

Week 5 Mental Maths Resources

If you get stuck on your mental maths sheet this week, come to this resource and see if it will help you!

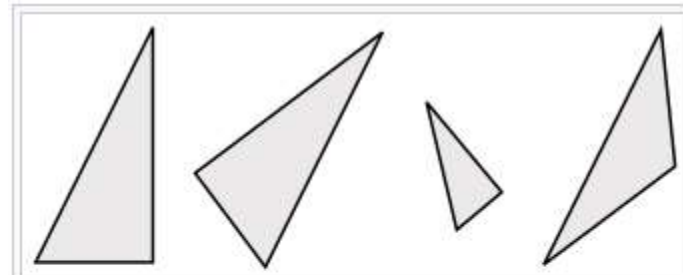
Please note, it only helps you if you actually look at it...




Congruent

In geometry, two figures or objects are congruent if they have the same shape and size, or if one has the same shape and size as the mirror image of the other.

- Two line segments are congruent if they have the same length.
- Two angles are congruent if they have the same measure.
- Two circles are congruent if they have the same diameter.



An example of congruence. The two triangles on the left  are congruent, while the third is *similar* to them. The last triangle is neither congruent nor similar to any of the others. Congruence permits alteration of some properties, such as location and orientation, but leaves others unchanged, like *distances* and *angles*. The unchanged properties are called *invariants*.

Elapsed Time

Elapsed time tells us how much time has passed between one event, and another event. For example, how long is a school day? One way to work it out is to use a table to count the hours, and then the minutes.

An example is to the right.

Here are some helpful videos to further explain elapsed time:

- Elapsed Time Using a Number Line
<https://www.youtube.com/watch?v=Orta5xU6DBo>

Elapsed Time – Mountains, Hills and Rocks Strategy – a clever strategy! Have a look!

<https://www.youtube.com/watch?v=aPtXMJ-qWYg>

		How much time has passed?
Start time:	9:00am	
	10:00am	1 hour
	11:00am	2 hours
	12:00 pm	3 hours
	1:00pm	4 hours
	2:00pm	5 hours
	3:00pm	6 hours
End time:	3:30pm	6 hours 30 minutes

Adding and Subtracting with Money

When adding or subtracting with Money, it is important to remember what we know about money.

1. There are 100 cents in 1 dollar
2. There are two decimal places after the decimal point
3. When adding or subtracting any numbers with decimal places, we need to line up the decimal places when doing the vertical algorithm, like this:

$$\begin{array}{r} \$ \quad 32.00 \\ \$ + \quad 3.45 \\ \hline \$ \quad 35.45 \end{array}$$

Here is a great video explaining how to add and subtract decimal numbers, which of course applies to money also. You only need to watch up to about 3minutes 50, after that he starts talking about division and multiplication.

<https://www.youtube.com/watch?v=kwh4SD1ToFc>

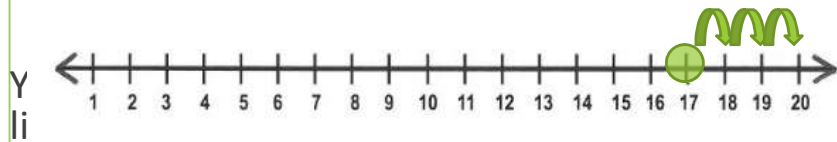
Here is a video explaining how to subtract when there are zeros in the sum, e.g. (\$20.00-\$3.70):

<https://www.youtube.com/watch?v=uAbX-nCmdK4>

Counting up to Subtract with Money

Let's look at this sum: $20-17=?$.

We could use the counting up strategy to solve this sum, by counting up from 17 to 20, like this:



We can also use counting up to calculate the difference.

OK, so here is a worded problem for us to solve:

I went to the shops and bought a Mars Bar for \$3.70. I only had a \$10 note. How much change should I get?

1. Count up from \$3.70 to the nearest dollar, which in this case is \$4. I am counting in 10 cent increments.

\$3.70, \$3.80, \$3.90, \$4.00.

So 3 jumps of 10 cents = 30cents.

1. Then count up from \$4 to \$10, which is \$6.
2. So my change should be \$6.30.

Multiplying Fractions

Remember how complicated adding and subtracting fractions is?

How you have to change all the denominators to be the same before you can do anything?

Probably multiplying fractions is even trickier, right?

WRONG!!!!

Multiplying Fractions is so easy!

All you do is multiply the numerators (top numbers) together, and then multiply the denominators (bottom numbers) together! You might then need to simplify the answer.

- For example:

$$\frac{1}{4} \times \frac{2}{3} = \frac{1 \times 2}{4 \times 3} = \frac{2}{12} = \text{reduces to } \frac{1}{6}$$

- Here is a video further explaining multiplying fractions...<https://www.youtube.com/watch?v=qmfXyR7Z6Lk>
- And here is one on simplifying fractions in case you need it.
<https://www.youtube.com/watch?v=AtBUQH8Tkqc>

Dividing Fractions

Oh dear, the two scariest Maths things in the one sentence!!! Dividing AND Fractions!!!

Relax, it's actually really easy to divide fractions!

All we do is:

- flip the second fraction
- multiply the numerators
- multiply the denominators
- simplify if necessary

Here is an example:

Invert the fraction that you are dividing by

$$\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$$

Multiply the numerators and denominators

$$\frac{4}{5} \times \frac{3}{2} = \frac{12}{10}$$

Simplify the fraction if necessary

$$\frac{12}{10} = 1\frac{1}{5}$$

For those who usually do 'extension' level maths, here is an explanation of why this method works:
<https://www.youtube.com/watch?v=4lkq3DgvmJQ>

Powers (also known as indices)

The **power**, also known as the **index**, tells you how many times you have to multiply the number by itself.

For example, 2^5 means that you have to multiply 2 by itself five times = $2 \times 2 \times 2 \times 2 \times 2 = 32$.

Short division.

Click the link below to watch a video about how to do short division.

<https://www.youtube.com/watch?v=SLze82Zcc4Y>

