



Oldfields Hall Middle School  
KS2 Mental Mathematics Guide

# 1. Multiplication.

Correct	
Wrong	

Your multiplication tables are very important. You should be able to quickly recall all multiplications up to 10 x 10.

Times Table - 10x10

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>1</b>	<b>1</b>	2	3	4	5	6	7	8	9	10
<b>2</b>	2	<b>4</b>	6	8	10	12	14	16	18	20
<b>3</b>	3	6	<b>9</b>	12	15	18	21	24	27	30
<b>4</b>	4	8	12	<b>16</b>	20	24	28	32	36	40
<b>5</b>	5	10	15	20	<b>25</b>	30	35	40	45	50
<b>6</b>	6	12	18	24	30	<b>36</b>	42	48	54	60
<b>7</b>	7	14	21	28	35	42	<b>49</b>	56	63	70
<b>8</b>	8	16	24	32	40	48	56	<b>64</b>	72	80
<b>9</b>	9	18	27	36	45	54	63	72	<b>81</b>	90
<b>10</b>	10	20	30	40	50	60	70	80	90	<b>100</b>

A few things to remember.

Times by 2 is just doubling and times by 4 is double and double again. All the numbers in 5 times table end in 5 or 0. You can use your fingers to help you with the 9 times table like this.



$$11 \times 57 = 5\underline{\quad}7 \quad 5 + 7 = 12 \text{ so that is } 2 \text{ carry } 1$$
$$11 \times 57 = 627$$

Multiplication with large numbers that end with zeros can be done by covering up the zeros to make it easier and then adding the zeros to your answer.

$$40 \times 7 = ?$$

$$4 \text{ (with zero covered)} \times 7 = 28 \quad \text{Cover the zero and write the answer.}$$

$$40 \times 7 = 280 \quad \text{There was 1 zero covered up so add one zero to the answer.}$$

$$30 \times 50 = ?$$

$$3 \text{ (with zero covered)} \times 5 \text{ (with zero covered)} = 15 \quad \text{Cover both the zeros and write the answer.}$$

$$30 \times 50 = 1500 \quad \text{There were 2 zero covered up so add 2 zeros to the answer.}$$

If there are no zeros, you can still multiply larger numbers by splitting them up into smaller parts.

$$49 \times 7 = ?$$

Split the 49 into 40 and 9 then multiply both by parts by 7.  
Once you have done this, add the two numbers together to give you the final answer.

$$49 \times 7 = ?$$

Split and times by 7:-

$$40 \times 7 = 280$$

remember the trick with covering zeros.

$$9 \times 7 = 63$$

$$343$$

add 280 and 63

$$\text{so } 49 \times 7 = 343$$

The last thing we need to look at is decimal multiplication.

$$1.2 \times 5 = ?$$

Ignore the decimal and carry out the multiplication.

$$12 \times 5 = 60$$

Now we only need to put the decimal point back in the answer but where? If you estimate the answer it will help,  $1.2 \times 5$  is one and a bit times 5 which must be a bit more than 5 so the decimal point must go between the 6 and the 0.

$$12 \times 5 = 6.0$$

## Example questions on multiplication

$$8 \times 7$$

$$6 \times 9$$

$$40 \times 7$$

Double 90

$$81 \times 2$$

$$49 \times 7$$

$$7 \times 8$$

$$6 \times 9$$

$$\text{Double } 1.9$$

$$1.2 \times 5$$

$$4 \times 150$$

$$35 \times 6$$

$$\text{Double } 42$$

$$17 \times 11$$

$$35 \times 30$$



### 3. Multi-step calculations.

When asked to do three or more calculations make sure you write down the sum on the answer sheet as it is read out. It is far easier to do it when you can see it in writing.

$$80 + 130 + 60 = ?$$

Add up the hundreds, units and tens separately.

Units	$0 + 0 + 0 =$	0
Tens	$80 + 60 + 30 =$	170
Hundreds	$100 =$	<u>100</u>
Total		270

$$40 \times 60 \times 10 = ?$$

Cover up the zeros and do  $4 \times 6 \times 1 = 24$ . We covered up three zeros so we add 3 zeros to the answer, 24000.

$$5 \times 40 \div 4 = ?$$

Always do the divide first to make the numbers smaller.

$$40 \div 4 = 10.$$

$$\text{Then do } 10 \times 5 = 50.$$

### Example questions on multi-step calculations.

Double 130 and then double again

$$40 \times 60 \times 10$$

$$20 + 23 + 26$$

$$80 + 130 + 160$$

$32 + 42 + 52$

$5 \times 40 \div 4$

$0.4 + 0.3 + 0.7$

$8 \times 5 + 40$

$5 \times 5 \text{ added to } 6 \times 6$

$17 + 27 + 37$

$4 + 7 \text{ then times } 5$

## 4. Shopping

Correct	
Wrong	

There are a few styles of shopping questions.

1/ 3m of fabric costs £1-20. How much for 5m of fabric?

First work out how much 1m costs.

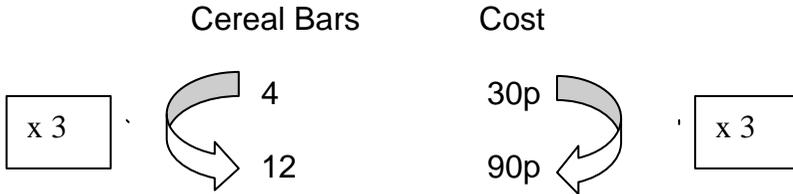
$$\text{£}1-20 \text{ divide by } 3 = 40\text{p}$$

Now multiply by how many metres you want.

$$5 \times 40\text{p} = 200\text{p} = \text{£}2$$

2/ 4 cereal bars cost 30p how much do 12 cereal bars cost?

It is difficult to answer this question, unlike the first example, because 30p does not divide by 4 easily. However, you might have noticed that 12 cereal bars is a multiple of 4 cereal bars. Three lots of 4 make 12 so we just multiply the cost by 3 as well; 3 lots of 30p makes 90p.



3/ Pies are sold in packs of five for 75p, how many pies can I get for £2?

You need to start writing down your 75 times table and stop when you have 200 or slightly more.

75    150    225

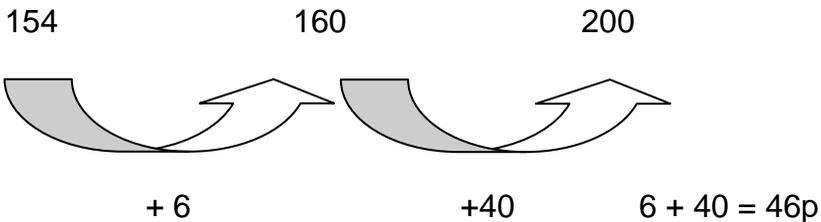
We do not have enough money to buy 3 lots of 75p so we can only buy 2 lots. As there are 5 pies for every 75p and we can buy two lots, we get 10 pies.

4/ Lemons cost 14p each. I buy 11 lemons how much change do I get from £2?

We need to find out how much the 11 lemons cost first.

$11 \times 14 = 154$       Can you remember the trick for the 11 times table?

We now need to find the change from £2, if we spend 154p, which we can do by counting up.



## Example questions on shopping.

Pies are five for seventy five pence. How many pies will I get for £2?

Four batteries cost 2 pound 40 pence. How much would 5 batteries cost?

3m of fabric costs one pound twenty pence. How much for 5m of fabric?

Lemons cost 14p each. I buy 11 oranges. How much change do I get from £2?

I had £1. I bought 3 Mars bars and got 34p change. How much did each Mars bar cost?

One CD costs one pound and ninety pence. How much do seven CD's cost?

An apple costs 32p. Jane buys 3 apples. How much change from £1?

4 cereal bars cost forty pence. How much do 12 cereal bars cost?

A calculator costs 85p. What is the cost of 3 calculators?

How much change from £10 if you spend £3.55?

4 orange cost 95p. How much does 1 orange cost to the nearest p?

## 5. Units

Correct	
Wrong	

In order to change between metric units you need to know some basic facts. If you don't then you can not answer the questions.

$10 \text{ mm} = 1 \text{ cm}$

$1000 \text{ ml} = 1 \text{ ltr}$

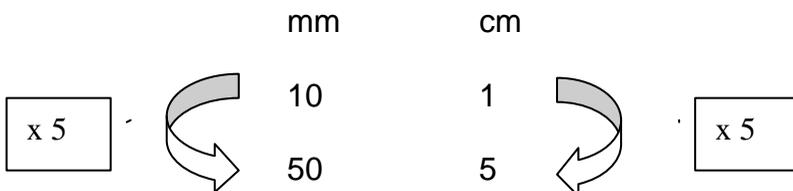
$100 \text{ cm} = 1 \text{ m}$

$1000 \text{ g} = 1 \text{ Kg}$

$1000 \text{ m} = 1 \text{ Km}$

How many mm in 5cm ?

First write down what you know, then write down what the question asks you. Now it's a simple matter to multiply both sides by the same number.



How many g in 15kg?



Example questions on units.

mm in 5cm

g in 3.4kg

mm in 18cm

ml in  $2 \frac{1}{2}$  l

m in  $7 \frac{1}{2}$  km

g in 15kg

cm in  $\frac{1}{4}$  m

m in 3.8 Km

## 6. Fractions of a whole number

Correct	
Wrong	

To find a fraction of a whole number you need to carry out the same two steps for every question.

Find  $\frac{3}{4}$  of 88?

Step 1       $88 \div 4 = 22$       Divide the whole number by the denominator.

Step 2       $22 \times 3 = 66$       Multiply the answer to step 1 by the numerator.

### Example questions on fractions of a whole.

$\frac{3}{4}$  of 88       $\frac{2}{3}$  of 99       $\frac{1}{2}$  of 70       $\frac{1}{2}$  of 27  
 $\frac{2}{5}$  of 1000       $\frac{3}{4}$  of 600       $\frac{1}{2}$  of 9

## 7. Find the missing number

Correct	
Wrong	

To find a missing number you should write down the question with a question mark where the missing number is. Now look at what you have written and ask yourself what number can I put where the question mark is to make the sum true.

Emily chooses a number. She halved the number then added fifteen. Her answer was 45. What was her number?

?  $\div$  2 + 15 = 45      Write it down.

Working backwards  $45 - 15 = 30$  and  $30 \times 2$  is 60.  
So the question mark must be 60.

## Example questions on missing numbers.

Emily chose a number. She halved the number then added fifteen. Her answer was 45. What was her number?

When a number is divided by 8 the answer is 3 remainder 6. What is the number?

I think of a number, subtract twenty and then times by 4. The answer is 40. Number is?

7 times a number is two hundred and ten. What is the number?

8 times a number is two hundred and forty. What is the number?

In a group of 75 children, there are twice as many boys as girls. How many girls are there?

4 times a number is 280, what is the number?

9 is half my number. What is  $\frac{1}{3}$  of my number?

## 8. How many in?

Correct	
Wrong	

How many 8's in 720?

These questions are all about your times tables. You need to do your 8 times table until you get to 720. This might take some time but if you cover the zero the question becomes how many 8's in 72. If you know your times tables you will know that  $8 \times 9$  is 72. Now add back the zero to get the answer 90.

## Example questions on how many in.

100 in 1000  
2 in 60

4 in 880  
30 in 600

7 in 49  
8 in 640

## 9. Fractions, decimals and percentages.

Correct	
Wrong	

To change fractions into decimals or percentages you need to remember that percentages are all about 100.

Change  $\frac{3}{5}$  into a percentage?



$$\frac{3}{5} = \frac{60}{100} \quad 60\% \quad 0.6$$

60). The

We have to multiply the denominator by 20 ( $5 \times 20 =$

so we have to multiply the numerator by 20 ( $3 \times 20 =$

numerator now shows the percentage.

Change  $\frac{15}{50}$  into a percentage?



$$\frac{15}{50} = \frac{30}{100} \quad 30\% \quad 0.3$$

We have to multiply the bottom by 2 ( $50 \times 2 = 100$ )

so we have to multiply the top by 2 ( $15 \times 2 = 30$ ). The

numerator now shows the percentage.

The denominator will always multiply up to 100 easily.

## Example questions on fractions, decimals and percentages.

$$\frac{20}{40} = ?\%$$

$$\frac{7}{10} = ?\%$$

$$\frac{1}{4} = 0.??$$

$$\frac{1}{5} = 0.??$$

$$\frac{3}{5} = 0.?$$

$$\frac{1}{2} = 0.?$$

$$\frac{7}{10} = 0.?$$

## 10. Divide.

Correct	
Wrong	

On a mental test, you only need to divide fairly small numbers. It is best to remember that division is the opposite of multiplication.

$$42 \div 7$$

Do your 7 times table on your fingers until you get to 42. However many fingers you have is your answer.  $6 \times 7 = 42$  so the answer is 6.

$$60 \div 3$$

Do your 3 times table on your fingers until you get to 60. However many fingers you have is your answer.  $20 \times 3 = 60$  so the answer is 20. You could cover the zero to make this easier.

## Example questions on divide.

What is the remainder when 27 is divided by 6?

$$100 \text{ in } 1000$$

$$4 \text{ in } 880$$

$$7 \text{ in } 49$$

$$2 \text{ in } 60$$

$$30 \text{ in } 600$$

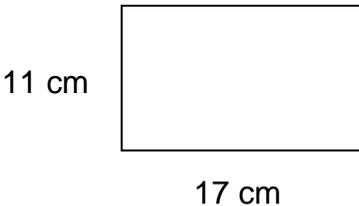
$$8 \text{ in } 640$$

# 11. Area and Perimeter

Correct	
Wrong	

The width of a rectangle is 17cm and the length 11cm. What is the area?

You should always draw yourself a rectangle and write on the measurements. Remember perimeter is round the outside and the area is the inside.



$$\text{Area} = 11 \times 17 = 187\text{cm}^2$$

If the question asks for the perimeter then its:-

$$11 + 17 + 11 + 17 = 56 \text{ cm.}$$

If you do not do a drawing you could well think the perimeter is 28, forgetting about the other two sides.

## Example questions on area and perimeter.

The width of a rectangle is 12cm and the length 11cm. What is the area?

The perimeter of a square is 2m. How long is each side in cm?

A rectangle measures 13cm by 5 cm. What is its area?

The width of a rectangle is 11cm and the length 24cm. What is the area?

Find the perimeter of a rectangle 13m long and 5 m wide?

## 12. Half way between.

Correct	
Wrong	

What number is halfway between 60 and 90?

To find half way between two numbers, add them together and then divide by 2.

$$60 + 90 = 150 \quad 150 \div 2 = 75.$$

### Example questions on half way between.

60 and 90    20 and 90    1.4 and 1.5    0.3 and 0.4

## 13. Time.

Correct	
Wrong	

1. What time is it eleven hours after eight p.m.?
2. How many hours are there in three days?
3. How many seconds in a hour?

You should know that there are:-

60 seconds in a minute  
60 minutes in a hour  
24 hours in a day.

There is always a clock in the room when you do the mental test so you can look at this to count on for questions like number 1.

## Example questions on time.

What time is it eleven hours after eight p.m.?

Half an hour after 10:15 ?

How many hours are there in three days?

How many seconds in a hour?

## 14 Add or more than

Correct	
Wrong	

$$£2.30 + £2.48$$

$$7 + 56$$

$$230 + 9$$

$$207 + 503$$

$$33 + 58$$

$$54 + 28$$

$$3.3 + 7.7$$

## 15. Multiples and factors

Correct	
Wrong	

Write the multiple of 7 that is between 135 and 145

Write 2 factors of 16 which add to make 12.

Find a number in a list of 5 numbers that is a multiple of 6

## 16. Adding fractions

Correct	
Wrong	

$$2 \frac{1}{2} + 3 \frac{1}{2} + 4 \frac{1}{2} =$$

$$\frac{3}{4} + \frac{1}{2} =$$

## 17. Shapes

Correct	
Wrong	

How many vertices does a cube have?

How many vertices does a triangular prism have?

## 18. Write in figures

Correct	
Wrong	

Quarter of a million in figures is 250,000

Two thousand and thirty in figures is 2030

## 19. Algebra

Correct	
Wrong	

$$m = 20 \quad 10 + 4m = ?$$

$$h = 12 \quad 6h - 2 = ?$$

## 20. Angles

Correct	
Wrong	

Estimate the size of an angle shown on the answer sheet.

What is the angle between the hands of a clock at 4 o'clock?

## 21. Percentage of (1)

Correct	
Wrong	

10% of 1000

20% of 350

5% of 200

50% of 600

## 22. Next number (1)

Correct	
Wrong	

What is the next odd number after 199?

## 23. Temperature (2)

Correct	
Wrong	

10 degrees lower than  $4^{\circ}\text{C}$  is?

8 degrees lower than  $3^{\circ}\text{C}$  is?



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