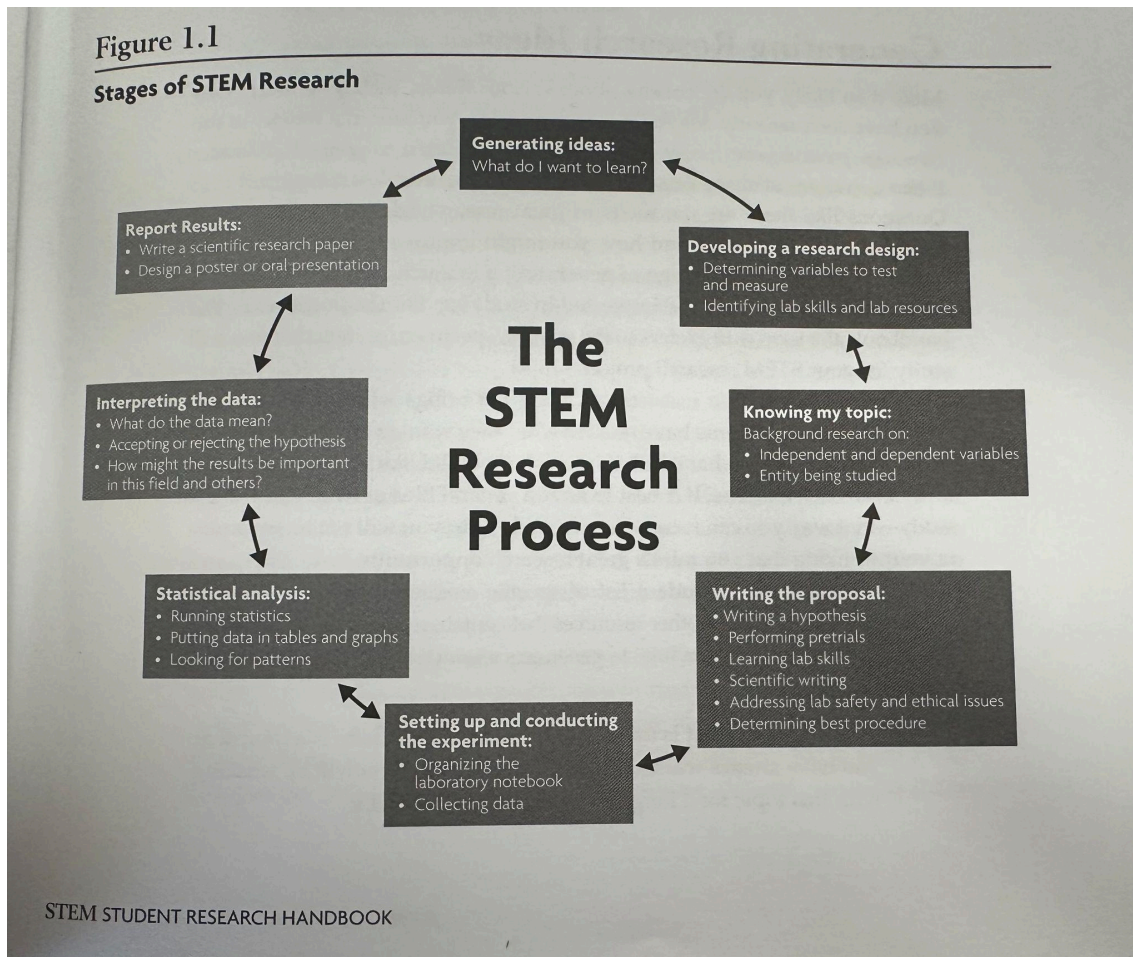


# Getting Started With Research

**Keep a Notebook or Journal to document all of the following!**  
**(This is required as part of your Display!)**



## Selecting Your Topic

This step may appear to be simple, but it may be difficult for some students. You may feel that you lack ideas and directions. This section of the handbook was designed to help you find the idea or problem that best fits you.

**Look through Science Publications to find something that interests you.**

- Science textbooks
- Lab manuals
- Science/Science Fair Websites
- Science magazines (not technical journals.)

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**Make a list of things you've always wondered about or wanted to do:**

- Making a Program that . . .
- Teaches Others to Write Programs
- Controls Roof Solar Panels
- Simulates Predator-Prey Relationships in a Nearby Habitat
- Regulates Greenhouse Temperature

**From the list, pick a topic...**

- that interests you
- is specific enough to make into
- conduct an experiment

**Examples:**

- "The Effect of \_\_\_\_\_ on \_\_\_\_\_"
- "The Design and Construction of a simpler (less expensive) \_\_\_\_\_"

**You will want to avoid:**

**Topics that are too general**

- Cannot be made into problem and experiment
- Make more specific: "Bacteria" becomes... "Effect of Bacteria on Plant Roots"

**Topics that require unavailable equipment**

- "Deep Sea Hydrothermal Vents"
- "Advantages of Two-Engine vs. One-Engine Cars"

**Topics that require too much time**

- "Designing a Submarine that can also fly"

**Topics that are potentially dangerous**

- "Building Better Explosives"
- "Effects of Different Gas Mixtures on Breathing"

**Projects that are mainly a tool or organism that interests you**

- "Microscopes"
- "A Computer I Built"
- "The Hamster as Research Animal"

**Topics that tend to be weak projects**

- "Which toothpaste tastes the best?"

**Develop your Research Questions**

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A research question drives the research process. The questions in the checklist below are included to assist in developing and refining the research question for your science fair project. *These early steps of the project should also be included in the laboratory notebook.*

## **Is the question important?**

- ☐ Is the question relevant?
- ☐ Will the question add to the scientific body of knowledge?

## **Is the question testable?**

- ☐ Can it be stated in a single sentence?
- ☐ Does the question allow adequate background research from scholarly sources?
- ☐ Is the answer more complex than a yes or no answer?
- ☐ Can an answer be found in a single research cycle?

## **Is the question doable?**

- ☐ Is there adequate access to facilities and equipment to conduct an experiment to test the question?
- ☐ Can it be completed in the timeframe you're working in?
- ☐ Is it ethical?

## **Other considerations**

- ☐ Review the restricted project guidelines. Complete the form if necessary.
- ☐ Get teacher (adult sponsor) approval.

## **Teacher & Student Resources**

- [Science Buddies Topic Selection Wizard](#)
- [Science Fair Checklist Google Doc Template](#)

*Questions adapted from Inquiry Based Science - Van Alden Education Institute Evaluating an Investigation Question (n.d)*

## **Things to think about:**

- Explore a variety of resources for meaningful project ideas: community concerns, local environmental issues, your backyard or garage, something that makes you wonder or that you are interested in figuring out or solving! The more interesting it is to you the more fun you will have exploring! This Exploration serves as your "Background Information" for your project.
- Once you have decided on a project idea, you need to **plan** how you will do it! Using a Design Process, determine your primary question or problem, what do you already know about this question (research what is already known), what do you think might be a solution, determine how to test your ideas to see if they work, and don't be afraid if your results are not what you expected!
- Check your project plan against the [Scientific Review Flow chart](#). Do you need

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ISEF forms completed prior to beginning? Use the [Tools](#) and [SRC Forms Templates](#) to write your proposed project plan and submit to [SRC Review Form](#) asap to get approval! **All students must follow the safety Guidelines**, but only grades 6-12 must complete the SRC approval prior to experimenting.

- DO NOT START EXPERIMENTING UNTIL APPROVAL IS RECEIVED!
- Once you have tested and collected some data- you need to analyze the data and interpret what it means. This may involve some math, like statistics, to help you interpret the data. You can make data charts and graphs to help others understand your data better.
- Once you have gone through all the above, it is now time to write it up! Most projects will have a Report that details the following sections: Abstract, Introduction & Background, Procedure or Methods, Data & Analysis, and a Conclusion. This report should be done on a computer, and may accompany your notebook/journal as part of your display.
- Make your presentation! This can be a tri-fold board or even a poster that displays your abstract, a brief introduction or background, a brief overview of the procedure, any data tables and graphs, your conclusion, and finally your next steps or questions generated based on your results. Recommend using Google Slides templates to create your display
- REGISTER for the STEAM Expo online at <https://ca-scc.zfairs.com>
- **\*\*Please use a personal email address- not your school email! Many schools do not allow outside organizations to contact you, and your email is the way we will notify you of any updates, SRC approval, and even for awards!\*\***