How do young children learn math concepts?

Mathematics for young children should be about inquiry, exploration and discovery. Children learn best through play and hands-on, real-life experiences. Concrete activities help children learn math concepts which are the foundation of mathematical understanding. Such concepts include:

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**On a Roll**

- Have children take turns rolling one die.
- Count the number of dots on top when the die has been rolled.
- Jump or clap the number of times indicated by each roll of the die.

**Variations:**

- Encourage children to think of other actions that can be done the same number of times as indicated by the roll of the die such as winking, wiggling, turning around, touching the ground or shaking hands with a partner. A second die can be added to this activity for higher numbers.
- Children can play this game with a partner, taking turns rolling the dice.
Ants on a Log

1. Use a ruler to help children measure and cut* a four inch piece of celery.
2. Have children spread peanut or almond butter on the celery.
3. Each child can count eight raisins. Put these “ants” on the log.

Children can follow the picture recipe to make this snack!

Size up your food:
Talk with children about the length and shapes of various foods. String beans and carrots can be cut into inch (or centimeter!) lengths. Tofu, cheese and meat can be served in cube shapes. Some noodles are shaped like cylinders!

*adult supervision required

Ten Little Candles
Fingerplay

Hold up ten fingers. At each “Wh!” blow on a finger and bend it down as if you are blowing out candles on a cake. Continue until there are none.

Ten little candles on a chocolate cake;
   “Wh! Wh!” now there are eight.
Eight little candles on a candlestick
   “Wh! Wh!” now there are six.
Six little candles, and not one more;
   “Wh! Wh!” now there are four.
Four little candles, red, white and blue
   “Wh! Wh!” now there are two.
Two little candles, birthday cakes are fun
   “Wh! Wh!” now there are none.
Patterns...Patterns...
“A pattern is something that repeats again and again.”

- Dress up with a striped necktie as you talk about patterns with children. Can children identify the pattern on the tie? Read the pattern with children. For example: “Blue, red, blue, red.”

- Search for and talk about patterns found in everyday life. Look for patterns in checkerboards, quilts, bee’s honeycombs, drum beats, dance steps, stripes, rugs, clothing designs, tablecloths, etc.

- Provide children with different colored beads for making their own pattern necklaces.

“3” Snacks

- Mix together pretzels and round crackers in a bowl.

- Give each child a napkin and instruct him or her to choose three items to put on his/her napkin.

- Point out the many combinations that make three! Three crackers; three pretzels; two crackers and one pretzel; or two pretzels and one cracker.

- Increase the number of snack items for more number fun!

- Ask children questions about their snack. How many would you have if I gave you one more? What if your friend took away your pretzels? What if a monster ate everything on your napkin? Children can “subtract” items by eating them.

One Potato, Two Potato
(Handclapping Rhyme)

One potato, two potato, three potato, four,
five potato, six potato, seven potato more.

One potato, two potato, three potato four,
Five potato, six potato, seven potato, ROAR!

Children make two fists. Put one fist on top of the other fist. Move the bottom fist to the top and continue as you say the rhyme. Encourage children to “roar” at the end of the second verse.
Messy Cooking

Set up a table with measuring cups and measuring spoons.

- Provide several empty cooking bowls, wooden spoons, a pitcher of water, and containers with flour and salt.

- Encourage children to freely mix salt, flour and water in the bowls to do some pretend cooking. Egg beaters, whisks, empty spice containers, other kitchen utensils and even food coloring can add to the fun.

- Have several sponges on hand. Children will enjoy cleaning the table once they are done “cooking.” Make a puzzle out of putting the nesting measuring cups and spoons back together.

- Throughout this activity, talk about numbers and amounts imprinted on the measuring cups and spoons.

Playing with Numbers

Provide different opportunities for children to be playful with numbers.

- Set up a magnetic board and numbers for play.

- Use number stampers for making number prints in playdough

- Use foam numbers in a tub filled with water. Children can use a strainer to scoop up numbers.

- Enhance children’s dramatic play by providing calculators, keyboards, cash register, play money, telephones, telephone books, dice and other props which include numbers.

- Ask children what they see when they look at numbers. Do children see a number that looks like a snake? Are there any numbers in the shape of a circle?
Use Your Whole Body!

Do a pattern dance!

Children can make up a series of actions to go along with the music. Dance movements may include clapping, marching, tapping, squatting, turning, waving, bowing, winking, clicking heels together, etc.
Create a pattern of movement such as:
Wiggle, kick, spin, wiggle, kick, spin……
Wink wink, jump, wink wink, jump, wink wink, jump….

Two heads are better than one?

Can children put their heads in groups of two, three and four? Can they make three fingers? Three elbows? Four feet? Five feet? Six toes?

Number Fruit Salad

Invite children to create their own fruit salad recipe!

- Provide several bowls full of different fruits cut into one-inch pieces. (banana, apple, watermelon, pineapple, pear, etc.)
- As they spoon the fruit into their own small bowls, children can count the pieces of each fruit.
- Write down the type of fruit and the number of pieces on an individual recipe card for each child. Encourage each child to give his or her fruit salad a name!
Bring books to life with these simple ideas that highlight early literacy skills.

5 Little Monkeys Jumping on the Bed
by Eileen Christelow

**Presentation Notes:** After taking a bath, putting on pajamas and brushing their teeth, five little monkeys are ready for bed...but not for sleeping. Invite children to jump along to this classic and join in on the repeating phrases. Counting down has never been so much fun!

**Skills Featured:** Phonological Awareness, Print Motivation

Pattern Fish by Trudy Harris

**Presentation Notes:** Read, enjoy and repeat this wonderful and interactive book about patterns. As you read aloud, use the natural rhythm and rhyme of the text to capture the children’s attention and get them involved. Ask children to clap their hands or slap their knees to the beat. Pause as you turn the pages and let the children call out the next part of the pattern. When a larger font is used, point to the word as the children say it.

**Skills Featured:** Phonological Awareness, Print Awareness, Print Motivation

Ten Black Dots by Donald Crews

**Presentation Notes:** One by one, black dots are incorporated into drawings of familiar objects in this counting book that inspires imagination. Point at the numerals presented in the text and invite children to count the dots in the pictures along with you. After reading the book through once, go back to the opening question, “What can you do with ten black dots?” Provide children with paper, glue and black dots cut from construction paper. Encourage children to make black dot creations by gluing the circles to the paper.

**Skills Featured:** Letter Knowledge, Narrative, Print Motivation

Inch by Inch by Leo Lionni

**Presentation Notes:** A clever inchworm uses his special skill of measuring to distract hungry birds who want to eat him for lunch. Talk to the children about the inchworm’s unusual method of measurement. Discuss tools that people use to measure length. Ask children to predict which will be the longest or shortest animal measured by the inchworm.

**Skills Featured:** Narrative, Print Motivation, Vocabulary
More Great Books!

We All Went on Safari: A Counting Journey by Laurie Krebs

Two of Everything by Lily Hoy Tong

One Duck Stuck by Phyllis Root

Cubes, Cones, Cylinders and Spheres by Tana Hoban

Fish Eyes: a counting book by Lois Ehlert

Big Fat Hen by Keith Baker

1,2,3 to the Zoo: a Counting Book by Eric Carle

Teeth, Tails, & Tentacles: an Animal Counting Book by Christopher Wormell

Counting Cockatoos by Stella Blackstone

Presentation Notes: Large numbers and clear photographs make this a wonderful introductory counting book. Point to the numerals and have children join in as you count the dots and the items in the photos. Call attention to the pattern that the dots make. For instance, at thirteen there is a row of ten dots plus a row of three. If children are only ready for numbers to ten, stop there. Alternatively, use the last half of the book to talk about counting by tens. Allow opportunity for children to explore this book on their own too!

Skills Featured: Letter Knowledge, Print Awareness

Presentation Notes: This campfire song makes a terrific, interactive sing-along book. Invite the children to march to the rhythm and hold up their fingers to correspond to the number of ants for each verse. For more fun, try the drum-making activity at the back of the book.

Skills Featured: Phonological Awareness, Print Motivation