

Counting Objects and Cardinality: math lesson, Kindergarten – download the PDF

How many crayons are in the box? How many friends are on the bus? To find out, you count! In this chapter you will learn how to count objects carefully, how to tell how many there are, and how to match numbers to groups. A grown-up can read the words aloud with you.

1. What does it mean to count?

Counting is a way to find out **how many** things are in a group. We say number words in a special order: one, two, three, four, five, and so on. The order never changes. Every time you count, you start at **one**.

D Definition: counting

To count a group, you say the number words in order, one for each object, until every object has been counted.

The number tells you the size of the group. A group of seven is a group with seven objects. It does not matter if the objects are big or small, red or blue, shiny or dull.

2. One-to-one correspondence

When you count, each object gets **exactly one** number word, and each number word goes to **exactly one** object. Math helpers call this one-to-one correspondence. You can touch each object,

or slide it to the side, while you say its number.



M

Method: count objects one by one

1. Start with the number word **one** on the first object.
2. Touch or move each object as you say the next number word.
3. Never skip an object and never count an object twice.
4. Stop when there are no more objects.

⚠

Watch out

If you say the words faster than you touch the objects, you may say two words for one object, or touch two objects while you say one word. Slow down so your hand and your voice move together.

3. The last number tells how many

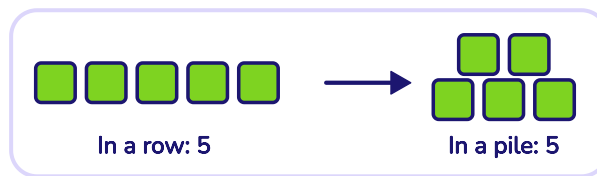
When you finish counting, the **last number word you said** tells how many objects there are in all. In the picture above, you say one, two, three, four, five, six. The last number is six, so there are six stars. You do not need to count them again.



Key idea: cardinality

The last number you say is the **total**. It names the size of the whole group, not just the last object.

Here is another surprise. The number of objects does not change when you move them around.



Five squares in a row, or five squares in a pile: it is still five. Moving objects does not add any and does not take any away. You can count in any order and still get the same total, as long as you count each object once.



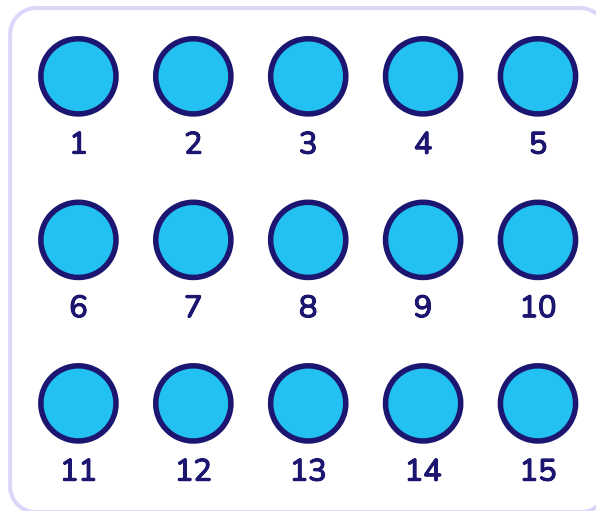
Example 1: counting crayons

Maya has crayons in a box. She touches each one and says: one, two, three, four, five, six, seven. The last number she said is seven. So there are **7** crayons. If she counts them again starting from the other end, she will still finish with seven.

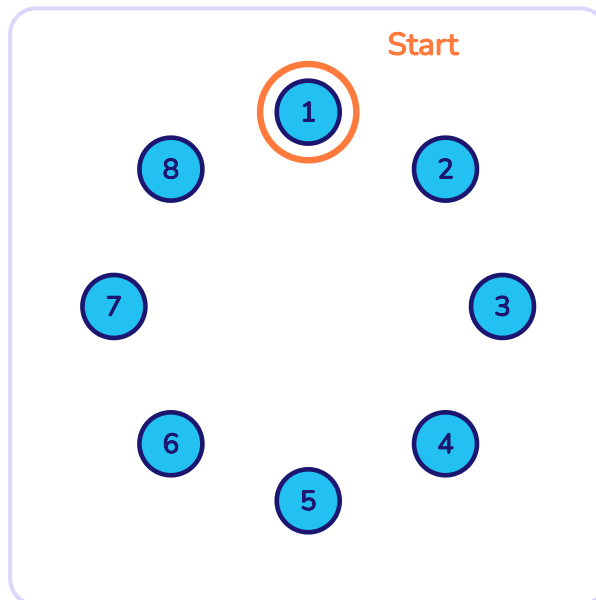
4. Counting in lines, arrays and circles

Objects can be arranged in different ways, and each way needs a plan.

- **In a line:** start at one end and move along to the other end.
- **In an array** (rows and columns): count the first row from left to right, then keep going with the next row. Do not start over at one!
- **In a circle:** there is no end, so choose a **starting object** and mark it. Stop when you come back to it.



In the array above there are three rows of five counters. The first row ends at five. The second row starts at six and ends at ten. The third row starts at eleven. The last counter is number fifteen, so there are **15** counters.



E Example 2: a circle of counters

Eight counters sit in a circle. You mark the first one with a ring and call it one. You go around: two, three, four, five, six, seven, eight. The next counter would be the ring again, so you stop. There are **8** counters.

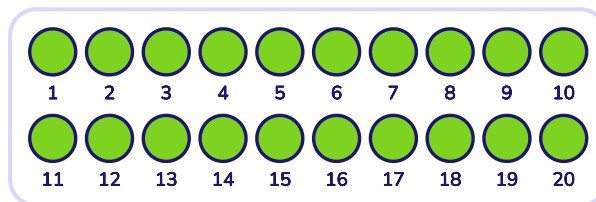


Tip from Zyro

On my planet we count stars in the sky. I always point to my first star with my glowing finger so I never lose it. Try putting a finger or a sticker on your first object!

5. Counting up to 20

After ten, we keep counting: eleven, twelve, thirteen, and on up to twenty. A good trick is to fill one row with ten objects and put the rest in a second row.



Here are the number words from eleven to twenty.

Numeral	Number word
11	eleven
12	twelve
13	thirteen
14	fourteen
15	fifteen
16	sixteen
17	seventeen
18	eighteen
19	nineteen
20	twenty

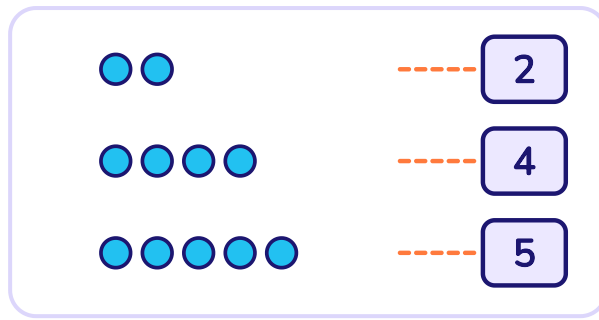
E

Example 3: seventeen buttons

You have a full row of ten buttons and a second row with some more. Count the full row to ten, then keep going: eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen. The last number is seventeen, so there are **17** buttons.

6. Matching numerals to quantities

A **numeral** is the written symbol for a number, like 5. The numeral 5 matches any group that has five objects. To match, count the group, then find the numeral that is the same as your last number.



The numeral **0** is special. It means that there are **none**: an empty plate has zero cookies. Zero is also a number!

7. Counting out a given number of objects

Sometimes you are asked to **get** a certain number of things, like “Please give me eight blocks.” Now you build the group yourself.

M

Method: count out

1. Move one object at a time from the big pile to a new spot, and say a number word each time.
2. Keep going until you say the number you were asked for.
3. Stop right there. The objects you moved are your answer, even if more objects are left in the pile.



Watch out

Do not stop one object too soon or too late. When you place the last block, the number word you say must be the number you were asked for.

8. Number words from zero to ten

Number words are the names we say for numbers. You can read them in this table, next to the numeral and a picture of how many.

Numeral	Number word	How many
0	zero	nothing
1	one	•
2	two	• •
3	three	• • •
4	four	• • • •
5	five	• • • • •
6	six	• • • • • •
7	seven	• • • • • • •
8	eight	• • • • • • • •
9	nine	• • • • • • • • •
10	ten	• • • • • • • • • •



The numbers on the number line are in counting order. Each number is one more than the number before it.

Key takeaways

- Say one number word for each object, and touch or move each object once.
- The last number word you say tells how many objects there are.
- The total stays the same when you move the objects around.
- In a line start at one end; in an array keep counting from row to row; in a circle mark where you start.
- You can count on past ten up to twenty: eleven, twelve, thirteen, and so on.
- A numeral matches a group when it is the same as your last number; zero means none.
- To count out a number, stop as soon as you say the number you were asked for.



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