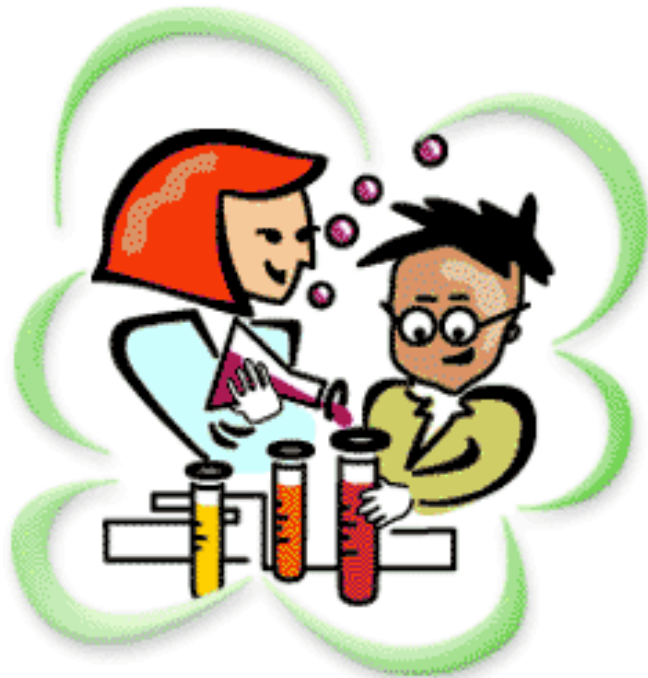


Hinson Middle School Science Fair Project



Name: _____

Period: _____

Date Issued: 8/31/15

Due On: 11/13/15

(Optional)

I STILL don't understand... _____

Science Fair Deadlines

Assignment	Due Date
Question Selection Worksheet	Tuesday, September 8 th
1 st Draft: Science Fair Project Proposal	Friday, September 18 th
Research Notes	Friday, October 2 nd
Science Fair Project Proposal & Official Paperwork	Friday, October 9 th
Run the experiment. Minimum 3 Trials, but more is better.	
FINAL REPORT	Friday, November 13 th
Hinson Science Fair - OPTIONAL - For all projects earning a "B" or better... If you choose, you can convert your report to a Display Board for the Hinson Science Fair.	Wednesday, December 9 th (Boards need to be at school on Tuesday, Dec. 8 th for set-up)
Tomoka Regional Science Fair - OPTIONAL - for winners of the Hinson School Fair	Saturday, January 30 th (Set-up on Friday, Jan. 29 th)

Grading Scale

Science Project	Possible Pts.
Purpose/ Problem	10
Background Info.	15
Hypothesis	10
Materials/Procedure	25
Graphs	10
Results	10
Conclusions	10
Abstract (on form)	5
Bibliography	5
TOTAL POINTS	100

Step 1 - Choosing a Topic

- The most difficult & important part of your project is choosing the topic. Here is a list of topics to avoid...good suggestions are on the following page.

FORBIDDEN TOPICS

1. People - NO surveys, NO medical tests (even simple things like pulse, blood pressure, vision tests), NO interaction whatsoever
*Exceptions - 1) statistical data (census info, public records, team stats.)
2) observation experiments - you observe people in a public place (park, mall, etc.) and track data without changing anything, interacting w/ them, or identifying them in any way.
2. Vertebrate animals
3. Mold or Bacteria
4. Fire

Bad Science Fair Topics

Topic to Avoid	Why?
Any topic that requires dangerous, hard to find, expensive, or illegal materials.	We care about your safety and your parents' pocketbook
Any topic that requires measurements that will be extremely difficult to make or repeat, given your equipment	Without measurement, you can't do science
Most consumer product testing of the "Which is best?" type. This includes comparisons of popcorn, bubblegum, make-up, detergents, cleaning products, and paper towels.	These projects only have scientific validity if the Investigator fully understands the science behind <u>WHY</u> the product works and applies that understanding to the experiment. While many consumer products are easy to use, the science behind them is often at the level of a graduate student in college.
Effect of colored light on plants, Effect of music/talking to plants,	Several people do this project at almost every science fair. You can be more creative!
Effects of watering plants with random liquids, (milk, orange juice, soda, etc.)	You may test different liquid treatments on plants, but you must have a LOGICAL reason why you think it might be effective.

Good Science Fair Topics

- **Are Interesting To You**
 - If you don't care about what you're doing, nobody else will care either
- **Are Creative & Original**
 - Try to think of an original idea...a question that you have about the world that you would like to answer.
 - If you need help, there are many books & websites with science fair project ideas...you can look at these to get the idea, but find a way to change the experiment & make it your own...take it to the next level!
- **Ask/Answer Only ONE Question**
 - Your results may lead you to other questions for later experiments, but this experiment should be focused on only 1.
- **Have Experiments That Are Relatively Easy To Do**
 - Keep it manageable - a simple experiment done correctly is worth more than a fancy experiment done poorly.
 - Materials & supplies should be easily found & inexpensive
- **Have Experiments With Results That Are Measurable/Graphable**
- **Are Suited To Your Deadline**
 - You have a limited amount of time...some experiments take a long time to perform, others can be done in a single day... keep this in mind.
 - Plants are GREAT in experiments, but they take time to grow...make sure you pick the right ones & plant them early enough.

***For help choosing a topic, go to the following websites

<http://www.sciencebuddies.org>
<http://www.all-science-fair-projects.com/>

*** This page is due on Tuesday, Sept. 8th

Name _____

Question Selection Worksheet:

1. Write three things you like...think about what you would like to learn more about:

2. Is there something you can get a lot of? (i.e., pipes, paper, skate supplies, CDs, car parts, gardening materials, etc...)

3. Which of the fields from the "Category Descriptions" on the NEXT PAGE interests you MOST?

4. Write 3 possible questions that you might explore with your project.

***Think: What will I CHANGE & what results will I MEASURE???? (Test & Outcome Variables)

a) _____

b) _____

c) _____

Space for student/teacher chat:

Category Descriptions

You must specify one of the following categories for your project.

Behavioral and Social Sciences***

Human and animal behavior, social and community relationships—psychology, sociology, anthropology,

Biochemistry

Chemistry of life processes—molecular biology, molecular genetics, enzymes, photosynthesis, blood chemistry, protein chemistry, food chemistry, hormones, etc.

Botany

Study of plant life—agriculture, agronomy, horticulture, forestry, plant taxonomy, plant physiology, plant pathology, plant genetics, hydroponics, etc.

Chemistry

Study of nature and composition of matter and laws governing it—physical chemistry, organic chemistry (other than biochemistry), inorganic chemistry, materials, plastics, fuels, pesticides, metallurgy, soil chemistry, etc.

Computer Science

Study and development of computer hardware, software engineering, internet networking and communications, graphics (including human interface), simulations / virtual reality or computational science (including data structures, encryption, coding, and information theory).

Earth/Space Science

Geology, mineralogy, physiography, oceanography, meteorology, climatology, speleology, seismology, geography, astronomy, planetary science, etc.

Engineering

Technology projects that directly apply scientific principles to manufacturing and practical uses—civil, mechanical, aeronautical, chemical, electrical, photographic, sound, automotive, marine, heating and refrigeration, transportation, environmental engineering, etc.

Environmental Science

Study of pollution (air, water, and land) sources and their control, ecology.

Mathematics

Development of formal logical systems or various numerical and algebraic computations, and the application of these principles—calculus, geometry, abstract algebra, number theory, statistics, complex analysis and probability.

Medicine and Health***

Study of diseases and health of humans and animals—dentistry, pharmacology, pathology, ophthalmology, nutrition, sanitation, dermatology, allergies, speech and hearing, etc.

Microbiology***

Biology of microorganisms—bacteriology, virology, protozoology, fungi, bacterial genetics, yeast, etc.

Physics

Theories, principles, and laws governing energy and the effect of energy on matter—atoms, molecules, states of matter, optics, acoustics, particle, superconductivity, fluid and gas dynamics, thermodynamics, semiconductors, magnetism, quantum mechanics, biophysics, etc.

Zoology***

Study of animals—animal genetics, ornithology, ichthyology, herpetology, entomology, animal ecology, paleontology, cellular physiology, circadian rhythms, animal husbandry, cytology, histology, animal physiology, invertebrate neurophysiology, studies of invertebrates, etc.

***You may do a project in this category, but no humans, vertebrates, mold, or bacteria may be a part of the experiment. You can do a data-based experiment, or a simulation.

NAME: _____ This Page is due on: Friday, Sept. 18th

1st Draft: SCIENCE FAIR PROJECT PROPOSAL

My CATEGORY is: _____

My QUESTION is: _____

RESEARCH:

1. The major concept/principle of science that my project deals with is _____

2. What do I need to research to better understand this principle?

3. What general scientific facts would a person need to know in order to understand my project?

EXPERIMENT:

My Test Variable (Independent) **is:** _____

My Outcome Variable (Dependent) **is:** _____

My idea for an experiment is: (Describe HOW you will actually DO the experiment)

Data Collection Log Book

*****You MUST begin your logbook BEFORE you begin work on your research notes*****

A log book is very much like a diary because it is the place where a researcher will record their daily observations, data, and results. The log book is a workbook. It is not meant to be especially clean or polished, although it should be legible so that others can follow your work. The log book will be placed on the table in front of your backboard during Science Fair.

The logbook should be...

- A permanent bound notebook (like a composition notebook) to insure pages are not removed.
- Handwritten in blue or black ink
- Written on one side of the page only (not the back) & number the pages

The data logbook should be set up as follows:

- o Title Page (Name, project title, class period)
- o Table of Contents (showing the page numbers)
- o Purpose
- o Research – Source 1
- o Research – Source 2
- o Research – Source 3 (continue if needed)
- o Hypothesis
- o Materials List ***Info on these is in the “Final Project” section of the packet
- o Procedure
- o Log book entries
 - Every time you do ANYTHING to your experiment, you need to make an entry in your logbook. The entry should explain what you did, what data you collected, etc.
 - Each entry needs to be on a new page & dated
- o Final observations, results, graphs, data tables, etc.

OTHER TIPS:

- ◆ Log books are legal documents. Errors should be neatly crossed out. No white-out!
- ◆ Entries must be factual, not be fabricated. Record entries as they happen.
- ◆ Entries should be made even when a “mistake” or unexpected results occur.
- ◆ You may include diagrams or pictures in the data notebook.
- ◆ Phone calls should be documented. Record who was called and their phone number (in case you must reach them again!) and summarize the conversation and any suggestions that were given.
- ◆ Visits with mentors or experts need to be documented. Record what was discussed and how it might affect the direction of the project.

Science Fair Project Research Notes

An important step in the scientific method is Research. This is necessary before you can establish a workable hypothesis which can be tested with an experiment.

Your assignment is to gather 30 facts on the topic of your experiment. You must have at least 3 different sources from which you gathered your research.

*****RESEARCH NOTES SHOULD BE WRITTEN IN THE LOGBOOK!!!*****

Page 1:

First & Last Name
The Title (question) of Your Project
(just skip a space & fill the title in later if you aren't sure yet)
Teacher Name - Science Class Period

Page 2: Table of Contents (just write the name of the page for now... you will fill it in later)

Page 3: Purpose (just write the name of the page for now... you will fill it in later)

Page 4: Source #1 - Bibliography Information at the top
List of facts from source #1

Next page: Source #2 - Bibliography Information at the top
List of facts from source #2

Next page: Source #3 - Bibliography Information at the top
List of facts from source #3

Do other pages in the same way if you have additional sources

- Facts should contain BASIC background information & facts about your topic.
 - See "research" questions 1,2, & 3 on previous page
- It should thoroughly explain the BIG scientific concept your project deals with
 - Examples - Plant needs, gravity, heat-transfer, properties of light, waves
- It CAN be written in notes, bullets... but facts need to be COMPLETE
 - Good Fact 😊 - Photosynthesis - plants use sunlight, CO₂, & H₂O to produce sugar (energy) and O₂.
 - Bad Fact ☹ - Plants do photosynthesis.
- It should NOT be a step-by-step procedure of how you will conduct your experiment.

RESEARCH NOTES are DUE on FRIDAY, OCT. 2nd

How to document references: Bibliography Information

Books

Format:

Author. Title. Place of publication: Publisher, Date.

Example:

Allen, Thomas B. Vanishing Wildlife of North America. Washington, D.C.: National Geographic Society, 1974.

Website or Webpage

Format:

Author. "Title of page." Editor. Date. Institution. [cited Access Date]. URL.
(simply omit any information that you do not have)

Example:

Devitt, Terry. "Lightning injures four at music festival." August 2, 2001. The Why? Files. [cited 23 January 2002]. <http://whyfiles.org/137lightning/index.html>.

Article from an Encyclopedia

Format:

Author. "Title of Article." Title of Encyclopedia. Date.

Example:

Pettingill, Olin Sewall, Jr. "Falcon and Falconry." World Book Encyclopedia. 1980.

NAME: _____ These 2 pages are due on: Friday Oct. 9th

SCIENCE FAIR PROJECT PROPOSAL

My CATEGORY is: _____

My QUESTION is: _____

My BASIC procedure for this experiment will be:

My HYPOTHESIS as to the results of this experiment is: **IF** _____

THEN _____

BECAUSE _____

My TEST Variable (Independent) IS: _____

My OUTCOME Variable (Dependent) IS: _____

***Continue on the next page!!! →

I will CONTROL the following variables; _____

The "real world" APPLICATION (Why would anyone care about the answer to your question? How is this information useful?) of this science is;

Materials: I am aware that the following materials are required in quantities sufficient ensure the reliability of the experiment:

Both the student and parent must sign this form and return it to your teacher before starting your project. This form is due no later than **FRIDAY, OCTOBER 9th**

"I have read the attached information and realize that my science fair project is due in class on **Friday, November 13th**."

STUDENT SIGNATURE _____

PARENT SIGNATURE _____

Final Science Fair Project Report

***You will **NOT** be making the typical science fair tri-fold poster project!!!

Report Format:

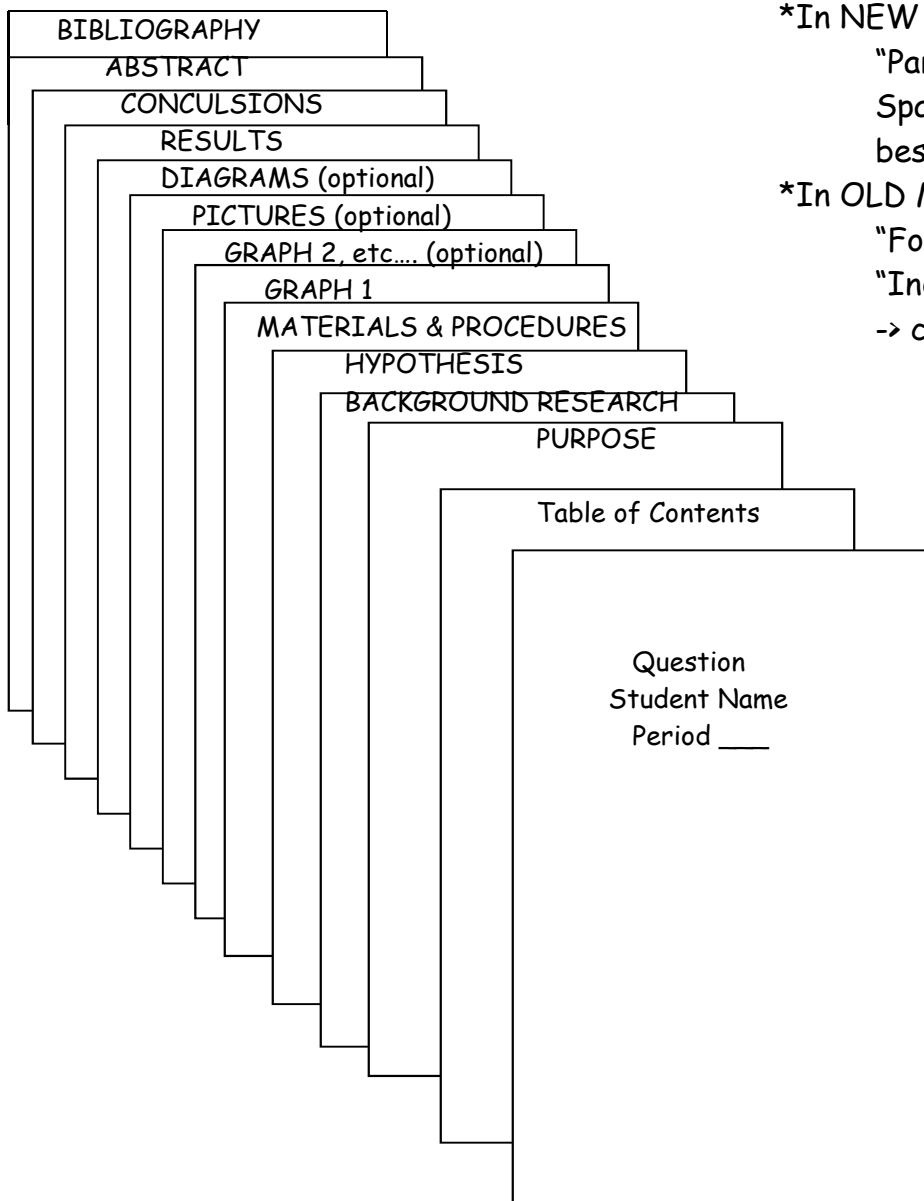
All elements of your science project will be included in a multi-page report.

- Times New Roman Font - Size 12 - Double Spaced
- Use the same format throughout!
- NO "CUTE" pictures....clip art, etc.....or colored paper
- Begin each section on a separate page (with a title, as shown below).
- Confine your graphs to ONE per page. Number each graph sequentially
- Follow the sequence below;

Double Spacing

*In NEW Microsoft Word- look at the "Paragraph" box -> click the "line Spacing" key (with up/down arrows beside lines) -> change to 2.0

*In OLD Microsoft Word - go to: "Format" -> "Paragraph" -> "Indents & Spacing" tab -> "Spacing" -> change single to double



You need to have all of the following sections in your report

- Cover Page
- Table of Contents
- Purpose
 - 1-2 paragraphs - Why are you doing the experiment? What are you trying to find out?
How could this information be helpful to someone? Who could this information help?
 - Use ideas/information in “Application” section of your final proposal.
- Background Research
 - Write a 1 page research paper based on the notes that you took.
 - Take the facts from your notes & organize them into paragraphs.
 - It should thoroughly explain the BIG scientific concept your project deals with.
- Hypothesis
 - NO “I think” or “I believe”...state it as a fact.
 - Follow the format - If (the amount/type/speed of ... is changed) then (..... will increase/decrease/etc.) because (why you expect it to happen).
 - EXAMPLE: If the amount of fertilizer is increased, then plant growth will also increase because plants need the potassium, phosphorus, & nitrogen in fertilizer for growth.
 - Same as your proposal
- Materials & Procedures
 - A list of all the materials you used, including the amounts
 - A DETAILED, step-by-step description of your experiment.
 - Should look like a recipe
 - Someone should be able to read this & re-do the experiment, include EVERYTHING!
 - The majority of your grade is based on this section. You must explain in detail so I know exactly what you did...if it is unclear, you will lose points!
 - You must repeat your experiment AT LEAST 3 times. Include this in your procedures.
- Graphs (required) Diagrams/Pictures (optional)
 - Make sure all graphs, diagrams, and pictures are properly labeled
 - Graphs need a descriptive title, X & Y axis titles, & a key.
 - Title Example: “The Effects of Fertilizer on Plant Growth”.
 - ALL MEASUREMENTS SHOULD BE METRIC
 - A useful website for making graphs = <http://nces.ed.gov/nceskids/createagraph/>

➤ Results

- Give the data that you found in your experiment (final numbers, averages, etc.)
- Include the data from ALL of your experiments (3 trials)
- Can be in a paragraph OR a data table

➤ Conclusions

- Do your results support/not support your hypothesis?
- If your results did not support your hypothesis, try to explain why.
- Discuss your data. What does it all mean? What results were the highest/lowest? Did you notice any patterns? How is this information useful? How could you take your research farther and do another experiment based what you learned in this one?
- About 2 paragraphs

➤ Abstract

- Write your abstract on the official abstract form. Your abstract should be a 1-paragraph summary of your entire experiment. It should include 4 parts....purpose of the experiment, procedures used, data, and conclusions.
- See this website for the official abstract form & instructions:
 - <http://www.ssefflorida.com/>
 - Scroll down. At the bottom of the page choose the blue icon “Rules/Forms”.
 - Scroll down. Under SSEF Forms, you will see “2016 Abstract”.
 - You will NOT be able to save your work on this form... when you close the page, it will erase everything. I recommend typing your abstract in Word, where you can spell-check & save your work. Then you can copy-paste it onto the official form.

➤ Bibliography

- You must have 4 citations (references)
- The 1st citation **for all projects** is the “Rules for the Science Fair” (below).

International Rules for Precollege Science Research: Guidelines for Science & Engineering Fairs 2015-2016. Society for Science. 26 Aug. 2015
<<http://student.societyforscience.org/forms>>.
- The other 3 are references you used in your research notes. The references MUST be in the correct bibliographic form. See the “How To Document References: Bibliography Information” page for directions on how to document your sources.

Science Fair Project Grading Policy

This project is a significant portion of your science grade for the 2nd 9 weeks.

Your grade on this project will count as _____.

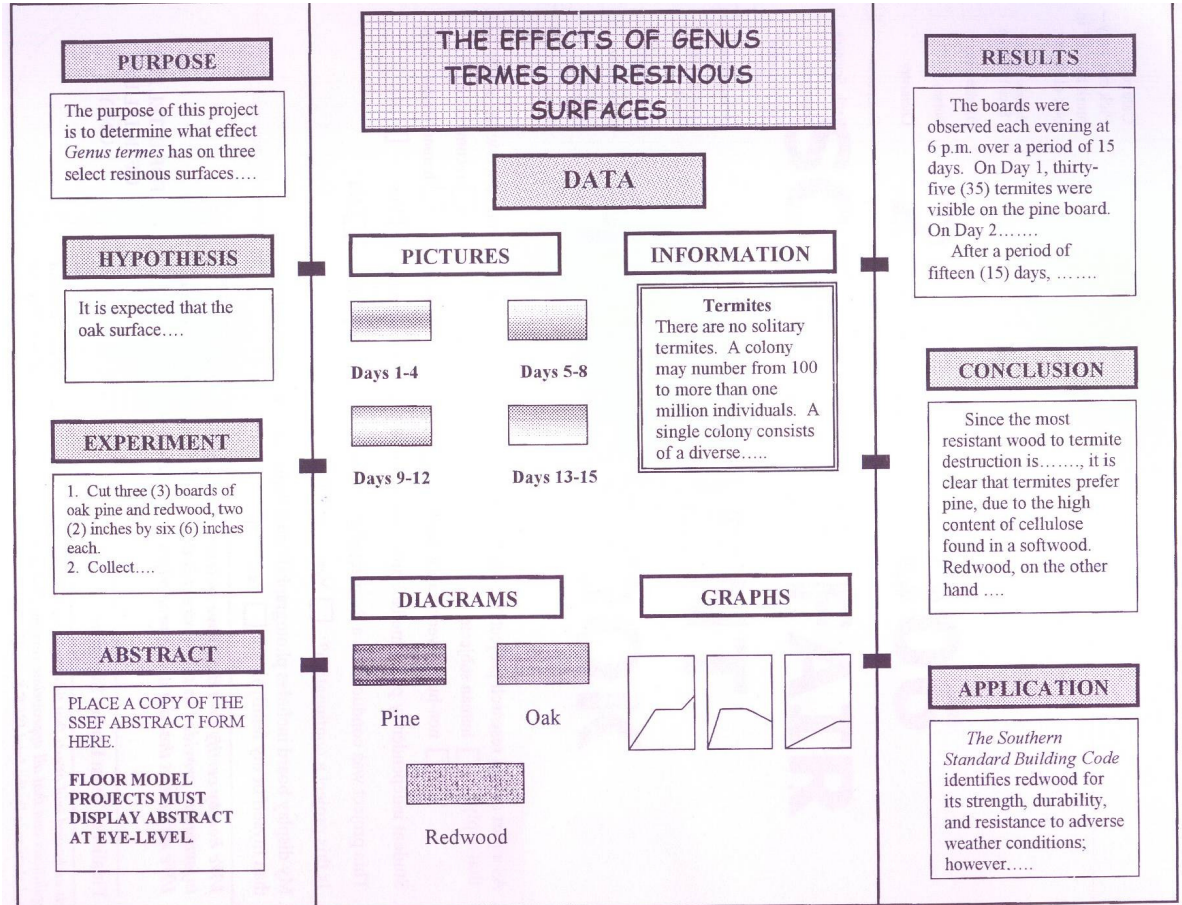
***The following rubric (see next page also) will be used to grade your final science fair report. The definitions and examples on this rubric serve as a guide. The final decision on the grade remains at the discretion of the teacher.

Science Project	5	4	3	2	1
Purpose/Problem (10) _____ X 2 = _____	Question was high-level, original, could be investigated, and has real-world application.	Question was on-grade-level, could be investigated, and has real-world application.	Question could be investigated, but has little real-world application and/or was below-level.	Question could be investigated, but has no real-world application.	Question could not be investigated.
Background (15) _____ X 3 = _____	Research is very thorough. It is clearly related to the project & hypothesis.	Research is adequate and related to the project & hypothesis.	More research is needed. The research did not show full understanding of topic.	Research seems unrelated to project topic & hypothesis.	Minimal research.
Hypothesis (10) _____ X 2 = _____	A logical hypothesis. It was written clearly, could be tested, and predicted the outcome of the experiment.	A logical hypothesis. It could be tested, and predicted the outcome of the experiment.	A testable hypothesis that did not predict the outcome of the experiment.	An unclear hypothesis. It could be tested.	An unclear & un-testable hypothesis.
Materials/Procedure (25) _____ X 5 = _____	Procedures were outlined in a step-by-step fashion that could be followed by anyone without additional explanations.	Procedures were outlined in a step-by-step fashion that could be followed with explanations of a few details.	Procedures were outlined in a step-by-step fashion. Procedures had gaps and need many significant explanations.	Procedures were NOT step-by-step. Procedure was unclear, many details missing.	Procedures were extremely unclear.
Graphs (10) _____ X 2 = _____	Graphs clearly & correctly show data. X&Y axis and groups are labeled. Units of measurement are included.	Graphs clearly & correctly show data. A few labels may be missing.	Graphs somewhat correctly show data. Some parts are unclear.	Graphs are incorrect or unclear	Graphs are extremely unclear.

	5	4	3	2	1
Results (10) _____ X 2 = _____	Data was collected several times. All data is clearly shown & properly labeled.	Data was collected several times. A few minor details need an explanation.	Data was collected several times. Only partial data is shown.	Data was collected only once.	Data is very unclear.
Conclusions (10) _____ X 2 = _____	A detailed conclusion clearly based on the data. Conclusion was related to hypothesis & well-supported.	A somewhat detailed conclusion based on the data. Conclusion was related to the hypothesis.	A conclusion clearly based on the data, but details were minimal.	A conclusion somewhat based on data and NOT related to hypothesis.	Conclusion NOT based on the data or related to hypothesis.
Abstract (5) _____	Abstract clearly summarizes the entire project and is typed on the official form.	Abstract clearly summarizes the entire project but is NOT on the official form.	Abstract is unclear and on form.	Abstract is unclear and not on form.	Abstract is very unclear.
Bibliography (5) _____	Has 4 sources, correctly documented	Has 4 sources, mostly correctly documented	Has 2-3 sources, correctly documented	Has 2-3 sources, incorrectly documented	Has 1 source
TOTAL POINTS (100)					

Sample Project Display

If you make a grade of A or B on your project, you will have the opportunity to compete in the school science fair. You will change your report to a display board ONLY if you choose to compete in the school science fair. Note the similarities between the report sections AND the display!!!!



- Use a full-size project board - 36 X 48 inches, tri-fold.
- Abstract should be in lower left-hand corner... other than that, the sample board above is just a suggestion. Yours may be slightly different depending on your experiment.
- You *MAY* increase the font-size of your report to make it easier to read from a distance.
- You can be creative with your board! It can be colorful and interesting to look at... but keep it neat and professional!