



Austin Energy Regional Science Festival 2008

HOW TO DO AN ELEMENTARY SCIENCE FAIR PROJECT – STUDENT GUIDE

1. PURCHASE SPIRAL NOTEBOOK

- You will use this notebook as a journal or log book to write down everything you do. You need to date every entry and note how much time you spent on each item. Begin writing in your journal when you start brainstorming ideas.

2. BRAINSTORM GENERAL IDEAS

- What are your interests or likes? Soccer, ballet, the Wee, animals, food, gross stuff, building things... etc.
- What kind of science interests you?
 - Plants (Botany)
 - Fungus, Bacteria (Microbiology)
 - Animals (Zoology)
 - Human Body (Anatomy)
 - Electricity, Gravity, Force, Light (Physical Science)
 - Chemicals, Acids/Bases (Chemistry)
 - Memory, Illusions, Training (Psychology)
 - Volcanoes, Rocks, Weather (Earth Science)
 - Product Testing (Consumer Science)
 - Surveys (Statistics)
- Look at project idea books, Web sites like www.sciencebuddies.org or Teacher Lists

3. CHOOSE TYPE OF PROJECT

- **Collection with Classification*** – a collection of items that are organized into groups according to their similarities and differences and labeled. Collections are good projects for grades 1–3.**
- **Exhibit: Demonstration, Model, or Display*** – shows how or why something works the way it does. This information can be found in a book; the facts are known.
- **Experiment*** – uses the steps of the scientific method to answer a question to which you do not know the answer without testing.

* See the next 2 pages for step-by-step instructions for each type of project.

** Students in Grade 4 and up are strongly encouraged to enter either Exhibits or Experiments rather than Collections.

- **Important** – Pay attention to the **difference between an experiment and a demonstration**. Many people and books confuse these two categories. Below are two examples of project ideas relating to rainbows, one as a demonstration and the other as an experiment.

Demonstration: How are rainbows formed?

Experiment: Can you form a rainbow by using a liquid other than water?

4. COMBINE YOUR FAVORITE IDEAS INTO A PROJECT

- **For a Collection:**

1. Remember to write a journal entry every time you do any work on your project. List the date and how much time you worked for each entry. Be sure to take pictures as you go along that can be used in your "**Journal/Log book**" or on your project board.
2. Choose items that you already have or can get easily. These items must be similar enough to be called a collection, but different enough to be put into different categories.
3. Begin background research by taking notes from books, websites or articles that talk about your subject. These will be your "**References.**" You will know you have completed your research when you can discuss your topic in your own words for about 5 minutes.
4. Once research is completed, begin organizing all the information into paragraphs. This will be the "**Background Research**" that you'll put on your project board.
5. Define categories based on physical properties, species type, or where it was found. Physical properties are things like color, weight, or shape. Make sure you have at least 2 samples for each category.
6. Decide if you will have your collection attached to your board or in front of it on the table. Make sure you clearly identify the categories. This is the "**Classification Scheme.**"
7. Don't forget to include "**Acknowledgements**" on your project board (names of the people who helped you with your project and how they helped).
8. Pay close attention to the layout of the project board. The order of information should make sense and be visually interesting. Be sure to include all the required elements, photos, and a log book. As a last step, add a creative "**Title.**"
9. Be sure you understand and are able to talk about what you've learned from your project. Practice presenting your project to an adult.

NOTE: Look in the Elementary Handbook for a list of items that cannot be brought to the Regional Science Festival. If you are using an unauthorized item, take pictures of your collection instead of bringing the actual items.

- **For a Demonstration/Model:**

1. Remember to write a journal entry every time you do any work on your project. List the date and how much time you worked for each entry. Be sure to take pictures as you go that can be used in your "**Journal/Log book**" or on your project board.
2. Decide if you want to construct a model. Be sure to leave enough time for this since some models can take a lot of time to create.
3. If you don't make a model, decide what you'll use instead such as photographs, drawings or objects from home.
4. Begin background research by taking notes from books, websites or articles that talk about your subject. These will be your "**References.**" You will know you have completed your research when you can discuss your topic in your own words for about 5 minutes.
5. Once research is completed, begin organizing all the information into paragraphs. This will be the "**Background/Research**" section that you'll put on your project board.
6. You'll also need to have a "**Written Explanation**" section on your board in which you explain what your project is about.
7. Create a section called "**Conclusions**" in which you talk about what you learned and what you could improve upon with your model.
8. Don't forget to include "**Acknowledgements**" on your project board (names of the people who helped you with your project and how they helped).
9. Pay close attention to the layout of the project board. The order of information should make sense and be visually interesting. Be sure to include all the required elements, photos, and a log book. As a last step, add a creative "**Title.**"
10. Be sure you understand and are able to talk about what you've learned from your project. Practice presenting your project to an adult.

- **For an Experiment:**

1. Remember to write a journal entry every time you do any work on your project. List the date and how much time you worked for each entry. Be sure to take pictures as you go that can be used in your "**Journal/Log Book**" or on your project board.
2. You will need to identify the problem. The "**Problem**" is the question that your experiment is trying to answer. *The question must be something that you're able to test.*
3. Formulate a "**Hypothesis.**" A hypothesis is a guess at what you think will happen when you test your experiment.
4. Find the "**Definitions**" of any important words that are written in your Problem Statement or your Hypothesis.
5. Begin background research by taking notes from books, websites or articles that talk about your subject. These will be your "**References.**" You will know you have completed your research when you can discuss your topic in your own words for about 5 minutes.
6. Once research is completed, begin organizing all the information into paragraphs. This will be the "**Background/Research**" section that you'll put on your project board.
7. Make a list of the "**Materials**" that you will need to conduct your experiment.
8. Make a list of the "**Procedure,**" or the steps that you will follow when doing your experiment. Be detailed so that someone reading your project board could perform your experiment using just your instructions.
9. An experiment must consist of at least 2 groups. One group is the "**Control,**" and the other is the "**Variable.**" Both groups are identical, except for one specific element. The "Variable" is the specific element that is different; it is the very thing that you are trying to test. (An example experiment might be to test a stain remover to see if it removes stains any better than washing with no stain remover. The stained garments, your wash technique, and drying technique would be exactly the same for both groups, with one exception. In the Variable group, you would use a stain remover. In the Control Group, you would *not* use a stain remover.)
10. Use a timeline to plan how long it will take you to complete your experiment and create a project board. If you will need live subjects (people, plants, or animals), be sure to allow enough time. (Remember, plants take a while to grow.)
11. Perform your experiment. Record the "**Results**" which tells what happened. Remember that a good experiment will have results that you can clearly measure. Use a chart and/or a graph to clearly show your results on your project board.
12. After you find your Results, form a "**Conclusion**" paragraph which answers the question in the Problem Statement and talks about what happened in your experiment. Be sure to include ways to improve your experiment.
13. Don't forget to include "**Acknowledgements**" on your project board (names of the people who helped you with your project and how they helped).
14. Pay close attention to the layout of the project board. The order of information should make sense and be visually interesting. Be sure to include all the required elements, photos, and a log book. As a last step, add a creative "**Title.**"
15. Be sure you understand and are able to talk about what you've learned from your project. Practice presenting your project to an adult.