Week 9, Day 1
Mental multiplication and division

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. Start by reading through the **Learning Reminders**.
   They come from our *PowerPoint* slides.
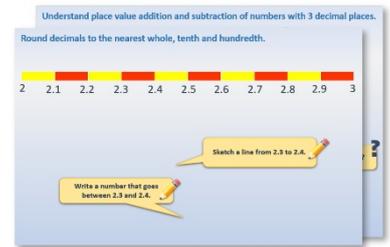
2. Tackle the questions on the **Practice Sheet**.
   There might be a choice of either Mild (easier) or
   Hot (harder)!
   Check the answers.
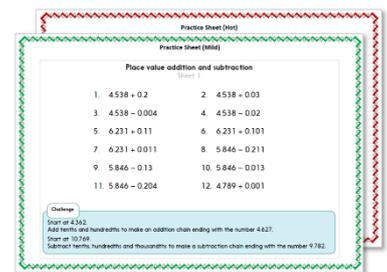
3. Finding it tricky? That's OK… have a go with a
   grown-up at **A Bit Stuck?**
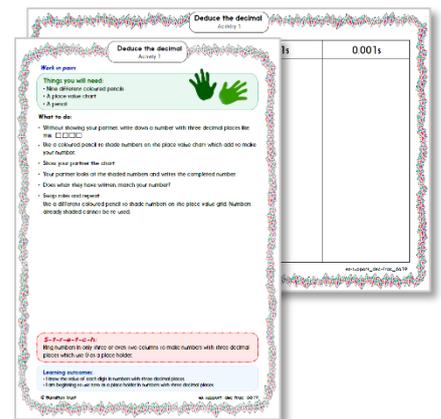
4. Have I mastered the topic? A few questions to
   Check your understanding.
   Fold the page to hide the answers!
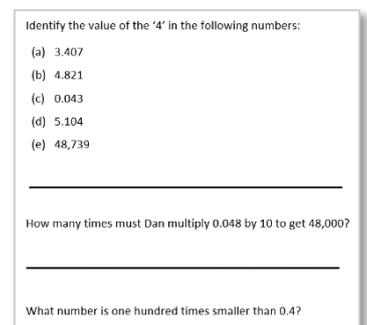
Learning Reminders

Use mental multiplication and division.

List ALL the pairs of factors of 36.

Pair of factors: 4 and 9

$4 \times 9 = 36$
$4 \times 90 = 360$
$4 \times 900 = 3600$
$4 \times 9000 = 36{,}000$
$36 \div 9 = 4$
$360 \div 9 = 40$
$360 \div 90 = 4$
$3600 \div 9 = 400$

If we know $4 \times 9 = 36$, what is 4×90? 4×900? 4×9000? **?**

What is $36 \div 9$? So what is $360 \div 9$? $360 \div 90$? $3600 \div 9$? **?**

Use one other pair of factors to generate a similar list of facts using place value.

Pair of factors: 6 and 6

$6 \times 6 = 36$
$6 \times 60 = 360$
$6 \times 600 = 3600$
$6 \times 6000 = 36{,}000$
$36 \div 6 = 6$
$360 \div 60 = 6$
$360 \div 6 = 60$
$3600 \div 6 = 600$

Pair of factors: 3 and 12

$3 \times 12 = 36$
$3 \times 120 = 360$
$3 \times 1200 = 3600$
$3 \times 12000 = 36{,}000$
$36 \div 12 = 3$
$360 \div 12 = 30$
$360 \div 120 = 3$
$3600 \div 12 = 300$

Two examples.

Learning Reminders

Use mental multiplication and division.

> Work out 2 × 456 and 10 × 456.

> Now we know these two facts, what others can we work out? ?

> e.g. We could use the answers to find 4 × 456, 5 × 456, 20 × 456 and the associated divisions.

2 x 456 = **902**
Double to give
4 x 456 = 1804; 1804 ÷ 456 = 4

10 x 456 = **4560**
Halve to give
5 x 456 = 2280; 2280 ÷ 456 = 5
Double to give
20 x 456 = 9120; 9120 ÷ 20

> Find 3 x 43, then derive other related multiplications and divisions.

3 x 43 = **129**
E.g. use doubling and halving
6 x 43 = ? And the related division?
30 x 43 = ? And the related division?
15 x 43 = ? And the related division?

Learning Reminders

Use mental multiplication and division.

Today's tip is <u>don't launch straight into a written method</u>. Look at the numbers - you may find it more efficient to use a <u>mental strategy</u>!

3 × 8742	3 × 2101	2 × 2.35,
450 ÷ 9	4326 ÷ 3	3603 ÷ 3

Think which ones you would solve mentally.
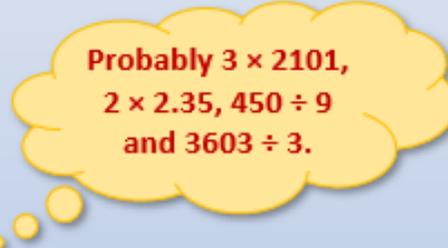
Probably 3 × 2101, 2 × 2.35, 450 ÷ 9 and 3603 ÷ 3.

Practice Sheet Mild
Using mental strategies to multiply

1. List ALL the factors of 28.

2. Write two common multiples of 3 and 4.

3. Solve these:

   36 × 10   36 × 2   36 × 3

4. Use your answers from question 1 to easily solve:

   36 × 5   36 × 20   36 × 4   36 × 8   36 × 6

5. Use similar strategies to solve the following:

   76 × 5

   64 × 20

   53 × 6

   82 × 4

   37 × 8

   153 × 5

   240 × 20

   In each case note down what you did to find the answer,

   e.g. 'Multiplied by 10 and then doubled'.

6. Does 24 x 30 give the same answer as 34 x 20?

   Make a prediction.

   Use mental strategies to solve each multiplication and test your prediction.

Challenge

Can you find a strategy for quickly solving these:
36 × 50   36 × 200   36 × 60

(Hint! Look at what you already know.)

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Practice Sheet Hot
Multiples, factors, multiplication and division

1. Write ALL the factors of 24.

2. If a number has 10 as a factor, what other three factors must it have?

3. If a number has 6 as a factor, what other three factors must it have?

4. Write two common multiples of 4 and 5.

5. Write three common multiples of 2, 3 and 5.

6. $2 \times 6 \times 5$

7. $15 \times 3 \times 2$

8. $4 \times 5 \times \boxed{} = 120$

9. $7 \times \boxed{} \times 5 = 350$

10. 720×4

11. $\boxed{} \times 80 = 480$

12. $450 \div 90$

13. $7 \times \boxed{} = 3500$

14. 8×23

15. 5×348

16. 25×36

17. $186 \div 5$

18. $284 \div 20$

Practice Sheets Answers

Using mental strategies to multiply (mild)

1. Factors of 28: 1, 28; 2, 14; 4, 7
2. Common multiples of 3 and 4, e.g. 12 and 24, i.e. multiples of 12
3. 36 × 10 = 360
    36 × 2 = 72
    36 × 3 = 108
4. 36 × 5 = 180
    36 × 20 = 720
    36 × 4 = 144
    36 × 8 = 288
    36 × 6 = 216
5. 76 × 5 = 380
    64 × 20 = 1280
    53 × 6 = 318
    82 × 4 = 328
    37 × 8 = 296
    153 × 5 = 765
    240 × 20 = 4800
6. 30 x 24 = 720   20 x 34 = 680

> **Challenge**
>
> 36 × 50 = 180 36 × 200 = 7200 36 × 60 = 2160
> Students should notice that these multiplications are similar to the first three multiplications in Question 2, except the second number has been multiplied by ten. This means that students simply need to add on a zero to the answers they already have.

Multiples, factors, multiplication and division (hot)

1.   1, 2, 3, 4, 6, 8, 12, 24
2.   1, 2, 5
3.   1, 2, 3
4.   20, 40
5.   30, 60, 90
6.   2 × 6 × 5 = 60
7.   15 × 3 × 2 = 90
8.   4 × 5 × 6 = 120
9.   7 × 10 × 5 = 350
10. 720 × 4 = 2880
11. 6 × 80 = 480
12. 450 ÷ 90 = 5
13. 7 × 500 = 3500
14. 8 × 23 = 184
15. 5 × 348 = 1740
16. 25 × 36 = 900
17. 186 ÷ 5 = 37.2
18. 284 ÷ 20 = 14.2

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Work in pairs

Things you will need:
• A pencil
• A large piece of paper

What to do:

• Work in pairs to write out the 6 times table on the left of the piece of paper.

• Next to this write out the 60 times table. Remember - you can multiply by 10 to get the answers.

• Now write out the 600 times table!

1 x 6 = 6	1 x 60 = 60	1 x 600 = 600
2 x 6 = 12	2 x 60 = 120	2 x 600 = 1200
3 x 6 = 18		
4 x 6 = …		

S-t-r-e-t-c-h:
Use more Mammoth tables facts to find the missing numbers:

8 x ☐ = 160   7 x ☐ = 2100   ☐ x 5 = 4000   ☐ x 9 = 630

Learning outcomes:
• I can use known times tables and place value to multiply, e.g. 6 x 3, 6 x 30, 12 x 300.
• I am beginning to use known times tables and place value to solve problems.

Check your understanding
Questions

Write the correct symbol (<, > or =) in each box to make the statements correct:

$$12 \times 12 \; \square \; 14 \times 10$$
$$80 \div 20 \; \square \; 90 \div 30$$
$$240 \div 6 \; \square \; 270 \div 9$$
$$800 \times 5 \; \square \; 70 \times 50$$

Sophia has the digit cards 6, 7 and 5.

She makes a 2-digit number and a 1-digit number.

She multiplies them together.

Her answer is a multiple of 10.

What could Sophia's multiplication be?

Fold here to hide answers

Check your understanding
Answers

Write the correct symbol (<, > or =) in each box to make the statements correct:

$$12 \times 12 \; > \; 14 \times 10$$
$$80 \div 20 \; > \; 90 \div 30$$
$$240 \div 6 \; > \; 270 \div 9$$
$$800 \times 5 \; > \; 70 \times 50$$

A child consistently using < rather than > is most likely reading the symbol 'the wrong way around'.

Sophia has the digit cards 6, 7 and 5.

She makes a 2-digit number and a 1-digit number.

She multiplies them together.

Her answer is a multiple of 10.

What could Sophia's multiplication be?

76×5 or 75×6. Since $7 \times 6 = 42$ and $7 \times 5 = 35$ the 6 and 5 must each be 1s digits for the answer to be a multiple of 10.

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