Copper Beech Montessori:

Parent Education Newsletter for Montessori Families

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Montessori Mathematics

The Montessori mathematics program began with Dr. Montessori's observation that children need manipulatives – objects they can handle, see and touch to learn mathematical concepts. If introduced to a math concept with physical objects the child can understand and move toward a more mathematical abstract level. The use of actual objects tends to decrease the time for a child to grasp a particular mathematical concept.

For example, at the 3-6 year old level, a child works on the Seguin Board (there are two boards – one that helps the child learn their teen numbers (11 – 19) and one that assists the child in learning numbers 11 – 99). The boards have moveable parts and the golden beads that are used to show quantity (how many) and symbol (number). Dr. Montessori incorporated her ideas and those of others to create a comprehensive, hands on math approach that is now copied by many (non-Montessori) public school systems.

The Montessori math program can be thought of in terms of:

- Numeration
- Operations
- Facts

Let's explore each area. Numeration is the basics of mathematics and each physical object/materials are designed with the idea that number concepts have to be understood before a child can begin to work math problems. Numeration work includes red and blue rods, spindle box, squaring and cubing chains, tens and teens board and more.

Operations – In the Montessori math program, the child is taught addition, multiplication, subtraction and then division. The philosophy is that multiplication is adding several numbers multiple times and much easier to learn than subtraction. Subtraction and division follow. A child is introduced to the concepts (addition) and then has the opportunity to practice what they have learned.

The next area in mathematics is fact work. Dr. Montessori created many fact charts that assist the child in easily learning their facts. There are also materials that can be teacher made that help the child learn their addition, multiplication, subtraction and division facts. Learning to memorize their facts early on provides accuracy in math operation work and also enables the child to learn how to memorize, a skill needed throughout life.

In the Montessori math program, geometry is considered part of the sensorial area of a 3- 6 age environment.

See Montessori Materials for more information about Montessori math apparatus.

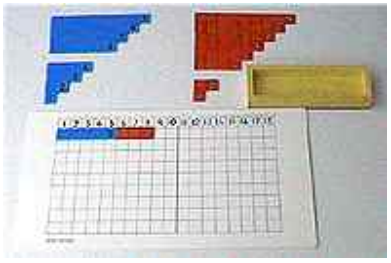
An abundance of Montessori math materials have been developed that encourage a child to practice concepts they have learned. Talk to your child about what they are learning in math, observe in your child's classroom to see the variety of math work available, and talk to your child's Directress as to how your child is progressing in mathematics.

Magnificent Montessori Materials

Number rods: A set of ten rods measuring from1 cm to 10 cm in length. The child learns number concepts by laying out each of the ten pieces. Later the child adds number cards to relate quantity to the number symbol.

Sandpaper Numeral Cards: Similar to sandpaper letters, the sandpaper numeral cards provide the child with an opportunity to learn the shape of a number in a very tactile and sensorial way.

Spindle Box: The exercise consists in placing spindles (like pegs) in a corresponding numbered slot. There are ten slots for numbers zero through ten. So the 'one' slot would get one spindle, the 'two' slot would get two spindles and so on. This is the first exercise where the children are introduced to the concept of zero having nothing. Each successive slot has a corresponding number of spindles.



Addition Strip Board: The addition strip board is an example of fact work that helps the child learn their facts independently. The child places blue and red strips on the board and then reads the chart to confirm their answer (which the child predicted initially).

Tips From Teachers:

What can you do at home to assist your child in learning math concepts? Following are some suggestions for how you can incorporate numeration, operations, and fact work into your daily life.

Math Maze: Create a math maze in a room, a yard, or throughout the home by placing different items and different quantities in different locations for your child to follow. Depending on your child's ability the quantities may be small or large. First, gather your maze items (legos, dominoes, dice, food, stuffed animals…). Then, determine a starting point. Place your first item and quantity at the START. For example, for a very young child that you are trying to help learn a number sequence (1, 2, 3, 4…) place one item at the START. A few steps away, place 2 of your next item and quantity, etc. For a young child you may want to lay a rope or string on the floor as a guide.

Ordinal Houses: Draw several houses in a row. Do not add detail to the house, just the basic shape (your child may be able to do this step). Ask your child to draw a door on the **first** house, two windows on the **third** house, a chimney on the **second** house, a potted plant on the first house… This activity can continue for as long as it interests your child and time allows. The activity not only helps your child learn ordinal numbers (first, second, third…) it also helps them learn to follow directions and work on numeration (draw two windows). This is an especially good car activity or when you are waiting (doctor office, public place…) as it only requires paper and pencil.

Coin Crazy: At the end of each day, give your child the coins from your pocket/purse. Ask your child to identify the coins. For each correctly identified coin, your child can keep the coin. Start by identifying each coin for your child. You may want to start with heads only and when heads are mastered, move to coin backs (Say, "Pick up all the coins that are heads up and identify."). This activity would need to be carefully monitored with a young child who may put the coins in their mouth. As an extension to this activity, you may want to work with your child on what to do with their money (save it for college or spending, tithe, put some away for a big item they want…).

Card Games: Card games are a great way to teach children math skills and social skills.

Here are some to try: Tripoley for Kids, Crazy 8's, Slapjack, War (it teaches your child how to quickly identify numbers and less/more).

Cooking with Children: Cooking involves lots of measuring. Let your child help you measure items the next time you make cookies or a treat. This is a great start to cooking.

Q & A

Q: We seem to be dealing with winter doldrums at our house. My five year old is reluctant to attend school and says she would rather stay home. What can I do to help her?

A: At times, all of us, adult and children alike, must learn how to deal with lack of motivation. Several things to consider when addressing this problem:

- Is your daughter bored?
- Is something going on that would make her want to stay at home instead of attend school (is there a new baby in the house or did a parent return to the workforce?)
- Is she being appropriately challenged?
- Is she getting along with her classmates?
- Is she wanting to stay home to get your attention?

After reflecting on those questions, see if any of the following suggestions help:

1. Set aside a little extra one-on-one time to do something special with her (perhaps she gets to go grocery shopping with you if she doesn't usually). If time allows, ask her what activity she would like the two of you to do in a 20 – 30 minute period of time. Something as simple as cuddling and reading a book can make all the difference to a child (any aged child).
2. Speak with her teacher to see if the teacher notices anything unusual at school.
3. Be positive about school and going to school. By the time children reach elementary age many learn (from peers, television, family…) that school is not fun. Instead of "Yeah, it's Saturday!" on the weekend and "Oh, no, it's Monday" try helping your child get excited about going to school – today you get to go on a field trip, today you are cooking with your class… If you aren't sure of daily activities, speak with the adults in the child's environment and they can provide you with a list of upcoming activities.
4. Create a calendar to mark off events, school days, days of the week… Assisting a child in creating a calendar can help them feel a sense of ownership and control – I know what is going on and when.

Don't lose heart, most children go through periods of time where they don't want to do something. It does not necessarily mean that they are in the wrong environment or they are not getting what they need. With help from you, her family, and school, your daughter should be back to loving school in no time!