

SCIENCE FAIR BASICS

The PPLD Science Fair is an unadjudicated fair. This means that we have no rules about how a student presents at our science fair. However, some families may wish to participate more fully in regional and state science fairs. These fairs have specific requirements. For this reason, we have compiled some information and resources here.

The following information has been adapted from [Science Buddies](#).

WHAT IS THE SCIENTIFIC METHOD?

The scientific method is a process for experimentation that is used to explore observations and answer questions.

- Do all scientists follow the scientific method exactly? No. Some areas of science can be more easily tested than others. For example, scientists studying how stars change as they age or how dinosaurs digested their food cannot fast-forward a star's life by a million years or run medical exams on feeding dinosaurs to test their hypotheses.
- When direct experimentation is not possible, scientists modify the scientific method. But even when modified, the goal (and many of the steps) remains the same: to discover cause and effect relationships by asking questions, carefully gathering and examining the evidence, and seeing if all the available information can be combined into a logical answer. New information or thinking might also cause a scientist to back up and repeat steps at any point during the process.
- Understanding the steps of the scientific method will help you focus your scientific question and work through your observations and data to answer the question as well as possible.



STEPS OF THE SCIENTIFIC METHOD

1. Ask a Question

The scientific method starts when you ask a question about something that you observe: How, What, When, Who, Which, Why, or Where? For a science fair project, some teachers require that the question be something you can measure, preferably with a number.

For detailed help with this step, follow the links to these resources on the Science Buddies website:

- [Your Question](#)
- [Laboratory Notebook](#)

2. Do Background Research

Rather than starting from scratch in putting together a plan for answering your question, you want to be a savvy scientist using library and Internet research to help you find the best way to do things and ensure that you don't repeat mistakes from the past.

For detailed help with this step, follow the links to these resources on the Science Buddies website:

- [Background Research Plan](#)
- [Finding Information](#)
- [How to Write a Bibliography in APA and MLA styles With Examples Research Paper](#)

3. Construct a Hypothesis

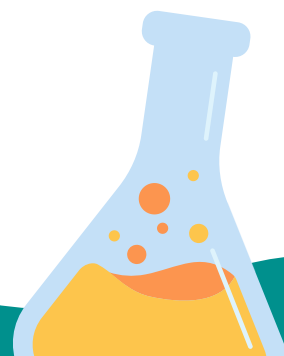
A hypothesis is an educated guess about how things work. It is an attempt to answer your question with an explanation that can be tested. A good hypothesis allows you to then make a prediction:

"If _____[I do this] _____, then _____[this]_____ will happen."

State both your hypothesis and the resulting prediction you will be testing. Predictions must be easy to measure.

For detailed help with this step, follow the links to these resources on the Science Buddies website:

- [Variables](#)
- [Variables for Beginners](#)
- [Writing a Hypothesis for Your Science Fair Project](#)



4. Test Your Hypothesis by Doing an Experiment

Your experiment tests whether your prediction is accurate and thus your hypothesis is supported or not. It is important for your experiment to be a fair test. You conduct a fair test by making sure that you change only one factor at a time while keeping all other conditions the same. You should also repeat your experiments several times to make sure that the first results weren't just an accident.

For detailed help with this step, follow the links to these resources on the Science Buddies website:

- [Experimental Procedure](#)
- [Materials List](#)
- [Conducting an Experiment](#)

5. Analyze Your Data and Draw a Conclusion

Once your experiment is complete, you collect your measurements and analyze them to see if they support your hypothesis or not. Scientists often find that their predictions were not accurate and their hypothesis was not supported, and in such cases they will communicate the results of their experiment and then go back and construct a new hypothesis and prediction based on the information they learned during their experiment. This starts much of the process of the scientific method over again. Even if they find that their hypothesis was supported, they may want to test it again in a new way.

For detailed help with this step, follow the links to these resources on the Science Buddies website:

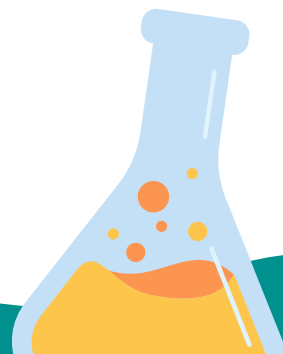
- [Data Analysis & Graphs](#)
- [Conclusions](#)

6. Communicate Your Results

To complete your science fair project you will communicate your results to others in a final report and/or a display board. Professional scientists do almost exactly the same thing by publishing their final report in a scientific journal or by presenting their results on a poster or during a talk at a scientific meeting. In a science fair, judges are interested in your findings regardless of whether or not they support your original hypothesis.

For detailed help with this step, follow the links to these resources on the Science Buddies website:

- [Final Report](#)
- [Abstract](#)
- [Display Board](#)
- [Science Fair Judging](#)



WHERE TO FIND IDEAS

Science Fair Project Books

Go to the PPLD catalog at PPLD.org and search for “Science Projects” to find a wide variety of books, some more general and some focused on particular science areas. There are also numerous titles also available as ebooks.

Science Buddies Topic Selection Wizard

This site allows you to fill out a survey identifying your age and interests and then provides recommendations for projects.

Other Websites to Browse:

Science Fair Project Ideas

Search this library of science projects by grade level or by subject.

Science Fair Central

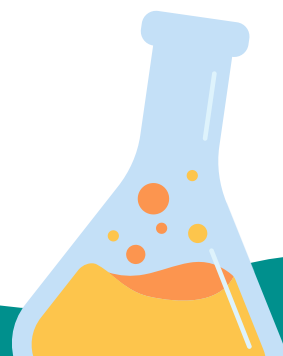
Hosted by Discovery Education and The Home Depot, this site offers project ideas and a step-by-step guide on completing and presenting them.

Science Experiments for Kids

These easy-to-do-at-home science experiments from a science academy in North Carolina are colorfully presented and nicely explained through directions and videos.

Science Reference Center

This database, accessible through the PPLD website with a valid library card and PIN, provides easy access to a multitude of full-text, science-oriented content. Designed to meet every student researcher's needs, Science Reference Center contains full text for 732+ science encyclopedias and reference books, 195 periodicals, 519 science videos, and other sources. Use this database for background research for your project, or put in the search term, “science experiment,” for ideas.



LOCAL FAIR INFORMATION

Students in grades 4 and 5:

The Pikes Peak Elementary Science and Engineering Fair will be held in April of 2025 at Palmer High School. The fair is for students in grades 4 and 5 who win at their school science fairs. You may be able to contact your local elementary school to see if they are having a science fair, and request to participate. Information on this fair can be found on the [website](#). Contact Christy Vacchio at christy.vacchio@d11.org for more information.

Students in grades 6 - 12:

The Pikes Peak Regional Science Fair (PPRSEF) is open to all 6 - 12 grade students in any educational setting (public, charter, private or homeschool) in Elbert, El Paso, Park, or Teller County. Registration for 2025 is open now and closes on January 20, 2025. The 2025 PPRSEF will be held at UCCS on Saturday, February 22, 2025.

Interested families should access [PPRSEF](#) for registration, guidelines, and information.

State Fair Information

If you win at regionals, you can attend the state fair in April! Check their [website](#) for more information.

Good luck! We look forward to seeing all your great projects at the PPLD Homeschool Science Fair!

