

N2.2

HTU ÷ U (whole-number answers)

objectives

- Recall multiplication facts to 10×10 and derive associated division facts.
- Calculate mentally $TU \div U$.
- Use a written method to calculate $HTU \div U$.
- Check whether a result is the right order of magnitude.
- Round up or down after division, depending on context.

starter

Vocabulary

times
multiplied by
divided by
product
multiple
remainder
squared

Resources

mini-whiteboards

As a class, chant the three times table, forwards and backwards. Ask a few random questions, varying the wording. Ask the class:

Q Which statements in the three times table are easy to remember? Why? Which are harder to remember? (e.g. 3×7 , 3×8)

Repeat the 'harder' facts three times each.

Ask a few random questions related to the table, varying the wording.

Q What is 9 times 3?

Q What is 27 divided by 3?

Q What is the product of 6 and 3?

Q What is 3 squared?

Q What is 3 multiplied by 8?

Q What is the next multiple of 3 after 30? How did you work it out?
(add 3 to 30)

Q How many threes are there in 21?

Q What is the remainder when 29 is divided by 3?

main activity

Vocabulary

problem
calculation
division
factors

Resources

OHT N2.2a
ITP *Grouping* (optional)

You could, if you wish, introduce the main activity by using the ITP *Grouping* downloaded from www.standards.dfes.gov.uk/numeracy.

Write $42 \div 3$ on the board. Show the class how to partition to calculate this mentally. Split the first number into a multiple of 10 that is an exact multiple of the divisor 3, plus the rest. So 42 is split into $30 + 12$, then each part is divided by 3.

$$\begin{array}{r} 42 \\ 30 + 12 \\ \downarrow \quad \downarrow \quad \div 3 \\ 10 + 4 = 14 \end{array}$$

Practise some examples, such as $68 \div 4$ (splitting 68 into $40 + 28$) and $90 \div 6$ (splitting 90 into $60 + 30$).

Write this problem on the board, or prepare it on an OHT.

*There are 6 stamps on every card of self-adhesive stamps.
John bought a total of 138 stamps.
How many cards of stamps did John buy?*

Ask pupils to work in pairs for a few minutes to try to answer the problem, then take feedback.

Establish that we need to know how many sixes there are in 138, or $138 \div 6$, and that the answer to this problem will be a whole number bigger than 20 (enough cards for 120 stamps) and less than 30 (enough cards for 180 stamps). It will be closer to 20 than to 30 because 138 is closer to 120 than to 180. Illustrate this if necessary by drawing an empty number line, marking the multiples of 10 from 120 to 180, and pointing out the position of 138. One way to work out the answer would be to keep subtracting six stamps but that this might take a long time. It would be easier to take away 60 stamps for 10 cards in one go, and then see what is left.

Write on the board:

$$\begin{array}{r} 138 \div 6 \\ \underline{60} \quad 6 \times 10 \\ 78 \\ \underline{60} \quad 6 \times 10 \\ 18 \\ \underline{18} \quad 6 \times 3 \\ 0 \end{array}$$

Q How many lots of 6 stamps have we taken away? ($10 + 10 + 3 = 23$)

Establish that the answer to $138 \div 6$ is 23.

Show pupils how the calculation could be made more efficient by subtracting 120 stamps all at once.

$$\begin{array}{r} 138 \div 6 \\ \underline{120} \quad 6 \times 20 \\ 18 \\ \underline{18} \quad 6 \times 3 \\ 0 \end{array}$$

Demonstrate an example with a remainder, such as $140 \div 6$, recording the answer as 23 r 2. Discuss with the class how to deal with the remainder in the context of two different problems.

*A baker packs cakes in boxes of 6.
The baker has baked 140 cakes.
How many boxes can the baker fill?*

*Eggs are packed in boxes of 6.
Some chickens have laid 140 eggs.
How many boxes will be used to pack all the eggs?*

Explain that in the first problem the answer will be a whole number of boxes. $140 \div 6$ is 23 r 2. The answer will need to be rounded down to 23, the number of full boxes

of cakes. In the second problem, the answer will again be a whole number of boxes, but in this case the answer must be rounded up to 24. 23 of the boxes will hold 6 eggs, and one box will hold 2 eggs. Stress to pupils that they need to think about the context of the problem before they round up or down.

Work through the problems on **OHT N2.2a**. Ask questions such as:

- Q What is the question asking us to calculate?**
- Q What are the key words in the question?**
- Q Which operation shall we use?**
- Q What is the approximate answer?**
- Q How shall we show our working?**
- Q Should the answer be rounded up or down in the context of the question?**

Make sure that pupils can explain the key steps in the calculation.

other tasks

Springboard 7 Unit 10

Unit 10 section 3: Division

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| 1 | Division using related multiplication facts | page 338 |
| 2 | Division | page 338 |
| 3 | Estimate then work out | page 339 |
| | Star challenge 7: Increasing in difficulty | page 339 |

Unit 10 section 4: Division II

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| | Star challenge 9: Word problems | page 342 |
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plenary

Resources

OHT N2.2b

ITP *Division grid*
(optional)

You could, if you wish, use the ITP *Division grid* downloaded from www.standards.dfes.gov.uk/numeracy to support the plenary of this lesson. Select options and ask questions to consolidate pupils' understanding.

Show **OHT N2.2b**, and complete with the class the first multiplication table.

Show the second multiplication table and ask pupils to study it in pairs. Tell them that the task is to fill in all the blank spaces in the table. If they have difficulty in getting started, suggest that they think about the possible factors of 21 in the bottom right corner of the table.

After a few minutes, take feedback, and work through the solution. Emphasise that using knowledge of multiplication and division facts helped to eliminate or confirm possible values, and that to solve the whole puzzle required systematic working.

Remember

- To calculate mentally $56 \div 4$, split the first number into a multiple of 10 that is an exact multiple of the divisor 4, plus the rest. So 56 is split into $40 + 16$, then each part is divided by 4.
- When you calculate $HTU \div U$, estimate the answer first. Set the calculation out carefully and work systematically and efficiently. Check the answer against the estimate.
- Check that the answer to a division calculation makes sense in the context of the problem. Think carefully whether it should be rounded up or down.

Gwen has a box of 250 staples.
She uses 7 staples to make a kite.

How many complete kites can she make
using the 250 staples?

Show your working.

..... kites

Shrubs cost £9 each. Mr Pym has £250.
He wants to buy as many shrubs as possible.

How many shrubs can Mr Pym buy?

Show your working.

..... shrubs

A teacher needs 220 booklets.
The booklets are in packs of 8.

How many packs must the teacher order?

Show your working.

..... packs

\times	4	5	3
2			
4			
7			

\times
...	60		
...		80	28
...	36		21