Introducing Children to the Scientific Method

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"Science is more than a school subject or the periodic table or the properties of waves. It is an approach to the world, a critical way to understand and explore and engage with the world, and then have the capacity to change that world."

—President Barack H. Obama, Remarks at the 2015 White House Science Fair

Young children are naturally curious. They ask questions, take objects apart and put them back together, and stack, pour, and squeeze materials to figure out how things work. Help children explore questions about subjects that interest them by introducing them to a simplified version of the scientific method. Children can use scientific inquiry to investigate a question or a problem.

Use these steps to encourage children to investigate their own questions. Preschoolers in our program were interested in locomotion—specifically, cars and wheels; the examples included for each step come from that inquiry.

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1. **Ask a big question.** A “big question” typically goes deeper than a yes or no answer—it asks why or how. Listen carefully to the questions children ask, and help them decide what big question to explore. Or they might want to look into a few related questions.

   Examples: “Why do cars have wheels?”, “How do wheels help cars move?”, “How do objects roll?”, “How can wheels help people?”

2. **Research.** Bring up the concept of research—looking for information. Explain to children that research is how we find out more to help us answer a question. Provide open-ended materials related to their question that children can experiment with. Work with children to find books that can help answer the question (it’s helpful to first stock your classroom library with books on the topic). Encourage children to interview family members, invite classroom visitors who are knowledgeable about the subject, or conduct Internet searches with an adult.

   Example: We offered children building materials, including wheels, ramps, tracks, and rods for axles, so they could investigate and experiment. We hoped the items would provoke the children’s thinking about the function of wheels and wheel-like items (tape dispensers, rolling pins, and pinwheels).

3. **Take a guess.** Talk to children about how scientists, after making observations, come up with their best guess about ways to resolve a problem or a question. Introduce the term hypothesis—a possible explanation for how or why something occurs. Brainstorm some hypotheses together.

   Example: “Wheels make it easier to move things.”

4. **Experiment.** Provide intentionally selected materials and space where children can test their hypothesis. Work with them to plan and guide experiments.

   Example: Children tried to move large, heavy blocks by using tools with and without wheels. First, they pulled the blocks in a wagon; next, they tied a rope around the blocks and dragged them across the floor. After the children completed their experiment, we asked them open-ended questions, like “What did you notice?” and “Why do you think that happened?”

5. **Write down observations.** Help children understand the importance of recording (documenting) their findings and communicating the results. They can draw pictures showing what happened in their experiment and dictate their observations to the teacher. Capture their thoughts—one-on-one, in small groups, or as a whole group. Some preschoolers may add words, using invented spelling.

   Example: Children drew pictures in their science journals of a wagon loaded with blocks. The teacher recorded the children’s words as they dictated a few sentences to describe their drawings. During a whole group discussion, she also wrote the children’s ideas on a flipchart.

6. **Reflect.** Reflecting—thinking and talking about our findings—is often the most important part of learning. Ask children what they learned. Help them understand that experiments don’t always work out the way we expect, but we may learn new ways to solve a problem or create something even better than we planned.

   Example: Children discussed what they observed about moving objects with and without the help of wheels. They noticed, for example, that the wagon’s wheels helped move the large blocks on the tile floor, but they didn’t help much on the carpet. **TYC**