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WALT Mentally Multiply Three Numbers

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Quick Warm Up

Spend 10 minutes practising your 6x, 7x and 9x tables or division facts.

- You could play some games on 'Hit the Button'.

<https://www.topmarks.co.uk/mathsgames/hit-the-button>

- You could practise these times tables on 'Daily 10'.

<https://www.topmarks.co.uk/mathsgames/daily10>

- Or, you could write the times table out on a piece of paper or in a notebook.

Vocabulary

multiply

multiplication

multiples

odd

even

number sentence

Mentally Multiply Three Numbers

Remember that when you multiply three numbers, you have to work the answer out in two steps

Look at this example:

$$\textcircled{2} \times \textcircled{3} \times 4 = \underline{\hspace{2cm}} \textcolor{red}{24}$$

1. Circle the two numbers you will multiply first.

Then, multiply these two numbers.

$$2 \times 3 = 6$$

2. Use the answer from step 1 and multiply it by the other number in the question - the number that you haven't circled. In this question, you need to multiply by 4.

$$6 \times 4 = \textcolor{red}{24}$$

Mentally Multiply Three Numbers - Hints and Tips

When you decide which two numbers to multiply first, think about these hints and tips:

- Look for two numbers that multiply to make 12 or less
multiply these two small numbers first
- Multiply by 10 last
do $\times 10$ last
- Look for two numbers that multiply to make a multiple of 10
multiply these two numbers that make a multiple of 10 first

Mentally Multiply Three Numbers - Hints and Tips

Other things to help you:

- When you need to multiply by 9, you could use Spiderman Hands
- If you are multiplying by 11 or 12, start from $10 \times$ your number and count on

E.g. to find 12×8

First, work out $10 \times 8 = 80$

Then, add 2 more lots of 8: $80 + 8 = 88$ $88 + 8 = 96$

- If you find a particular times table more difficult, write the multiples of that number down to help you

E.g. 7 14 21 28 ...

Mentally Multiply Three Numbers

Remember, it doesn't matter which order you multiply the three numbers.

- You will still get the same answer
- However, if you choose a sensible order to do the multiplication, you can make the numbers much easier to work with

Fluency

Look for Two Numbers that Multiply to Make 12 or Less

1	5	\times	9	\times	2	=
2	8	\times	3	\times	3	=

Multiply by 10 last

3	10	\times	8	\times	4	=
4	7	\times	10	\times	7	=

Look for Two Numbers that Multiply to Make a Multiple of 10

5	5	\times	9	\times	8	=
6	7	\times	6	\times	5	=

Now, Choose which Order to Multiply the Numbers

7	10	\times	6	\times	9	=
8	6	\times	4	\times	3	=
9	5	\times	7	\times	12	=
10	9	\times	2	\times	4	=
11	7	\times	10	\times	8	=
12	4	\times	9	\times	5	=

Reasoning 1

Todd and Lola were talking about their answers to $10 \times 5 \times 2$:



Todd

I think
 $10 \times 5 \times 2 = 52$



Lola

My answer to
 $10 \times 5 \times 2$ is 100

Who has calculated the answer correctly? Can you work out what the other child has done wrong?

Use a sentence starter to help you explain your reasoning.

Reasoning 2

Chris and Ella are finding the answer to this multiplication: $8 \times 3 \times 5$



I think I need to
work out 8×3 first.



I think it will be easier
to work out 8×5 first.

Who has chosen the easier way to find the answer?

Write down how to find the answer this way.

Then, explain your reasoning.

Problem Solving

How many different ways can you complete this calculation without using 1 in any of the boxes?

$$\boxed{} \times \boxed{} \times \boxed{} = 48$$

Explain how you knew which numbers to choose.

ANSWERS

Fluency

Look for Two Numbers that Multiply to Make 12 or Less

1	5	\times	9	\times	2	=	90
2	8	\times	3	\times	3	=	72

Multiply by 10 last

3	10	\times	8	\times	4	=	320
4	7	\times	10	\times	7	=	490

Look for Two Numbers that Multiply to Make a Multiple of 10

5	5	\times	9	\times	8	=	360
6	7	\times	6	\times	5	=	210

Now, Choose which Order to Multiply the Numbers.

7	10	\times	6	\times	9	=	540
8	6	\times	4	\times	3	=	72
9	5	\times	7	\times	12	=	420
10	9	\times	2	\times	4	=	72
11	7	\times	10	\times	8	=	560
12	4	\times	9	\times	5	=	180

Reasoning 1

Lola is correct. You need to do two steps to find the answer:

$$10 \times 5 = 50$$

$$50 \times 2 = 100$$

Here is another way to work out the answer by multiplying the numbers in a different order:

$$2 \times 5 = 10$$

$$10 \times 10 = 100$$

The answer is the same.

Todd's answer is not correct.

Although Todd has worked out $10 \times 5 = 50$ correctly, he has used the wrong operation and added the 2 to the 50 by mistake. He needed to multiply the 50 by 2 instead of adding the 2 to the 50.

Reasoning 2

Ella has chosen the easier way to find the answer because the answer to her first step is a multiple of 10.

Ella's two steps are:

$$8 \times 5 = 40$$

$$40 \times 3 = 120$$

Although Chris should get the same answer, the order he has chosen will be more difficult and he will be more likely to make a mistake. Chris's two steps are:

$$8 \times 3 = 24$$

$$24 \times 5 = ?$$

Chris's second step would be 24×5 which is much harder to do than 40×3 .

Problem Solving

There are many different ways to make 48:

$$2 \times 3 \times 8$$

$$3 \times 2 \times 8$$

$$8 \times 2 \times 3$$

$$2 \times 8 \times 3$$

$$3 \times 8 \times 2$$

$$8 \times 3 \times 2$$

$$2 \times 4 \times 6$$

$$4 \times 2 \times 6$$

$$6 \times 2 \times 4$$

$$2 \times 6 \times 4$$

$$4 \times 6 \times 2$$

$$6 \times 4 \times 2$$

$$2 \times 2 \times 12$$

$$2 \times 12 \times 2$$

$$12 \times 2 \times 2$$

$$3 \times 4 \times 4$$

$$4 \times 3 \times 4$$

$$4 \times 4 \times 3$$

I worked out which numbers to choose by thinking about which times tables have 48 as one of the answers.

48 is an answer in all of these times tables: 4s 6s 8s and 12s

Also, I knew that I could use the number 2 because 48 is an even number.

Finally, I thought that I could use the number 3 because 48 is in the 6x table and 6 can be divided by 3.