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***“Pursuit of Excellence…Every Student…Every Day!”***

# Science Fair

 *Information Booklet*

*2017-2018*

**Your project must include the following:**

* Handwritten or Typed Project Log
* Data (charts, tables, graphs, pictures, drawings, etc.)
* Models, samples, or dioramas
* Project Display Board
* Handwritten or Typed Report

### Science Fair Timeline

All **bold-faced items** are parts of the project that should be completed by the date indicated, and turned into the teacher. All other items are suggested dates that will help you and your child prepare a quality project for the science fair. All 6th and 7th grade students are required to participate.

|  |  |
| --- | --- |
| Task | Due Date Guide |
| Choose a problem. | September 25th- September 29th |
| **Problem is Due** 1st 9 Weeks Grading Period | **September 29th** |
| Research the problem you chose. Develop a hypothesis. | October 2nd- October 6th |
| **Hypothesis is Due** 1st 9 Weeks Grading Period | **October 10th** |
| Decide on the procedure you will use. Make a list of the materials you need. | October 9th- October 13th |
| **Procedure and Material Lists are Due** 1st 9 Weeks Grading Period | **October 13th** |
| Conduct your experiment.Collect data (Make charts, tables, and/or graphs; take pictures; drawings)Develop your conclusion.  | October 16th- November 17th |
| **Results and conclusion paragraphs are due.** 2nd 9 Weeks Grading Period*\*Results paragraph should include an explanation of your collected data. Also, provide a copy of your data (chart, table, graph, pictures, etc.)* | **November 27th** |
| Organize each component of your project into the written report.*\*The written report format is included in this packet on page 7.*Work on your display board. | November 27th-January 5th |
| **Written Report is due.****Project Display is due.** **Project Log is due.**3rd 9 Weeks Grading Period | **January 8th- January 12th** |

**How to Choose a Science Fair Idea:**

1. Choose a subject that you are curious about. Think about current events or things that you have always wondered about.
2. Ask a question about that subject. Try using one of these suggestions.

What is the effect of \_\_\_\_\_\_\_\_\_\_ on \_\_\_\_\_\_\_\_\_\_\_\_?

To what extent does the \_\_\_\_\_\_\_\_affect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

Which/What \_\_\_\_\_\_\_\_\_\_\_\_(verb) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

Is \_\_\_\_\_\_\_\_\_\_\_or \_\_\_\_\_\_\_\_\_\_\_\_\_ a better \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

Which \_\_\_\_\_\_\_\_\_\_\_ does a \_\_\_\_\_\_\_\_\_\_\_\_ prefer?

Can a \_\_\_\_\_\_\_\_\_\_\_ learn to \_\_\_\_\_\_\_\_\_\_\_\_\_?

1. Your project does not have to be complicated! Make it easy and fun!

The most important thing is to show that you have a good understanding of the project and have explored the scientific research to back your conclusions.

1. Where to get ideas:
	1. The idea list in this booklet.
	2. The library (there are lots of books under the key word: science projects)
	3. The Internet (Search for keywords: science fairs or science projects)
	4. Your teacher (she/he may have great ideas or resources)
	5. Your mom, dad, sisters, brothers or even a friend or neighbor (They may have a question that needs to be answered)
2. Cautions: Please use caution and common sense when choosing a project.

 Things to avoid:

* Dangerous Bacteria (all molds must be sealed during testing and only pictures can be with your display to show what happened)
* Experiments with animals that may cause them harm.(No live animals will be allowed at the science fair. You can take pictures of your animal observations and display the pictures.
* High Voltage
* Poisons and explosives
* Open flames in the exhibit
* Dangerous chemicals or acids

For many students, selecting a topic is a major challenge. Put some effort into choosing your topic, since it will impact the next few months of your life. Try to find a project that you are interested in. The possibilities are far too numerous to list, but there are some limitations.

The idea you choose to explore must be one that **you** can conduct a **measurable experiment** on. **Don’t choose an idea that will only generate a report.**

You must consider how long the experiment will take and what kind of equipment and permission will be required. There are restrictions on some topics for safety reasons, including some experiments with humans, vertebrate animals, and pathogens.

At first, it is usually best to pick several possible topics. Think about what kind of equipment would be required to complete the possible projects. **All projects are done at the student's home.**

Discuss your choices with your teacher and parents. You may need to contact doctors or scientists for research or advice. If your teacher recommends you not pursue a particular topic, take the advice seriously; they have your best interest in mind.

**Categories:**

**Animal and Plant Sciences –** Study of animals and animal life, including their structure, function, life history, interactions, classification, and evolution and the study of plant life, including their structure and function, life history, growth, interactions with other plants and animals, classification, and evolution.

**Behavioral and Social Sciences –** The science or study of the thought processes and behavior of humans and other animals in their interactions with the environment studied through observational and experimental methods.

**Physical Science –** This can include projects in chemistry or physics. Chemistry is the science of the composition, structure, properties, and reactions of matter. Physics is the science of matter and energy and of interactions between the two.

**Engineering and Energy** – Engineering is the application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical structures, processes, and systems. Energy projects involve the study of renewable energy sources, energy efficiency, clean transport, and alternative fuels.

 **Medicine and Health Sciences –** The science of diagnosing, treating, or preventing disease and other damage to the body or mind.

**Science Fair Ideas:**

 "A Guide to the Best Science Fair Projects" by Janice VanCleave.

“100 Award-Winning Science Fair Projects” by Glen Vecchione

“Giant Book of Winning Science Fair Projects” by Bob Bonnet & Dan Keene

“101 Great Science Experiments” by Neil Ardly

“50 Nifty Science Fair Projects” by Jill S. Molinski

<http://www.sciencebuddies.org/science-fair-projects/project_ideas.shtml>

<http://www.education.com/science-fair/>

<http://sciencefair.math.iit.edu/projects/>

If you get stuck, do a search for science projects on the internet or ask the librarian for science project books. Your classroom teacher is another great resource.

**Scientific Method:**

1. PROBLEM

The problem must be clearly identified and written in the form of a question. (example: What effect does darkness have on germinating lima beans?)

1. RESEARCH

There should be a few brief paragraphs identifying information about the problem. It should include information about the problem from other experiments or sources.

1. HYPOTHESIS

The hypothesis is a prediction of what will happen. It should answer the problem and be based on the research.

1. MATERIALS

All materials used for the experiment should be listed.

1. PROCEDURE

A step-by-step plan of the experiment should be written. This should be complete enough that by following the plan, anyone could repeat your experiment.

1. RESULTS

The analysis of the observations should include charts, graphs, and tables as well written descriptions of each. All charts, graphs and tables should have a title. All parts of the charts, graphs, and tables should be labeled or numbered. A paragraph summarizing the information shown should be displayed with each chart, graph or table.

1. CONCLUSION

The conclusion should begin with a statement of support or rejection of the hypothesis. You may also state that the results are inconclusive to prove or disprove the hypothesis. Include an explanation for your support or rejection of the hypothesis using the data collected (observation and analysis). Include any possible influencing factors of your experiment. (example: The closet where the dark seeds were kept was 10-15 degrees colder than the window where the seeds in the light were kept.) Mention ways to improve your experiment if it were to be done again, as well as other related experiments that could be done to learn more.

**Exhibit Size:** Outside dimensions must not exceed:

 Depth (front to back) 30 inches

 Width (side to side) 48 inches

 Height (top to bottom) 108 inches



Displays **have** to be on display board. But, they may include cardboard, poster board, or plywood.

*(can be purchased at Walmart, Home Depot, Target, Sams, Dollar General, Dollar Tree*)

Things to think about when designing your display:

* Give your exhibit a short attention-getting title
* Add pictures, photos, graphs, charts, a written report, and your project log
* Keep it simple and organized – avoid clutter
* Catch the judge’s eye with colorful borders, pictures and models
* Fasten items to the display securely
* Make your display sturdy
* Make your display easy to read and fun to look at!
* Photograph the steps and scientific process

**Sample Project Log:**

Keep a running log of your research, experiments and observations. This is as easy as having a notebook that you date and write your observations in or a typed dated log of each step of your project. The log is important because it keeps all your data in one place, so you can refer to it when you work on your written report. Your log would help someone else recreate your experiment step by step. You need to display your log with your exhibit.

PROJECT LOG

2/1/2002 Read about acid rain at the library.

2/5/2002 Visited the nursery, bought plants.

2/8/2002 Put plants in trays. Mixed solutions to spray on plants each day. Labeled each plant with A, B, and C.

2/9/2002 Sprayed plant A with tap water (4 squirts of 2ml). Plant B with the vinegar solution (4 squirts), and Plant C with nothing. Gave each plant 2ml of water at the roots. I wonder what the effect of acid rain is on plants?

**Written Report:**

###### Your report needs to include:

1. Title
2. Table of Contents
3. Abstract *(The abstract is a summary of your project in 250 words or less. It is not designed to give details, but rather to give an overview of your project. Compose the abstract as if you are writing to another scientist. Imagine your journal as one of 50 in front of this person, with them having the task of choosing the 2 or 3 journals that are most likely to help them with their work. The trick is to paint only the big picture without selling your project short.)*
4. Purpose Statement
5. Research
6. Hypothesis (what you think will happen based on your research)
7. Materials
8. Procedures (methods/what you did)
9. Results (what happened)
10. Data (graphs, charts, tables, etc. showing your information)
11. Conclusion (what did you learn and interpreted data)
12. Bibliography (in APA format- www.citationmachine.net)

When writing the report write neatly or type, use correct punctuation, check your spelling, design a creative cover, and do your very best! You will want to display your report in a folder.

Please put your name and home base teacher on the back of your project, report, and journal. To keep judging fair, we will have your project identified by a number only.

All science projects selected by the department will be judged. Judges will examine the selected projects. All projects selected for judging will receive a ribbon. The top projects will be submitted to attend the Regional Science Fair in Auburn.

**Example of an Abstract:**

The abstract is a summary of your project in 250 words or less. It is not designed to give details, but rather to give an overview of your project. Compose the abstract as if you are writing to another scientist. Imagine your journal as one of 50 in front of this person, with them having the task of choosing the 2 or 3 journals that are most likely to help them with their work. The trick is to paint only the big picture without selling your project short.

It includes portions of your:

a.    Purpose statement: What did you hope to learn?

b.      Hypothesis: What did you expect your outcome would be?

c.        Experiment: What type of experiment did you do? What was the scope of your experiment? What were the main steps you took to increase validity? What were the limitations of your experiment?

d. Conclusion: What were your end results? What are the logical next steps?

**Written Report Rubric:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  Points | 10 | 8 | 6 | 4 | 2 | 0 |
| Title/ Table of Contents | The title is present and creative and the table of contents is present, and organized.  | The title is present and thought out and the table of contents is neatly done. | The title and table of contents is good. | The title page and table of contents could be more thought out.  | Missing Title or Table of contents | Both not in report |
| Abstract | The abstract is 250 words or less and is done in excellent formatting. It explains the topic in detail. | The abstract is 250 words or less and is well done. It is clear what the project will be about.  | The abstract is completed in 250 words or less and tells what the topic is about. | The abstract is 250 words or less but the topic could use more details and explanation. | The abstract is not 250 words or less and does not explain the project very well.  | Not in report |
| Purpose | The purpose of the project is clearly stated and has gone above and beyond with explanation.  | The purpose of the project is stated well. | The purpose of the project is stated.  | The purpose of the project is stated but could use some more explaining.  | The purpose is not clearly stated and was not easy to find in the report.  | Not in report |
| Research | The research is present and the topic was researched thoroughly with supporting evidence clearly written.  | The research is present and the topic was researched well.  | The research is there and good thought is put into the research.  | The research is there but more thought could have been put into the research.  | The research is hard to find in the report and not clearly stated.  | Not in report |
| Hypothesis | The hypothesis is made and clearly states what the writer thinks will happen and why. | The hypothesis is made and states what the writer thinks will happen and why.  | The hypothesis is made and states what the writer thinks will happen and why.  | The hypothesis is complete but does not make sense for the project.  | Missing parts of the hypothesis.  | Not in report |
| Materials/ Procedures | The materials list and procedures list are complete and well put together and easy to recognize.  | The materials and procedures are listed and easy to find. | The materials and procedures are listed and easy to find.  | The materials and procedures are listed.  | Missing Materials or Procedures | Not in report |
| Results/Data | The results were clearly stated and backed up with tables and charts with the data from the experiment.  | The results were stated and backed up with data from the experiment.  | The results and data are in the report and done well.  | The results and data are in the report.  | Missing Results or Data | Not in report |
| Conclusion | The conclusion is stated clearly and sums up the report. Careful and excellent thought was put into it. | The conclusion is stated. Great and careful thought was put into it. | The conclusion is stated well. Good thought was put into it. | The conclusion is stated. Some thought was put into it. | The conclusion is poorly stated and put together. No thought was put into it.  | Not in report |
| Bibliography  | The bibliography was done excellently with correct formatting. | The bibliography was done well with correct formatting. | The bibliography was done with correct formatting. | The bibliography was done but with incorrect formatting.  | The bibliography was partially done.  | Not in report |