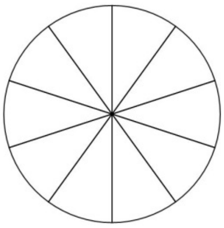
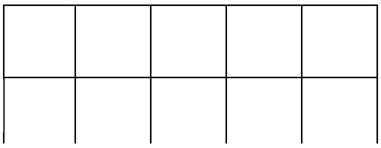
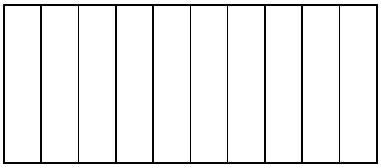
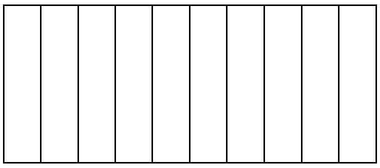
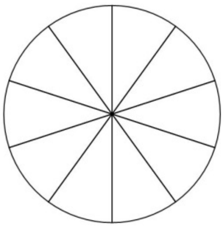
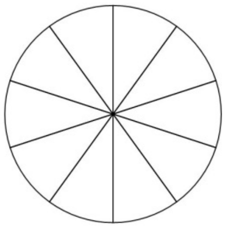
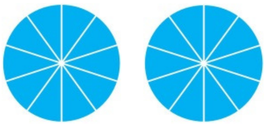
Using 10ths. *Stg 5/E6*  *props & rats*  Name: ______________________

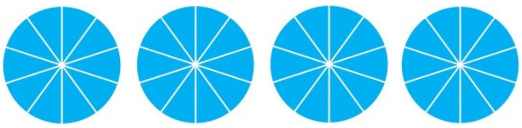
OK, serious-face time. Tenths are possibly the most important fraction that you will learn about. The good news is that they are possibly the easiest too! Let's have a look at the basics first. Shade or colour the fractions shown below:

$\frac{1}{10}$  $\frac{6}{10}$  $\frac{7}{10}$ 

$\frac{4}{10}$  $\frac{9}{10}$  $\frac{3}{10}$ 

How many 10ths are in these sets of tenths? (10 segments in each circle – count 'em up)

 (2 x 10) = ___  (5 x 10) = ___

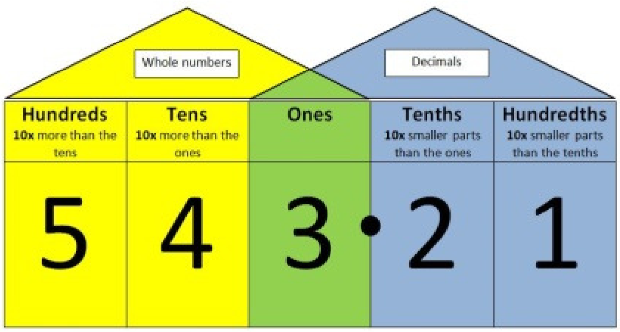
 (3 x 10) = ___  (4 x 10) = ___

Now try without the pictures:

1. There are ____ tenths in **7** (10 x 7)
2. There are ____ tenths in **6** (10 x 6)
3. There are ____ tenths in **9** (10 x 9)
4. There are ____ tenths in **8** (10 x 8)
5. There are _____ tenths in **11** (10 x 11)
6. There are _____ tenths in **10** (10 x 10)
7. There are _____ tenths in **12** (10 x 12)
8. There are _____ tenths in **17** (10 x 17)
9. There are _____ tenths in **15** (10 x 15)
10. There are _____ tenths in **19** (10 x 19)

Tenths are the first place value **smaller than 1** in the **'decimal'** system, and are the foundation for dealing with tiny parts of numbers.

$\frac{1}{10} = 0.1$



What if you're counting the 10ths in **other fractions** (there are 2 tenths in every 1 fifth)

11. There are ____ tenths in **1/5** (1/5 x 10)
12. There are ____ tenths in **3/5** (3/5 x 10)

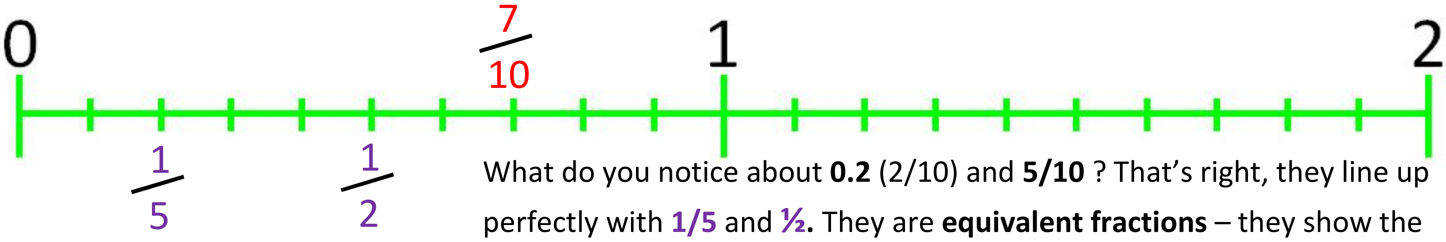
Tenths – not to be confused with 'tents' - that reminds me of a joke: You can't run through a campsite. You can only **RAN** – because it's *past tents*. =)

Dave Moran 2015

Using 10ths. *Stg 6* *props & ratios* Name: ________________________

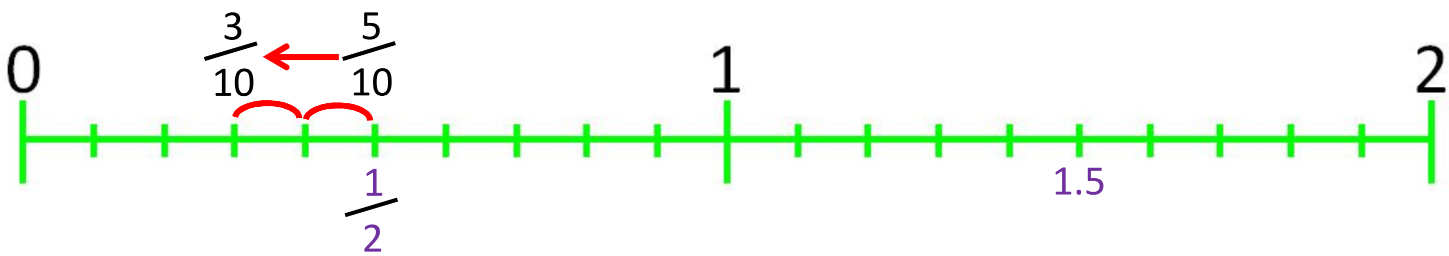
Dividing by 10, or splitting things into 10 parts is actually pretty easy. 10ths are easy because they behave in the same way as whole numbers, it's just that they're 10 times smaller. We can add, subtract, multiply and divide decimals nearly as easily as we do regular numbers. As we've learned, **1/10 is the same as 0.1** First, though let's have a go at seeing how tenths look compared to each other. Write the fractions or decimals in the correct position on the number line below:

$\frac{7}{10}$ 0.4 $\frac{3}{10}$ 1.2 $\frac{16}{10}$ 0.2 $\frac{9}{10}$ 1.9 $\frac{1}{10}$ 0.6 $\frac{17}{10}$ 0.2 $\frac{5}{10}$



What do you notice about **0.2** (2/10) and **5/10** ? That's right, they line up perfectly with **1/5** and **½.** They are **equivalent fractions** – they show the same amount but are chopped up differently.

Alright, lets ramp it up a little! Use the number line below to help you with these simple sums: E.g. 5/10 - 2/10 = 3/10



Remember, if the denominator is the same in both fractions, just keep it. (look out, they get harder)

6/10 – 3/10 = ____ 11/10 + 4/10 = ____ 12/10 – 4/10 = ____

4/10 + 6/10 = ____ 13/10 – 8/10 = ____ 9/10 + 7/10 = ____

1 – 2/10 = ____ **1** + 3/10 = ____ **2** – 12/10 = ____

½ + 1/10 = __ /10 ½ - 2/10 = __ /10 ½ + 6/10 = __ /10

'Decimals' are divided by 10 or multiples of 10. The word 'decimate' literally means to give away, or destroy one tenth of something. In modern language we use it to mean 'wreck everything'. E.g. "The cyclone will decimate that village"

Let's go for a conversion! Convert these fractions into decimals, or the other way around. Easy peasy.

E.g. 3/10 = 0.3 5/10 = __.__ 12/10 = __.__ 7/10 = __.__

0.6 = __ /10 1.7 = __ / 10 0.9 = __ /10 1.3 = __/10

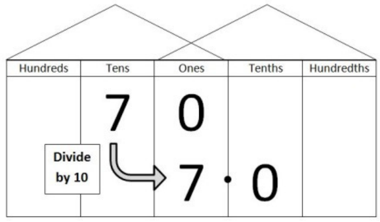
Some historians think that decimal fractions were first used by the Chinese in the first century BC (2100 years ago), and then spread to the Middle East and from there to Europe, where our modern mathematics was developed.

Picture: http://britton.disted.camosun.bc.ca/china%5Cdevelopment.htm

Dave Moran 2015

Using 10ths. *Stg 6 part2* *props & ratios* Name: ___________________________

Let's learn about finding tenths of whole numbers! Don't worry, it's easier than falling off a log. That's floating down a river. With rapids. Finding the tenth of a number is exactly the same as dividing by 10. We can get our old friend 'place value' to help us out. By merely shifting our digits across to smaller values we can divide any number by 10 instantly – and in the same way find out what 1/10 of that number is. E.g **1/10 of 70 = 7** (7.0, but we don't need the '.0')



Try it with these guys here:

1/10 of 80 = ___	1/10 of 60 = ___	1/10 of 10 = ___	1/10 of 90 = ___
1/10 of 7 = 0.__	1/10 of 3 = 0.__	1/10 of 4 = 0.__	1/10 of 8 = 0.__
1/10 of 30 = ___	1/10 of 20 = ___	1/10 of 40 = ___	1/10 of 50 = ___
1/10 of 120 = ___	1/10 of 100 = ___	1/10 of 110 = ___	1/10 of 75 = ___

What about that last one? – we do exactly the same thing, but keep the '5' because it has a value. Effectlvely all we seem to be doing is putting a dot in between the digits! Try some other tenths (you can say '**x**' for '**of**':

1/10 of 52 = ___	1/10 x 83 = ___	1/10 of 59 = ___	1/10 x 86 = ___
1/10 of 43 = ___	1/10 x 28 = ___	1/10 of 63 = ___	1/10 x 37 = ___

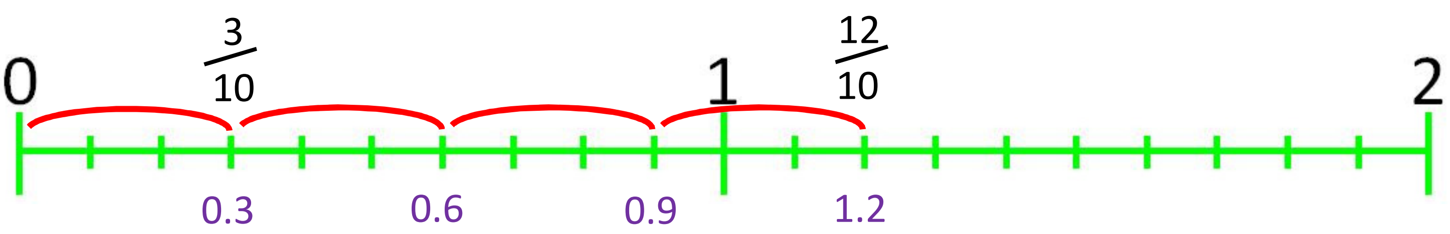
That's all very nice, but what if you have more than **one** tenth? No worries buddy, just multiply it by the numerator. E.g. **3/10 x 40 = 12**, because **1/10 of 40 = 4** then **4 x 3 = 12**

I.	1/10 x 50 = ___	so 3/10 x 50 =	(3 x 5) = _____
II.	1/10 x 90 = ___	so 5/10 of 90 =	(5 x ___) = _____
III.	1/10 x 80 = ___	so 7/10 x 80 =	(7 x ___) = _____
IV.	1/10 of 20 = ___	so 3/10 x 20 =	(3 x ___) = _____
V.	1/10 x 70 = ___	so 4/10 x 70 =	(4 x ___) = _____
VI.	1/10 x 110 = ___	so 6/10 x 110 =	(6 x ___) = _____
VII.	1/10 x 60 = ___	so 5/10 x 60 =	(5 x ___) = _____
VIII.	1/10 x 120 = ___	so 7/10 x 120 =	(7 x ___) = _____
IX.	1/10 x 3 = ___	so 3/10 of 3 =	(3 x ___) = _____
X.	1/10 of 4 = ___	so 9/10 x 4 =	(9 x ___) = _____

Interesting fact: just like there is no end to whole numbers (a concept called 'infinity') there is no end to decimal fractions either. No matter how small the fractions get, you can always divide it by 10 again. Spooky.

∞

What on Earth is happening here? Well, just like regular multiplication, we're skip counting up in sets. Say we're talking about **4/10ths of 3.** We know that **1/10 of 3 = 0.3**, or **3/10.** So, we just multiply that decimal by the numerator **4** to get **4 x 0.3 = 1.2**



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Using 10ths. *Stg E7* *props & ratios* Name: ____________________________

We've learned that it's possible to multiply fractions with the same denominator (straightforward) so what if we need to multiply 2 fractions that have different denominators? *Can you even do that?* Yerp, here's how:

In the example below we want to multiply 3/10 x 2/3. To get our heads around this it's good to remember that the 'X' symbol reads like 'of' when multiplying fractions. So we're trying to find 3/10 **of** 2/3.

$\frac{3}{10} \times \frac{2}{3}$

1. First, multiply the numerators $3 \times 2 = 6$
2. Then multiply the denominators $10 \times 3 = 30$
3. We get 6/30 – a strange fraction, so can we **simplify** it into something sleeker?
4. **Yes!** Both the numerator and the denominator are **divisible by 6**

$\frac{6}{30} \div 6 = \frac{1}{5}$

To simplify fractions, it pays to know your times-tables really well, because you need to find a **factor** that is common to both the denominator and the numerator. E.g: 1 x **6** = 6, 5 x **6** = 30. OK, we've got the basics, let's try a few. Nothing will get broken.

$\frac{9}{10} \times \frac{2}{5}$ 9 x 2 = ____ / 10 x 5 = ____ = ___ = ___

$\frac{2}{10} \times \frac{5}{6}$ 2 x 5 = ____ / 10 x 6 = ____ = ___ = ___

$\frac{6}{10} \times \frac{4}{7}$ 6 x 4 = ____ / 10 x 7 = ____ = ___ = ___

$\frac{7}{10} \times \frac{8}{11}$ 7 x 8 = ____ / 10 x 11 = ____ = ___ = ___

Handy tip: if the numerator and denominator of the fraction you are simplifying are both even, try halving then halving again to find the lowest common factor.

Wow, it's all a bit serious at first, but you'll get it- trust me!

Here's the cool thing: **dividing** by fractions is nearly the same process except for a little flip! It's just like multiplying, but you 'reciprocate' the second fraction – so ⅔ becomes 3/2 – the **reciprocal fraction.**

1. First multiply the 1st numerator by the 2nd denominator $1 \times 10 = 10$
2. then, multiply the 1st denominator by the 2nd numerator $2 \times 1 = 2$
3. We get 10/2, or ten halves –can we simplify it?
4. Yes! Ten halves is the same as **5**

$\frac{1}{2} \div \frac{1}{10} = \frac{1}{2} \times \frac{10}{1} = \frac{10}{2} = $ **5**

$\frac{1}{5} \div \frac{1}{10} = \frac{1}{5} \times \frac{10}{1} = $ ___ = ___

$\frac{2}{5} \div \frac{1}{10} = \frac{2}{5} \times \frac{10}{1} = $ ___ = ___

$\frac{4}{5} \div \frac{3}{10} = \frac{4}{5} \times \frac{10}{3} = $ ___ = ___

What we are really doing is here is saying how many times 1/10 fits into 1/2. It's easier to understand with simpler fractions. Check out the website below to get a fantastic explanation: www.mathsisfun.com/fractions_division.html

Dave Moran 2015