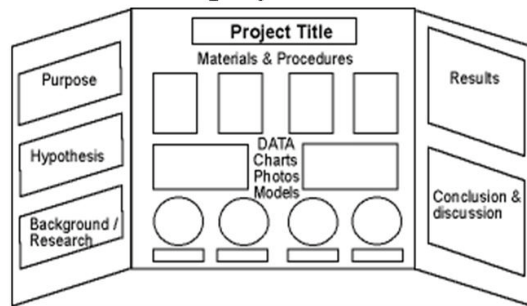
These are only a few ideas! Mrs. Cole’s Science Website has hundreds more ideas for problem questions and many more helpful resources for science fair projects too! ☺

There are many ways to display your work. Typically, a trifold cardboard display works best. Here are a few examples. Remember that your required components are clearly explained on the first page. **Please make sure your name is clearly visible on your display.** Also, include some artifacts such as photos, experiment materials, etc. These can be displayed on or in front of your board. **Do not put out free samples or treats for the science fair visitors.**

### Science Fair Display Board Guide



### Display Board



Arrange information so that it is easy to read and flows in a logical order.

Top to bottom and left to right.

## MANAGING YOUR TIME FOR THE SCIENCE FAIR PROJECT

This project is mainly homework. Mrs. Cole will go over this packet thoroughly, discuss questions and concerns, show examples of projects, and have two conferences with each student during the next six weeks. One conference will be to discuss the problem question, and the other will be a conference to make sure each student is on track.

Please do not bring in projects before the date of the fair as we have limited space. Remember that the actual experiment is done at home. You may display the materials that you used for the experiment, but the experiment will not be done at the fair. Your presentation board will show what you have learned and must include all the components of the scientific method explained on page one.

You should also include artifacts (photos, materials, etc.) related to your experiment. Do not display anything that is valuable, as the projects will not be locked up at any time. Also, there will not be electrical outlets available to use. Different classes will be visiting the science fair throughout the afternoon. You may wish to make neat, polite signs to let students know of any materials they may or may not touch.

Below is a sample timeline. Use the calendar on the next page to set up your own timeline. **The science fair is Wednesday, January 23, 8:30am-2:30pm.** The projects will be displayed in the hallway downstairs by the 5<sup>th</sup> Grade TAG lockers and on the stage of Lars Auditorium. You can set up your projects first thing this morning. At 2:30 that day, we will pack up the projects. All projects will be taken home that afternoon.

### Timeline Example

*This is only an example.*

*Make one that meets your needs using the calendar on the next page.*

Task	Due Date
Choose a problem question.	Wednesday, December 19
Conduct the research.	Tuesday, January 2 - Wednesday, January 3
Design the experiment.	Thursday, January 4
Collect the necessary materials.	Saturday, January 5
Conduct the experiment and gather data.	Monday, January 7 - Sunday, January 13
Create presentation board.	Monday, January 14 - Saturday, January 19
Make any final touches.	Monday, January 21
Bring in project to display.	Wednesday, January 23

# December & January

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
December						
9	10	11 Science Fair Requirements Discussion	12	13	14	15
16	17	18	19 Problem Question Sheet Due <i>(Mrs. Cole will meet with each student this week.)</i>	20	21	22
23	24 No School	25 No School	26 No School	27 No School	28 No School	29
30	31 No School					
January						
		1 No School	2 No School	3 No School	4 No School	5
6	7 School Resumes	8	9 Mrs. Cole will have a check-in conference with each student during this week.	10	11	12
13	14	15	16	17	18 <b>1/2 Day of School</b> What a great day to work on the project! ☺	19
20	21 No School What a great day to work on the project! ☺	22	23 <b>TAG Science Fair 8:30am- 2:30pm</b>	24	25	26

***This is the rubric that Mrs. Cole will use to grade your project.  
All of the parts below need to be on your presentation board.  
This is for your reference. Mrs. Cole will have another copy for the actual grading.  
Special Note: If you do not have access to a printer, let Mrs. Cole know  
and she will print out anything that you need.  
Please submit any printing requests by Monday, January 21.***

## Science Fair Project Grade

Criteria	Points Possible	Points Earned
<b>Problem Question</b> <i>The question was <u>testable</u>.</i>	10	
<b>Research</b> <i>The student presented research about the topic (why the topic was chosen, background information, fun facts, etc.) The student also included where the information was found (books, websites, etc.).</i>	10	
<b>Hypothesis</b> <i>A prediction was stated based on research and background knowledge. The reasoning behind the hypothesis was also explained thoroughly.</i>	10	
<b>Experiment</b> <i>The student listed the materials and explained how the experiment was conducted. The student included the experimental variable, the control variables, and the dependent variable. Observations were also included.</i>	10	
<b>Results</b> <i>The student organized and presented the data in an organized and informative manner.</i>	10	
<b>Conclusion</b> <i>An explanation regarding how the results relate to the hypothesis was included. The student also explained why these particular results might have occurred.</i>	10	
<b>Reflection</b> <i>The student stated any further or unanswered questions about the topic <u>and</u> explained could be done differently if the experiment was conducted again.</i>	10	
<b>Effort</b> <i>The project is neatly done and organized well. Effort was made to put together an interesting display with artifacts (photos, materials, etc.). The student used appropriate grammar, spelling, and punctuation.</i>	10	

Points Possible = 80

Points Earned = \_\_\_\_\_

Grade: \_\_\_\_\_





Hypothesis (Be sure to explain your reasoning):

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Experiment Notes

*(Materials, Procedure, Variables, Observations):*

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Experimental Variable	Control Variables	Dependent Variable





