

7th Grade Science Fair Timeline

<i>Due Date</i>	<i>Component Description</i>
9/21/15	Topic Selection Group Member Selection Parent Permission Slip
	Research Summary Works Cited
	Hypothesis Experimental Plan
	Experiment Completion Observation and Data Collection
	Analysis Graph and Claims/Evidence
	Conclusion
	Final Binder Report
	Exhibit (Display Board)
	In Class Presentation
5/5/16	SCIENCE FAIR PARENT NIGHT

CHOOSING YOUR TOPIC

1. Access Mrs. Cramer's Blended Schools website.
2. Select Science Fair from the tabs on the left and explore the posted links for topic ideas.
3. Identify your top three choices in the space below. Evaluate the topics by responding to the questions in the chart.

Possible Topic Choices	How much time is needed to complete the project? (Hint: Does your experiment require plants? Would you grow them from seeds? Can your data be collected in a day? Several weeks?)	What materials would be required to complete a science fair project on this topic? Circle the materials that you would need to purchase. How much do they cost?	What are some possible research choices (Do not just say books or internet).
1.			
2.			
3.			

<i>FINAL TOPIC CHOICE:</i>	<i>Questions/Problems I Want to Investigate about My Topic:</i>
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Research Resources:

A. Places I could visit for more information:

B. People I could interview:

C. Research resources I should explore:

Group Members:

NAME:	NAME:
1.	3.
2.	4.

For the Student:

I, _____, have shared the Science Fair Parent Letter, topic selection, and group member selection with my parents or guardians. I understand that I am not permitted to complete my science fair experiment without the presence of an adult. Additionally, I understand that I must follow the safety rules of the science classroom even outside of school.

Student Signature: _____ Date: _____

For the Parents/Guardians:

I, _____, have reviewed the Science Fair Parent Letter, topic selection, and group member selection with my child. I understand that my son or daughter is not permitted to complete his or her science fair experiment without the presence of an adult. I approve of my child's final topic choice, questions for exploration, and group member selection.

Parent Signature: _____ Date: _____

Name: _____ Section: _____ Date: _____

SCIENCE FAIR MASTER RUBRIC

ITEM DESCRIPTION: (Please see section handouts for specific information and point break down)	Due	On time? (DP)	Max Pts.	Your Total:
1. Topic Selection: (Signed and completed) Topic Title: _____		__/2	5	
2. Research Summary (at least 200 words): -Works Cited: __/2 -Content: __/4 -Mechanics: __/4		__/2	10	
3. Hypothesis/Experimental Design -Question: __/1 Materials, IV, DV, Con: __/4 -Hypothesis: __/3 Proposed Data: __/2 -Exp Plan: __/8 Proposed Table: __/2		__/3	20	
4. Data Collection: -Quantitative: __/5 (numerical data, proper units) -Qualitative: __/5 (descriptive data) -Mechanics: __/5 (typed, organized, no spelling errors)		__/3	15	
5. Analysis/Graph: -Title: __/1 Graph Type: __/1 -Labels: __/1 Style: organized, color , computer -Units: __/1 generated: __/3 -Claims & Evidence: __/3		__/2	10	
6. Conclusion: -Proper Format: __/4 -Includes Data: __/4 -Mechanics: typed, grammar, usage, format __/2		__/2	10	
7. Display Board: Labels: __/2 -8 Board Components: __/16 Style: __/4 -Creativity: __/4 Mechanics: __/6 -Organization: __/4 Pictures: __/4		__/3	40	
TOTAL:		__/17	110	
PERCENTAGE:				
COMMENTS:				

Research Summary Directions

- 1. Now that you have selected your science fair topic, you must research relevant background information in order to write an informed hypothesis and design a controlled experiment. IT MUST BE RESEARCH!! IT SHOULD NOT BE A PARAGRAPH EXPLAINING WHAT YOU ARE DOING IN YOUR EXPERIMENT.**
- 2. Each person in the group is responsible for collecting research information from one source and summarizing the most important information. Every group member must use a different source. In other words, no two students may use the same book, website, or magazine. IF YOU DON'T UNDERSTAND OR KNOW THE WORDS DON'T USE THEM OR DEFINE THEM AND LEARN THEM. BIG SCIENCE WORDS THAT WE HAVE NOT USED USUALLY MEANS THAT THE INFORMATION WAS PLAGIARIZED.**
- 3. Potential research sources include books, encyclopedias, magazines/journals, and reliable internet websites.**
- 4. The final research summaries(s) must be typed in black ink on an 8 ½ x 11 in. piece of paper according to the format on this handout. The summaries should be double-spaced. Each research summary must be AT LEAST 200 words in length.**
- 5. Don't forget to give your sources credit! You must include a work cited with your research summary. Follow the format below. If you use a website, I want the link copy and pasted into the doc.**
- 6. For more help writing the work cited, check out the Fort Couch library webpage by visiting: <http://www.uscsd.k12.pa.us/Page/1529>**

Format for a Book:

Author's Last Name, First Name. Title. City of Publication: Publisher,
Copyright date: Pages used.

Format for an Encyclopedia:

Author of the article. "Title of the article." Name of the encyclopedia. Volume
number. Copyright date: Pages.

Format for a Website:

Author's Last Name, First Name. "Title of the work." Name of the web site.
Web. Date you visited the site <Electronic address or URL of the site>.

Component	Description	Point Breakdown
Works Cited	Proper format, have at least one source listed.	2 pts.
Information	Presents relevant information that helps you plan your hypothesis and experiment.	4 pts.
Mechanics	-Summary is typed according to format below and is the proper length. -All sentences are written in complete sentences using proper grammar, spelling, and usage.	4 pts.

YOUR NAME: _____

(TOPIC NAME): *Research Summary*

Work Cited:

"MythBusters." *Discovery Channel*. N.p., n.d. Web. 06 Nov. 2013. <<http://dsc.discovery.com/tv-shows/mythbusters/mythbusters-database/corked-bat-makes-baseball-fly-farther.htm>>.

Type 200 word minimum paragraph in the space below. Then go to a new page for the next person. Use the same heading for each person (but the works cited will change). Each group member will get their own page.

Hypothesis and Experimental Plan Directions

1. Now that you have completed research about your science fair topic and written abstracts to summarize your findings, you possess the background knowledge necessary to design a controlled experiment using the scientific method.
2. Please follow the format of this form when writing your hypothesis and experimental plan. You may initially complete this paper in pencil as a rough draft. However, the hypothesis and experimental plan that you submit to be graded **MUST BE TYPED**.
3. Only **ONE COPY** of the hypothesis and experimental plan must be submitted to Mrs. Cramer to be graded. It must be on the google doc so Mrs. Cramer can view it.
4. If the assignment is late, you will be penalized daily performance points. This assignment is a group grade.
5. Sample hypotheses include:
 - a. If galvanized, painted steel, and steel nails are exposed to water, then the galvanized nails will be the most rust-resistant.
 - b. If green bean plants are grown in organic and inorganic fertilizer, then the plants grown in the organic fertilizer will grow to a greater average height.
6. If you would like to see examples of outstanding student work from last year's science fair, please see Mrs. Cramer for samples to review.

Hypothesis and Experimental Design

Question (1 pt.):

Hypothesis (If..., then...) (3 pts.):

Independent Variable (1 pt.):

Dependent Variable (1 pt.):

Control Variables (Constants) (1 pt.):

Materials (List may be bulleted.) (1 pt.):

Procedure:

Using COMPLETE sentences, write down the numbered steps you will follow in order to test your hypothesis. Your plan must be so SPECIFIC that a person unfamiliar with your project could follow the directions and complete the experiment without asking you for clarification. As you write your experimental plan, keep in mind the safety rules of the science classroom. (8 pts.) **ALL experiments MUST include at least three trials or gain at least three pieces of data.**

- 1.
- 2.
- 3.

Data Collection:

In COMPLETE sentences, explain what qualitative (Hint: WORDS!) and quantitative (Hint: NUMBERS!) data you will collect in order to answer your question and support/disprove your hypothesis. Consider how often you will collect data, what units you will use, and what, if any, equipment will be required to take any necessary measurements. Include a sample data table below your explanation.) (2 pts. for explanation, 2 pts. for sample data table)

Write a 3-5 sentence summary explaining what data you will collect and how. Look on the next page for examples.

Proposed Data Table: (Remember to label the columns and rows with appropriate units!) Create a rough draft on paper first. Then go to "Table" in the menu above and hover over table to choose the number of columns and rows you need. You will need TWO tables one for the numbers you collect and one for the words or descriptions you collect. **ALWAYS INCLUDE AVERAGES IF POSSIBLE!**

Experimental Data Format

COMPUTER-GENERATED Quantitative and Qualitative Data Tables: (May be organized in multiple data tables.)

EXAMPLES:

Mass of Nail after Passage of Time Quantitative Data

	Day 5	Day 10	Day 15
Galvanized Nail	3 g	2.9 g	2.87 g
Steel Nail	2.7 g	2.68 g	2.54 g

Health of Plant after Exposure to Acid Rain Qualitative Data

	Day 1	Day 2	Day 3	Day 4
Plant A	Plant's leaves are wilting	Two leaves have fallen off plant	An additional leaf fell	Plant is becoming yellow in color
Plant B	Plant's stem is bent	Roots have risen above surface of soil	One leaf fell	No new observation today

Experimental Data Collection (performing the experiment)

1. SAFETY FIRST!!! All safety rules apply inside as well as outside of the science classroom. At all times, a parent or guardian must supervise your science fair group as you conduct your experiment. If you need goggles or aprons, please see Mrs. Cramer.
2. START IMMEDIATELY!!! The due date may seem far away, but you must plan NOW! If your experiment involves plants and you do not intend on purchasing grown plants, you need to start germinating your seeds ASAP. Develop a meeting schedule with your group members now. Do NOT wait until the weekend before the data is due to conduct the experiment.
3. Only ONE TYPED COPY of the data must be submitted to Mrs. Cramer on the google doc.
4. If the assignment is late, you will be penalized daily performance points. This assignment is a group grade worth 15 points. Please refer to the rubric below for a point breakdown.

Component	Description	Point Breakdown
Quantitative Data	Quantitative data is the numerical data you will collect. Hint: Think measurements and numbers. (Ex: height of plant, temperature of solar oven, speed of wind turbine, etc.)	4 pts. – Numerical Data 1 pt. – Appropriate Units
Qualitative Data	Qualitative data includes the descriptive data you will collect. Hint: Think observations that cannot easily be measured, but are instead best described in words. (Ex: health, degree of taste, etc.)	5 pts.
Mechanics	Data table(s) is/are typed. Data table(s) is/are organized and easy to interpret. No spelling errors. (-1/2 pt/error)	2 pts. 2 pts. 1pt.

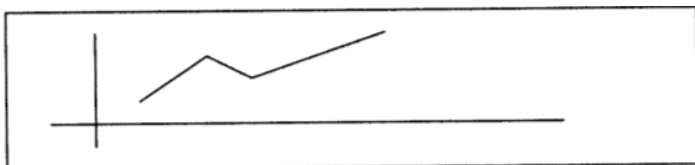
Analysis of Results: Computer Generated Graph

Graph Rubric

Component	Description	Point Breakdown
Title	<i>Be as specific as possible!</i>	2 pts.
Labels	<i>Labels X and Y-axes of bar and line graphs are labeled with variables. (Pie — label each slice)</i>	2 pts.
Units	<i>Units Include units with all quantitative data.</i>	2 pts.
Graph Type	<i>The most appropriate graph type is utilized to represent data.</i>	1 pt.
Style	<ul style="list-style-type: none">• <i>Data points are neat, organized, and easy to interpret.</i>• <i>Graph is IN COLOR! Color may be added using colored pencils, markers, or crayons if color printer is unavailable.</i>• <i>Graph is computer-generated.</i>	1 pt. 1 pt. 1 pt.

Graph Format

Excel Graph or Create a Graph Website



If you need help creating a graph in Excel, please see Mrs. Cramer immediately for online tutorial web addresses.

Options:

- A bar graph is used when you want to compare different types of data. It is important to make it easy to identify each bar. It is recommended that you code each bar with a color or pattern to distinguish one group of data from another. Provide a key to help people interpret what each color or pattern means.
- A line graph is when you want to show how the dependent variable is affected by changes in the independent variable or if you want to show how the data change over time.
 - The dependent variable should be placed on the y-axis and the independent should be placed on the x-axis.
 - Connect your points after plotting them.
 - If plotting multiple lines on the same graph, it is recommended that you color code each line. Remember to include a key!
- A pie chart is used when you want to indicate the proportion of the whole that a group represents.
 - First determine what percentage of the whole each group represents. Convert the percentage to a decimal. Multiply the decimal by 360 degrees, the number of degrees in a circle.
 - Use a protractor to measure the degrees of the circle composed of each group. Color code each data group's slice of pie!

Analysis of Results: Claims and Evidence:

No that you can compare the data, use the table below to make at least three claims (statements you know to be true) that supports and/or disproves your hypothesis. Then list three pieces of evidence (data) that supports those claims. This will help to write your conclusion.

Claim:	Evidence:

Conclusion of Results:

1. Only one copy of the conclusion needs to be submitted to Mrs. Cramer on the google doc.
2. The conclusion MUST BE TYPED!!!
3. Please refer to the rubrics and templates below for specific point breakdowns of this assignment. The conclusion is worth 10 points.

Conclusion of Results Rubric

Component	Description	Point Breakdown
Conclusion	Proper Format: 5 pts. Evidence (data) Provided: 3 pts.	8 pts.
Mechanics	<ul style="list-style-type: none">• Conclusion is typed according to format below.• All sentences are written in complete sentences using proper grammar. (- 1/2 pt/spelling error)	1 pt. 1 pt.

Conclusion of Results: Follow the format listed. Write the conclusion in paragraph form.

DO NOT INCLUDE OPINIONS IN YOUR ANALYSIS!

1. *First restate the question or problem as your topic sentence. You could also restate the main idea or concept of the experiment.*
2. *Use details and data (claims and evidence) from your experiment to answer the question.*
3. *Every statement must be supported by evidence/data.*
4. *Refer to your hypothesis and tell us if it is support or not supported.*
5. *Explain using science words (lab language) why you received your results*
6. *Explain what possible errors (experimental limitations) could have affected your results. Don't just say human error.*
7. *What further testing would you do to investigate your topic?*
8. *Restate the topic sentence to end your conclusion...ie Therefore we determined....*

Display Board Directions

Due: _____

1. Only one board has to be submitted per science fair group. All components MUST be typed.
2. The board is worth a total of 40 points.

Display Board Rubric

Component	Description	Point Breakdown
8 Components	See diagram below. 2 pts per component	16 pts.
Creativity	The board is visually appealing and colorful. The design is unique and original.	4 pts.
Organization	The board is organized as directed below.	4 pts.
Style	The information is displayed in an appropriate font and type size that is easy to read. BIG EASY TO READ FONTS!!!	4 pts.
Labels:	Each component can be clearly identified with a label	2 pts.
Pictures	Pictures and/or artifacts from your experiment are displayed	4 pts.
Mechanics	Complete sentences are used where appropriate. Information is grammatically correct. (1/2 pt per error)	6 pts.

Display Board Format:

Research Summaries:	<u>TITLE</u>	Data Table
Procedure:	QUESTION: BIG PRINT	Data Graphs
Variables: IV, DV, Constants	HYPOTHESIS: BIG PRINT	Analysis of Results
	CONCLUSION: Regular Print	
	Group Members	

SCIENCE FAIR OFFICIAL GRADE SHEET

(Please see rubrics for specific information and point break down)

TOPIC: _____	Due	On time?	Max Pts.	Your Total:
1. Topic Selections: (Signed and completed) <ul style="list-style-type: none"> ● Name: _____ ● Name: _____ ● Name: _____ ● Name: _____ 		___/2	___/5 ___/5 ___/5 ___/5	
2. Research Summaries: <ul style="list-style-type: none"> ● Name: _____ ● Name: _____ ● Name: _____ ● Name: _____ 		___/2	___/10 ___/10 ___/10 ___/10	
3. Hypothesis/Experimental Design		___/3	20	
4. Data Collection:		___/3	15	
5. Analysis/Graph:		___/2	10	
6. Conclusion:		___/2	10	
7. Display Board:		___/3	40	
8. Final Lab Report Binder:		___/3	10	
TOTAL:		___/20	120	
PERCENTAGE:				
COMMENTS:				

Name: _____ Section: _____ Date: _____

Communication and Evaluation

Topic:

Self Evaluation:

What did you do to complete the project?

Did you do your fair share?

Where you on task when completing the experiment or doing the board with your group?

Did you help with the final binder?

Did you help with the board?

Peer Evaluation:

List each person in your group. Include yourself. Place a check in each appropriate box.

List each person in your group	Compiled Final Binder	Contributed to Google Doc	Typed for board	Decorated Board	Performed Experiment	Other
1.						
2.						
3.						
4.						
5.						
6.						

Who did more than his\her share?

Who did less than his\her share?

Is there anyone that was disruptive or did not stay on task in team meetings?

On the back of this paper write any information that would be helpful in my evaluation.

PRESENTATION

THE SCIENCE FAIR is on May 5th, 2016 in the Fort Couch Gym from 7-8 pm.

1. The night of the science fair each group should have a hands-on item related to the project.
2. At 8:00 the science fair is over. At 8:00 you may either donate your board to the class or take it home. Anything left in the gym after 9:00 will be thrown away.
3. Stand by your booth and when anyone stops at your board, give your 30 second presentations.

30 Second Presentation

1. What is your question or topic?
2. What is your hypothesis?
3. Procedure?
4. Results?
5. Any questions?