

**Triangle Math and
Science Academy
Science Fair
2019-2020**

Due Dates

What Is Due?	Due Date
Submit Idea	September 23
Research and Bibliography	October 14
Hypothesis, Research Question, Engineering Goal, Expected Goal	October 14
Research Methods and Conclusions	
- Procedures	October 14
- Risk and Safety	October 14
Research Proposal in class presentations	October 14-17
	IF STUDENTS QUALIFY FOR THE SCHOOL SCIENCE FAIR THEY WILL CONTINUE WITH THE DATES BELOW
Experimentation, Data, Graphs, Conclusions	December 13
Abstract (Final Draft)	December 13
Science Fair Board, Journal, and presentations to judges	December 18

Introduction

You are about to embark on a journey through scientific discovery. To be a scientist, you do not have to own a lab coat, clipboard and pen, or work in a lab. In fact, many scientists work in the field, with people, and sometimes in their backyard. You will also become a scientist by designing a project, testing a hypothesis, analyzing data, and presenting your findings to the scientific community. A few things to keep in mind before we start:

- Science Fair project proposal is **mandatory** and will take place throughout the first semester.
- You may work alone or you may work with a partner. If you work with a partner, each partner must be able to visit with and work with each other equally and with minimal parental interference. This means that parents must be on board with you working with somebody else and must allow you two times to work together at designated locations. If you have a partner and decide you don't want to work together anymore, you must a.) have a backup plan/project for each partner, and b.) ask for change before the hypothesis due date. Once the hypothesis is submitted, you two must stay as partners until the end, so please choose wisely. Also, any prizes won together will be split.
- Throughout your whole project, you must be as impersonal in your writing as possible. Avoid naming individuals, speaking in 1st person (ex. I, me, we, etc.), and stating opinions when not appropriate.

- **YOU (AND YOUR PARTNER)** must be the ones doing your project. Parents may drive you places, purchase your materials, help set up and supervise the experiment, but parents **MAY NOT** do the experiment for you.
- Pace yourselves. There are multiple due dates and assignments to complete your project as a whole. Please **DO NOT PROCRASTINATE**, wait until the last minute, or fall behind on your assignments as catching up and doing a proper job will be difficult.

Brainstorming and Rationale

What is my science fair project going to be? Your first assignment as a scientist for Triangle Math and Science Academy is to think. Great scientists have thought up ideas thanks to a simple question. The infamous story of Sir Isaac Newton and the falling apple, or Archimedes of ancient Greece and his reason for shouting “Eureka!” are but a couple of examples of how ordinary people made simple observations that developed into great principles in science. The more you make observations about the world around you, the more reflective your thoughts will be. Use this to your advantage and start your brainstorming.

Before you begin your experiment, you must submit a research plan. This will explain and outline your ideas for the project.

*****WHAT NOT TO DO (NO-NO QUESTIONS)*****

- Go online or read a book to find a science project
- Projects that will take excessive amounts of time (long term growth, weekly/monthly measurements, etc.)
- Projects along the lines of “I want to test if (enter object here) works the (best, fastest, longest, hardest, etc. ”

Submit Idea

Each student is required to submit an idea for the science fair. Students can work individually or with a partner, but they **MUST** be in the same class. Each person will submit a Google form

for approval stating what you would like to do for your project by September 23. **Anyone who does not submit an idea by September 23 will be assigned a project to research.**

This year, students will model real world applications by first submitting a project proposal to their teacher. The project proposal should be in the form of a Powerpoint or Prezi and will be presented to the class. Each student/team will have 5 minutes to present their proposal to the class. **Only qualifying project proposals will be admitted into the 2019-2020 Triangle Math and Science Academy Science Fair.** Each proposal will include the following:

- Background/Research
- Research Question
- Hypothesis
- Variables
- Materials
- Procedures
- Theoretical Data

Proposals are due October 14 and presentations will take place in class October 14-17. All finalists will be announced on October 18 and will be rewarded with a pizza party and dress down day.

Research and Bibliography

In order to come up with an explanation for your question, you must research information regarding your project. The purpose of your research is to have a greater understanding of what to expect for your project. Research any and every aspect of the project: modern use, historical use, scientific principles, dangers, etc. Use resource and reference materials with credibility, such as scientific journals, textbooks, websites (**limit of 2**), professionals, etc. For each resource material, please have at least 1 well-written paragraph summary explaining what you found in your research. **Each of your references should be written using APA format.** Your research paragraphs will be entered into your science fair journal. A bibliography is needed for your research plan.

Research Question, Hypothesis, Engineering Goal, Expected Goal

After completing your research, you should have a pretty good idea of what to expect for your experiment. You will complete the next sections and include it in your research plan.

- Your research question will be a statement of the question that you researched. (ex. Why do egg shells dissolve in vinegar?)
- Please state your hypothesis. Your hypothesis should be more than just “an educated guess”. It should include a statement along the lines of “If ... then ... because ...”. The hypothesis should also be testable and have a clear outcome. Remember, the project must be understood and be able to be repeated if read by somebody else, namely the science fair judges.
- Your engineering goal will explain the design of your project. What are the control and experimental groups give an idea of how you plan to do your science fair project. Give a brief summary of what you (and your partner) will do.
- For your expected outcomes, what do you expect will occur (the results) before conducting the experiment? Your expected outcome should support your hypothesis, as well as be supported by your research.

Research Methods and Conclusion

The following sections will be included within your research plan for proof of safety and for proactive research.

Procedures: Make a bulleted list of all materials needed for your project. Any measuring equipment must mention measuring capacity and at what increments it measures. Number or bullet all the steps for your procedures. Your steps should be **specific and detailed**. Your steps should also include how you are collecting your data. What specifically are you measuring or looking for? How many trials are you running? What is/are the control group/variables?

Risks and Safety: Please write a paragraph using your research in order to “identify any potential risks and safety precautions needed.”¹ This information should have been included in your research of any dangerous substances, reactions, organisms, or hazards.

Data Analysis: “Describe the procedures you will use to analyze the data/results that answer research questions or hypotheses”.¹ In other words, after you collect the data how do you plan to analyze it? What kind of graphs will you use? What patterns do you think you will see? How will these relate to your hypothesis?

Additional Information: Should any of the experiments include any of the following, then you will need to include in your research plan the information found on Form 1A from the North Carolina Science Fair website to ensure proper precaution, safety, and care of subjects in your projects:¹

- Human Participants
- Vertebrate Animal
- Potentially Hazardous Biological Agents
- Hazardous Chemicals, Activities, and Devices

Project Proposal Presentations

You will create a Powerpoint presentation to your class. You will be given **5** minutes to present and **2** minutes to answer questions. Your presentation should be brief, direct, and go through the entire scientific method as presented in your Powerpoint. You (and your partner) should practice going through the presentation before presenting to the class. As your classmates are presenting, you are part of the scientific community and are recording information of what your classmates have done. This is to promote thought through asking them questions to better understand their projects and giving them a chance to reveal more about their project. Simply reading your presentation is unacceptable and will result in a lower grade. Note cards are acceptable if supplementing your presentation, not as an alternative reading tool. Questions during Q&A must be appropriate and thoughtful. Questions along the

lines of “Why did you choose this?” do not support the nature of the project. Please see the rubric below for what is wanted when presenting.