

Math SKILLS

Math is always present in young children's play as they explore materials and their surroundings. Building with blocks, problem solving a puzzle, sorting beads by color, exploring patterns and shapes of objects are all experiences of math. To give children a solid foundation of math, surround them with math language (bigger, same, less, more, etc.) and plan for experiences in the following areas: spatial relationships, classification, patterning, one-to-one correspondence, ordering, numeration, shapes, and measurement/time/estimation.

■ Spatial Relationships Definition:

Spatial Relationships is hearing and learning positional words such as: above, around back, below, beside, bottom, down, far, first, front, here, in, in back of, in front of, inside, last, middle, near, off, on, out, outside, over, there, top, under, up, etc.

■ Spatial Relationships Activities Ideas:

■ Listening to Directions

Materials: Pile of toys such as dolls, stuffed animals

To Do: Give direction to move the toys in different positions: On top of your head, under the table, next to the child on the floor, etc. Ask the children to offer ideas.

To Expand: Talk about positions while you're playing outside.

Animal In a Box

Materials: Shoe box and bean bag animal for each child

To Do: Ask each child to bring a shoe box and a stuffed animal from home. Pretend the box is the animal's home (dog house, cave, zoo cage, etc.) Ask the children to copy you or "do as you do with their animal."

Put the animal in a variety of positions in and around the box. When the children have imitated your position, ask them to tell you where the animal is.

To Expand: Ask a child to model or name a location for the group to follow.

Bean Bag Toss

Materials: Hula hoop, bean bags

To Do: Have the children toss the bean bag at the hula hoop. Ask them to tell you where the bean bag landed. (in the hoop, next to the hoop, far away from/near the hoop, etc.)

To Expand: Challenge them with a direction of position for them to follow:

Try to toss the bean bag near that tree, or under the swing, or far away from the house.

Cross the Bridge

To Do: Say the following poem using the index finger of each hand. One finger is the bridge, one finger is the man/woman:

Here is the bridge. (move one finger)

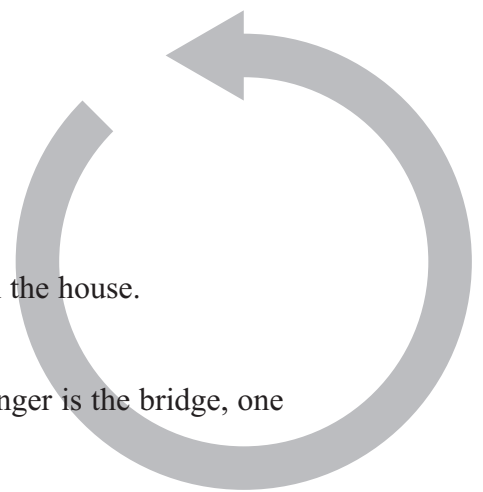
Here is the man. (move the other finger)

He wants to go over the bridge.

Do you think he can?

Move one finger over the other. Help your child play the game with his/her fingers.

To Expand: After you've played the game a few times, add other ideas. For example, the man wants to go under the bridge, on top of the bridge, jump on the bridge, and sleep on the bridge.



Classification Definition:

Classification is sorting and grouping like things together. Children tend to instinctively sort things and once shown, will typically catch on quickly. Children will begin to sort based on one attribute, such as color, shape, etc. M&M candies, for example can only be sorted by color. Once this is understood, introduce sorting the same objects by a different attribute. If for example, you're sorting Duplos: first sort by color and second, sort by shape or size of block. There are lots of different ways to sort: alike/same, color, different, member, not, sets, shape, size, type

Classification Activities Ideas:

Sorting Laundry

Materials: Basket of laundry

To Do: Have the children sort the clothes. Can you put all the shirts over here? Where can we pile socks? Let's group the pants over here. etc.

To Expand: Continue sorting each group into additional sub-groups: red socks, black socks, etc.

Sorting Checkers

Materials: Checkers

To Do: These are great beginning sorting objects because they only differ by color. After the children have explored them a bit, practice putting them in piles while you are describing how they are the same. "Here's where I'll put the red ones. Here's where I'll put the black ones."

To Expand: Ask questions, such as "Why do these belong together?" "Could a red one go in this pile? No? Why not? Why is it different?"

Sorting Animals

Materials: Stuffed animals

To Do: Make a collection of stuffed animals of distinct, different sizes: some small, some medium, and some large. Talk about the animals, particularly about their size with the children. As you describe the animals, practice putting them in different piles.

To Expand: Mix the stuffed animals back up into one pile. Can the children put them back into piles by size?

Cereal Box Match

Materials: Several pairs of matching cereal box fronts of brands familiar to children

To Do: Lay the box fronts on the floor and ask children to match or put the same ones together.

To Expand: Lay the box fronts face down and play as a memory game turning one at a time over to find matching pairs.

Snack Hotdish

Materials: Mix of items for snack (teddy grahams, fruit snacks, gold fish, shaped crackers, shaped chips, etc.), large bowl

To Do: Have the children help you make snack "hotdish" by dumping all of the items in a large bowl and mixing them up. For snack, give each child a scoop of the mixture and explore as you nibble all of the different attributes: sweet, salty, shapes, pointy, curved, lumpy, flat, spicy, yummy, yucky, etc.

To Expand: Make a list of the words. Make a list of each child's favorite part of the hotdish.

Tips:

Try to keep classification activities separate from patterning. The two types of activities can use similar materials, but if introduced close to one another, children will have difficulty moving beyond classifying to patterning. The classifying activity should be introduced and understood before patterning.

It's helpful to provide containers or tools to keep groups of items together and divided. Tools for sorting may include: small paper plates, colored bowls, pieces of construction paper, egg cartons, frozen meal trays, Dixie cups, ice cube trays, muffin pans, deli trays, etc.

Patterning Definition:

Patterning is putting materials or actions in an order that keeps repeating itself. Patterns can be named and the easiest pattern would be an ABAB pattern. For example, lay out colored socks on the floor and point to each one while saying: "Red sock, blue sock. Red sock, blue sock." and so on.

Patterning Activities Ideas:

Silverware Play

Materials: Silver ware (spoons, forks)

To Do: Lay out a pile of silverware. Have each of your preschoolers, take a fork, and lay the fork in front of them. Next have each child take a spoon and lay it to the right of the fork. Ask the children, "Can you find another fork?" Continue and talk about the pattern you've created. For example, Go back to the first fork and say your pattern: "Fork (A), spoon (B). Fork (A), spoon (B). Fork (A), spoon (B), etc.

To Expand: Try creating patterns using: legos, block, cereal, clothing, touching body parts, Tupperware, buttons, mittens, milk caps, pens/pencils, canned goods, paper strips, children (boy/girl), shoes (tie/Velcro), small collections (dinosaurs, teddy bear counters), cars/trucks, stuffed animals, jewelry, fruit snacks, crackers, markers/crayons, erasers, books, etc.

Rhythm Patterns

To Do: Make patterns by clapping, snapping, tapping, stomping, playing an instrument. Show examples of repeating sounds in a certain order, such as "tap, clap, tap, clap, etc."

To Expand: Look around the house for simple items that could be used to make rhythm patterns, such as spoons tapping kettle lids and the floor, etc.

Movement or action patterns

To Do: Try creating patterns by jumping, hopping, walking, etc. Demonstrate a simple ABAB pattern such as "step, hop, step, hop, etc." Talk about the actions and then do them together after modeling it first.

Beaded Bracelets

Materials: Pipe cleaners, two colors of small beads

To Do: Create an ABAB pattern by threading the beads on the pipe cleaners alternating colors. Secure the ends to make a bracelet.

To Expand: At a later date provide 3-4 colors or many assorted colors to pick from to create more elaborate patterns. Have the children lay their pattern out in front of their working area to help them keep track of it.

Draw a Pattern

Materials: Cut out or drawn shapes of simple clothing such as a pair of socks, pair of mittens, or a T-shirt

To Do: Introduce the activity by talking about patterns and how a pattern is the same on each item of a pair (or in the case of the shirt, how it repeats itself top to bottom.) Ask each child to pick out two colors of crayons (more gets confusing) and color a pattern on one item and repeat it on the next.

To Expand: Examine real items for patterns: striped or patterned socks, mittens, T-shirts.

Tips:

Children will usually want to explore and play with materials before they can focus on creating patterns.

To introduce patterns, you will need to lay one out, explain the repeating aspect and say or "read" the pattern aloud.

Create your pattern starting at the left and working to the right to promote reading readiness.

One-to-One Correspondence Definition:

One-to-one correspondence is a skill that most children need introduction to. Children need to be taught to touch an object when counting. For example, before singing 5 Little Monkeys, ask children to hold up the fingers of one hand; touch each finger and count 1-2-3-4-5 Little Monkeys . . .

One-to-One Correspondence Activities Ideas:

Set the Table

Materials: Napkins, cups

To Do: Set the table with napkins making sure every person has one napkin. “One for Danny, one for Karen, one for Erik, etc.” Continue with cups.

To Expand: How many napkins are there at the table? How many of us are at the table? Continue with cups.

Musical Animals

Materials: Children, objects

To Do: Have the children sit in a circle, and begin passing out stuffed animals until everyone is holding one animal. Begin playing music, asking the children to pass the animals in the same direction to the person next to them. When the music stops, “What animal do you have?” Continue to play without taking animals away.

To Expand: Try playing musical chairs without taking a chair away.

Act It Out

To Do: Whenever possible, use children to act out the “Five Little . . .” songs, such as:

Five Little Monkeys, Five Green and Speckled Frogs, Five Little Snowmen Fat, Five Little Ducks, etc. Be sure to count each child while touching them and ask them to act out their part of the song.

To Expand: Provide props for the children to manipulate: bathtub ducks, felt cut-out ducks, craft foam frogs, pom poms as monkeys, cotton balls as snowmen, etc.

How Many Baskets?

Materials: Basket ball hoop, ball, counters, container

To Do: Setup a game of counting number of baskets made. Decide on a number of shots or a length of time for shooting. Each time a basket is made put a counter in the container. When the turn is done, count the counters. Keep a list of scores.

To Expand: Talk about how many each child got. Don’t have a basket ball hoop or ball? Use a laundry basket and bathing puffs.

Ordering Definition:

Ordering is about comparative words, such as big/bigger/biggest, first/next/last, heavy/heavier/heaviest, light/lighter/lightest, most/least, short/shorter/shortest, smallest/smaller/small, tall/taller/tallest

Ordering Activities Ideas:

Let’s Line Up

To Do: Line up your group of children tall to tallest. Talk about your line. Who’s tall? Who is taller? Who is tallest?, etc.

To Expand: You could also talk about: first, next, last

Fingerplay

Pumpkin:

One little pumpkin sitting by the door,
Mother bought another one at the grocery store.
Repeat for 2, 3, 4, and 5 pumpkins, changing the name of the person who went to the store.
Daddy bought another one . . .
Sister bought another one . . .
Brother bought another one . . .
End with the following:
Five little pumpkins sitting by the door,
Mother said, “That’s enough, we don’t need anymore!”

The “3” Books

Materials: Books: Three Billy Goats Gruff, The Three Bears

To Do: Read the story emphasizing the concept words: small, medium, biggest.

To Expand:

A. Act the stories out using toys or children.

B. Sort real items (preferably items that are the same except for size) into “small, medium, large” such as: infant/child/adult socks, shirts, hats, shoes, etc. Other ideas for items: dolls, toy vehicles, canned foods, boxed foods, pieces of paper, books, etc.

Touch For Size

Materials: Pillowcase, several items of various sizes

To Do: Begin by placing all but the smallest item in the pillowcase. Place the smallest item on a taped line or the edge of the table. Ask the children to each take an item out of the bag and arrange the items smallest to biggest (working left to right.)

To Expand: Play the game again, beginning with the smallest item but this time ask the children to feel in the bag for the next sized item.

Numeration or Number Sense Definition:

The spoken number “2” means two pieces. The expectation for 4-5 year olds is that she/he could gather up to 5 pieces or items from a pile and point to each item as counting up to 5.

Numeration Activities Ideas:

Counting

Materials: Basket of fish crackers.

To Do: Start by telling a story about the fish. “You have a pool in front of you and you need one fish. Everybody reach for one little fish. He’s swimming around and needs a friend. Can you find another fish?” Continue until you reach five fish. Lay the fish out and beginning on the far left, point to each fish and say the number as you count.

To Expand:

A. While walking outside look for a number of stones, leaves, twigs, etc.

B. Ask at snack: would you like 2 crackers or 3 crackers. Count and compare.

C. Again, at snack time, link the number of crackers to the children’s ages. For example, “How old are you Jane? Let’s all take 4 crackers because Jane is 4 years old.”

D. Expose the children to the written numbers when you’ve finished counting. For example, “Now that you all have your crackers lined up, let me show you what the number 4 looks like.”

Tips:

Some children will be able to take and count more than 5 items.

Exposure to printed numbers is okay, but there is not an expectation for children to recognize the printed numeral.

Number Games

Materials: Your home or center

To Do: Play number games with your children. Give instructions such as “take 2 steps” and have the children count the steps as they are taken. Or “Pick up 4 blocks” and have the children count the blocks as they are picked up. “Clap 3 times” and count the claps, etc. Model many examples first and then try these together.

To Expand: Once your children are familiar with this game, make papers or cards with a printed number on each one (up to #5.) Hold the card up while telling your children what to do. Switch places and have the children tell you or each other what to do next.

How Many Are There?

Materials: Your home or center

To Do: Be detectives and count to find out how many you have of each: telephones, beds, clocks, rugs, doors, rooms with carpet/rooms with hard floors, windows, sinks, etc.

To Expand: Create a list for children to count and write down for at home use.

How Many in My Family?

Materials: Colored dot stickers, paper

To Do: Ask the children to name the people in their family. Give them a sticker for each family member to put on their paper. Write the names on the stickers. Count with the child and write the number on the paper.

To Expand: Use the stickers as heads and have the children draw with crayons the rest of the bodies of family members.

Counting Fingers and Toes

To Do: Count your fingers on one hand. Touch each finger and say the number out loud. Count the fingers on one of your child's hands. Touch each finger and say the number out loud. Repeat the same counting with toes.

Touch your fingers.

Touch your toes.

Now we'll count them.

Ready, set, go!

To Expand: For younger children, count one hand/foot only going up to five. For older children, use both hands and feet then combine working up to twenty.

1, 2, 3, Go!

To Do: Count as a transition: "One, two, three! (go)" Use for taking turns, starting the line moving, sitting down, giving pushes on the swing, throwing balls, beginning a race, dumping out toys, etc. Encourage the children to count with you.

To Expand: Change your "go" number daily. Announce in the morning what it will be and then count up to that number several times during the day as your transition.



How Many Fit?

Materials: Half or whole bagel for each child, small snacks such as raisins, carrot sticks, small chunks of cheese, dry cereal, etc.

To Do: Put the bagel on the table, one for each child. Give each child a selection of the small snacks asking the child to fill the hole in the center of the bagel. Fill it up, empty and count how many snacks fit in the hole. Repeat and/or eat the snacks and bagel.

Shapes Definition:

Being able to name a shape is important but being able to describe it's attributes (i.e. Three sides, three corners) is also important and basic to understanding future geometry. Vocabulary to include: triangle, square, rectangle, circle, oval, diamond, cube (box), sphere (ball), cylinder (can), corner, side, closed, open, curved, straight, trapezoid & rhombus (appropriate for older preschoolers)

Shapes Activities Ideas:

Exploring Shape of Real Things

Materials: Gather an assortment of shapes: circle (juice can lid), square (box top), triangle (Dorito chip)

To Do: Introduce the shapes. Investigate the sides, corners, curves, lines, modeling how to analyze then name a shape.

Shape Detectives

Materials: Cut out paper shapes: circle, square, triangle, rectangle.

To Do: Play detectives. “Can you find anything in the room that we can put in the shape (circle)?”

To Expand: Continue with other shapes. Send them out of the room looking for a specific shape.

Shape Days

Materials: Reminder notes

To Do: Introduce “Shape Days.” Designate one shape a day and ask the children to bring something of that shape back the following day. It’s helpful for children and parents to have a note reminding them of which shape you’re working on.

Shapes in Art

Materials: Various art materials, paint, paper

To Do: Do art activities focusing on a specific shape:

- Circles: markers on paper plates, paint on bubble wrap and press paper over paint to make prints, colored dot stickers for collaging
- Squares/Rectangles: dip berry baskets in paint and print on paper, print with rectangle and square blocks dipped in paint, tape small boxes together to make a group collage, including pudding, check, jello, etc. boxes.
- Triangles: cut pieces of paper into triangles to decorate with markers or crayons, glue edges of large triangles onto a paper and fold open as a tent door. Decorate with crayons.
- Various: Cut various shapes out of construction paper scraps. Collage to create designs or pictures of objects.

Measurement, Time, Estimation Definition:

Introducing measuring by exploring different ways to measure without using typical measurement tools such as: rulers, measuring cups, yard sticks, etc. Once measuring has been introduced and is understood, progress to using the typical tools.

Measurement, Time, Estimation Activities:

How Long Are We?

To Do: Lay two children next to each other on the floor. Who is longer? Run a strip of tape on the floor for the length of each child. Beginning at one end of the tape, have children walk, toe to heel, along the tape, counting steps. How many steps is each child? Which child was longer? Shorter?

To Expand: Instead of using feet as your measurement, use spoon, envelopes, clothespins, etc. to measure and count the number of units.

This Is Our Day

Materials: Magazine pictures

To Do: Talk about time sequences with your children such as morning, noon (lunch time) and night (bedtime). Discuss things that happen during different times of the day. Collect pictures that show sample activities such as brushing teeth, lunch time foods, pictures of pajamas, etc. Sort the pictures.

To Expand: Act out different things you’d do in the morning, noontime, and nighttime.

Tips:

If you cut all the shapes out of white paper, children will be least apt to compare by color. You might also need to explain that things may be different sizes but are the same shape. For example, a block is smaller than a table, but both are rectangle shaped.

Some shapes look similar to young children and they may be apt to quickly lump them into the same category, such as circle/oval, square/rectangle. Allow children time to have objects of these shapes side by side to compare. Talk about likeness and differences making sure to emphasize the points that distinguish one from the other.

Tip:

The key to measuring accurately is identifying a starting point or an edge and lining up from there. This step needs to be taught first.

How Long Does It Take?

Materials: Kitchen timers, stop watches, egg timers, etc.

To Do: Let the children explore and play with the timers. Most children will initiate timing things: how long it takes to run around the house, how many jumps you can do, how long a walk takes, how long until snack, etc.

To Expand: Chart the results. Compare to similar event on another day. Did it take more or less time? Longer or shorter?

Number Nursery Rhymes & Familiar Songs

One, Two, Buckle My Shoe

One For the Money, Two For the Show

Five Little Monkeys

Once I Caught a Fish Alive

This Old Man

One Elephant Went Out to Play

There Were 10 In the Bed

Math Books suggestions:

1,2,3 To the Zoo: A Counting Book

The Secret Birthday Message

Up to Ten and Down Again

Teddy Bears One to Ten

Count and See

26 Letters and 99 Cents

Round & Round & Round

Lucy and Tom's 1, 2, 3

Cat Count

One Gorilla

One Was Johnny

How Much is a Million?

Who's Counting?

Mouse Count

Little Quack

Piggies

What's the Time?

Ten Terrible Dinosaurs

Five Little Monkeys Jumping on the Bed

Hide and Snake

The Doorbell Rang

There Were Ten in the Bed illustrated

Five Little Ducks

Let's Go Visiting

Brown Rabbit's Shape Book

Five Little Penguins Slipping On the Ice

Ten Little Ladybugs

Big Sarah's Little Boots

More Than One

Eric Carle

Eric Carle

Lisa Campbell Ernst

Susanna Getz

Tana Hoban

Tana Hoban

Tana Hoban

Shirley Hughes

Betsy Lewin

Atsuko Morozumi

Maurice Sendak

David Schwartz

Nancy Tafuri

Ellen Stoll Walsh

Lauren Thompson

Audrey & Don Wood

Lara Tanel

Paul Stickland

Eileen Christelow

Keith Baker

Pat Hutchins

Karen Young

illustrated by Pamela Paparone

Sue Williams

Alan Baker

Steve Metzger

Melanie Gerth

Paulette Bourgeois

Miriam Schlein

Tips:

Objects that maintain their shape in length will provide more success for measuring than flexible objects. For example, measure using straws versus lengths of yarn.

Sequences of 3 are appropriate for children to remember and understand: For example: get up, go to day care, have playtime; get your backpack, put your papers inside, sit at the table.

Young children don't have a concept of time measured by the clock as we do. Try using gestures to show an amount of time. For example, if you'll be playing outside for an hour, tell the children, "We'll be outside for about this long" (hold your hands apart showing a distance you think measures about an hour) You can vary your "time measurement" from arms stretched out wide (lots of time) to fingers pinching a little bit of space (just a few minutes.)