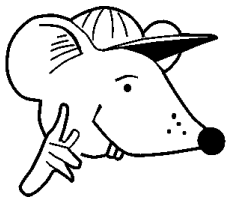
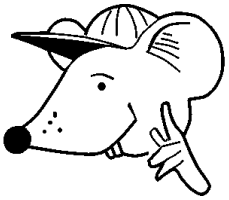
Back to Previous Menu



MATHEMATICS



N.S. Yr. 4 P.68

Develop and refine written methods for division.

Equipment

Pencil, paper.

MathSphere

Concepts

Children should understand that approximating an answer is important in many contexts and may be used to see if the answer to a problem looks reasonable.

In many cases, an approximate answer is all that is needed. Eg. If a garage base needs 3.7 cubic metres of concrete, it is sufficient to know that the answer is just under 4 cubic metres, as this is probably the amount that will need to be purchased anyway.

In this module, we are looking at estimating an answer and then using ideas that lead to a formal, written method of division.

Method 1.

Eg. 66 ÷ 4
First an approximate answer.

The answer to **66 ÷ 4** lies between **60 ÷ 4** and **68 ÷ 4**, ie between **15** and **17**.

Now perform the sum by using **multiples of the divisor** (ie multiples of 4) and 'nibbling' away at the dividend (first number in the division sum).

66 ÷ 4 = (40 + 26) ÷ 4 = 10 + 6 with a remainder of **2**
= **16** remainder **2**

Multiple of 4

We can also write this out like this:

	66	
	– 40	**(10 × 4)**
	26	
	– 24	**(6 × 4)**
Remainder →	**2**	

So the answer is **16** remainder **2**

Concepts (Contd)

Method 2.

Eg. 98 ÷ 6
First an approximate answer.

The answer to **98 ÷ 6** is approximately **100 ÷ 5 = 20**.

Lay the sum out in a more conventional manner, firstly taking away a tens multiple of the divisor (**6** in this case).

$$
\begin{array}{rll}
6\overline{)98} & & \\
-\ \underline{60} & & (10 \times 6) \\
\ \ 38 & & \\
-\ \underline{36} & & (6 \times 6) \\
\ \ 2 & &
\end{array}
$$

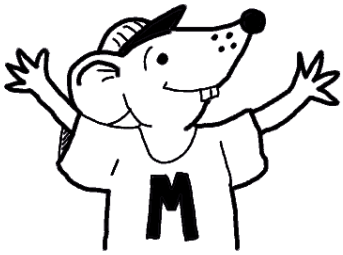
The answer to **98 ÷ 6** is therefore **16** remainder **2**

N.B. At first site, these two methods look very much the same when laid out vertically, but in the two following years, the methods will diverge, so please stick with it. If you wish to see where these ideas are leading, look at the same modules for years 5 and 6.

Children are obviously going to find this a difficult idea to grasp and in most cases will need a lot of help and encouragement.

In this module, we lead the children through the operation using only sums involving tens and units divided by units and then some examples for them to try.

It would probably be better to try just a few examples at a time and spread the work out to allow time for assimilation.



Now that you can do some division sums in your head, we are going to see how you can write down more difficult ones.

Always begin with an estimate of the answer.

Let's say we want to divide **77** by **5**.

First, we estimate the answer: **70 ÷ 5 = 14,** **80 ÷ 5 = 16**
So we expect our answer to be between **14** and **16**.

Piece of cake!

Now, let's do the sum. First we split the first number into a **multiple of 5** and a bit left over:

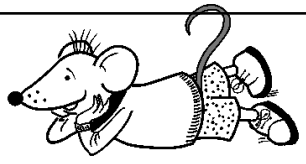
77 ÷ 5 = (50 + 27) ÷ 5

Then we divide the **50** by **5** and the **27** by **5**.
27 divided by **5** gives us a remainder of **2**

So: 77 ÷ 5 = (50 + 27) ÷ 5 = 10 + 5 remainder 2

So: 77 ÷ 5 = 15 remainder 2

Let's try another one!



Divide 96 by 7

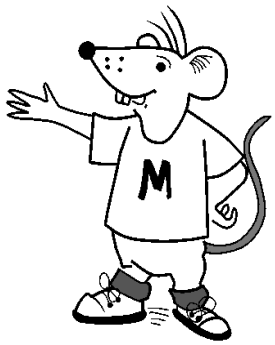
Multiple of 7

96 ÷ 7 = (70 + 26) ÷ 7 = 10 + 3 remainder 5

So: 96 ÷ 7 = 13 remainder 5 !!!!!!!!!! Yippee!!!!!!!!

Let's try one together.

You fill in the boxes.



Divide 53 by 8

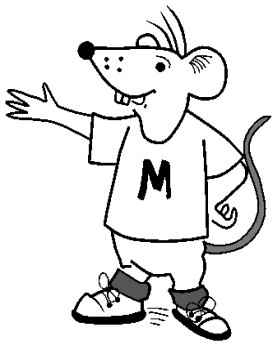
Multiple of 8

53 ÷ 8 = (☐ + 13) ÷ 8 = ☐ + 1 remainder 5

So: 53 ÷ 8 = ☐ remainder ☐

Ready for another.

You fill in all the boxes this time.



Divide 75 by 6

Multiple of 6

75 ÷ 6 = (☐ + ☐) ÷ ☐ = ☐ + ☐ remainder ☐

So: 75 ÷ 6 = ☐ remainder ☐

Now try these on your own. Don't forget to do an estimate.

a. 47 ÷ 4 **b.** 69 ÷ 5 **c.** 83 ÷ 6 **d.** 46 ÷ 3

e. 73 ÷ 6 **f.** 99 ÷ 7 **g.** 97 ÷ 8 **h.** 56 ÷ 4

We can also set these sums out vertically, like this:

Let's divide **78** by **5**

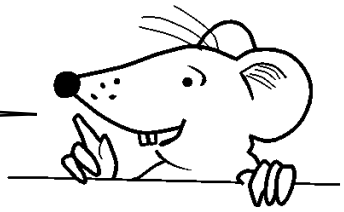
Multiple of 5

Another Multiple of 5

78
– 40 **(8 × 5)**
38
– 35 **(7 × 5)**
3

So the answer is 15 remainder 3

Let's try another one.



Let's divide **94** by **6**

Multiple of 6

Another Multiple of 6

94
– 60 **(10 × 6)**
34
– 30 **(5 × 6)**
4

So the answer is 15 remainder 4

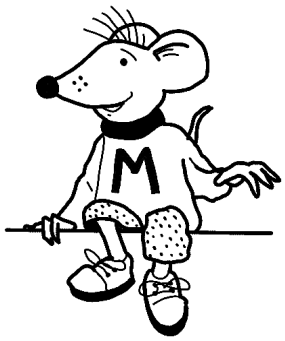
Now try these on your own. Don't forget to do an estimate.

a. 63 ÷ 5 **b.** 71 ÷ 4 **c.** 68 ÷ 6 **d.** 58 ÷ 4

e. 85 ÷ 7 **f.** 83 ÷ 5 **g.** 47 ÷ 3 **h.** 64 ÷ 4

Here is a slightly different method.

Lay the sum out vertically and take away a tens multiple of the divisor.



Let's divide **97** by **6**

Tens multiple of 6

Another Multiple of 6

$$\begin{array}{rll} 6\overline{)97} & & \\ -\ \underline{60} & (10 \times 6) & \\ 37 & & \\ -\ \underline{36} & (6 \times 6) & \\ \underline{\ 1} & & \end{array}$$

So the answer is 16 remainder 1

Now try these on your own. Don't forget to do an estimate.

a. 87 ÷ 7 **b.** 63 ÷ 5 **c.** 93 ÷ 8 **d.** 68 ÷ 5

e. 91 ÷ 6 **f.** 74 ÷ 6 **g.** 94 ÷ 8 **h.** 72 ÷ 5

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Answers

Page 5

53 ÷ 8 = (**40** + 13) ÷ 8 = **5** + 1 remainder 5

So: 53 ÷ 8 = 6 remainder 5

75 ÷ 6 = (**60** + **15**) ÷ **6** = **10** + **2** remainder **3**

So: 75 ÷ 6 = **12** remainder **3**

a. 11 r 3 **b.** 13 r 4 **c.** 13 r 5 **d.** 15 r 1
e. 12 r 1 **f.** 14 r 1 **g.** 12 r 1 **h.** 14 r 0

Page 6

a. 12 r 3 **b.** 17 r 3 **c.** 11 r 2 **d.** 14 r 2
e. 12 r 1 **f.** 16 r 3 **g.** 15 r 2 **h.** 16 r 0

Page 7

a. 12 r 3 **b.** 12 r 3 **c.** 11 r 5 **d.** 13 r 3
e. 15 r 1 **f.** 12 r 2 **g.** 11 r 6 **h.** 14 r 2