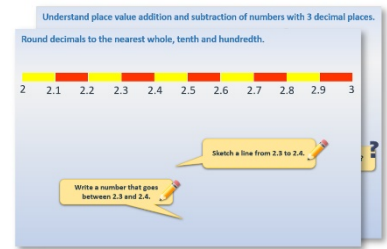


# Week 9, Day 1

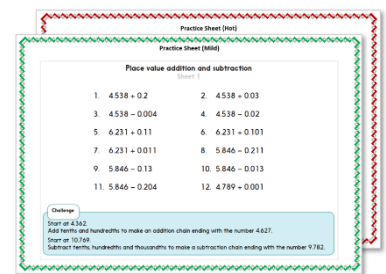
## Mental multiplication and division

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

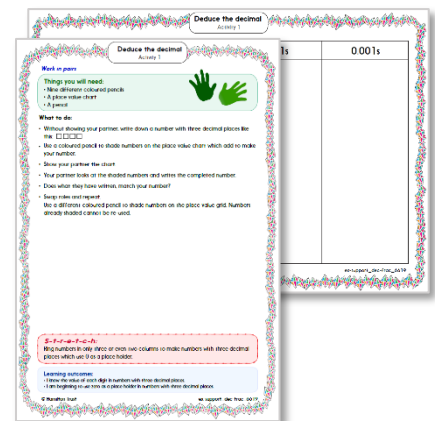
1. Start by reading through the **Learning Reminders**. They come from our *PowerPoint* slides.



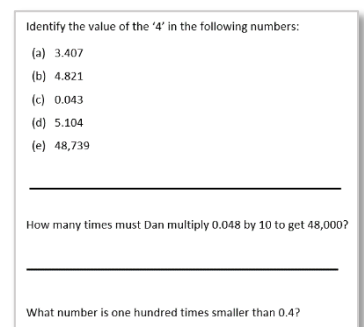
2. Tackle the questions on the **Practice Sheet**. There might be a choice of either **Mild** (easier) or **Hot** (harder)! Check the answers.



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  $4 \times 90$ ?  
 $4 \times 900$ ?  $4 \times 9000$ ?

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: 3 and 12

$$3 \times 12 = 36$$

$$3 \times 120 = 360$$

$$3 \times 1200 = 3600$$

$$3 \times 12000 = 36,000$$

$$36 \div 12 = 3$$

$$360 \div 12 = 30$$

$$360 \div 120 = 3$$

$$3600 \div 12 = 300$$

Pair of factors: 6 and 6

$$6 \times 6 = 36$$

$$6 \times 60 = 360$$

$$6 \times 600 = 3600$$

$$6 \times 6000 = 36,000$$

$$36 \div 6 = 6$$

$$360 \div 6 = 60$$

$$360 \div 60 = 6$$

$$3600 \div 6 = 600$$

$$3600 \div 600 = 6$$

Two examples.

## Learning Reminders

Use mental multiplication and division.

Work out  $2 \times 456$  and  
 $10 \times 456$ .



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

e.g. We could use the answers to find  
 $4 \times 456$ ,  $5 \times 456$ ,  
 $20 \times 456$  and the associated divisions.

$2 \times 456 = 902$   
Double to give  
 $4 \times 456 = 1804$ ;  $1804 \div 456 = 4$   
 $10 \times 456 = 4560$   
Halve to give  
 $5 \times 456 = 2280$ ;  $2280 \div 456 = 5$   
Double to give  
 $20 \times 456 = 9120$ ;  $9120 \div 20$

Find  $3 \times 43$ , then derive other related multiplications and divisions.


$3 \times 43 = 129$   
E.g. use doubling and halving  
 $6 \times 43 = ?$  And the related division?  
 $30 \times 43 = ?$  And the related division?  
 $15 \times 43 = ?$  And the related division?

## Learning Reminders

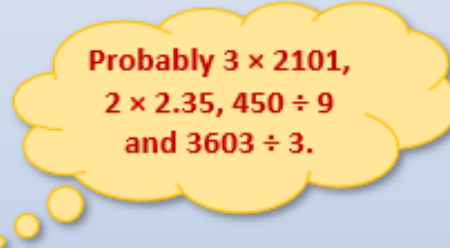
Use mental multiplication and division.

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

$$\begin{array}{lll} 3 \times 8742 & 3 \times 2101 & 2 \times 2.35, \\ 450 \div 9 & 4326 \div 3 & 3603 \div 3 \end{array}$$



Think which ones you would solve mentally.



Probably  $3 \times 2101$ ,  
 $2 \times 2.35$ ,  $450 \div 9$   
and  $3603 \div 3$ .

## Practice Sheet Mild

### Using mental strategies to multiply

- List ALL the factors of 28.
- Write two common multiples of 3 and 4.
- Solve these:  
 $36 \times 10$     $36 \times 2$     $36 \times 3$
- Use your answers from question 1 to easily solve:  
 $36 \times 5$     $36 \times 20$     $36 \times 4$     $36 \times 8$     $36 \times 6$
- Use similar strategies to solve the following:  
 $76 \times 5$   
 $64 \times 20$   
 $53 \times 6$   
 $82 \times 4$   
 $37 \times 8$   
 $153 \times 5$   
 $240 \times 20$   
In each case note down what you did to find the answer,  
e.g. 'Multiplied by 10 and then doubled'.
- Does  $24 \times 30$  give the same answer as  $34 \times 20$ ?  
Make a prediction.  
Use mental strategies to solve each multiplication and test  
your prediction.

#### Challenge

Can you find a strategy for quickly solving these:

$36 \times 50$     $36 \times 200$     $36 \times 60$

*(Hint! Look at what you already know.)*

## 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.  $4 \times 5 \times \square = 120$
9.  $7 \times \square \times 5 = 350$
10.  $720 \times 4$
11.  $\square \times 80 = 480$
12.  $450 \div 90$
13.  $7 \times \square = 3500$
14.  $8 \times 23$
15.  $5 \times 348$
16.  $25 \times 36$
17.  $186 \div 5$
18.  $284 \div 20$

## Practice Sheets Answers

### Using mental strategies to multiply (mild)

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

### Challenge

$$36 \times 50 = 180 \quad 36 \times 200 = 7200 \quad 36 \times 60 = 2160$$

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)

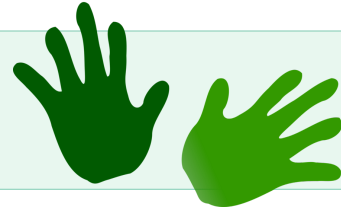
- 1, 2, 3, 4, 6, 8, 12, 24
- 1, 2, 5
- 1, 2, 3
- 20, 40
- 30, 60, 90
- $2 \times 6 \times 5 = 60$
- $15 \times 3 \times 2 = 90$
- $4 \times 5 \times 6 = 120$
- $7 \times 10 \times 5 = 350$
- $720 \times 4 = 2880$
- $6 \times 80 = 480$
- $450 \div 90 = 5$
- $7 \times 500 = 3500$
- $8 \times 23 = 184$
- $5 \times 348 = 1740$
- $25 \times 36 = 900$
- $186 \div 5 = 37.2$
- $284 \div 20 = 14.2$

## A Bit Stuck? Mammoth multiplications

**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!

	$1 \times 6 = 6$	$1 \times 60 = 60$	$1 \times 600 = 600$
	$2 \times 6 = 12$	$2 \times 60 = 120$	$2 \times 600 = 1200$
	$3 \times 6 = 18$		
	$4 \times 6 = \dots$		

### **S-t-r-e-t-c-h:**

Use more Mammoth tables facts to find the missing numbers:

$8 \times \square = 160$

$7 \times \square = 2100$

$\square \times 5 = 4000$

$\square \times 9 = 630$

### Learning outcomes:

- I can use known times tables and place value to multiply, e.g.  $6 \times 3$ ,  $6 \times 30$ ,  $12 \times 300$ .
- 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:

$$12 \times 12 \quad \square \quad 14 \times 10$$

$$80 \div 20 \quad \square \quad 90 \div 30$$

$$240 \div 6 \quad \square \quad 270 \div 9$$

$$800 \times 5 \quad \square \quad 70 \times 50$$

---

Sophia has the digit cards  $\boxed{6}$ ,  $\boxed{7}$  and  $\boxed{5}$ .

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*

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## Check your understanding

### Answers

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

$$12 \times 12 \quad > \quad 14 \times 10$$

$$80 \div 20 \quad > \quad 90 \div 30$$

$$240 \div 6 \quad > \quad 270 \div 9$$

$$800 \times 5 \quad > \quad 70 \times 50$$

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

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Sophia has the digit cards  $\boxed{6}$ ,  $\boxed{7}$  and  $\boxed{5}$ .

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?

$76 \times 5$  or  $75 \times 6$ . 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.