

# **Mental Maths**

## **Year 5**

**I can multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 and explain the effect**

Solve:

$$345 \times 10 =$$

$$345 \times 100 =$$

Fill the gaps:

$$3790 \times \square = 379000$$

$$3790 \div \square = 379$$

$$\square \times 1000 = 497200$$

Harry has £20, he wants to save 10 times this amount.

**Q** How much more does he need to save?

Claire says

'When you multiply a number by 10 you just add a nought and when you multiply by 100 you add two noughts.'

**Q** Do you agree? Explain your answer.

Apples weigh about 160g each.

**Q** How many apples would you expect to get in a 2kg bag?  
Explain your reasoning.

$$6 \times 7 = 42$$

**Q** How can you use this fact to solve the following calculations?

$$4200 \div 70 =$$

$$0.6 \times 0.7 =$$

Here are the answers to some questions.

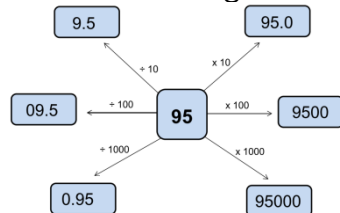
**Q** Can you write three different questions that could make these numbers by multiplying and dividing by 10, 100 or 1000?

5890, 40, 67000, 2000

David has £35700 in his bank. He divides the amount by 100 and takes that much money out of the bank. Using the money he has taken out he spends £268 on furniture for his new house.

**Q** How much money does David have left from the money he took out? Show your working.

Look at the diagram below:



Tick the boxes which are correct and put a cross next to the boxes which are incorrect.  
Explain what the correct answer should be.

Put these calculations in order from smallest to biggest:

$$100 \times 540$$

$$5.4 \times 1000$$

$$5400 \div 10$$

$$5400 \div 1000$$

$$540 \div 10$$

**Q** By using a number from column A, an operation from B and a number from C, how many ways can you find to make 70?

A	B	C
7	X	1
70		10
700	÷	100
7000		1000

**Q** Can you find a path from 6 to 0.06?

You are not allowed to make diagonal moves.

<b>6</b>	x 10	x 10	÷ 100
÷ 10	x 100	x 100	÷ 10
x 10	÷ 10	÷ 1000	÷ 100
÷ 1000	x 1000	x 100	<b>0.06</b>

B is 10 times bigger than A  
C is 1000 times bigger than A

**Q** What is the value of  $C \div B$ ?

I know by heart all squares of multiples of 10 up to 100  
I can recognise and use cube numbers, and the notation for cubed (<sup>3</sup>)

Work out:

$6^2 =$

$3^3 =$

$4 \text{ squared} =$

$8 \text{ cubed} =$

Fill in the missing answers from the grid below:

$4^3$	$4 \times 4 \times 4$	64
$7^2$	$7 \times 7$	
$2^7$	$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$	
$5^3$		
$3^6$		
	$4 \times 4 \times 4 \times 4$	
		8
$6^3$		

Julian thinks that 42 is 16.

**Q** Do you agree?

Convince me.

**Q** Always, Sometimes, Never?

A square number has an even number of factors.

**Q** Always, Sometimes, Never?

Square and Cubed numbers are always positive.

Last year my age was a square number. Next year it will be a cube number.

**Q** How old am I?

**Q** How long must I wait until my age is both a square number and a cube?

The answer to a cubed number is 216.

**Q** What's the root number?

**I can count forwards in steps of powers of 10 for any given number up to 1,000,000**  
**I can count backwards in steps of powers of 10 for any given number up to 1,000,000**

Finish the sequence:

1000, 2000, 3000, \_\_\_\_\_, \_\_\_\_\_

350, 340, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

11800, 11900, \_\_\_\_\_, \_\_\_\_\_

Fill in the missing numbers:

4523			
9000			6000
13,450	12,450		
102,342		100,342	

Spot the error:

289636, 299636, 300636, 301636, 302636

**Q** Can you spot the mistake?

18700, 18800, 18900, 19100

Correct the mistake and explain your working.

**Q** True or False?

When I count in 10's I will say the number 12300.

**Q** What are the next three number sentences in the sequence?

$$345000 - 1000 = 344000$$

$$344000 - 1000 = 343000$$

$$343000 - 1000 = 342000$$

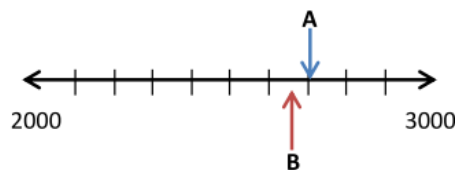
**Q** Could you use the same numbers to write different number sentences?

Jenny counts forward and backwards in 10s from 317.

**Q** Which numbers could Jenny count as she does this?

427	997	507
1,666	3,210	5,627
-23	7	-3

Here is a number line:



**Q** What is the value of A?

B is 10 less than A.

**Q** What is the value of B?

**Q** Can you count back in 30's to find the trail through the grid?

START							
394,432	394,492	394,585	394,705	394,505	394,805	394,905	
394,118	394,402	394,372	394,625	394,957	394,891	394,635	
394,292	394,312	394,342	394,302	394,645	394,665	394,232	
394,888	394,282	394,485	394,499	394,680	394,685	394,605	
394,578	394,252	394,222	394,192	394,102	394,072	394,042	
393,565	393,798	393,411	393,162	393,132	393,082	394,012	
393,565	393,166	393,374	393,641	393,445	393,052	FINISH	393,022

**I know the factors of all numbers up to 12 x 12**

Use 12 cubes.

**Q** How many different arrays can you make?

Think about making towers of cubes that are equal in height.

**Q** Can you write a multiplication sentence to describe the towers?

The numbers in your multiplication sentences are the factors of 16!

Now explore the factors of other numbers up to 12.

Missing number sentences:

$$7 \times 5 = \square = 5 \times \square$$

$$12 \times 6 = 6 \times \square$$

$$2 \times 3 \times 5 = \square \times 5$$

$$2 \times 7 \times 5 = \square$$

13 x 12 can be solved by using factor pairs, e.g. 13 x 3 x 4 or 13 x 2 x 6.

**Q** What factor pair could you use to solve 17 x 8?

Fill in the missing numbers:

$$25 \times 3 = \square \times \square \times \square$$

Here are six number pairs.

3    4    6

8    12    16

Use the cards to complete three factor pairs.

$$\square \times \square$$

$$\square \times \square$$

$$\square \times \square$$

**Q** Can you write any more factor pairs for this number?

Write down:

- the first 5 multiples of 8.
- all the factors of 20.
- a common factor of 36 and 12.

Use factor pairs to solve 15 x 8.

**Q** Is there more than one way you can do it?

Rob and James are talking about multiples and factors.

Rob says '0 is a multiple of every whole number.'

James says '0 is a factor of every whole number.'

**Q** Who is correct?

Explain why 6 is a common factor of 18 and 24.

Tom says:

'Factors come in pairs, so all numbers have an even number of factors.'

**Q** Do you agree?

Explain your reasoning.

Multiply a number by itself and then make one factor one more and the other one less.

**Q** What do you notice?

**Q** Does this always happen?

E.g.  $4 \times 4 = 16$

$6 \times 6 = 36$

$5 \times 3 = 15$

$7 \times 5 = 35$

Try out more examples to prove your thinking.

Place  $<$ ,  $>$ , or  $=$  in these number sentences to make them correct:

$50 \times 4 \square 4 \times 50$

$4 \times 50 \square 40 \times 5$

$200 \times 5 \square 3 \times 300$

The school has a singing group of more than 12 singers but less than 32.

They sing together in different ways.

Sometimes they sing in pairs and sometimes in groups of 3, 4 or 6.

**Q** Whatever size groups they are in, no one is left out and everyone is singing.

**Q** How many singers are there in the school choir?

Polly is planting potatoes in her garden. She has 24 potatoes to plant and she will arrange them in a rectangular array.

List all the different ways that Polly can plant her potatoes.



**I can write a percentage as a fraction of 100**

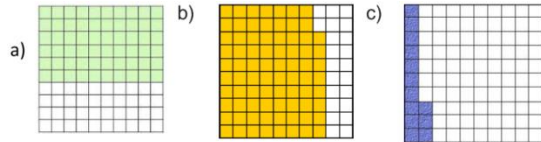
Write the decimals as percentages.

a) 0.2    b) 0.7    c) 0.35    d) 0.56    e) 0.98

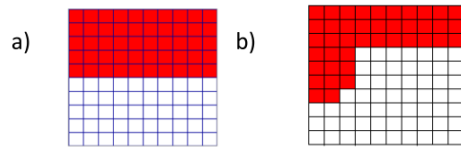
2. Write the percentages as decimals.

a) 10%    b) 60%    c) 40%    d) 25%    e) 75%    f) 81%

Write the amount shaded as a fraction, decimal and percentage.



Write the shaded amount as a decimal and a percentage.



Order the amounts from highest to lowest

0.6    62%    0.68    0.7    65%

There are 100 malteasers in a bag. 56 were eaten.

**Q** How many are left?

Write this as a fraction and as a decimal.

There are 200 lego pieces in a box. Theo uses 114 of them to build a robot.

Write the amount he used as a percentage out of 100

Fill in the missing boxes to make the statement true:

$$\square\% = \square/100 = 0.1$$

Clare reads 150 pages of her 500 page book. She says:

"I have pages left to read."

**Q** Can she write this as a percentage out of 100?

Explain why.

**Q** True or false?

You can write 12.5% as a decimal.

Explain your answer.

Lilly has a 100 square grid. She colours in 25% of them and says:

"I have coloured in 1/4 "

**Q** Is she right?

Explain why.

This 50 square grid showing a percentage out of 100 has been cut up. Work out the percentage from the pieces below.



**I know the basic fraction/percentage/decimal equivalences  
I can write a decimal number as a fraction**

Complete this table:

Fraction	Decimal	Percentage
6/10		
	0.2	
		25%
37/100		
	0.68	
		5%

Ash spends  $\frac{3}{5}$  of his money on a coat and 30% on shoes. He started with £55.

**Q** How much does he have left?

A painter uses  $\frac{1}{25}$  of white paint to paint a wall.

**Q** What percentage does he have left?

Here are a mix of equivalent percentages, fractions and decimals.

(provide with the above)

Put them into correct piles.

Helen, Adam and Sam are talking about which fractions are equivalent to 0.4.

Adam: "4/10 is equivalent to 0.4"

Helen: "40/100 is equivalent to 0.4."

Sam: "1/4 is equivalent to 0.4".

**Q** Who is correct?

Justify your answer.

Blake is working out how much money he can spend on his dad's birthday present. He wants to spend 60% on a camera and on a t-shirt.

**Q** Is this possible?

Explain why.

If...

$$0.1 = \frac{1}{10}$$

$$0.2 = \frac{2}{10}$$

Then...

$$0.15 = \frac{1.5}{10}$$

**Q** Do you agree?

Explain why.

Use the five digit cards to complete the statement below.

0	0	1	6	6
---	---	---	---	---

$$\begin{array}{r}
 \square \\
 \hline
 \square \square
 \end{array}
 =
 \square . \square$$

Bingo!

Each child makes a grid of 6 and writes down 6 different, sensible (linking to objective) fractions or percentages. Read out decimals. First to mark off their whole board wins!

In pairs, take a pack of cards of different fractions, decimals and percentages. Turn them over one at a time. The first person to write an equivalent fraction, decimal or percentage on their whiteboard wins a point.

**I can round any given number to the nearest 10, 100, 1000, 10000, 100000**

The school kitchen wants to order enough jacket potatoes for lunch. Potatoes come in sacks of 100.

**Q** How many sacks do they need for 766 children?

Complete the table below:

Lowest possible whole number	Rounded number	Highest possible whole number
4500	5000 to the nearest 1000	5499
_____	300 to the nearest 100	_____
_____	_____ to the nearest 10	74

Round the following numbers to the nearest

- a) 10
- b) 100
- c) 1000

4821    69243    2781

In 2013, there were 778803 births in the UK.

**Q** What is this to the nearest 1000?

**Q** Nearest 10000?

**Q** Nearest 100000?

In July 2015, the population of the UK was estimated to be 64881609.

**Q** What is this rounded to the nearest million?

Caroline thinks that the largest whole number that rounds to 400 is 449.

**Q** Is she correct?

Explain why.

Henry says :

'747 to the nearest 10 is 740.'

**Q** Do you agree with Henry?

Explain why.

A number rounded to the nearest 10 is 550.

**Q** What is the smallest possible number it could be?

A number rounded to the nearest 1000 is 54000.

**Q** What is the largest possible number this could be?

Round the number 259996 to the nearest 1000. Round it to the nearest 10000.

**Q** What do you notice about the answers?

**Q** Can you think of 3 more numbers where the same thing would happen?

**Q** True or False?

All numbers with a five in the tens column will round up when rounded to the nearest 100 and 1000.

Nathan thinks of a number. He says:

'My number rounded to the nearest 10 is 1150, rounded to the nearest 100 is 1200 and rounded to the nearest 1000 is 1000.'

**Q** What could Nathan's number be?

Roll five dice; make as many 5 digit numbers as you can from them.

Round each number to the nearest 10, 100, 1000 and 10,000.

**Q** From your numbers, how many round to the same 10, 100, 1000 or 10,000?

When a number is rounded to the nearest 100 it is 200. When the same number is rounded to the nearest 10 it is 250.

**Q** What could the number be?

Roll three dice. Make all the three digit numbers that you can using the three digits. Round them to the nearest 100.

**Q** Can each of the numbers round to the same multiple of 100?

**Q** Can all of the numbers round to a different multiple of 100?

**Q** Using the number cards 0-9, can you make numbers that fit the following rules?

1. When rounded to the nearest 10, I round to 20.
2. When rounded to the nearest 10, I round to 10.
3. When rounded to the nearest 1000, I round to 1000.
4. When rounded to the nearest 100, I round to 7200.

**I can round decimals to the nearest whole number**

12.34 rounded to the nearest whole number is  $\square$ .

$\square$  rounded to the nearest tenth is 14.4.

Simon is measuring a box of chocolates with a ruler that measures in centimetres and millimetres. He measures it to the nearest cm and writes the answer 28cm.

**Q** What is the smallest length the box of chocolates could be?

Which decimals below round to 4 when rounded to the nearest whole number?

4.2 3.8 4.5 3.5 4.7

Explain your reasoning.

Circle each decimal which when rounded to the nearest whole number is 5

5.3 5.7 5.2 5.8

Explain your reasoning.

Write all the decimals with one decimal place that round to 32 to the nearest whole number.

Sort the numbers below into the table rounding each of them to the nearest whole number.

23.1 23.2 24.4 23.5 23.4 24.3 23.9 22.8 22.5

Rounds to 23	Rounds to 24

Two numbers with one decimal place both round to 23. The numbers add up to 46.

**Q** What could the two numbers be?

Explain your thinking.

Write a list of five instructions of how:

- to round decimals with one decimal
- place to the nearest whole number.

Roll two dice. Using the numbers make two numbers with one decimal place. Round the numbers to the nearest whole number.

**Q** How many combinations of the two dice can you find that would round to the same whole number?

Using the digit cards below, how many numbers can you make with one decimal place that would round to 45. You can only use each card once per number.

2	4	4	5	6
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**Q** Can you make more or less numbers that round to 46?

**Q** If you were given the following digit card, how many numbers with one decimal place that would round to 47?

7
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I can add 9 to any number by adding 10 and taking 1

I can add 11 to any number by adding 10 and adding 1

I can subtract 9 from any number by taking 10 and adding 1

I can subtract 11 from any number by taking 10 then taking 1

I can halve any number with up to one decimal place