

Building your child's Mathematical Mind

Subitizing

I know that seems like a weird word, but all it means is the ability to know how many without counting.

For example, if you hold up 4 fingers on one hand, does your child know it is 4 without having to count each finger? If so, that is subitizing. When you are playing with dice and a five gets rolled, does your child know that it is 5 without having to count all the dots?

The ability to tell "how many" without having to count each individual item is a really big key to building your child's number sense. However, even as adults we can't subitize sets of items that are larger than 5, unless they are arranged in a familiar pattern like dice. Here are some fun and easy things you can do with your child so that they see math, and subitizing, outside of school.

- 1) When giving your child a group of things at snack time, give them the items and say how many they are getting. For example, give them 3 crackers and say, "*Here you get 3 crackers. This is 3 crackers.*" This way they start to see numbers are connected to a group of objects instead of counting out each individual cracker.
- 2) Fast Finger Flash - hold up a number of fingers and then hide it behind your back. Ask them if they could tell how many fingers you were holding up. After they get good at doing it with only fingers on one hand, move to showing fingers using both hands so they can practice subitizing up to 10.
- 3) Play the old card game of "war." Split a deck of cards in half, you get half and your child gets the other half. Each person flips over one of their cards, whoever has the most on their card wins. You can also play that whoever has the least on their card wins. Most of the time try to encourage your child not to count to tell how many, but just by looking at the cards can they tell who has more and who has less?

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Verbal Counting

Counting is a foundational understanding for all that your child will be doing in mathematics.

Counting is more than just repeating the series of numbers. All of math is built on the structure and the patterns within the counting sequence. So, help your child notice the repetition of the 0-9 in the numbers. Here are stages kids go through while learning to count:

- Child knows some number words, but does not say them in the correct order
- Child starts at 1 (or zero) when counting, but says it as a string of words and may not hear them as separate words
- Child starts at 1 (or zero) and understands they are separate words. Can count up to 10, then learns to count up to 20. Children also start to count backwards from 10 and 20.
- Child can start from any number when counting. For example, ask your child *"Can you start counting from 7?"*
- Child can skip count with understanding. For example, when counting by 2s they don't just have the sequence of 2,4,6,8,10 memorized, instead the child understands that they skip a number.

Here are some fun and easy things you can do with your child so that they see math, and counting, outside of school.

1. Count EVERYTHING and NOTHING. Have your child count collections of items, but also just have them count without counting items. For example, ask them to count to the highest number they can.
2. Start counting at random numbers. For example, ask your child to count by ones, but start at 7. This can be used when playing Hide & Seek. Don't just have them count to 20. Instead you could have them start at 7 and count to 27 before they come find you.
3. Here are some great apps that can help build your child's counting abilities:
 - a. Tally Tots Counting
 - b. Line em Up
 - c. Math Adventures Number Find Lite

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Object Counting & Cardinality

When children are little, we get excited that they can recite the sequence of numbers, but that is not what counting is really about. The true purpose of counting is to count things and be able to tell how many they have. This is known as Object Counting and Cardinality.

Object counting occurs when your child learns to attach the counting words to objects and they are able to count a set of items. Once they count the set of items, being able to answer the question "How many do you have?" is known as Cardinality. Here are some fun and easy things you can do with your child so that they see math, and counting objects, outside of school.

1. When your child counts out a set of items, ask them "*So, how many do you have?*" Often they might just recount, but model the idea of cardinality for them after they count by saying things like, "*Oh, you have 4 goldfish.*"
2. Zero is a difficult concept for kids when learning to count items. So, when counting out items, ask them what it would look like if they had zero. For example, you could ask your child, "*You got 3 goldfish, will you give Momma zero goldfish?*"
3. Let your child set the table. This lets them get practice counting out 'enough' items for everyone in the family.
4. Here are some great apps that will help build your child's object counting and cardinality:
 - A. Dominoes Addition
 - B. Friends of Ten
 - C. Happi 123
 - D. Count Sort
 - E. What's Hiding?
 - F. Quick Images

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Spatial Relationships

In a previous page I described the concept of SUBITIZING. Subitizing and Spatial Relationships are tied closely together. When you work on Subitizing, you are helping your child to instantly recognize how many in a visual pattern like this:



As we move into Spatial Relationships, the emphasis will be helping them make connections and build relationships between different visual patterns. For example, how are these two visual patterns the same? How are they different?



Spatial Relationships helps your child build their understanding of how numbers are related to other numbers. This is an essential piece to help them develop more efficient strategies as they move forward with addition and subtraction.

1. Ask your child to describe what is the same and what is different about anything. This idea does not need to be limited to visual patterns, it can be done with anything you see. "How are those two trees the same? How are they different?" "These two teddy bears look a lot alike...do you notice anything that is different about them?"
2. Check out this website, www.wodb.ca, it has great pictures that have been compiled together to give children opportunities to talk about Which One Doesn't Belong in the set. The cool part about the pictures on this site is that there is more than one image that could be the one that doesn't belong...your child just needs to be able to justify their choice.

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One/Two More & Less

In a previous page I described the concept of Verbal Counting. Verbal Counting and One/Two More and Less are tied closely together. When children are counting up and counting down they are developing the pattern of one more and one less, however lots of kids don't see that connection.

One/Two More and Less can happen when working on Spatial Relationships, which is helping your child make connections and build relationships between different visual patterns. For example, ask them questions like *"How are these two visual patterns the same? How are they different?"* Some kids will just say that the one on the left is more, but by asking them the question *"How much more?"* really emphasizes the One/Two More and Less relationship between amounts.



One/Two More and Less are essential to helping your child become fluent with addition and subtraction. Here are a couple quick ways you can build their understanding of One/Two More and Less at home:

1. Read counting books. Books like *5 Little Monkeys* and *Ten Little Fish* are great ways to practice counting up and down. Just make sure to emphasize how each page is showing one more (or one less).
2. At snack time, give your child an amount and then ask if they would like 1 more (or 2 more) and see if they can figure out how many they would have if you gave them 1 more.
3. At snack or dinner time, compare the amount of items each person has. *Who has more? How much more? Who got the least number of green beans? How many less?*

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Benchmarks of 5 & 10

Ten is a powerful number in our number system because we have a Base 10 system. Children should instantly know how a number relates to 10. However, before they get there, they need to understand how a number relates to 5. This first starts by the finger patterns we use to show an amount. When we show 4 fingers on one hand, often kids know it is 4 because they see one finger isn't up. Similarly for amounts larger than 5, we know the amount because we see all 5 fingers up on one hand and then some more on the other hand. In the image below, if we don't use the Benchmark of 5 to help see the 7 as 5 and 2 more, we have to count all the fingers to know there are 7.



This is also why you might see visuals come home like the one below. This is called a ten frame and it helps your child use the relationship to 5 and 10 to determine how many are being shown instead of having to count.



Benchmarks of 5 and 10 help your child move past counting one-by-one, to more efficient strategies and will become especially important in helping them become fluent with their addition and subtraction facts. Here's two ways to help build this at home:

1. Do finger patterns with your child and emphasize the relationship to 5 and 10 by having them pay attention to the fingers that are up AND the ones that are down.
2. Play Make 10 Go Fish. This game is played just like Go Fish, but instead of asking a person for the same card, you ask for the card that goes with yours to 'Make 10.'