

Measurement, Sorting and Data: math lesson, Kindergarten – download the PDF

Look around you! Some things are long and some are short. Some are tall and some are heavy. In this chapter you will learn to describe things, compare them, sort them into groups and show your counts in a picture graph.

1. What can we measure?

Every object has parts that we can describe. These parts are called **attributes**. Three attributes we can measure are **length**, **height** and **weight**.

D Measurable attributes

- **Length** tells how long something is from one end to the other end, like a pencil or a snake.
- **Height** tells how tall something is from the bottom to the top, like a tree or a door.
- **Weight** tells how heavy something is, like a watermelon or a feather.

Color and shape are attributes too, but we do not measure them. We use them to sort. You will see that in part 5.

2. Comparing two objects directly

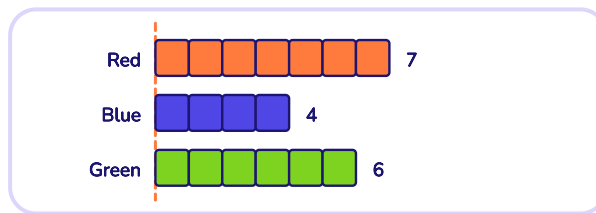
To compare two objects **directly**, put them side by side. Then look at them closely. You do not need numbers yet!

M

How to compare length

1. Put the two objects next to each other.
2. Make the left ends start on the same line.
3. Look at the right ends. The one that goes farther is longer.

Here are three ribbons that all start on the same dashed line. The red ribbon reaches the farthest, so it is the longest.



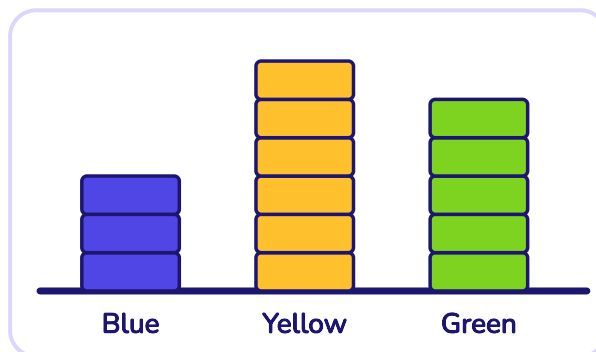
Careful! If the two objects do not start on the same line, you can be fooled. An object that ends farther away is not always longer. Always line up the starting ends first.

3. Longer, shorter, taller, heavier, lighter

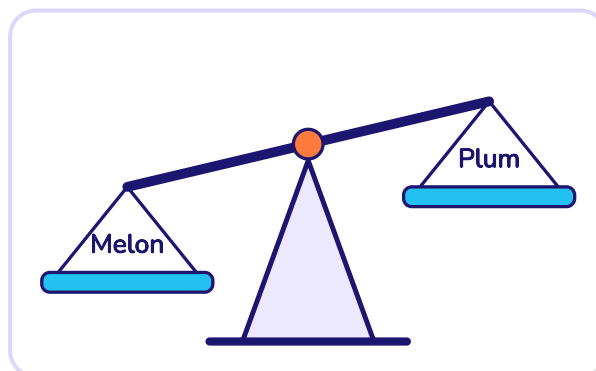
We use special words to compare. Use the right word for the right attribute.

Attribute	Bigger word	Smaller word
Length	longer	shorter
Height	taller	shorter
Weight	heavier	lighter

Compare the three towers below. They stand on the same floor. The yellow tower reaches the highest, so it is the **tallest**. The blue tower is the **shortest**.



To compare weight, you can hold one object in each hand, or use a balance scale. The side that goes **down** holds the **heavier** object. The side that goes **up** holds the **lighter** object.



E Example 1: heavier or lighter?

The scale goes down on the melon side. So the melon is **heavier** than the plum. The plum is **lighter** than the melon.



Zyro says On my planet we compare things with our eyes first. Then we check with our hands. Try it with two books!

4. Measuring with units

Sometimes we want a number. We can measure with small objects that are all the same size, like cubes or paper clips. These are called **units**. Line them up end to end with **no gaps** and **no overlaps**, then count them.



Example 2: measuring with cubes

A crayon is 6 cubes long. A marker is 9 cubes long. Since $9 > 6$, the marker is longer. It is $9 - 6 = 3$ cubes longer than the crayon.

The unit must stay the same. If you measure one thing with cubes and the other with paper clips, you cannot compare the two numbers.

5. Sorting objects into categories

To **sort** means to put things that are alike into the same group. A group is called a **category**. We pick a **rule**, like color, shape, size or kind, and put every object in the right group.



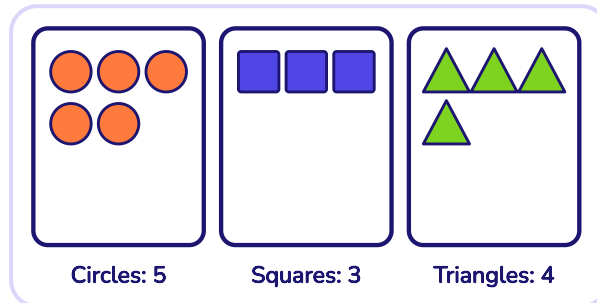
How to sort

1. Choose one rule (for example: shape).
2. Make one box for each kind of shape.
3. Put each object in the box where it belongs.

The same objects can be sorted in more than one way. A big red circle can go with the big things, with the red things, or with the circles. Only the rule changes!

6. Counting objects in each category

After sorting, count what is in each box. Touch each object once and say one number for each. The last number you say tells how many are in the group. You can also count all the groups together to find the total.



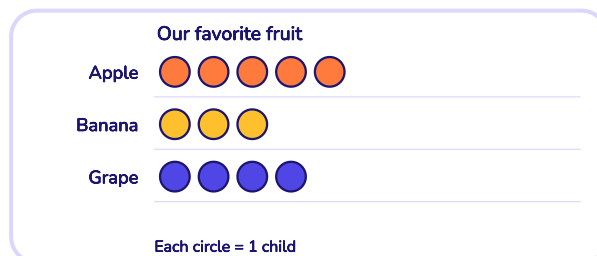
E Example 3: counting categories

There are 5 circles, 3 squares and 4 triangles. The group with the **most** is the circles. The group with the **fewest** is the squares. All together: $5 + 3 + 4 = 12$ shapes.

You can also put the categories in order by how many objects they have. From fewest to most the order is squares (3), triangles (4), circles (5).

7. Picture graphs and comparing categories

A **picture graph** shows counts with pictures. Each picture stands for one thing. Each row is one category. A longer row means more.



Read the graph. Apple has 5 circles, banana has 3 and grape has 4. Apple has the most. Banana has the fewest. Apple has $5 - 3 = 2$ more than banana.



Comparing categories

To find out how many more or how many fewer, take away the smaller count from the larger count. Use the words **more than**, **fewer than** and **equal to**.



Careful! Say **fewer** for things you count and **less** for amounts like water. Say that the banana row has fewer children.

Key takeaways

- We can measure length (how long), height (how tall) and weight (how heavy).
- To compare, line objects up on the same starting line and use words like longer, shorter, taller, heavier, lighter.
- A balance scale goes down on the heavier side.
- To sort, pick a rule and put each object in its group.
- Count each group, then compare the counts: most, fewest, more than, fewer than.
- In a picture graph, each picture is one thing and a longer row means more.



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