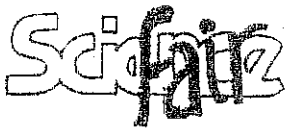
SCIENCE FAIR PROJECT GUIDE



STUDENT

CLASS

A

this is how we grade your project

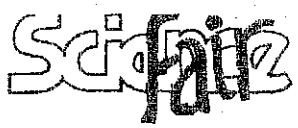
SCIENCE FAIR JUDGING GUIDE & RUBRIC

This rubric will be used to assess each science fair project at Louis Armstrong Middle School. The descriptions found under the column labeled "15" represents high-level student achievement for each particular task, the column labeled "10" represents achievement that is on grade level, while the level "5" constitutes a level of work needing improvement. The category labeled "Below Grade" represents an unacceptable or missing component of the project. Your project may be graded in between each level on each task as well.

Category To be graded	15	10	5	Below Grade
Exhibit / Display Score: ____	The display has been constructed with excellent craftsmanship. Observations are clearly summarized; written explanations are concise with effective use of data organizers such as graphs, and illustrations.	This display has been constructed with good craftsmanship with only a few sections that could have used more work, effort, and/or neatness.	There is no type of organization with explanations, observations, and/or data organizers. It is difficult following the steps of your project due to the lack of organization.	No display provided.
Oral Presentation Score: ____	There is a high level of preparation evident. The presenter(s) have an in-depth understanding of their selected topic. They are able to answer all questions relating to their project.	There is a fair level of preparation evident. The presenter(s) have a general understanding of their selected topic. They are able to answer most questions relating to their project.	There is a low level of preparation. The presenter(s) have a very basic understanding of their selected topic. They are able to answer few if any questions relating to their project.	Not prepared to present.
Grade Appropriate Score: ____	The degree of difficulty exceeds the author's current grade level.	Overall, the problem chosen to investigate is on grade level.	The problem chosen to investigate is below grade level.	Problem researched was far below grade level.
Creativity & Originality Score: ____	The project was either personally generated or largely modified from another source. Project contains high levels of creativity.	This project is not commonly seen in this fair; Project contains some creativity.	This project or a slight variation of this project is commonly found in the science fair. Project contains little creativity.	Project represents little if no originality or creativity.
Experiment Score: ____	The experiment is clearly done with a high level understanding of the scientific method.	The experiment is clearly done with a decent level understanding of the scientific method.	The experiment is clearly done with a low level understanding of the scientific method.	No use of the Scientific method.
Validity of Results and conclusions Score: ____	The measurable results are supported by enough trials. The conclusion references the results and discusses the original hypothesis.	The measurable results are supported by enough trials. The conclusion may reference the results and discuss the original hypothesis briefly.	The measurable results are not supported by enough trials. The conclusion does not reference the results and discuss the original hypothesis.	The results and conclusion do not reference any part of the project.

B

STUDENT GUIDELINES for Project and Presentation



Keep a log of all of these items in your journal.

1) Choose a topic. Be sure it interests you. Don't pick one because you think it will be easy.
2) State your purpose as a question. What is it that you want to find out by doing this project?
3) Research your problem. Look at any books/websites that might help you, make observations by simply looking at things, talk to people, and find out as much as possible about your topic. Fill out a resource form for each reference that you have found.
4) Form a hypothesis. What do you think is going to happen? Based on what you know or found out from step #3, what do you think the results of your experiments will be? After doing the experiments, it may turn out that your guess was wrong. It is okay if this happens.
5) Plan your project. How will you test your hypothesis? What experiments will you do? How will you measure the results? Where will you keep your information? Be sure to keep notes and write down everything you do and what happens.
6) Collect all your materials. Find a place to keep things where others won't bother them. Let other family members know what you are doing so they do not throw your materials away by mistake.
7) Conduct your experiments. Remember, the more times you do an experiment the more reliable and accurate the results will be. Do each experiment at least three times and get an average of the results for your graph. Use something to measure your experiments: a ruler or yardstick if you are measuring distance, a clock to measure time, etc. Check the measurements to be sure you are correct.
8) Record your data. As you do your experiments, you will want to write down what you saw or found out. Organize this information in an orderly manner. Put the date, time, and any other useful information. Write your measurements clearly.
9) Draw conclusions. What did you learn from your experiments? Have you proved or disproved your hypothesis? You made a guess about what you thought would happen. Now tell what really did happen. You don't lose points if your guess turned out to be wrong.
10) Prepare your titles, charts, graphs, drawings, and diagrams. Make them large enough to see, neat, and colorful.
11) Construct your science fair display. See the science fair board outline. Attach the form to the back of the science fair board.
12) Prepare and practice your presentation. Be able to tell about what you used what you did in your experiments, and what you found out. Know it well enough that you don't have to read it from the display.
13) Plan a time line so you don't leave everything until the last minute. If you need help, tell your parents and your teacher, the earlier the better.

RELAX AND ENJOY YOURSELF. YOU WILL DO A GREAT JOB!

C

YOUR SCIENCE FAIR ORAL PRESENTATION

- A lot of kids are scared of speaking in public or to a teacher/judge. Just imagine they are a fellow scientist who just wants you to share what you learned.
- Relax, smile, and have fun. Remember, you are the expert and you had fun doing the project. But if you are a little nervous, we listed some things that you need to do during the presentation.

Helpful Hints:

- Look sharp, feel sharp, and you will be sharp. Dress nice that day, be polite, and speak clearly. You will show that you have confidence. Don't forget to look at your audience.
- Introduce yourself.
- Point to the title of your display. Tell your audience why you chose to study this.
- State your problem that you studied (your question.) Tell them about your hypothesis (what you thought might happen.)
- Talk about what you learned while researching your topic.
- Talk about the sources (books, websites, and interviews) that helped you understand your topic.
- Tell about your project and explain the steps you took to conduct your experiment. Be sure to mention all the materials involved and point out the pictures that you may have taken.
- If it applies, be sure to show them that you tested your experiment at least 3 times.
- Show them all of the cool graphic organizers that you made, like your tables and charts. Remember to point out the labeled parts of your graph or table to show that you know what it represents.
- Be sure to explain what your data means. Make sure you can read your graphs and tables. Let them know if you were surprised by the results, or if you know what would happen because you studied about it.
- Make sure you sound like an expert on your topic. Always use the appropriate vocabulary especially by using words from the Scientific Method, like: Problem, Hypothesis, Procedure, Results, and Conclusions.

SCIENCE FAIR RULES

Aw!, you mean there are rules? Of course there are, silly, this is made by adults!

- Number one rule. . . think safety first before you start. Make sure you have recruited your adults to help you.
- Never eat or drink during an experiment and always keep your work area clean.
- Wear protective goggles when doing any experiment that could lead to eye injury.
- Do not touch, taste, or inhale chemicals or chemical solutions.
- Respect all life forms. Animals are not allowed to be used in experiments. Do not perform an experiment that will harm a person.
- All experiments should be supervised by an adult.
- Always wash your hands after doing the experiment, especially if you have been handling chemicals.
- Dispose waste properly.
- Any project that involves animals, drugs, firearms, or explosives are NOT permitted.
- Any project that breaks district policy, and/or local, state, or federal laws are NOT permitted.
- Use safety on the Internet! NEVER write to anyone without an adult knowing about it. Be sure to let an adult know about what websites you will be visiting, or have them help you search.
- If there are dangerous aspects of your experiment, like using a sharp tool or experimenting with electricity, please have an adult help you or have them do the dangerous parts. That's what adults are for so use them correctly. (Besides, it makes them feel important!)
- **NO** experiments on solar systems, i.e. making a solar system as your project.
- **NO** VOLCANOES
- **NO** alarm systems
- **NO** explosive items.
- Do **NOT** include photos of any humans, including you.

Student Signature_____ Parent Signature_____

D

Safety Contract

I, _____, hereby certify that on this day of _____, I have successfully completed a review of safety procedures for a science project. I agree to follow the safety guidelines listed below, and I will take every necessary precaution to operate safely throughout my experiment.

- I will follow the safety guidelines of my teacher and my school.
- I will keep my work area neat and free of unnecessary papers, books, and materials. I will keep my clothing and hair neat and out of the way, and I will wear a safety apron and/or gloves if necessary.
- I know the location of all safety equipment (such as the fire extinguisher and first-aid kit) and the nearest telephone.
- I will wear safety goggles when handling chemicals, working with a flame, or performing any other activity that may cause harm to my eyes.
- I will not use chemicals, heat, electricity, or sharp objects until my teacher or parent instructs me to do so, and I will follow the adult's instructions carefully.
- I will be especially careful when using glassware. Before heating glassware, I will make sure that it is made of heat-resistant material, and I will never use cracked or chipped glassware.
- I will wash my hands immediately after handling hazardous materials. I will clean up all work areas before I leave the laboratory, put away all equipment and supplies, and turn off all water faucets, gas outlets, burners, and electric hot plates.

I understand and agree to the above and all other safety precautions presented to me in class. I am hereby ready to undertake my science project with safety from this day forward.

_____

Student's signature

6th Grade Science Team

_____

Parent's/guardian's signature

E

Parent Guidelines for Science Fair Project

Dear Families,

Your child is about to begin his/her science fair project! It should be a fun learning opportunity for your child. This guide may be helpful during the next several weeks. Please remember:

- As a parent, your job is only to assist. This is an opportunity for your child to think and act like a scientist, and to create and discover his or her very own science project!
- Please allow your child plenty of time to make mistakes. He/she might even need to start the experiment again. Remember, Real scientist constantly refine their studies and start over again.
- For safety reasons, please be available to assist your child with research and any portions of the experiment that may pose a safety risk.
- Please make time to visit the public library and use the Internet to assist your child with project research.
- Remember, this is a multipart project. Your child must complete a science journal, display board, and a presentation in order to receive full credit.

How to Help

As your child works on his or her project, he or she will likely face stumbling blocks. To help, ask questions to help your child figure things out; don't just provide the answers. Open-ended questions, such as, "What else could you try to solve this?" or "What is stopping you from going on to the next step?" are best (Fredericks & Asimov, 2001, p.xiii). Sometimes just talking it out can help children get unstuck. If not, ask the teacher for help. Respect your child's independence in learning by helping at the right level.

Helping at the Right Level at Every Step

Project Step	Helping at the right level:	Going too far:
Ask a question.	• Discussing with your child whether a project idea seems practical	• Picking an idea and project for your child: A topic not of interest will turn into a boring project.
Do background research.	• Taking your child to the library • Helping your child think of keywords for Internet searches	• Doing an Internet search and printing out articles
Construct a hypothesis.	• Asking how the hypothesis relates to an experiment the child can do	• Writing the hypothesis yourself
Test the hypothesis by doing an experiment.	• Assisting in finding materials • Monitoring safety (you should always observe any steps involving heat or electricity)	• Writing the experimental procedure • Doing the experiment, except for potentially unsafe steps • Telling your child step-by-step what to do
Analyze data and draw a conclusion.	• Asking how your child will record the data in a data table • Reminding your child to tie the data back to the hypothesis and draw a conclusion	• Creating a spreadsheet and making the graphs yourself, even if your child helps type in values • Announcing the conclusion yourself
Communicate your results.	• If a presentation is assigned, acting as the audience • If a display board is assigned, helping to bring it to school	• Writing any of the text on the display board • Determining the color scheme and other graphic elements

My child and I have read the Science Fair Guidelines in its entirety. We know when each section is due and that the project display board and science journal must be completed and brought to school by _____.

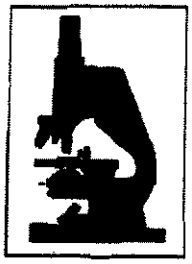
My child understands that he/she is responsible for presenting his/her project to the class on _____.

_____ _____

Student name/class Parent Signature

F

Science Fair Project Checklist



Louis Armstrong Middle School

Your project should include all of the following items. Be sure that you double-check each of these items before you turn in your project.

SCIENCE PROJECT DUE DATE IS MONDAY, February 27, 2016

Science Fair Categories:

Biological Environmental
Physical Consumer

❑ 1. TITLE

This can be a catchy phrase that has to do with your topic.

❑ 2. PURPOSE/STATEMENT

This is where you put your question. Tell why you are doing this project. What are you trying to discover? What interest you about this topic? Why did you choose to do this experiment?

❑ 3. HYPOTHESIS

This is an educated guess, written in an if ... then ... statement. If I do _____, then _____ will happen.

❑ 4. PROCEDURE

A. Materials

List what you used to perform your experiment.

B. Step-by-Step Instructions

Tell exactly what you did.

(To be a fair test the experiment must be repeated at least 3 times.)

C. Variables

Controlled Variable(s) – What stays the same in the experiment.
Independent Variable – What you will change in the experiment.
Dependent Variable- What you measure or observe in the experiment.

❑ 5. RESULTS

A. Written

Record what happened in your experiment.

B. Pictorial

This is where you place your photographs, illustrations, data table(s), and graphs.

❑ 6. CONCLUSION

State whether your results support or do not support your hypothesis. What did you learn from this experiment? Compare and contrast your data. Remember that this is the most important part of your project.

❑ 7. BIBLIOGRAPHY

What sources did you use in this project? This might include science fair idea books, reference books, internet sites, or even people.

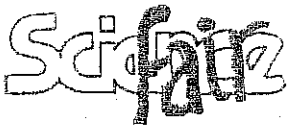
❑ 8. LOG BOOK

This should be a notebook or folder that includes your recorded data such as the research notes you made, dates and times, observations, etc. It also includes your abstract.

❑ 9. ABSTRACT

An abstract is a written summary of your entire science project. It is the first page of your log book. Your abstract should include:

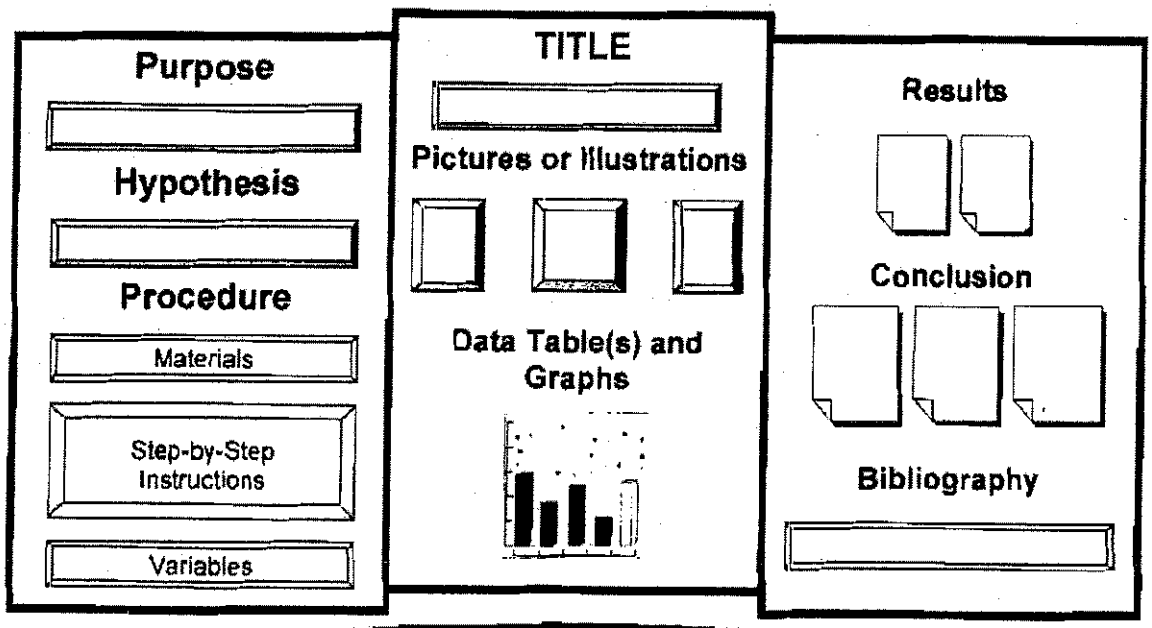
- The purpose of the experiment
- The procedures you used
- The data you collected
- What you have concluded from doing the experiment.



G

Do not put your name on the front of your project. Post the signed Parent/Guardian form on the back of your project board. NO MOLD OR BACTERIA EXPERIMENTS! See the Parent/Guardian form for more information regarding items not to include.

SAMPLE SCIENCE FAIR DISPLAY



This area is on a tabletop in front of your display board and is used to display the log book from your experiment. Your abstract should be the first page of your log book.

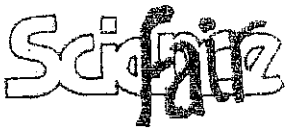
Science Fair Category Descriptions

- **Biological Sciences:** This includes projects that deal with humans, animals, or plant studies.
- **Environmental Sciences:** This is any study that deals with pollution of air, water, or land. It is also any study dealing with energy conservation.
- **Physical Sciences:** This is any study of the laws of matter including chemicals, light, sound, magnetism, the earth, and the stars.
- **Consumer Sciences:** These are the studies of providing for the well-being of individuals and households in the context of how they are influenced by marketplace institutions and communities.

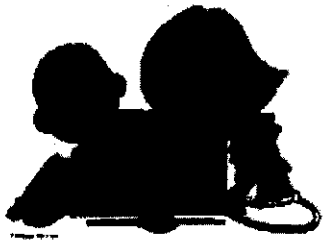
Follow the project board illustration above to set up your display board. Make the board accurate, organized, and accurate. Remember to make a good first impression! Doing your writing and labeling by computer looks professional and neat. DO NOT WRITE ON THE BOARD DIRECTLY. A good idea is to frame all of your titles and work with colored paper. Use a maximum of three different colors. Do and show your best work!

Having trouble finding a science fair project idea?

Here are some websites that may help:



- http://www.ipl.org/div/projectguide/
- http://school.discoveryeducation.com/sciencefaircentral/
- http://www.science-projects-resources.com/
- http://www.all-science-fair-projects.com/
- http://www.sciencebuddies.org/
- http://www.terimore.com/
- http://www.portaportal.com sign in as a guest user password: lams

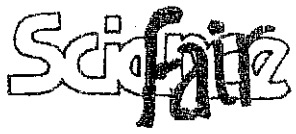


Standards

- CCSS.ELA-Literacy.WHST.6-8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
- CCSS.ELA-Literacy.WHST.6-8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.
- CCSS.ELA-Literacy.WHST.6-8.9 Draw evidence from informational texts to support analysis reflection, and research.
- CCSS.ELA-Literacy.WHST.6-8.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
- CCSS.ELA-Literacy.WHST.6-8.1 Write arguments focused on *discipline-specific content*.
- CCSS.ELA-Literacy.RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

RESOURCE FORM

You must have at least 3 resources.



Resource # _____

Type of Resource: _____

Website http://_____

Book
Author: _____

Title: _____

Publishing company: _____

Location of Publishing Company: _____

Date of Publication: _____

Information found in your own words:
(Must be a least one paragraph summary.)

_____

_____

_____

_____

_____

_____

_____

_____

_____

J