

Prairie Hills
Jr. High

2011-2012

Science Fair
Packet

Our District's goal for holding a Science Fair is to stimulate and nourish a fond interest in science and to foster a lifelong appreciation of science processes in preparation for a life in an increasingly technological society. The Science Fair is also a great chance to promote educational links among parents, community, and school.

PHJH
Science Fair

Students must design and carry out an experiment to investigate a question or problem, including a written report and oral presentation component.

Possible categories to consider when deciding on a topic for the science project...

<p>Aerospace Science Is the study and investigation of the earth's atmosphere and outer space. It includes the design, manufacture, and operation of: aircraft, rockets, missiles, etc.</p>	<p>Astronomy Is the science dealing with all celestial bodies of the universe. It includes the planets and their satellites, comets and meteors, and the stars and galaxies.</p>	<p>Behavioral Science Is the science that studies, through observation, the behaviors of humans and other animals and the interpretation of those behaviors.</p>
<p>Biochemistry Studies the processes and physical properties of living organisms. Including the chemistry of absorption, digestion, metabolism, and photosynthesis.</p>	<p>Botany Is a branch of biology that studies plant structure, reproduction, physiology, growth, classification and disease.</p>	<p>Chemistry Is the science of matter; dealing with the composition of substances and their properties and reactions, especially of atomic and molecular systems.</p>
<p>Computer Science Is the study of the design and operation of computer hardware and software, and of the application of computer technology to science.</p>	<p>Consumer Science Is the study of comparisons and evaluations of store bought products. Including: taste tests, color preferences, quality control and product efficiency.</p>	<p>Earth Science Is concerned with the origin, structure, and physical phenomena of the earth. Including: geology, geography, oceanography, seismology, and meteorology.</p>
<p>Electronics Deals with the manufacture of electrical devices. Including: communication circuits (radio, tv, etc.) and integrated circuits (electric motors, solar cells, etc.)</p>	<p>Engineering The practical application of scientific knowledge in the design, construction, and operation of roads, bridge, buildings, machinery, and lighting/heating.</p>	<p>Environmental Science Studies the protection and care of natural resources. Including: solar energy, water purification, pollution control, soil chemistry, and insecticides.</p>
<p>Health Science Is the study of the human body and good health practices. Including: proper diet, care of the teeth and eyes, and hygiene.</p>	<p>Materials Science The study of metallic and nonmetallic materials and how they can be used in modern technology.</p>	<p>Mathematics Is the science dealing with the measurement, properties, and relationships of quantities as expressed in numbers or symbols.</p>
<p>Microbiology The branch of biology dealing with micro organisms. Including: bacteria, viruses, yeasts, fungi, and protozoa.</p>	<p>Physics Is the branch of science concerned with the properties of matter and energy and the relationships between them.</p>	<p>Zoology Is the study of animals, including their classification, structure, function, development, physiology, and evolution.</p>

Choosing A Topic

- Design a project that is original in plan or execution, the project should communicate scientific ideas in new or better ways.
- Investigate and explore something you find interesting, a question that you would like to be able to answer.
- Consider the resources you have available make sure you can get hold of all the materials you will need.
- It is important that your project has a central theme or purpose, to answer a definite scientific question or solve a problem.
- The way the project is handled and carried out is important, the choice of the topic is not.
- Start planning early and be realistic about the amount of time needed.

Using the Scientific Method

The scientific method is a way to ask and answer scientific questions by making observations and doing experiments.

The steps to the scientific method are:

- Ask A Scientific Question
- Perform Background Research
- Formulate A Hypothesis
- Design The Experiment
- Conduct The Experiment
- Analyze The Data
- Draw A Conclusion
- Report The Results

Science Fair Project Timeline

September 2011

- Registration Form Due/Choose Topic
- Research Topic
- Lab Report Part A Due

October 2011

- Gather Materials
- Conduct Experiment
- Lab Report Part B Due

November 2011

- Written Report Due
- Display Boards Due

December 2011

- Oral Presentations

January 2012

- PHJH Science Fair

April 2012

- District Science Fair

Organizing Your Written Report

The paper must include (in this order):

- The Abstract- a brief summary of your work.
 - Limit the abstract to the following 3 paragraphs (approximately 200 words)
 - Purpose
 - Procedure
 - Conclusion
 - Approximately 200 words, Typed and single spaced
- Safety Sheet- all safety hazards must be identified.
- Endorsements- are required when humans or non-human vertebrates are used.
- Title Page- your title should be concise and clear.
- Table of Contents- include page numbers, prepare after report is complete.
- Acknowledgements- give credit for those who helped you with your project.
- Purpose and Hypothesis- state precisely the question you are investigating, and your expected outcome of your test.
- Review of Literature- report to the reader any background information you used that pertains to your project.
- Materials and Procedure- list exactly what supplies were used in the experiment and the steps that were taken.
- Results- data and/or observations should be organized in tables/charts/graphs. Also must include a written explanation of your interpretation of the results.
- Conclusion- limited to the results of the investigation and refer back to your stated purpose and hypothesis.
- Reference List- a list of sources used throughout the process of your investigation, use APA format when list the references.

When preparing your report:

- Typed, double spaced, one inch margins, and 12 pt Times New Roman Font.
- Your last name should be on the top of each page in the header.
- Remember to put headings/titles on graphs/charts/tables.
- All photographs must have captions explaining their significance.
- Avoid the use of 1st person, do not use "I" or "We"
- Before you hand in your report make sure to reread, revise, and rewrite.
- Recheck your calculations, spelling, and grammar.

Preparing For Your Oral Presentation

The speech must include (in this order):

- Introduction
- Purpose and Hypothesis
- Background Information
- Procedure (what you did)
- Results (discuss your data)
- Conclusion

Scientific Method/Lab Report Rubric

	15-11	10-6	5-0	Points Awarded
Knowledge Gained	Exhibits a thorough understanding of topic. Student has acquired scientific skills.	Is somewhat familiar with topic. Demonstrates minimal acquired scientific skills	Demonstrates little to no knowledge gained or scientific skills.	
Scientific Approach	Well defined problem, uses a logical, orderly method to solve the problem.	Adequately defined problem OR attempted to follow SM, but not both.	Little to no evidence of the scientific method being used.	
Experimental Approach: Variable	Single variable was tested, all other variables were controlled or accounted for.	Attempt was made at controlling variables but not all variables were accounted for.	Variables were not controlled.	
Experimental Approach: Control Group	Method was appropriate and effective. A control or comparison group was in evidence.	Method was inadequate, but an attempt for control or comparison was made.	Experimentation was not performed, i.e., was a demonstration or exhibit.	
Reliability of Data	Data is numerical and metric. 5 trials were conducted for reliable data.	Data is numerical and metric OR 3 trials were conducted, but not both.	Little to no data collected.	
Validity of Conclusion	Conclusion is consistent with data and/or observations. Conclusion is based on data.	Conclusion is present but inconsistent with the data collected.	No conclusion present	
	10-6	5-1	0	Points Awarded
Originality	Demonstrates a novel approach and/or idea.	Some originality demonstrated.	No originality demonstrated	

Notes:

Name:

Total Points: _____

Written Report Rubric

	10-6	5-1	0	Points Awarded
Abstract	Present; contains summary, purpose, procedure and conclusion.	One or two parts of the abstract is/are missing	Abstract is missing.	
Safety Sheet	Safety sheet is present and all hazards have been identified.	Safety sheet is present, but not all hazards are identified.	Safety sheet is missing.	
Title Page/ Table of Contents	Both are present and accurate.	One is missing or inaccurate.	Both are missing.	
Purpose and Hypothesis	Problem is identified and prediction is made.	Problem is identified but prediction is not made.	Both are missing.	
Review of Literature (R of L)	R of L is thorough and pertinent, adequately cited using APA format.	R of L is pertinent, but not adequately cited using APA format.	Material is irrelevant or no citations.	
Materials	Materials are listed and measurements are metric.	Not all materials listed, or measurements are not metric.	No materials listed.	
Procedure	Procedure is easily followed, all steps included.	Procedure is present, but not complete or confusing.	Procedure is missing.	
Results	Results are organized in tables or graphs, data is quantitative.	Results are not organized/quantitative, or confusing.	Results are missing.	
Conclusion	Concise interpretation of data, referred to purpose and hypothesis.	Conclusion is present, but not consistent with the data.	Conclusion is missing.	
Reference List	Quality of sources is adequate and listed using APA format.	Quality of sources is inadequate or not listed using APA format.	Reference List is missing.	

Notes:

Total Points: _____

Name: _____

Project Display and Oral Presentation Rubric

Display	10	5	0	Points Awarded
Materials (Upper Left)	Present	Wrong Location	Missing	
Procedure (Lower Left)	Present	Wrong Location	Missing	
Title (Upper Middle)	Present	Wrong Location	Missing	
Purpose (Center)	Present	Wrong Location	Missing	
Hypothesis (Lower Middle)	Present	Wrong Location	Missing	
Results (Upper Right)	Present	Wrong Location	Missing	
Conclusion (Lower Right)	Present	Wrong Location	Missing	
Presentation	10	5	0	Points Awarded
Quality	Summarizes the project, was well prepared	Adequate information, but difficult to follow	Information is irrelevant and unclear	
Dynamics	Speaks fluently with good eye contact	Moderate eye contact, relied heavily on note cards	No eye contact, read from note cards	
Time	Finished within allotted time	Less than 1 minute over allotted time	More than 1 minute over allotted time	

Notes:

Name:

Total Points: _____