## MS4b: Counting On 12.4-9.8 = 2.6 <br> 

Choose which questions you want to practice below. Remember to do them mentally, practicing the mental maths method.

Easier
13.4-11.8

Trickier
124.13-111.89
104.66-89.93

## Fractions - Division

Dividing proper fractions by whole numbers

## What is a half divided by 2 ?



## A half divided by two is a quarter:




What is one half divided by six?


## One half divided by six?



$$
\frac{1}{2} \div 6=\frac{1}{12}
$$



## What is a one half divided by five?

## Back to the pie.

Divide the half into five pieces:


## One half divided by five is one tenth:



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

## What is one half divided by three?



## Quite easy to see?



## Now lets look for the connections:

$$
\begin{array}{ll}
\frac{1}{2} \div 2=\frac{1}{4} & \frac{1}{3} \div 2=\frac{1}{6} \\
\frac{1}{2} \div 6=\frac{1}{12} & \frac{1}{2} \div 5=\frac{1}{10}
\end{array}
$$

It seems that we could turn each into a multiplication:

$$
\begin{array}{ll}
\frac{1}{2} \times \frac{1}{2}=\frac{1}{4} & \frac{1}{2} \times \frac{1}{3}=\frac{1}{6} \\
\frac{1}{2} \times \frac{1}{6}=\frac{1}{12} & \frac{1}{2} \times \frac{1}{5}=\frac{1}{10}
\end{array}
$$

We see that multiplication and division are closely connected.

$$
\begin{array}{ll}
\frac{1}{2} \times \frac{1}{2}=\frac{1}{4} & \frac{1}{2} \times \frac{1}{3}=\frac{1}{6} \\
\frac{1}{2} \times \frac{1}{6}=\frac{1}{12} & \frac{1}{2} \times \frac{1}{5}=\frac{1}{10}
\end{array}
$$

## Let's try a few more:



What is a third divided by three?

## A third of a third:



## What is a third divided by four?



## A third divided by four is also a quarter of a third?



## A quarter of a third is a twelfth.



$$
\frac{1}{3} \div 4=\frac{1}{12}
$$

Now lets add some new numerators:

$\frac{2}{3} \div 4=?$

## Two thirds divided by four:



## Last one:



$$
\frac{3}{4} \div 5=?
$$

Three quarters divided by five:


3
$-5=$ ?
4

Three quarters divided by five:


$$
\frac{3}{4} \div 5=\frac{3}{20}
$$

## And looking at our last four results:

$$
\begin{array}{cc}
\frac{1}{3} \div 3=\frac{1}{9} & \frac{1}{3} \div 4=\frac{1}{12} \\
\frac{3}{4} \div 5=\frac{3}{20} & \frac{2}{3} \div 4=\frac{2}{12}=\frac{1}{6}
\end{array}
$$

## Again, we could use multiplication:

$$
\begin{array}{ll}
\frac{1}{3} \times \frac{1}{3}=\frac{1}{9} & \frac{1}{3} \times \frac{1}{4}=\frac{1}{12} \\
\frac{3}{4} \times \frac{1}{5}=\frac{3}{20} & \frac{2}{3} \times \frac{1}{4}=\frac{2}{12}=\frac{1}{6}
\end{array}
$$

