

NUMBER SENSE

The term *number sense* refers to understanding numbers: a sense of their relative values, a sense of their structure through place value, and a sense of the changes following arithmetic operations. Some considerations to keep in mind when helping young children learn about numbers are recognizing and visualizing quantities, naming quantities, and counting.

Mere counting does not help children understand quantity. Numbers are different from other lists. In counting, seven includes quantities one to seven, but when we say the alphabet, G does not include the letters A to G.

Researchers have found that 5-month-old babies can distinguish between 1, 2, and 3 objects and half of 12-month-old babies can distinguish up to 4 objects. When you point to objects in counting, the young child loses the concept of the whole and assumes you are naming the objects. That is why if you ask a young child to count four objects and then ask her to give you four, she will frequently give you only the fourth object. Therefore, never count (by pointing to each object) fewer than 5 objects. Instead, refer to the collection by the number, for example, 4 apples.

To recognize quantities 6 to 10, they must be grouped. To understand the necessity of grouping, try to see mentally a group of eight apples in a line without any grouping—impossible. Next try to see five of those apples as red and three as green; most likely you can visualize them. Grouping by fives corresponds, of course, to our fingers. Such grouping is not a new idea; the Romans grouped in fives with their numerals: V for 5 and L for 50. Another example is piano music, which is written with two groups of five lines. Who could read it if the staves were not separated?

The words a child uses for naming numbers plays an important role in understanding place value. English is inconsistent in naming numbers 11 to 99, particularly from 11 to 19.

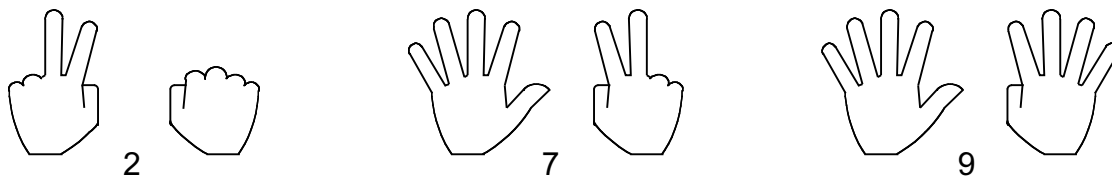
On the other hand, Asian languages follow a simple pattern. Their number words are as follows: 1 to 10, then ten 1 (11), ten 2 (12), ten 3 (13). The twenties are 2-ten, 2-ten 1, 2-ten 2, and so forth. In Asian languages, only 11 words are needed to count to 100, while 28 words are needed in English. Research shows that children learning the “math” way of number naming understand place value about three years earlier than those who do not. Therefore, teach children to count with ten 1, ten 2, . . . , 9-ten 9. Do this for several months.

Activities in this chapter focus on naming and recognizing quantities, evens and odds, and place value with tens and ones.

N1 ACTIVITIES USING FINGERS TO SHOW QUANTITIES

Most children are taught to raise a certain number of fingers when asked their age. One of the joys of having a birthday is being able to hold up one more finger.

Because we read from left to right, ask the child to use his left hand to represent the quantities 1 to 5. It does not matter which fingers on the left hand the child uses. Do not count. To teach three, do not say, “This is one, two, three”; say, “This is three.” Then teach 6 to 10 with 5 on the left hand and the amount over 5 on the right hand. See the figures below.



Then do the inverse, show quantities on your hands and ask the children to name them. Teach *Yellow is the Sun*. (The song and sheet music may be found on RightStartMath.com.) Be sure the children use their fingers at the appropriate times. Also teach them the rhyme, *One, Two, Buckle my Shoe*, which will be used later for even and odd numbers.

Yellow is the Sun

*Yellow is the sun.
Six is five and one.
Why is the sky so blue?
Seven is five and two.
Salty is the sea.
Eight is five and three.
Hear the thunder roar.
Nine is five and four.
Ducks will swim and dive.
Ten is five and five.*

One, Two, Buckle my Shoe

*One, two, buckle my shoe.
Three, four, shut the door.
Five, six, pick up sticks.
Seven, eight, lay them straight.
Nine, ten, a big, fat hen.*

N2 FINGER CARDS IN ORDER

This is simple sorting.

Objective: To recognize the finger representations from 1 to 10.

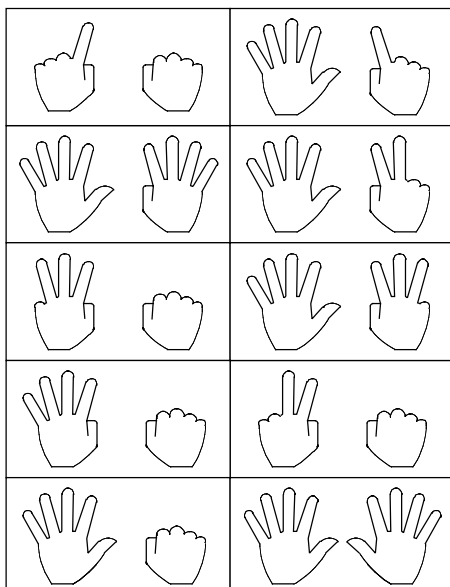
Number of players: One.

Cards: One set of finger cards from 1 to 10, found on Appendix page 1. (Two sets will be needed for Finger Card Memory (N4).)

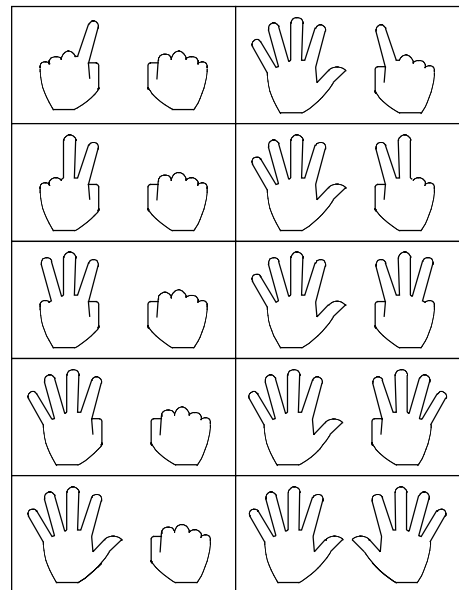
Layout: Lay the cards face up in random order.

Object of the game: To put the cards in some kind of order.

Play: Let the child decide what order to use. Shown here are the first column with 1 to 5 and the second column with 6 to 10.



Cards with 2 and 9 are mixed-up.



The finger cards in order.

N3 MIXED-UP FINGER CARDS

This game is fun for young players.

Objective: To find errors in the pattern made in the previous game (N2).

Number of players: Two.

Cards: A set of finger cards from 1 to 10, found on Appendix page 1.

Layout: The layout from the previous game.

Object of the game: To find the mixed-up cards.

Play: While the first player turns his back, the second player switches any two cards in the layout. The first player then looks and corrects the mixed-up cards. The players then exchange roles.

N4 FINGER CARD MEMORY

This is a simple memory game.

Objective: To practice recognizing the finger formats.

Number of players: Two.

Cards: Two sets of finger cards from 1 to 10, found on Appendix page 1.

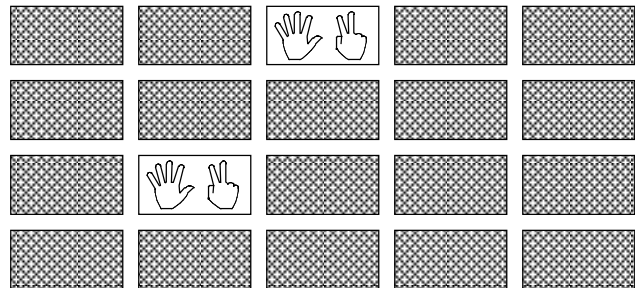
Layout: Lay out the cards face down in four rows.

Object of the game: To collect the most cards.

Play: The first player turns over one card for both to see and says aloud how many fingers it shows. Then he looks for the same card among the remaining cards and turns it over.

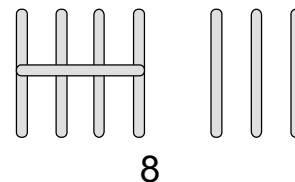
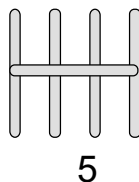
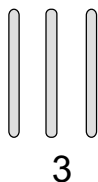
If they match, he collects them both and takes another turn.

If they do not match, he returns both cards face down in the same place and the other player takes her turn. Players continue to take turns until all the cards are collected.



N5 TALLY STICK ACTIVITIES

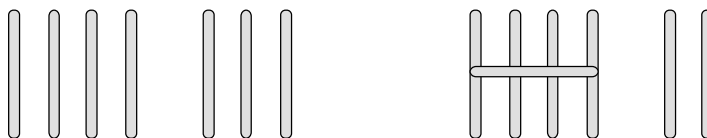
Tally sticks are simply craft sticks or Popsicle sticks. (Use only top quality sticks that are not warped.) Ask the child to show 3 fingers and then demonstrate 3 with the tally sticks by laying out 3 sticks vertically, each about an inch apart (2.5 cm) as shown below. Practice with quantities 1 to 4, asking the child both to construct them. Later ask the child to name the ones you construct.



When the child can lay out 1 to 4 sticks and identify them without counting, show 5 with the 5th stick laid horizontally across the center of the 4 (see the second figure above). The horizontal stick is easier to work with and some young children have problems with diagonals. This is an example of grouping, a basic concept in mathematics.

Continue through to 10; however, when you go beyond 10, start a new row for each ten. Lay out other objects grouped in fives and ask the child to say how many without counting.

Give the child simple problems to solve with these tally sticks. For example, “What are 4 apples and 3 more apples?” With the 7 sticks laid out, ask, “How can you tell me how much this is without counting?” [Make 5 with one of the sticks from the 3.]



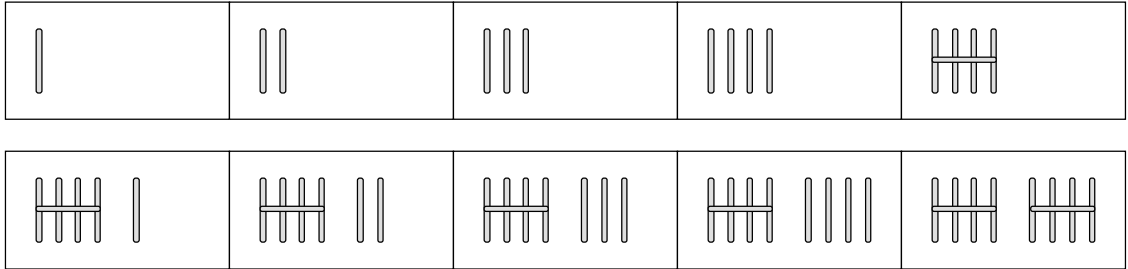
Grouping 4 apples and 3 more apples to get 7.

N6 TALLY CARDS IN ORDER

This is the same activity as Finger Cards in Order (N2), but with the tally cards.

Cards: One set of tally cards from 1 to 10, found on Appendix page 2. (Two sets are needed for the next game.)

Play: Again, let the child decide what order to use. Shown below is an order using two rows.



N7 MIXED-UP TALLY CARDS

With the tally cards in order, play the Mixed-Up Finger Cards game (N3) with the tally cards.

N8 TALLY CARD MEMORY

This is the same game as Finger Cards Memory (N4), but with the tally cards.

Cards: Two sets of tally cards from 1 to 10, found in the Appendix page 2.

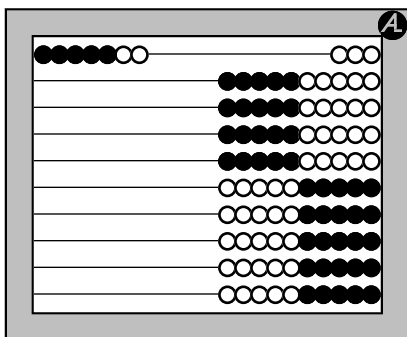
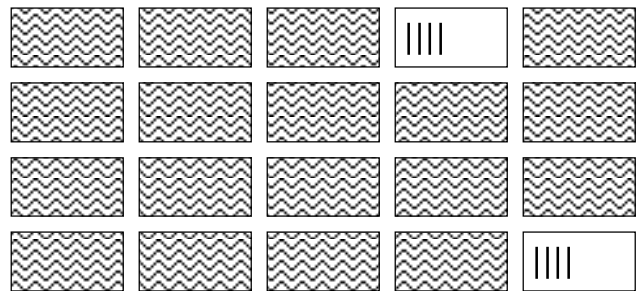
Layout: Lay out the cards face down in four rows.

Object of the game: To collect the most cards.

Play: The first player turns over one card for both to see and says aloud how many tally sticks it shows. Then she looks for the same number among the remaining cards and turns it over.

If they match, she collects them both and takes another turn.

If they do not match, she returns both cards face down in the same place and the other player takes his turn. Players continue to take turns until all the cards are collected.



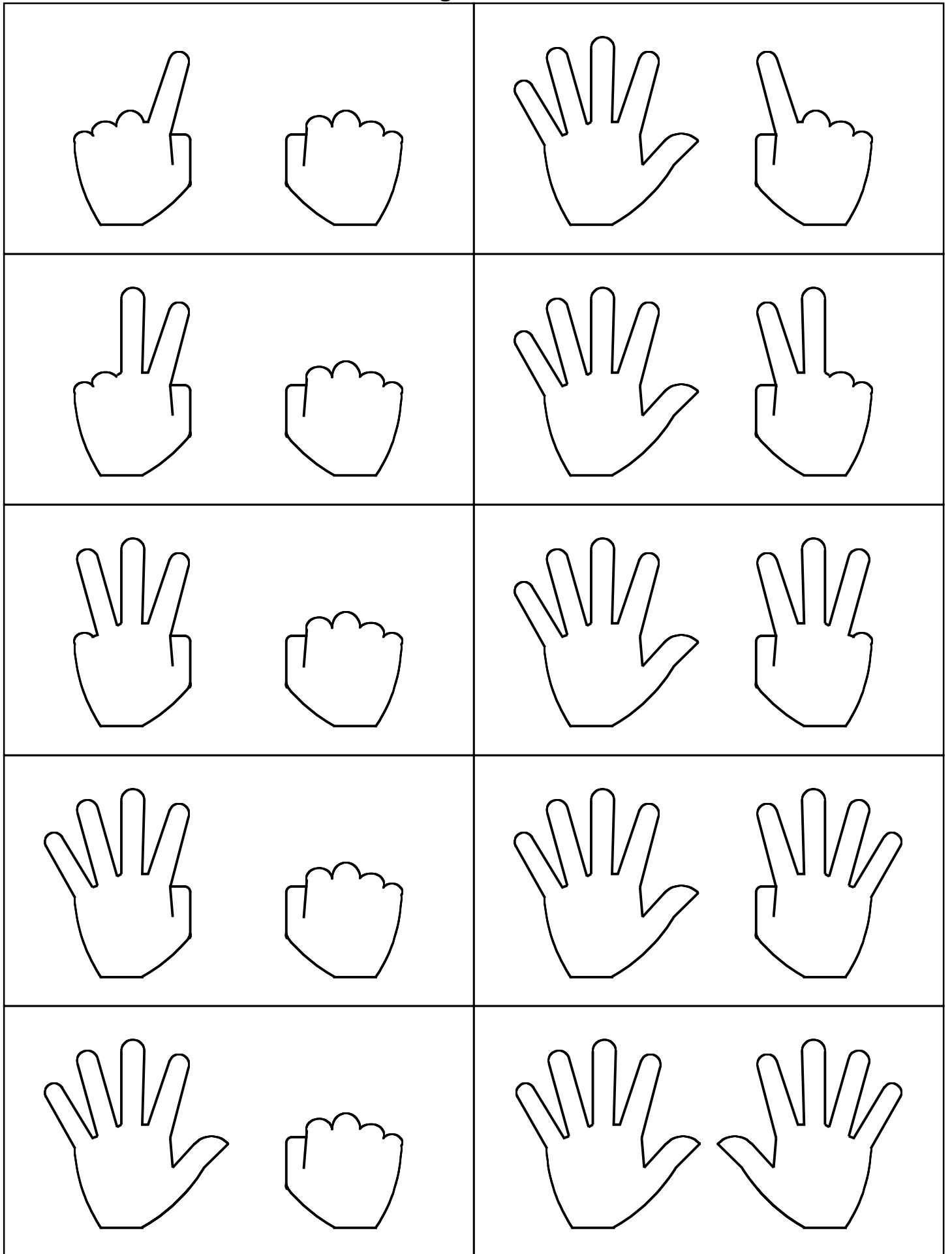
Entering 7.

N9 BASIC AL ABACUS ACTIVITIES

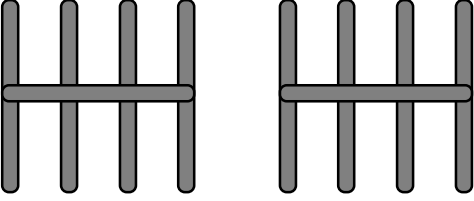
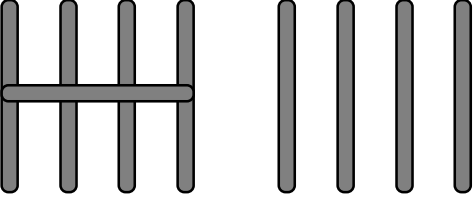
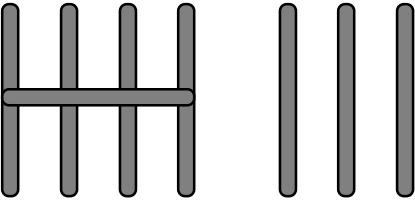
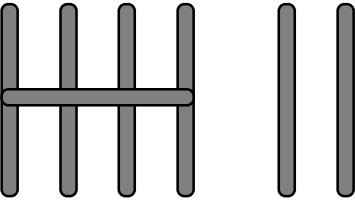
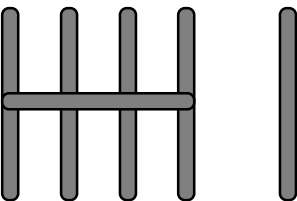
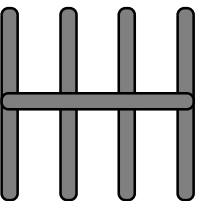
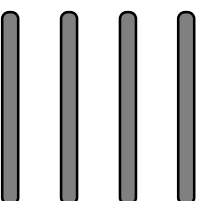
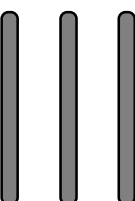
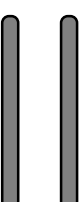

Start with the abacus flat on a surface with the dot, or logo, in the upper right corner. Clear by moving the beads toward the dot.

Ask the children to show 2 with their fingers and then to enter 2 on the top wire by sliding the beads *as a group* to the left edge. If a child starts counting, challenge her to do it without counting. When the children can enter and name quantities 1 to 5, proceed to 6 through 10.

Also, do the inverse; enter quantities and ask the children to name the number.



Tally Cards

Bead Cards

