
Montessori Environment Promotes Problem Solving and Critical Thinking

The Montessori environment promotes problem solving and critical thinking skills in a variety of ways. With each piece of material that is presented to the child, there are problem solving skills that are required to master the work.

Practical life has three main areas: care of the person, care of the environment, and grace and courtesy. When a child is able to take care of themselves in the classroom, it not only gives them self-confidence and freedom, but helps with concentration, and later in the mastery of critical thinking skills. These critical thinking skills eventually lead to abstract learning in other areas of the classroom.

In the sensorial area of the Montessori classroom, problem solving and critical thinking are key components of the child's everyday work. The Montessori sensorial materials help the child to distinguish, to categorize, and to relate new information to what he or she already knows. Dr. Montessori believed that this process is the beginning of conscious knowledge. It is brought about by the intelligence working in a concentrated way on the impression given by the senses.

Math is a principal element in any Montessori classroom and allows children to problem solve. The Montessori math materials start out with simple red and blue rods and progress to bead work with the decimal system, to addition with the bank game and eventually charts. The progression is led by the child, as the guide watches to help the child discover along the way. The guide lays the foundation and the child uses their critical thinking skills to explore and complete the work. The materials are designed to give him or her the satisfaction of learning by discovery rather than by being told.

The language aspect of Montessori also includes problem solving and critical thinking skills. The children learn at their own rhythm, which allows them to concentrate on what they find fascinating. While the child is completing work they have their full attention on the materials as they chose that material. The child will need to be spoken to and listened to often, they will need a broad exposure to language with correct articulation, enunciation, and punctuation. The guide plays a immense role in the child's learning in that they are there to support the child, give him order to classify what he has learned, to help build self-confidence, and to provide meaningful activities.

Within each material there is an underlying problem solving skill also known as the control of error. The control of error is the point when a child acknowledges the fact they have done something wrong when working with the materials. They then must go back, deconstruct the work, and see where they made a mistake. This control of error allows for problem solving skills and critical thinking skills to work together as a whole. For example; if the child is working with the knobbed cylinders and they try to put the smallest cylinder in the largest cylinders space they will realize this is incorrect and go back and fix the problem. As the child masters the work they begin to think critically by broadening their horizons on the different levels of variations and extensions of the work which allow the child to think "outside the box" and start to also bring in the aspect of creativity. They begin to think of alternate solutions and ideas by using their critical thinking skills. Overall, critical thinking and problem solving play a large role in every section of the Montessori classroom.

Tips for Teaching Critical Thinking & Problem Solving

So how can we best support and teach our children as they are developing critical thinking skills? Here are some tips and ideas to help children build a foundation for critical thinking and help them grow into problem solvers:

- **Provide opportunities to play.** It is during play that children test their thinking, whether dropping a spoon over and over again off the side of a high chair tray; rolling two marbles down a chute to see which is faster; seeing what happens when you dip chalk in water; or mixing cornstarch and water to

make "goop". Providing space for playing, including time for outdoor play can provide open-ended opportunities to try something and see the reaction; try something else and see if you get a different reaction. This informal process of testing how things work is crucial to critical thinking.

- **Help children view themselves as problem solvers and thinkers by asking open-ended questions.** Rather than automatically giving answers to the questions your child raises, help them think critically by asking questions in return: "What ideas do you have? What do you think is happening here?" Respect his or her responses whether you view them as correct or not. You could say, "That is interesting. Tell me why you think that." Use phrases like "I am interested to hear what you're thinking about this." "How would you solve this problem?" "Where do you think we might get more information about this problem?"
- **Don't solve all problems immediately for children.** Instead ask some of the questions above and provide enough information so children don't get frustrated, but not so much information that you solve the problem for them.
- **Help children develop hypotheses.** "If we do this, what do you think will happen?" "Let's predict what we think will happen next."
- **Encourage thinking in new and different ways.** By allowing children to think differently, you're helping them hone their creative problem solving skills. Ask questions like, "What other ideas could we try?" or encourage coming up with other options, "Let's think of all the possible solutions."
- **Encourage your child to research for further information.** You can help your children develop critical thinking skills by guiding them towards looking for more information. Say, "Now how could we find out more? Your dad knows a lot about this. Shall we ask him? Or shall we try searching on the computer?"

Of course there are times when you can't take this much time for your child to reach an answer on his or her own. At those times, it is okay to take short cuts. Children also learn from observing how you solve problems. However, when you can, taking time to allow your child to think through problems will be hugely helpful to developing your child's critical thinking skills in the long run.