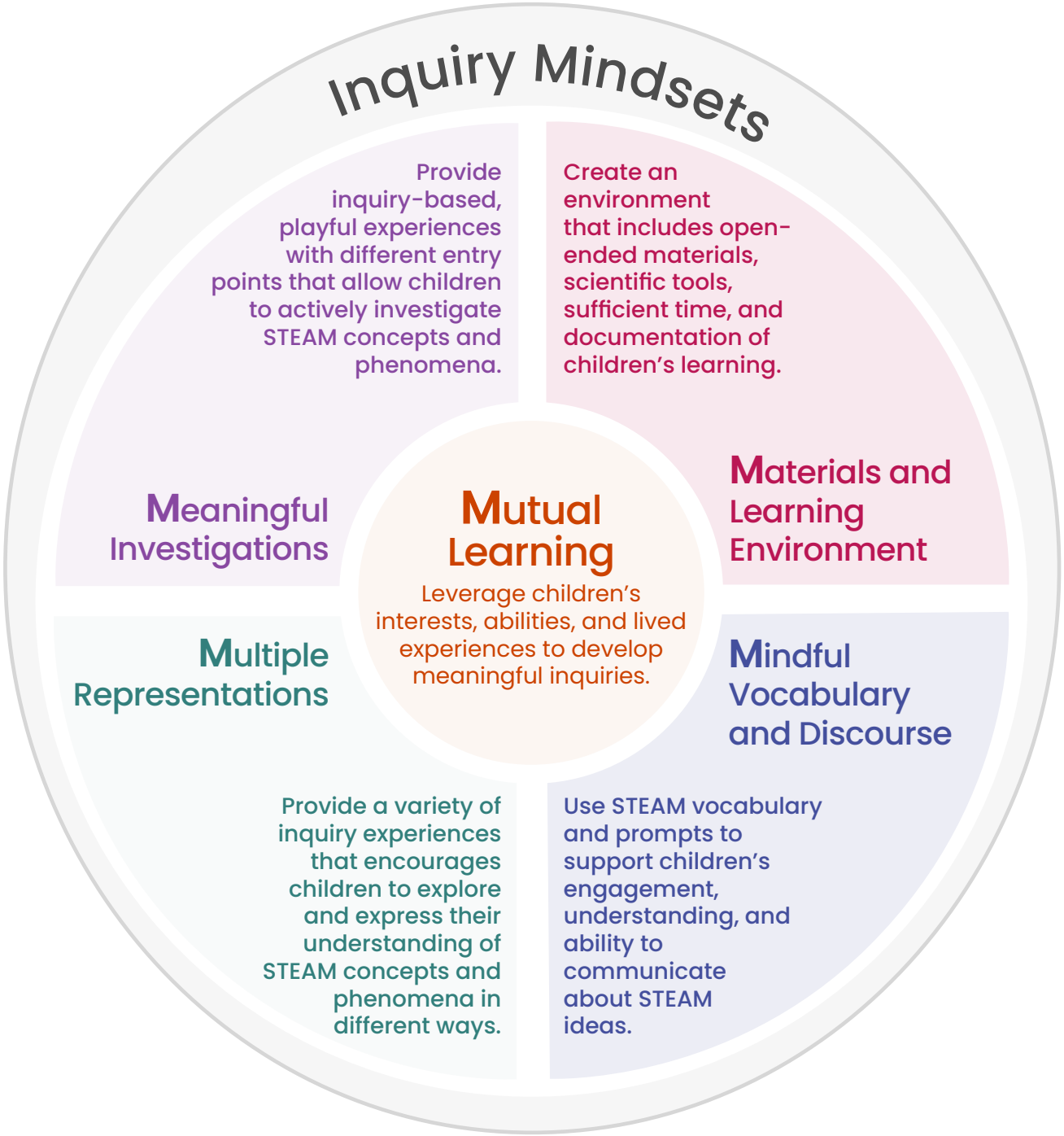
M^5 Early STEAM Approach Overview

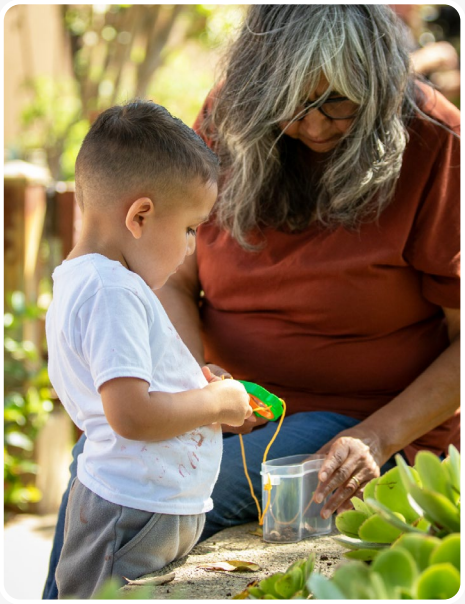
The M^5 Early STEAM Approach is a comprehensive, research-based approach to early STEAM learning from birth through eight years of age. These practices build on the M^5 Early Math Approach and are adapted to support inquiry related to science, technology, engineering, arts, and mathematics (STEAM).



Inquiry Mindsets

To develop a culture of inquiry, we must first develop a mindset that is ready to embrace this culture. Our mindsets—shaped by our thoughts and feelings—impact the ways we interact with the world. Approach inquiry with a mindset that is:

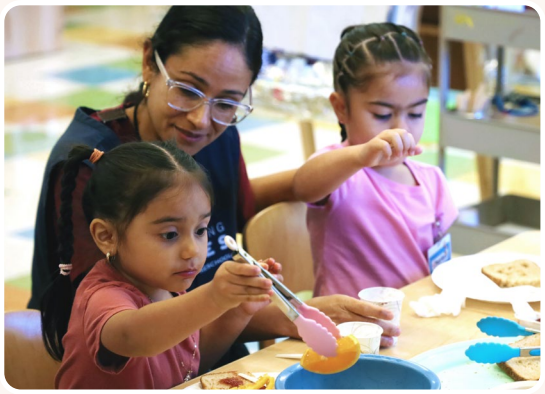
- curious about the world and the ways children learn;
- respectful and supportive of all children's emerging ideas and developing theories about STEAM concepts and phenomena; and
- flexible and willing to take risks—following children's lead to explore and test their ideas in ways you might not anticipate.



When approached with an inquiry mindset, the five teaching practices described on the following pages can help foster and sustain a culture of inquiry in your learning settings.

Mutual Learning

Learn with and be responsive to individual children.



- Observe intentionally during interactions to learn about children's interests, abilities, and experiences that spark exploration and inquiry.
- Partner with families to learn about their cultures, languages, skills, and daily experiences. Then, offer inquiry experiences that build on and connect to children's home lives. For example:
  - Knowing that a child's family has a lemon tree at home, an educator might use a lemon to show children how seeds can be found within fruits. The educator might ask children about their experiences with lemons and encourage them to predict what they might find inside.
- Scaffold children's inquiries in ways that respond to their strengths and abilities.
  - Children benefit from a variety of experiences—those that are primarily child-led and those that involve greater educator guidance.

Meaningful Investigations

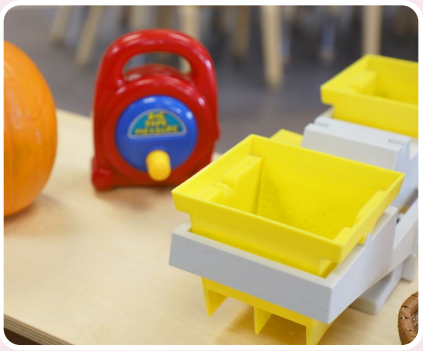
Meaningful investigations are open-ended inquiry experiences that align with children's abilities, designed to encourage children to notice and wonder about STEAM concepts and phenomena, and connect to children's everyday lives.

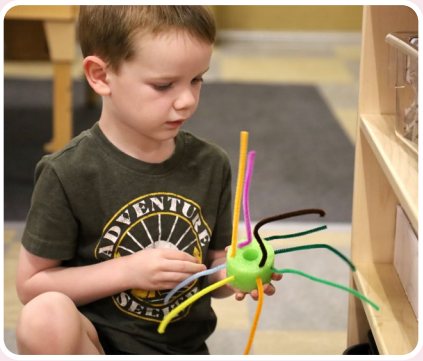
- Review foundations and early learning standards to better understand what concepts and skills are appropriate for children of different ages.
- Provide experiences that encourage children to
  - express curiosity about STEAM concepts and phenomena,
  - use different skills to investigate questions, and
  - construct explanations and understanding based on evidence.
- Embed inquiry experiences within daily routines, play, and planned experiences that can vary in duration (for example, investigations might last minutes, hours, or extend over several days or weeks).

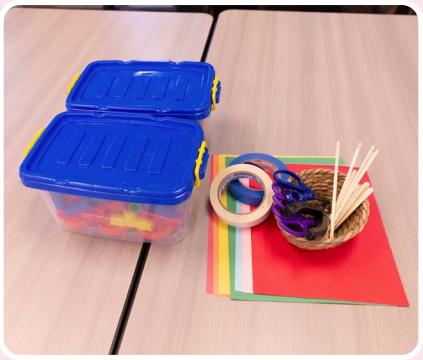
Materials and Learning Environment

Create an environment that includes open-ended materials, tools, and documentation to support inquiry:

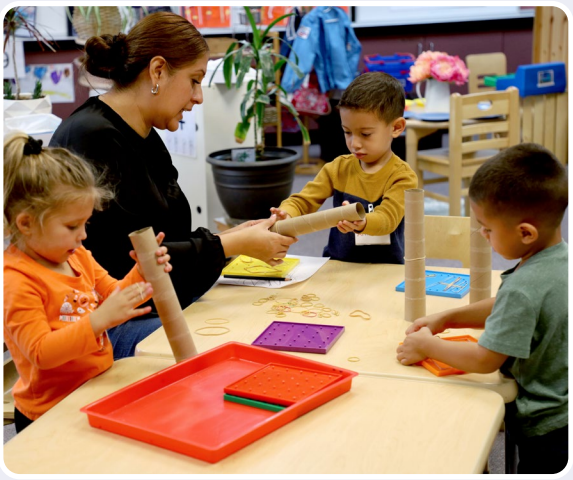
- Provide open-ended materials (for example, natural materials, crafting supplies, recycled objects) that can be used to explore and express children's understanding of STEAM concepts and phenomena in different ways.
- Support children to use tools that can extend their senses (for example, a balance scale or magnifying glass) and allow them to investigate in different ways (for example, tongs or pipettes).
  - Children might need support in learning how to use different tools effectively.
- Create and display documentation of children's inquiries as part of the learning environment. Here are some examples of ways to document inquiry:
  - Create a wonder web to document children's curiosities.
  - Display photos that show children's inquiry processes.
  - Post children's drawings that represent STEAM concepts and phenomena.
- Include fiction and nonfiction books, in English and in children's home languages, that highlight STEAM concepts.







Mindful Vocabulary and Discourse



Support children to communicate about their questions and investigations:

- Use open-ended questions to encourage children to engage in the inquiry process. For example:
  - "What do you wonder about?"
  - "What might happen if ...?"
  - "How might we find out?"
- Connect new vocabulary with observable STEAM concepts and phenomena.
- Communicate in ways that meet children's needs (for example, use gestures, images, or children's home languages).
- Encourage children to describe their investigations, reflect on their experiences, and explain their thinking. For example,
  - "Tell me more about what you are thinking"
  - "Why did you choose to ...?"

Multiple Representations

Provide children with opportunities to explore and express their understanding of STEAM concepts and phenomena in different ways over time:

- Connect, extend, and deepen learning by providing opportunities for children to revisit the same concept in different contexts or with different materials over multiple days or weeks.
- Provide opportunities for children to construct and communicate knowledge of STEAM concepts and phenomena in different ways. For example:
  - Invite children to express their understanding by using gestures, movements and objects; drawing or creating (for example, with clay); speaking; writing; or using assistive technology.