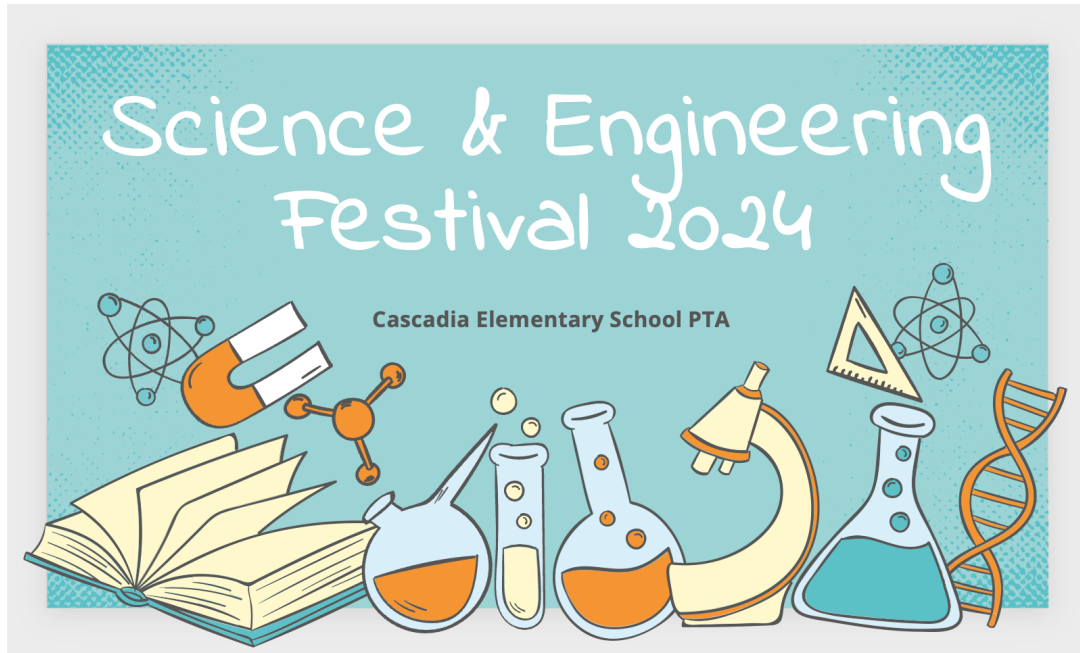


Project Planning Guide: Grades 3-5



Find additional info and resources at the Cascadia PTA website

<https://cascadiapta.org>



Developed by Dr. Kristen Bergsman for Cascadia Elementary PTA in 2022 and revised in 2024.



How to Participate in the Cascadia PTA Science & Engineering Night

Note: If your teacher has assigned a required science project, you should follow their directions and use their scoring rubric for guidance.

- Register to participate using the online registration form. Find it on the PTA website or in the Dragon Digest.
- You can work on your own, or in a small group with other Cascadia students.
- Your parents/guardians can help you when needed, but this is your own project. You are the Scientist or Engineer, and the adult is your helper. You should be the one leading the project. Have fun with it!
- Use this guide to help you plan your project and display board.
- Check out the PowerPoint on the PTA website for an overview and important information for parents.
- Plan on having your project and display board completed before the Cascadia PTA Science & Engineering Night on **April 25th, 2023**. Everyone who participates and displays their project will get a small prize and be entered in a random prize drawing.



(Photos from Google Image Search).

Choose: Choose a scientific question to explore or an engineering design problem to solve. Another option is to research a science or engineering topic.



What do you wonder about? Think about questions you have about plants, animals, chemical reactions, the human body, computers, machines, weather, rocks and minerals, etc. How could you investigate those questions? What problems have you noticed in your life that could be solved through engineering? What could you design or build to solve these problems?

You can use the [Science Buddies Topic Selection Wizard](#) to help you get started or browse the [Science Buddies Science Projects Library](#), which includes science and engineering examples. You can search by grade level and topic.

Write down some ideas of things you are curious about, what to know more about, or problems you want to help solve. Talk with an adult to help you think through your ideas. Then, choose one for your project!

Next, develop your question and hypothesis. If you are doing an engineering design project, identify the **problem** and some ideas for possible **solutions**.

Question: _____?
(What is the effect of X on Y? How does the X affect Y?)

Hypothesis: I think that _____ (will happen) because _____.

What is the Difference Between Engineering and Science Projects?

- **Science projects** focus on asking questions about and making sense of the natural world. Scientists develop a hypothesis and design an experiment to test it.
- **Engineering projects** identify a real problem that people face, and then design and test one or more solutions. Oftentimes, engineers make models of their solutions to try them out and gather data on how they work and how they can be improved.

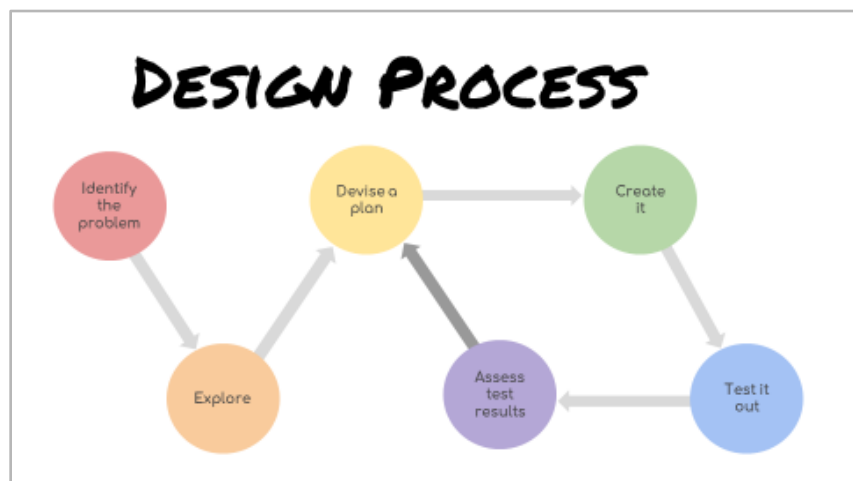
Practices of Scientists	Practices of Engineers
Asking questions about the natural world	Defining problems in the designed world
Developing and using models	
Planning and carrying out investigations	Planning and carrying out tests of possible solutions
Analyzing and interpreting data	
Using math and computers	
Constructing explanations	Designing solutions
Using evidence to explain how things work	
Gathering and sharing information	

Adapted from the Next Generation Science Standards.

Engineering design process:

The procedure engineers and designers follow to create something useful and solve a problem.

(From Pacific Science Center's TinkerTank program)





Plan: Plan out the steps of your project. List the steps for your project. Add a date for each step. Plan on having your project and display board completed before April 25th.

Things you might include in your timeline:

- Choose my topic (scientific question or engineering design problem)
- Gather the materials
- Start the project (take photos and collect data)
- Finish the project
- Make my display board
- Practice explaining my project to someone else (3 minutes)

Steps to Do My Project	Date
Present my project/display at Cascadia PTA Science & Engineering Night	April 25th



Gather: Gather the materials you need for your project. Start by making a list. Ask an adult for help getting the materials you need. You may need to work within a budget and plan on how long it will take to get the supplies. Make sure you clean up when you are done.

Materials I Need	How Many?



Be Safe! Ask an adult for help if you'll be working with anything sharp or hot, or if you will be using chemicals that could hurt your eyes or skin, or that are unhealthy to breathe. You may need to wear gloves or safety glasses to stay safe. Be sure to protect surfaces (tables, counters, floors) at home. Get adult permission for your project before you get started.

Attention Parents: Please ensure that your student does not bring any of the following to the Cascadia PTA Science & Engineering Night as part of their project display:



- No items that could be messy, dangerous, or could spill. Consider bringing a table cover if there is any risk of damaging the table surface.
- No live animals, human or animal body fluids, sharp items, dry ice, flames, weapons, projectiles, lasers, or drones.
- No eating or taste-testing as part of a project display.
- No items that pose a burn hazard.
- No items with belts, pulleys, chains or moving parts with tension or pinch points that are not shielded.
- Electrical devices must be protectively enclosed; wiring/switches/metal parts must be insulated, grounded, and shielded to prevent accidental contact.
- Projects involving animals must be limited to behavioral or observational studies of animals in their natural environment or zoological parks that do not negatively affect an animal's health or wellbeing. Do not bring live animals to display.
- We can only provide a limited number of tables near electrical outlets. If you will need access to an electrical outlet, please let us know on the registration form.

(Adapted from the [ISEF Safety Guidelines](#), see full regulations at link).



Look and Record: As you work on your project, observe and collect data (what you find out). You can take photographs, make drawings, make a data sheet, create a model, and/or make charts, graphs, or tables.



Plan: I will record what I did and what I learned by:

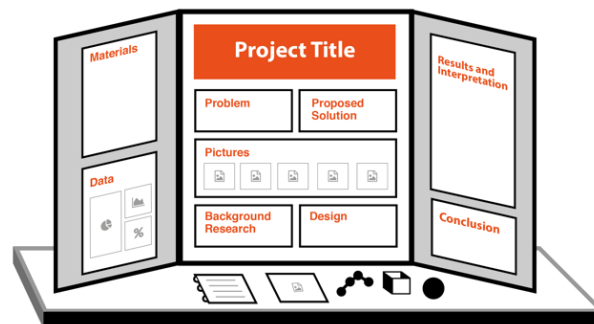
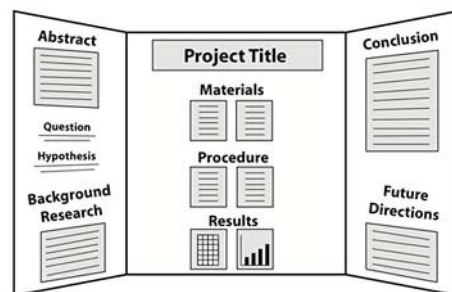
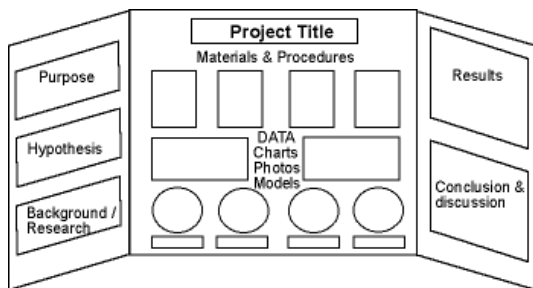
Take Notes: I observed, measured, or noticed...



Create: Create your display as a way to share your project with others. Use a tri-fold display board.

Add a title. Then add your name, grade level, and homeroom teacher's name. Add headings and information about your project. You can also include photographs, drawings, and graphs/charts.

You can write by hand, but it is preferable to type on the computer and print out text, which will be much easier for visitors to read. You can decorate your display to make it colorful and fun, but keep it organized and neat. Some ideas for layouts are shown below.



Brainstorm: Some possible title ideas include...

Possible Headings for Your Display Board

Some ideas for headings are listed below for science and engineering projects. You don't need to include all of these headings; choose what makes the most sense for your project. If you instead choose to do a research project, your headings will likely be different.

Possible Science Project Headings	Possible Engineering Project Headings
<ul style="list-style-type: none"> ● Purpose or Abstract: A quick summary of your project or a description of why it is important. ● Question: What scientific question did you explore? ● Hypothesis: What do you think/predict will happen? ● Background Information: What information did you learn about the topic to help you plan your experiment? ● Materials: What materials did you use? ● Procedure: What did you do to test your hypothesis? ● Results: What data did you collect? ● Conclusion: What did you learn? ● Future Directions: If you had more time, what would you want to investigate next? ● Resources: Did you use any books, websites, or other sources of info? 	<ul style="list-style-type: none"> ● Design Problem: What is a problem in your everyday life that you want to solve? ● Proposed Solution: What is your idea for how to solve the problem? ● Constraints: What were some limitations you had to consider when creating your design solution? ● Background Information: What information did you learn about the problem and possible solutions? ● Materials: What materials did you use? ● Procedure: What did you do? Did you create a model? How did you test it? ● Results: What data did you collect? How did it inform your design? Were you able to iterate and optimize your design to make it better? ● Conclusion: What did you learn? Did your design work? ● Future Directions: If you had more time, how would you improve your design? Would you try an alternate solution? ● Resources: Did you use any books or websites or other sources of info?



Share: Plan on attending the Cascadia Science & Engineering Night on April 25th, 2023. Bring your family!

At the evening event, students' display boards will be set up in the Commons. You will stand in front of your display, explain what you did, and share what you learned. Hooray! Practice ahead of time briefly explaining your project.

During the event, you will have time to view other students' displays and talk to them about their own projects. You will also be able to visit with our outreach presenters from local science and engineering organizations.

We will send your parents/guardians more information to help you prepare.

You can also ask your teacher if you can bring in your display board to share with your class. Some teachers may want their students to share, others may not; it's up to them!

Questions? Talk to your parent/guardian or teacher. In addition, your parent/guardian may email the Cascadia PTA Science & Engineering Festival Chair: Dean Stevens (deanystevens@me.com)

We can't wait to see what questions you explore and what you learn!

