

Using your Math Equations

Before you Begin

These equations are designed to be used with concrete manipulative materials such as the Montessori golden beads and/or the Montessori stamp game. For children who are able to write numbers legibly, offer them equation slips to write their own problems and solutions. They may like to paste the completed slip into a notebook (this creates a wonderful historical record of their progress). Each set of equations contains static (no borrowing/carrying) problems and dynamic (with borrowing/carrying) problems. Dynamic equations are marked with a star in the equation's upper right-hand corner. Always begin with static problems. Work with these repeatedly until the operation's concept (eg, addition means "put it all together beginning with the smallest things") is completely clear. The initial focus is on the process rather than the accuracy of the results. If you discover one or two extra beads on the rug, discreetly hide them. (I would find many of these in my pockets at the end of a day.) Don't let a simple counting error distract the children from internalizing the concept at hand. Present the operations in the following order: (1) **Addition** (put it together); (2) **Multiplication** (put it together so many times); (3) **Subtraction** (take it away); and, (4) **Division** (take it away/share it out so many times). The procedure for all operations is the same:

1. Begin with static problems (no carrying/borrowing)
2. Explain and repeat the rules
3. Introduce the operation's symbol

When you are ready for dynamic problems, use the concrete materials to reinforce the process of making exchanges. For example, show the child clearly that 10 units are the same as one ten bar. Let the child experiment with making exchanges. Children often "discover" these equivalences for themselves – how wonderful!

Addition

Explain to the children that there are two basic rules for addition. Say, "Today we're going to do some addition work. Addition means put it all together. What does addition mean?" Have the children repeat the first rule. Then, continue by saying, "We always start by putting together the smallest things first. What do we put together first?" Again, encourage the children to repeat the rule. Introduce the operation this way every time you do addition work in order to reinforce the concept. The first time you do addition, you may want to introduce the plus sign. To do this, say, "Addition is a long word. Instead of saying it every time, we like to draw this symbol." Draw the plus sign on a slip of paper (preferably in red to stay with the color-coding). Then continue by saying, "This says addition. It means put it all together." When you begin dynamic problems, review the first two rules as above and then add a new rule. Say, "Today, we have a special new rule to follow. When you get to 10, stop. What's the rule?" Encourage repetition and have fun when they're counting and reach 10 – be dramatic about the stop

Multiplication

There are two basic rules for multiplication. Say, "Today we're going to do some multiplication work. Multiplication means put the same thing together so many times. We always put the smallest things together first." Again, encourage the children to repeat the rules and introduce the symbol for multiplication as you did for addition.

Subtraction

There are two basic rules for subtraction. Say, "Today we're going to do some subtraction work. Subtraction means take it away. We always start by taking away the smallest thing first." Again, encourage the children to repeat the rules and introduce the symbol for subtraction as you did for addition.

Short Division

There are three basic rules for short division. Say, "Today we're going to do some division work. There are three things you need to know to do division. First, division means share it fair. What does it mean? Second, we always start sharing the biggest thing first. What do we share first? Third, the answer is what one person gets. What's the answer?" Again, encourage the children to repeat the rules and introduce the symbol for division as you did for addition.

Long Division

Use green ribbons/skittles to represent one "person," blue ones to represent ten "people," and red to represent 100 "people." First, review the rules for short division. Then, hand out the ribbons and explain what they mean. "You represent one person but you represent ten people. Imagine that you have 10 people in your family and they couldn't be here today. So, you have to get enough for everyone. You'll get 10 times more than everyone else." Again, encourage the children to repeat the rules.

