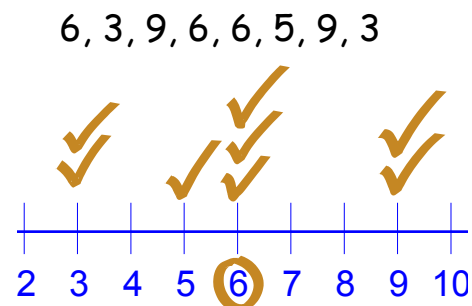# How to Find the Mode or Modal Value

The mode is simply the number which appears **most often**.

Example:

In {6, 3, 9, 6, 6, 5, 9, 3} the Mode is 6, as it occurs most often.

6, 3, 9, 6, 6, 5, 9, 3

2　3　4　5　6　7　8　9　10

Finding the Mode

To find the mode, or modal value, it is best to put the numbers **in order**. Then **count** how many of each number. A number that appears **most often** is the **mode**.

Example:

3, 7, 5, 13, 20, 23, 39, 23, 40, 23, 14, 12, 56, 23, 29

In order these numbers are:

3, 5, 7, 12, 13, 14, 20, **23, 23, 23, 23**, 29, 39, 40, 56

This makes it easy to see which numbers appear **most often**.

In this case the mode is **23**.

Another Example: {19, 8, 29, 35, 19, 28, 15}

Arrange them in order: **{8, 15, 19, 19, 28, 29, 35}**

19 appears twice, all the rest appear only once, so **19 is the mode**.

How to remember? Think "mode is most"

More Than One Mode

We can have more than one mode.

Example: {1, 3, 3, 3, 4, 4, 6, 6, 6, 9}

3 appears three times, as does 6.

So there are two modes: at **3** and **6**

Having two modes is called **"bimodal"**.

Having more than two modes is called **"multimodal"**.

Grouping

In some cases (such as when all values appear the same number of times) the mode is not useful. But we can **group** the values to see if one group has more than the others.

Example: {4, 7, 11, 16, 20, 22, 25, 26, 33}

Each value occurs once, so let us try to group them.

We can try groups of 10:

- 0-9: **2 values** (4 and 7)

- 10-19: **2 values** (11 and 16)

- 20-29: **4 values** (20, 22, 25 and 26)

- 30-39: **1 value** (33)

In groups of 10, the "20s" appear most often, so we could choose **25** (the middle of the 20s group) as the mode.

You could use different groupings and get a different answer.

Grouping also helps to find what the typical values are when the real world messes things up!

Example: How long to fill a pallet?

Philip recorded how long it takes to fill a pallet in minutes:

{35, 36, 32, 42, 58, 56, 35, 39, 46, 47, 34, 37}

It takes longer when there is break time or lunch so an average is not very useful.

But grouping by 5s gives:

- 30-34: **2**
- 35-39: **5**
- 40-44: **1**
- 45-49: **2**
- 50-54: **0**
- 54-59: **2**

"35-39" appear most often, so we can say it normally takes **about 37 minutes** to fill a pallet.