

# STEM

## Practices in Early Childhood



The best way to teach children science and engineering is through doing! Underlying the doing of science and engineering are eight STEM practices that build a strong foundation for scientific thinking and the engineering design process. In the *Every Child Ready* Learning Lab curriculum, children practice and use eight STEM practices detailed by the National Research Council (2020). These practices encourage children to be active learners and independent thinkers. Learning Lab lessons range from designing and building bridges to exploring how sunlight affects plants to experimenting with various bubble solutions. Each are designed to engage children in STEM practices that are rooted in early childhood standards.

# STEM Practices

STEM Practice	Children will...	Related Habits of Mind	Examples
<b>Question</b>	ask questions or identify problems in the world around them.	Brainstorm Visualize	<ul style="list-style-type: none"> <li>Ask questions like, <i>Why is the sky blue? Why did my tower fall?</i></li> <li>Model questions like, <i>What makes a shadow?</i></li> </ul>
<b>Use Models</b>	draw diagrams or create three-dimensional models to represent structures, cycles, processes, and things from nature.	Construct Represent Visualize	<ul style="list-style-type: none"> <li>Draw diagrams of life cycles, parts of a flower, maps, or classrooms.</li> <li>Build models of houses, insects, or simple machines.</li> </ul>
<b>Plan &amp; Investigate</b>	plan for tasks or investigations, with support.	Brainstorm Collaborate Design Measure Test Visualize	<ul style="list-style-type: none"> <li>Plan an experiment to test how ramp height effects toy car distance or speed.</li> <li>Brainstorm ways to solve a building challenge or another real-world problem.</li> </ul>
<b>Analyze &amp; Interpret</b>	draw and write information to identify patterns or outcomes.	Apply Evaluate Theorize	<ul style="list-style-type: none"> <li>Organize class votes into a bar graph to identify which book is liked most.</li> <li>State observations on the outcome of a color mixing investigation.</li> </ul>
<b>Apply Mathematics</b>	apply knowledge of numeracy, geometry, measurement, and data analysis to science and engineering tasks and problems.	Measure	<ul style="list-style-type: none"> <li>Use a ruler to measure how far a ball rolled off of different ramps.</li> <li>Sort objects into categories, such as sink or float, using a graphic organizer.</li> </ul>
<b>Explain &amp; Solve</b>	explain why something happened using prior knowledge as well as brainstorm new solutions to issues.	Iterate Model Plan Question Reason Visualize	<ul style="list-style-type: none"> <li>Explain why a taller ramp resulted in a car rolling farther, including key vocabulary.</li> <li>Consider how to redesign a bridge if the one constructed falls when tested.</li> </ul>
<b>Conclude</b>	begin to defend explanations using prior knowledge and evidence, or "argue" why one solution is better than another.	Infer Interpret Iterate Justify Summarize	<ul style="list-style-type: none"> <li>When a child says, "The balloon will turn into a spider," with support, children can discuss why this is not likely.</li> <li>Two children propose different solutions to a classroom recycling issue and discuss their thinking with support.</li> </ul>
<b>Communicate</b>	communicate thoughts, explanations, conclusions, and reasoning with spoken or written words and images (e.g., diagram).	Describe Draw Express Label Reason Write	<ul style="list-style-type: none"> <li>Draw a diagram of a experiment. A teacher might dictate labels onto the diagram.</li> <li>Write statements, with support, such as, "I think ____ because ____"</li> </ul>