Math is Everywhere

Big Idea: Always Count Something

In Real Life, we count something in order to find out *How Many of What*?

- *How many adults and how many children are coming to the family barbecue?*
- *How many times did I go the gym?*
- *How many invitations shall I send?*

Young children who can reel off the number words from 1 to 20 or more are just saying words. They may not yet understand that each number corresponds to an exact quantity--no matter what you count!

Counting that is used to name "How many of what" is called **Rational Counting**. By the end of Kindergarten, children need to master rational counting to 10. That means they can give you an exact number of things when asked.

If you say, *Give me 8 pencils and they give you 5, they don't really understand how many* 8 is!

One of the rules for rational counting is: ***When counting a collection, each item is counted once and only once***.

It helps to point to each thing as you count. We call this **one to one correspondence.**

Turn This Bookmark over to have fun with **StoryBook Counting Riddles**

After Reading...

Caps for Sale by Esphyr Slobodkina:

- Count how many caps you would need if everyone in your family got a new cap from the peddler.

- *What if 2 of you want blue baseball caps and the rest wanted red caps?*

- *Can you make up another caps riddle?*

Goldilocks & the 3 Bears by Robert Southey:

- What if Goldilocks came into your house while the family was gone?

- *Can you count how many bowls of porridge she would have to taste?*

- *Can you count how many chairs are at the table?*

- *How about counting how many beds are in your home?*

- *How many stairs would Goldilocks have to go up in your house?*

- What else can you count in your house?

Pete the Cat: 4 Groovy Buttons by Eric Litwin:

- Can you count how many buttons you each have on your shirt?

- *Who has **more** buttons than Pete?*

- *Who has the **same** number of buttons as Pete?*

- *Who has **less** buttons than Pete?*

Can you come up with some more Story Book Counting Riddles?

Erikson Institute
Early Math Collaborative

town square

Math is Everywhere

Big Idea: **To be fair, say: What Kind of Bigger you are talking about?**

In Real Life, we often want to know ***What's bigger? Who has more?*** To make a fair comparison, we need to think about:

- **What kind of bigger is it?**
  Young children often look at size in a global way--big or small. But there are different aspects of size we might compare such as height, weight, capacity. They think someone who is taller must be older. Most children will also say a tall narrow glass is bigger than a short wide one, even though they hold the same amount of water. They can learn to name the exact dimension they are comparing.

- **Is it more than, less than, or equal?**
  In real life, we often don't need to use a ruler or inches and pounds to find out *What's bigger?* or *Who has more?* We can use direct comparison.

We can put 2 things side by side to see which is taller or longer.

To share a collection of toys, each child can take one at a time, until all are gone.

Turn This Bookmark over to have fun with **StoryBook Bigger This Way or That Way problems**

NAME TOWERS

- Use connecting blocks of the same size to make name towers for everyone's name; use one block for each letter.
- Children can compare: *How many names are the same or shorter than mine? How many are longer?*
- What if you use last names? *Whose first name is longer than their last name?*
- What if you clap syllables? *Does that change whose name is longer? (Ann &Ava each have 3 letters, but Ava has 2 syllables &Ann has only 1).*

The Three Little Pigs
WHAT'S BETTER DEBATES

- The wolf is bigger than the pigs but the 3rd little pig is smarter. Explain what you think is better—to be bigger or smarter?
- The first 2 pigs built their houses faster but the 3rd pig's house was better built and stronger. Explain what you think is better—to finish faster or to make something better and stronger?

WHAT KIND OF BIGGER HOUSES?

Work together or on teams. Choose the same number of blocks—maybe 6 or 10. Use them to build different kinds of bigger houses:
•One that is higher but is not wide?
•One that is wider but is not high?
•One that has 1 big room?
•One that has 2 smaller rooms?

Can you come up with more Storybook Bigger This Way or That Way Problems?

Erikson Institute
Early Math Collaborative

town square

TownSquarecentral.org
© 2020 Earlymath.erikson.edu

Math is Everywhere

Big Idea: Fast Ways to Count How Many of What

In Real Life, we don't count by ones, beginning with one if we have a lot of things. It takes too long and it's easy to get mixed up. Imagine that you have 40 paper plates with 10 of each color. You might:

Begin at the higher number we know and **count on** or **count back**.

"I need 12 plates so I'll use 1 stack of red, then take 11,12 from the blue stack."

"I only need 7 plates so I'll take away 10, 9, 8 from the green stack and use the 7 left."

Skip count by 2's or 5s or 10s:

"Let's put the 20 plates we have left in stacks of 10: Here's 2,4,6,8,10. I'll start a new stack."

"We can put 5 plates on those 3 tables, so we'll need 5,10, 15 more plates".

These faster ways of counting work because of a rule for rational counting, called the **stable order rule**. It says that the order of the numbers is a **fixed pattern**, with each number representing a quantity that is ***always one more*** than the number that precedes it and ***one less than*** the number that comes after it; that is, 4 is one more than 3 and 3 is one less than 4.

Turn This Bookmark over to have fun with Story Book Counting On/Counting Back Riddles

After Reading:

5 Little Monkeys Jumping on the Bed by Eileen Christelow:

Can you count how many monkeys would be jumping on the bed if everyone in your family pretended to be a monkey?

Can you count how many of you would be left on the bed if one of you fell off? What if 2 fell off?

What if 2 more monkeys came over to play with the 5 Little monkeys? Can you count how many monkeys there would be if they all started jumping on the bed?

Can you make up another jumping monkey riddle?

Pete the Cat: I Love My White Shoes by Eric Litwin and James Dean:

Count how many white shoes Pete has.

What if everyone in your family got new white shoes? Can you count by 1s or 2s to tell how many shoes that would be?

What if 3 of you stepped in a pile of strawberries and the rest of you walked around it. How many white shoes would there be now?

The Doorbell Rang by Pat Hutchins:

Your family is sharing pizza. Into how many pieces should it be cut?

Decide on 2 different pizzas to share. How many would want a slice of one? How many the other? Both? How many pieces would that come to?

Grandma brings over enough cookies so everyone in your family can have 2. How many cookies is that?

Can you come up with more Story Book Counting On/ Counting Back Riddles?

Erikson Institute
Early Math Collaborative
town □ square
TownSquarecentral.org
© 2020 Earlymath.erikson.edu

Math is Everywhere

Big Idea: Name Your Rule When Sorting

In Real Life, we often use different rules to decide how we want to sort the same collection of things into smaller groups. The "rule" means we name the qualities or *attributes* that say what goes in what group.

*Before doing laundry, we sort into **whites, colors, delicates**, etc; later we sort the load into **clothing type** (shirts, pants, dresses) or for each person (baby's clothes, mine, etc.).*

Faced with a large pile of socks, we begin by matching up pairs and then sorting them into sizes.

Young children need many, many experiences recognizing that many different items can share one or more **attributes**. They also discover that **any collection of things can be grouped in different ways**, depending on the rule.

Children find it very easy to sort by color. But with practice, they come up with quite complicated rules:

All of Timmy's toys go in boxes according to type—cars in one, stuffed animals in another. But at bedtime, he likes to choose his daily 3 favorites to take to bed.

Talking about the attributes builds children's language as well as their ability to think mathematically-to think logically and precisely.

Turn This Bookmark over to have fun with Story Book What's My Rule Riddles

Play Card Games:

Old Maid

You can play this with a regular deck of cards or a special deck. The idea is to make pairs of cards: Such as 2 red queens or 2 black jacks. You want to get rid of all your cards.

One card is different—it can't be paired up. The person who is stuck with that card loses the game.

This game is really mathematical. It is a fun way for children to learn to sort—matching is the after all, the easiest way to sort.

Be sure to talk about how each pair is the same.

Happy Families

This game is somewhat like Old Maid. Instead of making pairs, you try to collect a "family" of 4 cards that belong to the same category.

Sometimes the families might all have the same name. Or you can find specialty sets. For example, the deck might show 4 farm animals like cows, chickens, sheep, and goat; another set might be 4 wild animals, like wolves, polar bears, lions, and tigers.

Maybe you could make up a set of cards using photos of your family and a friend's family?

Can you come up with more Who/ What Goes with Who/ What Card Games?

Erikson Institute
Early Math Collaborative

town square

TownSquarecentral.org
© 2020 Earlymath.erikson.edu

Math is Everywhere

***Big Idea*: There are many ways to put together and take apart a number**

In Real Life, if you want to put out 10 pieces of fruit for guests, you don't begin by trying to remember math facts that add up to 10 (like 5+5, 4+6, 3+7…) Instead, you look around to see what you have on hand. That could be:

- *5 apples and 5 oranges*
- *6 apples and 4 bananas*
- *1 banana for the baby & 9 oranges*
- *Or 3 apples, 3 bananas and 4 oranges*

In math talk, we say that breaking down or **_decomposing_** a whole is a way of sorting a collection into smaller sets.

Composing means putting the collection back together again—which is another everyday math situation. At clean-up time, you might say:

"Let's put all the toy cars into one box and see how many there are. I see 3 police cars, 2 blue RVs & 5 red racing cars –that makes 10 cars altogether."

Children don't need flash cards to become whizzes at putting together & breaking down numbers. They learn their number facts best when they have had many real life experiences that help them to understand that there are many ways to break up a whole and to put it back together.

Turn This Bookmark over to have fun with Story Book Taking Apart & Putting Together Stories

After reading:

The Gingerbread Man

Count up how many different creatures are chasing the gingerbread man in this version of the story. *How many are people and how many are animals*?

Retell the story so that all the people and pets in your house are going after the gingerbread man. How many would that be?

How about making up a different version that has 7 characters from other fairy tales –who could they be? How about 4 characters from the 3 Little Pigs (the wolf & all 3 pigs) plus the 3 Bears! Can someone turn the answer into fractions *(4/7 of the characters come from 1 story and 3/7 come another).*

Five Creatures by Emily Jenkins

This delightful book describes all kinds of ways that a mother, a father, a little girl and their 2 cats can be sorted. For example, the girl and one of the cats have red hair but the other 3 don't.

Create a few pages for a book that features the creatures in your house. You can use drawings or photos to show how some are the same in one way and the others go in another set because they are different.

Create a random collection of 5 or 10 toys. Take turns sorting the collection into 2 or 3 groups –see if someone can guess the rule you used. Can you come up with a tricky sort such as, *"This one has a label on it and the other 4 don't"*

Can you think of other Taking Apart & Putting Together Stories?

Erikson Institute
Early Math Collaborative
town square

TownSquareIcentral.org
© 2020 Earlymath.erikson.edu