

# SCIENCE FAIR CENTRAL

## ENGINEERING DESIGN PROJECTS FOR ELEMENTARY SCHOOL STUDENTS

The most challenging part of bringing an engineering project to life can often be coming up with a project idea. If your young engineers are struggling with finding the best questions to ask or the right problems to solve, the process and ideas below can help.

### Ask and Imagine

#### Start with a Question

Engineers look for problems they want to solve or how to improve a design. The engineering design process helps us organize an idea into a series of steps to come up with a solution.

Table 1 outlines how to plan and implement an engineering project with elementary students. In grades K-2, students will ask questions and make observations. They will sketch, draw, or make a physical model of their design by breaking the problem into parts. In grades 3-5, students will identify that sometimes solutions to a problem are limited by materials and resources. They should conduct research about their problem, and work together to brainstorm, test, and refine ideas.

Capture sheets are included to help students document their work. It can also serve as a template for how to display student engineering project for a community night.

**Table 1**

Grades K-2	Grades 3-5
<p>With guidance, students will ask questions based on observations to find more information about the natural and/or designed world.</p> <p><b>Observations may include:</b></p> <ul style="list-style-type: none"><li>• Plant growth</li><li>• Weather</li><li>• Animals</li><li>• Sports</li><li>• Cooking</li><li>• Health</li><li>• Vehicles</li></ul>	<p>Students will ask questions based on background knowledge, a personal challenge, or identify a local problem that needs to be solved.</p> <p><b>Problems may include:</b></p> <ul style="list-style-type: none"><li>• Transportation</li><li>• Art as an influencer</li><li>• Locker solutions</li><li>• Work spaces in the classroom</li><li>• Community health</li><li>• Local environment</li><li>• Entertainment</li></ul>



## Grades K-2

Title:	
Plan	Create
Use information from observations to support your idea. Make a new tool or improve an object.	Develop a simple model or sketch a design.
Test	Communicate
Describe how different parts of the model support your idea.	Draw, write, and use numbers to explain your design.



## Grades 3-5

Title:	
Plan	Create
Use information from different texts to support your idea. Draw, write, and use numbers to explain your idea.	Develop a model to test cause and effect or develop a diagram or physical prototype.
Test	Communicate
Describe how different parts of the model support your idea.	Summarize your idea with evidence. Use tables, diagrams, and charts to explain your design.



Students may be asked to display and communicate their project. Listed are some materials that can help highlight their accomplishment!

## Display Board

### Board

- 40 in. x 30 in. x 3/16 in. White Tri-Fold Project Board

### Accessories

- Self-Adhesive Vinyl Letter Set
- Vinyl Letters and Numbers
- Permanent Markers
- Ruler or Meter Stick

### Adhesives

- Rubber Cement
- Extra Strength Glue Stick
- Foam Mounting Tape
- Extra Strength Spray Adhesive
- Ruler or Meter Stick

### Cutting Tools

- Hobby Knife
- Scissors

*Most items are available at your local Home Depot.*

