



Science Fair Project Question

Key Info

- We have several resources to help you decide what your science fair project will be about:
 - **The Topic Selection Wizard** (http://www.sciencebuddies.org/science-fair-projects/recommender_register.php) asks you a series of questions about everyday interests and activities then recommends an area of science and science fair project ideas that are best for you.
 - **Science Fair Project Ideas** (http://www.sciencebuddies.org/science-fair-projects/project_ideas.shtml) lets you browse through hundreds of science fair project ideas.
 - **If Your Teacher Assigned a Specific Area** for your science fair project (like "biology" or "earth science"), then you should go to **Science Fair Project Ideas** (http://www.sciencebuddies.org/science-fair-projects/project_ideas.shtml).
- Once you find a general topic that interests you, write down the question that you want to answer. A scientific question usually starts with: How, What, When, Who, Which, Why, or Where. For example, if you are interested in robots, your question might be "How much current does a robot's arm use to lift a weight?"
- Can you design a fair test to answer your question? A "fair test" requires that you change only one factor (variable) and keep all other conditions the same. If you cannot design a fair test, then you should change your question.
- Your science fair project question should involve factors or traits that you can easily measure using a number. Or, factors or traits that are easily identified, like colors.
- Read through the list of *Science Project Topics to Avoid*, in the Examples tab, to make sure you set yourself up for success! If your topic is close to something on the list, it is best to pick something else.

Finding an Idea for Your Science Fair Project

One of the most important considerations in picking a topic for your science fair project is to find a subject that you consider interesting. You'll be spending a lot of time on it, so you don't want your science fair project to be about something that is boring.

We know that finding a topic is the hardest part of a science fair project, and sometimes you just need a little help focusing on what sorts of topics would be of interest to you. To help you find a science fair project idea that can hold your interest, Science Buddies has developed the Topic Selection Wizard. By answering a series of questions about everyday interests and activities, you will help us identify an area of science that is best for you. So click on the following link and let's get started!

- **The Topic Selection Wizard** (http://www.sciencebuddies.org/science-fair-projects/recommender_register.php) asks you a series of questions about everyday interests and activities then recommends an area of science and science fair project ideas that are best for you.
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Your Science Fair Project Question

The question that you select for your science fair project is the cornerstone of your work. The research and experiment you will be conducting all revolve around finding an answer to the question you are posing. It is important to select a question that is going to be interesting to work on for at least a month or two and a question that is specific enough to allow you to find the answer with a simple experiment. A scientific question usually starts with: How, What, When, Who, Which, Why, or Where. Here are some characteristics of a good science fair project question:

- The question should be interesting enough to read about, then work on for the next couple months.
- There should be at least 3 sources of written information on the subject. You want to be able to build on the experience of others!

Now, for something like a science fair project, it is important to think ahead. This will save you lots of unhappiness later. Imagine the experiment you might perform to answer your question. How does that possible experiment stack up against these issues?

- The experiment should measure changes to the important factors (variables) using a number that represents a quantity such as a count, percentage, length, width, weight, voltage, velocity, energy, time, etc. Or, just as good might be an experiment that measures a factor (variable) that is simply present or not present. For example, lights ON in one trial, then lights OFF in another trial, or USE fertilizer in one trial, then DON'T USE fertilizer in another trial. If you can't measure the results of your experiment, you're not doing science!
- You must be able to control other factors that might influence your experiment, so that you can do a fair test. A "fair test" occurs when you change only one factor (variable) and keep all other conditions the same.
- Is your experiment safe to perform?
- Do you have all the materials and equipment you need for your science fair project, or will you be able to obtain them quickly and at a very low cost?
- Do you have enough time to do your experiment before the science fair? For example, most plants take weeks to grow. If you want to do a project on plants, you need to start very early! For most experiments you will want to allow enough time to do a practice run in order to work out any problems in your procedures.
- Does your science fair project meet all the rules and requirements for your science fair?
- Have you avoided the bad science fair projects listed in the table "Science Project Topics to Avoid" in this project guide?

If you don't have good answers for these issues, then you probably should look for a better science fair project question to answer.

Some science fair projects that involve human subjects, vertebrate animals (animals with a backbone) or animal tissue, pathogenic agents, DNA, or controlled or hazardous substances, need SRC (Scientific Review Committee) approval from your science fair BEFORE you start experimentation. Now is the time to start thinking about getting approval if necessary for your science project (see [SRC](http://www.sciencebuddies.org/science-fair-projects/project_src.shtml) (http://www.sciencebuddies.org/science-fair-projects/project_src.shtml)).

Examples

These are examples of good science fair project questions:

- How does water purity affect surface tension?
- When is the best time to plant soy beans?
- Which material is the best insulator?
- How does arch curvature affect load carrying strength?
- How do different foundations stand up to earthquakes?
- What sugars do yeast use?

These are examples of bad science fair project topics that you should avoid:

Science Project Topics to Avoid	Why
Any topic that boils down to a simple preference or taste comparison. For example, "Which tastes better: Coke or Pepsi?"	Such experiments don't involve the kinds of numerical measurements we want in a science fair project. They are more of a survey than an experiment.
Most consumer product testing of the "Which is best?" type. This includes comparisons of popcorn, bubblegum, make-up, detergents, cleaning products, and paper towels.	These projects only have scientific validity if the Investigator fully understands the science behind why the product works and applies that understanding to the experiment. While many consumer products are easy to use, the science behind them is often at the level of a graduate student in college.
Any topic that requires people to recall things they did in the past.	The data tends to be unreliable.
Effect of colored light on plants	Several people do this project at almost every science fair. You can be more creative!
Effect of music or talking on plants	Difficult to measure.
Effect of running, music, video games, or almost anything on blood pressure	The result is either obvious (the heart beats faster when you run) or difficult to measure with proper controls (the effect of music).
Effect of color on memory, emotion, mood, taste, strength, etc.	Highly subjective and difficult to measure.
Any topic that requires measurements that will be extremely difficult to make or repeat, given your equipment.	Without measurement, you can't do science.
Graphology or handwriting analysis	Questionable scientific validity.
Astrology or ESP	No scientific validity.
Any topic that requires dangerous, hard to find, expensive, or illegal materials.	Violates the rules of virtually any science fair.
Any topic that requires drugging, pain, or injury to a live vertebrate animal.	Violates the rules of virtually any science fair.
Any topic that creates unacceptable risk (physical or psychological) to a human subject.	Violates the rules of virtually any science fair.

Science Project Topics to Avoid	Why
Any topic that involves collection of tissue samples from living humans or vertebrate animals.	Violates the rules of virtually any science fair.

Science Fair Project Proposal Form

You might want to fill out this [Science Fair Project Proposal Form](http://www.sciencebuddies.org/science-fair-projects/project_proposal_form.pdf) (http://www.sciencebuddies.org/science-fair-projects/project_proposal_form.pdf) **SO** that you can get feedback on your science fair project from your teacher, parents, or other people you know who might give you valuable feedback.

Science Fair Project Question Checklist

Here are some things to consider as you finalize your question:

What Makes a Good Science Fair Project Question?	For a Good Science Fair Project Question, You Should Answer "Yes" to Every Question
Is the topic interesting enough to read about, then work on for the next couple months?	Yes / No
Can you find at least 3 sources of written information on the subject?	Yes / No
<p>Can you measure changes to the important factors (variables) using a number that represents a quantity such as a count, percentage, length, width, weight, voltage, velocity, energy, time, etc.?</p> <p>Or, just as good, are you measuring a factor (variable) that is simply present or not present? For example,</p> <ul style="list-style-type: none"> • Lights ON in one trial, then lights OFF in another trial, • USE fertilizer in one trial, then DON'T USE fertilizer in another trial. 	Yes / No
Can you design a "fair test" to answer your question? In other words, can you change only one factor (variable) at a time, and control other factors that might influence your experiment, so that they do not interfere?	Yes / No
Is your experiment safe to perform?	Yes / No
Do you have all the materials and equipment you need for your science fair project, or will you be able to obtain them quickly and at a very low cost?	Yes / No
Do you have enough time to do your experiment more than once before the science fair?	Yes / No
Does your science fair project meet all the rules and requirements for your science fair?	Yes / No
Have you checked to see if your science fair project will require SRC (Scientific Review Committee) approval?	Yes / No
Have you avoided the bad science fair project topic areas listed in the "Science Project Topics to Avoid" table?	Yes / No

You can find this page online at: http://www.sciencebuddies.org/science-fair-projects/project_question.shtml





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