

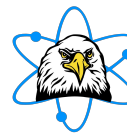


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# Ayers Science Fair Handbook 2016

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<http://www.AyersScienceFair.org>



## **A Message From the Science Fair Committee**

Congratulations for signing up to participate in the Eighth Annual Ayers Ryal Side Science Fair for students in Grades 3-5!

The following information is designed to help you prepare for the fair, including guidelines on how to pick a topic, create a project, and display your project.

This package also includes very important safety rules, including limitations for animal projects. Please pay close attention to the safety rules and limitations. All participants will be required to follow these important rules.

If you have any questions along the way, please just ask. You can e-mail any questions you have to: [info@AyersScienceFair.org](mailto:info@AyersScienceFair.org)

We look forward to seeing your projects in March!

*-- 2016 Ayers Science Fair Committee*



## 2016 Science Fair Schedule

### Between Now and Fair Day

Date	Milestone
Tuesday, December 22, 2015	Registration forms are sent home to students.
Monday, January 11, 2016	Science Fair Information Night in the Ayers Library at 7PM.
Friday, January 15, 2016	Deadline for students to submit his/her registration forms!
Tuesday, January 19, 2016	Students receive student packets and project boards.
Monday, February 22, 2016	Students will be asked to submit their project titles.

### Fair Day - **Tuesday, March 8th, 2016**

Time	Event
AM Drop-Off	Participants bring their projects to the gym in the morning.
2:00PM	Participants go to the gym at the end of school and prepare their projects which will have been placed on tables by grade. Only participating students are permitted during the judging.
2:30PM	Judging begins. All participants are required to be present for the judging.
4:00PM	Judging is complete and all participants should be picked up.
6:30PM	The public is invited to come and see the projects. Participants in the fair should return to school and attend to his/her displays!
7:00PM	Award Ceremony (all participants).
7:30PM	The public exhibit ends. Presentations remain in the gym.

### The Day After the Fair - **Wednesday, March 9th, 2016**

Science Fair projects remain on display in the gym for other grades to come and see the following day.

Students should plan to bring their projects home on March 9th, 2016 at the end of the day.

<http://www.AyersScienceFair.org>



## Safety Rules

The following safety rules must be followed:

1. No combustible materials, such as gasoline or alcohol.
2. No flames.
3. No temperatures above 100 degrees Celsius (212 degrees Fahrenheit) in display.
4. No temperatures below 0 degrees Celsius (32 degrees Fahrenheit)
5. No dangerous chemicals such as toxic materials or medicines, including dry ice.
6. No poisonous or disease-causing organisms.

*If the project is too dangerous for the student to handle, it is probably best to choose another project!*

## Avoid the need for an electrical outlet

Please avoid using electrical power for your display. There are very few display locations that have access to an electrical outlet. Participants cannot be guaranteed a display location that is near an electrical outlet. **Batteries are allowed.**

## Animal Projects

Animal study projects would maintain a respect for all living things. For this Science Fair, the following rules apply:

1. No vertebrate animal studies are allowed except for observations of animals in their natural environment (for example, wild animals in the wild, zoo animals in the zoo, pets around the house). Vertebrate animals include people, dogs, cats, hamsters, guinea pigs, mice, rats, birds, fish, amphibians, reptiles, and similar animals.
2. No projects are allowed that might inflict pain or injury to the animals under observation.
3. Small animals are allowed on display. The animal must be caged or contained. The cage must be small enough to fit on the allotted space for your project. Please no animals larger than a guinea pig, and no cats or dogs on leashes.
4. Live animals must be taken home after the evening of the fair and cannot be displayed during the classroom visits.

**Please contact us if you have any questions!**

e-mail: [info@AyersScienceFair.org](mailto:info@AyersScienceFair.org)

<http://www.AyersScienceFair.org>



## Project Basics - Three Easy Steps!

### Step 1 : Choose a Topic

Science is the study of the world around us and the universe beyond. The topics are endless! Most important when choosing a topic is to pick something that is really interesting to you.

To pick the right topic for you, check out science books from the library, talk to adults you know that work in the science field, or speak with people who just love science. If you have a computer and internet access, use the website list provided later in this handbook to delve into the endless options.

Looking deeper into a particular category that interests you may also help narrow down possible science fair topics. Most projects can be placed into one of the following categories.

Physical Science	Earth and Space Science	Life Science
Chemistry Physics Electricity & Magnetism Aerodynamics	Geology Oceans Weather & Climate Environmental Issues Ecology Astronomy	Anatomy Microbiology Genetics Zoology Botany
Applied Science	Behavioral / Health Science	<b><i>What interests you?</i></b>
Applied Mathematics Engineering Computers	Food Sports Forensic Science Psychology & Sociology Consumer Science Health & Medicine	



## Step 2 : Create Your Project

Once you have selected your topic, the real fun begins! Your project can be a research-based project, or an experimental project.

### Research Projects

For a research project, your goal is to learn facts about your topic and share those facts in an interesting and comprehensive display. Your research display can include: information from the internet and the library, graphics, comparisons, displays of charts and graphs, statistics from conducting a survey, a demonstration, a model, samples, or collections.

Here's an example of a research project:

*Megan loves collecting crystals! She is fascinated about them and has quite a collection. She wants to display her collection while demonstrating that she has learned something new about them. She decides to ask the question, "What are some common crystals?" Megan will then walk through the following steps to complete her project:*

1. Read books about crystals, investigating what is common and not so common.
2. Research using the internet and find some interesting photographs of really neat crystals. Then she draws some formations herself.
3. Try growing common crystals.
4. Complete her collection so that she has both a polished and rough specimen of each crystal. This will let her ask the judges to try and pair up the matching crystals.
5. Provide general information about each crystal.
6. Find an interesting way to proudly display her collection and project.

*Keep in mind not all research based projects have collections.*



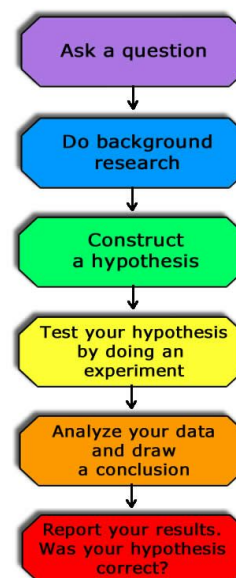
## Experimental Projects

Experimental projects use the Scientific Method.

The steps of the scientific method are to:

- Based on observations, ask a question
- Do Background Research
- Construct a Hypothesis
- Test Your Hypothesis by Doing an Experiment
- Analyze Your Data and Draw a Conclusion
- Communicate Your Results

## The Scientific Method



Here is a sample of an experimental project:

*Alexander is really curious about how batteries work. After doing some initial research, he decides to do an experimentation science fair project - one that requires an experiment and one that expects him to follow all six steps of the Scientific Method.*

1. Alexander asks the question, "Can I create my own battery?"
2. He researches the components of a battery and learns all about positive electrons, negative electrons, circuits, and current flow.
3. He creates a hypothesis. In this case, he hypothesizes that he can create a battery using lemons, zinc, copper, and wires.
4. "I believe I can make a battery using lemon, zinc, copper, and wires."
5. To test his hypothesis, he sets up an experiment using the materials listed in his hypothesis. In this case, copper metal, zinc metal, wires, alligator clips, lemons, and a small LED.
6. Alexander's initial experiment fails. He analyzes his experiment and his research and decides that he used insufficient zinc and copper. After adding more, he lights the LED.
7. Alexander concludes that his hypothesis was correct and demonstrates how to create your own battery.



### Step 3 : Prepare Your Presentation

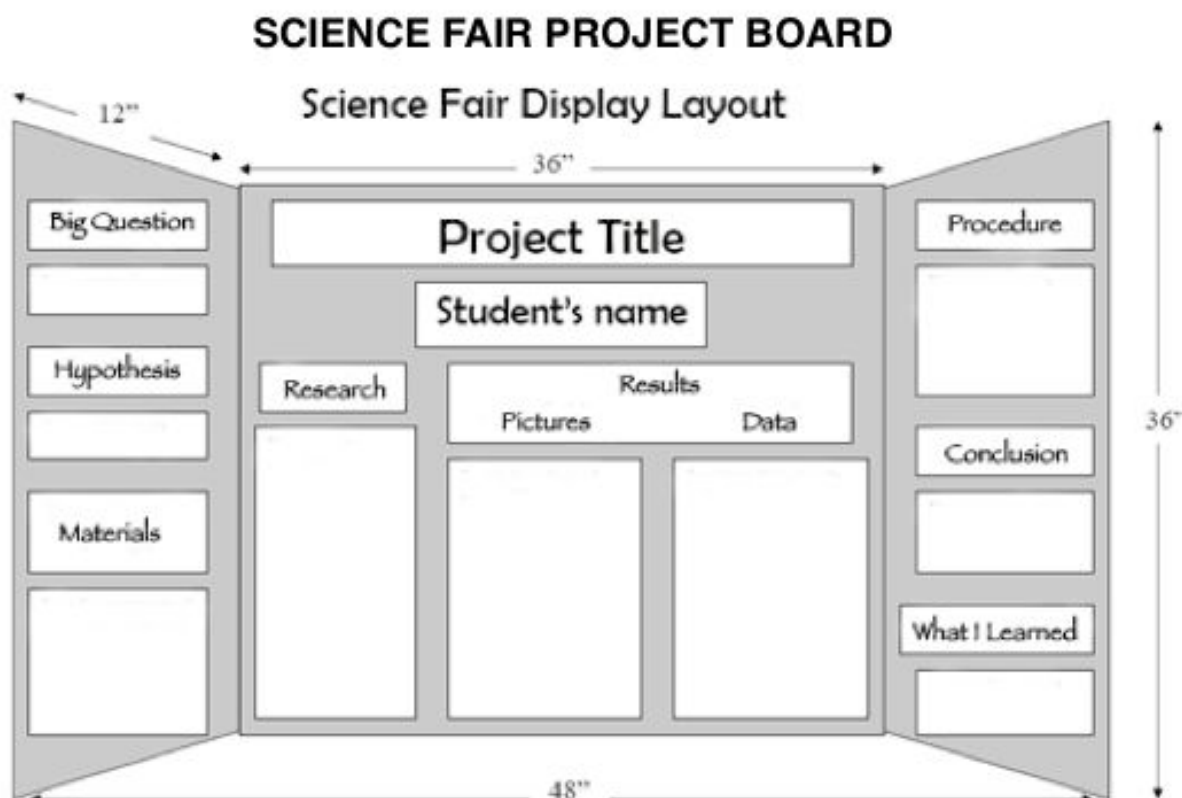
Once your project is complete, it's time to show your work to the judges and your classmates. At the Science Fair, participants will be given a three-foot wide, two-foot deep space on a table for project display. There needs to be enough room for all the displays, so please do not make yours any wider than three feet wide, two-foot deep.

**A tri-fold display board will be provided for you.**

Also, remember that participants cannot be guaranteed the availability of an electrical outlet. Avoid using AC power for your display (batteries are acceptable).

Many participants also build models or display parts of their experiments on the table in front of their poster displays. If you took notes or used a journal, you could put your notebook or journal on display!

Here's an example template for a science fair poster:







## Judging Guidelines

Students will meet individually with a judge. All students will receive written comments from the judges. The judges will complete a form focused on the following:

- **Understanding** – How well do you understand your topic?
- **Research Methods** – For research projects, did you conduct thorough research to explain your topic in detail?
- **Scientific Method** – For experimental projects, did you follow a scientific method, including making observations, developing a hypothesis, testing the hypothesis, and analyzing results?
- **Originality** – How creative is your work? Did you pick a unique topic or find an unusual or creative way to explore a common topic?
- **Presentation** – What is the quality of your display? It is neat with sufficient detail to show your work?
- **Communication** - How well do you communicate your topic to the judges? Can you explain your project, including the experiments you performed and the results of those experiments?



## Online Resources

Can't decide on a topic? Not sure what your project should look like? Use these online resources for ideas!

**Always get permission before using the internet!**

### Science Buddies

- <http://www.sciencebuddies.org>

Science Buddies has a nice survey tools, which recommends project ideas based upon your interests.

### Education.com

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

Education.com has over 700 science fair project ideas for elementary school students.

### All Science Fair Projects

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

Details on over 1,000 science fair projects, which can be searched or browsed.

### Discovery Science Fair Center

- <http://school.discoveryeducation.com/sciencefaircentral/>

Offers Science Fair topics and presentation tips.

### YouTube

- <https://www.youtube.com/>

With adult supervision, you can go to YouTube and search "science fair projects" or "science fair presentations" to get a feel for what a science fair looks like, listen to students discuss their projects, or get an idea for a project.



## Frequently Asked Questions

We will maintain a list of frequently asked questions at:

[www.AyersScienceFair.org](http://www.AyersScienceFair.org)

Please check there for updates, or if you have any questions, e-mail us!

[info@AyersScienceFair.org](mailto:info@AyersScienceFair.org)

### Can I work with a partner?

We are not allowing partner projects in the 2016 Science Fair.

### Do I have to do an experiment, or can I research and explain an interesting topic?

Both research projects and experimental projects are acceptable.

However, over the past several years, we have observed that the judges tend to prefer projects that are experimental or include data-gathering beyond what you would find in the library or on the Internet.

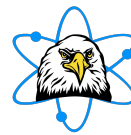
If you choose to do a research project, consider doing something to supplement your research, such as building a model or conducting a survey. For example, if you want to study how highway accidents are related to driving habits, you could survey drivers about the speed they drive, whether they wear seatbelts, and whether they eat or talk on the phone while driving. Share your survey results as part of your display!

### Can an adult help me with my project?

Yes. In fact, an adult should help you with any part of your project that requires supervision. However, you should do as much of your project on your own as you can - especially your display board.

### What should my display look like?

Your handbook includes ideas about what your display should include. Most importantly, your display should be neat and organized, and it should focus on the important aspects of your project. Be creative - use artwork or pictures to make it interesting to review. Do not forget to put your name, project title, and grade on the front of your display!



## What will happen when the judges review my project?

You will meet with one judge the afternoon of the fair. The judge will ask you to explain your project and what you learned.

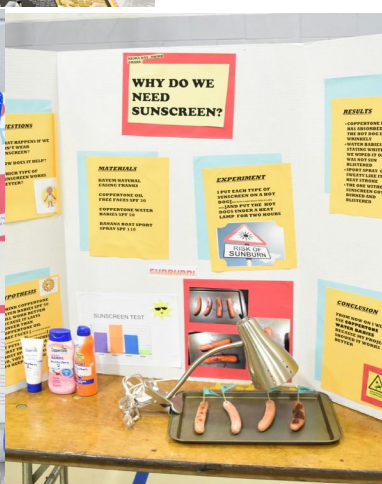
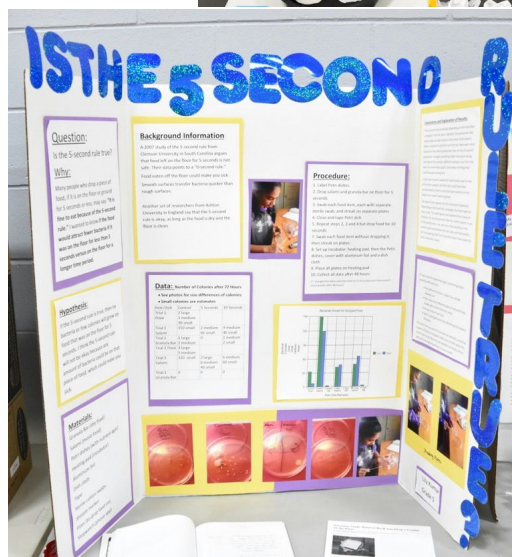
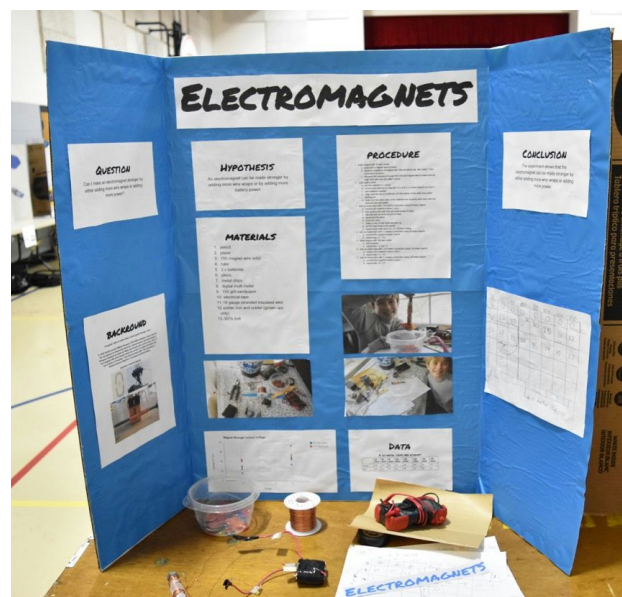
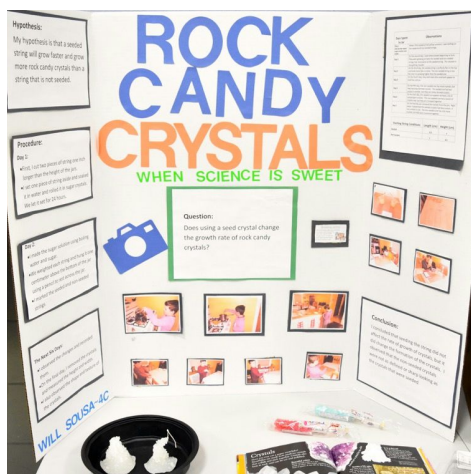
The judges are interested in learning about your project, including the research you completed and the experiments you conducted. Important judging elements include the quality of your display and how well you can explain your project.

## What do I do while I'm waiting to be judged?

Everyone is required to stay in the gym while waiting to be judged. There will be chairs set up where you can sit. No one should be walking around looking at the projects during judging. Please bring homework or a book to read, or another quiet activity.

## What do some past projects look like?

Here are some pictures from last years science fair!



<http://www.AyersScienceFair.org>

