

5-4 Numeracy: using everyday numbers

Children in early childhood like to line up or count things. However, young children have not gained sufficient understanding of number yet. For example, you might see children who proudly count to 100, but are bewildered by a task such as dividing six cookies fairly between three friends. The concept of number is said to be acquired after the age of five-and-a-half. By starting from recognizing the quantity of objects - in terms of being many or few, more and less, bigger and smaller kindergarten children can develop their concept of quantity into a concept of numbers.

Mathematical thinking in everyday life and play

A kindergarten provides many opportunities for children to explore mathematical thinking, for example distributing journals or newsletters to fellow children (one-to-one correspondence), separating marbles according to colors (sorting), lining dumplings according to their sizes (size arrangement), putting away empty boxes by separating bigger and smaller ones (size classification), and lining up from the shorter to the taller children (height arrangement). Through these various tasks that challenge their comparing skills to judge which is more or less and which is bigger or smaller, children develop mathematical thinking that allows them to recognize the quantity, in terms of how many there are, and size, in terms of a measurement. As mathematical thinking demands recognition of numbers as symbols, children gradually become interested in the power of written numbers. Thus, through the kindergarten activities and play, children encounter and think about a wide range of numbers. By focusing on the hands-on math experiences, a teacher at kindergarten needs to organize the environment in such a way that children can discover numbers on many occasions and in various ways, and so develop their mathematical thinking.

..... Educational goals

- **Developing quantitative and numerical concepts by comparing a wide range of elements, through autonomous activities.**
- **Developing quantitative reasoning skills to judge the right amount that one wants, while dealing with things and objects.**
- **Developing confidence and self-competency, by engaging in independent activities that utilize numerical abilities appropriate to individual levels of maturity.**
- **Expanding logical thinking, through organizing play by arranging things in order and choosing proper tools for the play.**
- **Associating an amount of things with their corresponding number and understanding what numbers, as symbols, stand for, through employing mathematical thinking on many different occasions.**
- **Establishing a basic foundation for mathematical thinking, through activities related to space or time, such as putting building blocks away or guessing the speed of a thrown ball.**

Daily math activities at kindergarten

Distributing snacks

A child is giving plates to members in a group and distributing a fair amount of snacks to everyone.

Children are seriously comparing the number of their own snacks with those of other children. If there are some snacks left over, children will try to divide them until every child gets an equal share.

Putting scissors away

Scissors are supposed to be put away in the corresponding holes in a holder.

By checking empty holes, children can work out how many pairs of scissors are missing.



Putting a sticker on a journal

Children are putting a number sticker on their journals, which shows the same number as the date on the calendar in front of them.

Math Activities in Play

Making sand dumplings

For firmer dumplings, children are thinking the right ratio of water and sand (correspondence between the amount of water and that of sand).

It sometimes takes more than half an hour to make nice and shiny sand dumplings, but children are trying hard to make a firmer and shinier one than anybody else.

Playing house

A child is arranging a set of a plate and a bowl to each friend for a dinner party.

Initially a child sets plates and bowls separately, but as she gets used to it, she can arrange a dish and a bowl at the same time as a set. When there are too few or too many dishes, the child will find that out by matching the dish with a person.

Stamp rally

By identifying a leaf with one of the five leaves on a card (one-to-one correspondence), children are thinking how many of which leaves they need to find next.



Dice game

By rolling dice, children are practicing counting the numbers.

By comparing the value of one's

Tic-tac-toe

Two players try to place three pieces in a row before the opponent does. Mature children can logically think where they should put their pieces while blocking their opponents' move at the same time.

Card game: War

By comparing one's card with others', a person with the highest number card can take all the cards.

The winner is the person with the most cards.

Bowling

Children try to knock all the pins down at one time.

Children decide how to align the pins and how far the bowler is to the pins.

Children with sophisticated mathematical ability can compile a calculation table with which they can figure out how many pins were knocked down.

Keep in mind

- Provide an organized environment and encouragement to help children spontaneously develop mathematical thinking through fun activities.
- Start from small numbers understandable to children, such as three, and gradually increase to bigger numbers such as ten.
- With regard to various ways of counting numbers, encourage children to exchange their opinions freely with others.
- Try to be sure that every child who wants to do the job of distributing snacks has a turn.
- Identify storage places clearly to promote children's responsible behavior. For a younger class, indicate individual storage places for each item as in one-to-one correspondence, whereas for an older class, display the amount of toys through both the number and the drawings corresponding to the quantity.
- Draw children's attention to the classroom calendar by putting information about events and activities.
- When playing with cards, remove King, Queen, and Jack cards from the game. If Ace cards also seem confusing to some children, overwrite them with 1s.
- During the card game, some children may cause trouble in an effort to win. A teacher should guide them to resolve the situation by providing the time to talk together about what happened.

Tips and suggestions

- Numbers are often taught in a lesson setting, but it may be better to start by introducing numbers through using real objects in a game.
For example: By showing a 5 card, you ask, 'Can you find five things that are the same kind in this room?' Then let children show and say the items they found.
- Any teaching materials and tools at kindergarten can be used for counting and dividing. A teacher can stimulate children's mathematical thinking even in music or physical exercise classes.
- A number table that shows numbers and drawings corresponding to the quantity can effectively attract children's interest and curiosity toward numbers. When posting the cards on the wall, show and explain them one by one to children so that they come to be aware of these number cards. You can also use a table when children need to count certain things.
- During traditional games, some children can develop mathematical thinking. Make the games easier and simpler for young children and put them at a game center or other shelves within the children's reach. In addition to mathematical thinking, many games can also effectively stimulate logical reasoning.
For example: Traditional games such as 'Congkak' in Malaysia, 'Mancala' in Africa and Pakistan, and 'Shagai' in Mongolia can help players develop numerical understanding.
- Card games can familiarize children with numbers and further develop their early arithmetic skills such as simple additions and subtractions. Among a wide range of card games, choose appropriate ones in relation to children's readiness.

For example:

Familiarizing with numbers: Memory game, where players find matching pairs of cards.

Number sequencing: Lining cards starting around the 7 cards by putting the cards of the same suit in one line (or 5 cards for a variation)

Comparison: War, where two players lift one card from one's pile and placing it face up, then the person with the higher card can get both cards.

Addition: Double War, with 32 cards of 1s to 4s each player lifts two cards and adding the values, then the person with the higher value can get both pairs of cards. Adding more cards increases the level of difficulty.