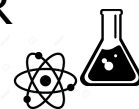


# WESTLAKE SCIENCE & ENGINEERING FAIR

## SCIENCE PROJECT WORKBOOK

### Thursday, February 26, 2025



The Westlake Science & Engineering Fair gives Westlake students an opportunity to learn more about a topic they are interested in, gain valuable skills on the scientific process, develop creativity, organizational, critical thinking skills, and so much more! This packet will help guide you & your child through the process.

**WHO CAN PARTICIPATE?** ALL Westlake students!

**WHO SUPERVISES?** This is an at-home project supervised by a mentor. Each student needs a mentor to help them through the organizational components of the project. Mentors are an essential part of the science fair project and work as a **guide** from start to end.

\* **Note to mentors:** Your role is to help students translate their interests into a scientific experience. You will help students navigate the steps of this process. Resources and examples to help you through this process can be found online at:

<http://www.supportwestlake.org/science-fair.html>

### MARK YOUR CALENDAR

Before you get started, get organized, look at your calendar and create a timeline that works for you. Fill in the “Goal Date” column below then add dates to each section of the packet.

Goal Date	Suggested Duration	STEPS TO COMPLETION
	1 week or less	Find a mentor
	1 week	Choose a question or problem
	1 week	Build understanding by asking QUESTIONS & doing RESEARCH
	1-2 weeks	Plan your experiment, collect materials and begin
	1 day	Write your hypothesis
<b>Thurs. Dec. 18 Thurs. Jan 15 Wed. Feb 11</b>		After School: Pick up your poster board in the MUR <i>Participants must be registered prior to pickup</i>
<b>Tues. Feb 10</b>		<b>REGISTRATION CLOSES - Register online</b> <a href="http://www.supportwestlake.org/science-fair.html">http://www.supportwestlake.org/science-fair.html</a>
	1-2 weeks	Complete your experiment and collect data
	1 week	Interpret the data, write the results and conclusion
	1 week	Design your poster board
	1 week	Practice your presentation
<b>Wed., Feb. 25th</b>		<b>Set up your Project in the MUR after school (12:15-1:15)</b>
<b>Thurs, Feb. 26th</b>		<b>WESTLAKE SCIENCE FAIR</b> 8am-12pm judging, 5:30-7pm Open to Families
Fri, Feb 27th		Pick up your board & presentation <b>after school</b>
<b>Sat, March 28th</b>		<b>County STEAM Expo</b> (Register by March 2nd)

Questions? Contact: [westlake.sciencefair@gmail.com](mailto:westlake.sciencefair@gmail.com)

More resources at: <http://www.supportwestlake.org/science-fair.html>

# EXPERIMENT PROJECT WORKBOOK

*Let's Get Started!*

This guide will lead you through the steps to a successful project based on an experiment. Remember you need to write down all your ideas and progress in a **notebook**. The 📖 icon will remind you to make a new **notebook entry** with a Title and Date. Consider using the sentence frames provided. Use the checkboxes to mark your progress. Notebooks are available in the office

## SECTION A: FORM YOUR IDEAS

**STEP 1: Find a Mentor**     *Goal Date* : \_\_\_\_\_

*A mentor should be ...*

- Someone comfortable guiding your scientific thinking
- Willing to talk with you multiple times over the course of the project
- Someone who will keep you on track, organized and help you access the materials you need

My mentor is \_\_\_\_\_

👉 *STOP! Make sure you have a Mentor before you continue.* 👉

**STEP 2: Choose a question or topic based on your personal interests**

*Goal Date* : \_\_\_\_\_

**IMPORTANT RULES:** Special project approval is required BEFORE STARTING if you are studying people, vertebrates (animals with bones), handling human or animal tissues or fluids, microorganisms, rDNA, chemicals (cleaning agents, solvents, organic chemicals) hazardous equipment (UV light, rockets), or controlled substances (anything that the student cannot legally purchase). Projects with harmful fungi (mold) or bacteria must be performed in a lab setting.

**MENTORS:** Email [westlake.sciencefair@gmail.com](mailto:westlake.sciencefair@gmail.com) with the potentially unsafe category from the above list and provide a short explanation of how you, as the Mentor, will provide a safe experience for your student and/or others while conducting this experiment. Projects involving mold are prohibited. Those involving bacteria require additional forms.

**NOTE:** *Projects that include mold will not qualify for the county science fair*

A project idea should be ...

- Most importantly, something you find interesting.
- Something you can directly investigate or explore, which could be either a
  - question that can be answered with an **experiment** OR ...
  - problem that requires an **engineered solution** (IF you decide on a design/engineering project please pick up an engineering packet from your teacher, the office (or download from <https://www.supportwestlake.org/science-fair.html> )
- Something based on components that can be measured clearly, such as time, weight, distance, height, volume, things you can count, etc.

 **Notebook entry: Topics of Interest**

- Make a list of 3-5+ topics that are interesting to you
  - I am interested in \_\_\_\_\_.
- Talk to your mentor about possible ideas to pursue based on this list.
  - Star the topic(s) you are most interested in

 **Notebook entry: Questions**

- Brainstorm things you can measure about your topics/questions you have.
- Choose a question that you can answer with an experiment
  - Think: **Can I measure it?** Can I get the materials?
  - Sketching out your ideas might help!
  - *How does \_\_\_\_\_ affect \_\_\_\_\_?*

My question is:

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 *Your initial question may change as you go through the research process!* 

**Judges might ask you:**

- *How did you come up with the idea for your project?*
- *What questions did you have about your topic that you needed to answer?*
- **How will you measure the results of your investigative question?**

**STEP 3: Build understanding by asking QUESTIONS & doing RESEARCH**

Goal Date : \_\_\_\_\_

**Before** you begin your project, you will need to learn more about your topic. This could be done through playing with your ideas and materials, talking with people/experts or learning more through research.

### **Notebook entry: Research & Explorations**

- Write down what you already know about your topic. (Personal stories, things you've seen, watched or read). These are your *prior experiences*.
- With the support of your mentor, gather information about your topic.
  - Play around with your ideas to learn more and see if there are surprises
  - Have conversations with people or experts in your field
  - Do research with books, videos, or websites
  - Write down important questions you have about your topic
- Keep a list of the resources you used in your research.

 *As you learn more, revise your original question if needed!* 

#### **Judges might ask you:**

- *What prior experiences did you have with these ideas?*
- *What ideas did you learn while doing your research?*
- *What resources were most useful for you in your research?*
- **What area of science does your question relate to? (chemistry, biology etc.)**  
*Visit the Resource section of the Westlake Science Fair website for a complete list*

### **STEP 4: Write a Hypothesis that includes an explanation**

Goal Date : \_\_\_\_\_

A hypothesis is a prediction of what you think will happen based on your experiences & research. It includes an explanation based on logical thinking. Your hypothesis does not have to be correct. Use your own ideas and explain them!

### **Notebook entry: Hypothesis**

- In a few sentences what do you think will happen and explain *why*? Your explanation should be based on the understanding you built during your research and experience.
  - *If \_\_\_\_\_ then \_\_\_\_\_ because \_\_\_\_\_.*
- Draw and label a picture that highlights the important ideas in your hypothesis.

See examples at <http://www.supportwestlake.org/science-fair.html>

#### **Judges might ask you:**

- *What did you think was going to happen before you did your tests or went through your engineering process? Why?*
- **What scientific information did you learn that helps to explain your project question?**

## STEP 5: Plan your experiment.

Goal Date : \_\_\_\_\_

Now that you know more about your topic. It's time to make a plan that describes how you will carry out your project. What materials will you need to gather? How will you perform your test? Plan to include a control group and have enough trials/repetitions to make sure your results aren't based on randomness. You might need to repeat your test a lot of times!

### **Notebook entry: Methods/Procedures**

- Use words, annotated drawings and/or lists to explain each step of what you are going to do.
- Explain how you'll make sure only a single variable is changing during your tests. If more than one thing is changing, you won't be able to explain what happened.
  - Depending on the experiment, include a group in your tests that you don't do anything to. This will be the controlled reference point to see if your variable actually has an effect.
- Write down what measurements you will take and what tools you'll use.
- Plan on repeating the experiment a number of times so you can be confident the results weren't due to randomness. This will be at least 3 times but possibly more.

See examples at <http://www.supportwestlake.org/science-fair.html>

### **Notebook entry: Materials**

- List the materials you will need for your project.
- Collect your materials. Talk with your mentor if you need to purchase anything.

#### **Judges might ask:**

- *How did you design your investigation or experiment? **How did you collect your data?***
- *What steps did you take to ensure someone else doing the same experiment could get the same data/results?*
- **What were some of the variables involved in your project?**
- *For engineers, how did you come up with your criteria for success?*

## SECTION B: CONDUCT YOUR TEST

**STEP 6: Conduct the experiment**      Goal Date : \_\_\_\_\_

### **Notebook entry:** *Data and Results*

- Create a data table to record your data. Remember to include the unit of measurement.
- Record any other observations. “I notice \_\_\_\_\_.”
- Draw pictures, take photos.
- Make a display of your data (graph, chart) to help you visualize the results.
- Repeat your trials several times. Calculate an average.

#### **Judges might ask you:**

- **Did you make a graph or chart? How does it help explain your results?**
- *What challenges came up when you were doing your tests or engineering cycles?*
- *For engineers, how many design cycles did you do (tested, modified, re-designed)?*
- *For engineers, did you build a prototype? What did you learn from it?*
- *Did you do any calculations during your project?*

## SECTION C: EXPLAIN YOUR RESULTS

**STEP 7: Interpret the results.** Goal Date : \_\_\_\_\_

Construct an explanation of your results based on your research and understanding of science. How have your ideas changed based on what happened?

### **Notebook entry:** *Conclusion*

- Explain what happened and **why**.
  - Was the *If \_\_\_ then \_\_\_ because \_\_\_* hypothesis supported or not supported?
  - Does the explanation (*because* portion) of your hypothesis seem valid?
  - If you are unsure, discuss with your mentor or do more research.
  - Use words or drawings to describe your thinking. Refer to the science you learned through your research.

### **Notebook entry:** *Reflections*

- What went well with your tests? Do you think your results are valid?
- What challenges did you have? Were there mistakes/ errors?
- List new questions about your topic based on your results.
  - *I wonder \_\_\_\_\_.*
- What needs more research/ experimentation to deepen your understanding?
  - *I'd like to know \_\_\_\_\_.*
  - *If I had more time I would \_\_\_\_\_.*

**Judges might ask you:**

- How would you explain your results? **How does your data/results answer your hypothesis?**
- Could the source of your results be based on random chance? Why or why not?
- What surprised you about the results of your work? Did the results match your predictions?
- **Can you apply your scientific knowledge to help explain your results?**
- What new questions did you have after you collected your data?
- Would it be valuable to collect more data? Why or why not?

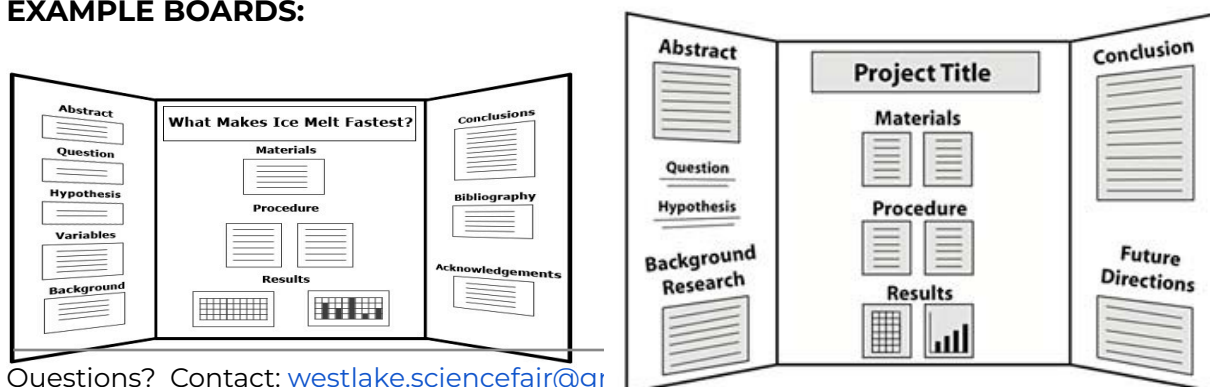
## SECTION D: SHARE YOUR PROJECT

### **STEP 8: Design a Poster Board Presentation** Goal Date : \_\_\_\_\_

Design a poster board to tell the story of your project. Use your creativity and have fun making your board! Projects may be typed or handwritten, all writing must be NEAT and LEGIBLE. There is no one way to make a poster board, but be sure to include the sections listed below.

- Pick up a poster board from the MUR on **Thurs. Dec 18th, Thurs. Jan 15th, or Wed. Feb 11th** (Participants must be registered prior to pickup)
- Neatly** write or type each section:
  - Question (Make sure it is clear what your project is all about!)
  - Purpose
  - Background Research
  - Hypothesis
  - Variables
  - Methods
  - Materials
  - Results (Data Tables, Charts, Graphs that include captions)
  - Conclusion
  - Acknowledgements
- Think of a title for your project
- Make sure titles, subtitles and text are clear and large enough to read
- Arrange all parts on your poster board - make sure they fit before gluing down!
- Remember to bring your notebook!
- Include props or samples (if possible) so people can interact with your project. Electricity will not be provided. You will have 1x2 feet of table space in front of your display.

### EXAMPLE BOARDS:



Questions? Contact: [westlake.sciencefair@q](mailto:westlake.sciencefair@q)

More resources at: <http://www.supportwestlake.org/science-fair.html>

**Judges might ask you:**

- What was one of the highlights of your project?
- What was a challenge you faced?
- If you repeated your tests, is there anything you would do differently?
- If you decided to work more on this idea, what would you do next to improve your understanding of your topic.

**STEP 9: Practice your Presentation** Goal Date : \_\_\_\_\_

Have your mentor and other adults ask you questions about your project. Go back through this packet and check out some of the questions judges might ask you to help you prepare.

**STEP 10: Acknowledge your helpers**

 **Notebook entry:** *Acknowledgments*

Congratulations, this is the last entry in your notebook! Write a few sentences about who helped you and how they helped you.

**Judges might ask you:**

- Who helped you on your project?
- Which parts of your project did you receive help with?

**Looking forward:**

**How does Judging Work?**

- 1) You will be called out of class and 3 judges will talk to you about your project.
- 2) The judges will complete the rubric (to help evaluate your project) as well as a paper feedback form for you. Rubrics & feedback forms are on the following page.
- 3) There are two judging divisions: TK-3 and 4-5. All projects that meet county requirements will receive an "Exceptional Project" certificate and are recommended to compete in the county science fair.

*\* If your project does not receive a recommendation to go to the county, you can STILL attend the county science fair by making the recommended changes to your project. Email the committee a picture of your board if you have specific questions.*

**Save the Date! The Santa Cruz County Science Fair: March 28th**

**Register for the county [STEAM Expo](#) online BY March 2, 2026 to participate.**

More information can be found online at: <https://sites.google.com/santacruzcoe.org/santacruzsteamexpo/home>