

YEAR 6 – HELPING YOUR
CHILD WITH FLUENCY IN
MATHEMATICS

EXPECTATIONS IN YEAR 6

- Read, write order and compare numbers to 10,000,000 and determine the value of each digit.
- Rounding numbers up to 1,000,000
- Use negative numbers in context
- Use estimation to check calculations
- Use common factors to simplify fractions
- Use common multiples to find equivalents
- Find percentages of amounts
- Convert units of measure (multiplying and dividing 10, 100 and 1000)

No mention of Times Tables as all multiplications to 12 x 12 'should' be known by the end of year 4.

WHAT IS FLUENCY? WHY IS FLUENCY IMPORTANT?

- Something that is automatic or requires little thinking. i.e playing a musical instrument or speaking a language fluently
- This is the same in mathematics with number facts, table facts and making connections.

There are three elements to fluency:

- **Efficiency** (using the most suitable method)
- **Accuracy** (being correct)
- **Flexibility** (having a tool kit of different methods)
- **Why is fluency important?**
- Children who are fluent in maths are:
 - Less anxious about mathematics
 - Able to make connections
 - Able to problem solve

To be fluent in maths, regular activities need to be done as the brain only has a limited working memory.

PLACE VALUE

A KEY SKILL FOR FLUENCY IN MATHS IS THE ABILITY TO MULTIPLY/DIVIDE BY 10/100/1000, YOU WILL NOTICE THAT THE DIGITS MOVE ACCORDING TO WHETHER THEY HAVE BEEN MULTIPLIED OF DIVIDED, THEIR PLACE VALUE CHANGES

[HTTPS://WWW.TOPMARKS.CO.UK/FLASH.ASPX?F=MOVINGDIGITCARDS](https://www.topmarks.co.uk/Flash.aspx?f=MovingDigitCards)

X 10, 100, 1000,

- 1
- 10
- 100
- 1,000

÷ 10, 100, 1000

- 1
- 0.1
- 0.01
- 0.001

HAVE A GO AT MULTIPLYING AND DIVIDING BY 10, 100, 1000

MOVE EACH DIGIT TO THE LEFT
EITHER 1, 2 OR 3 PLACES

- $41 \times 10 =$
- 412×10
- 341×100
- 756×1000

MOVE EACH DIGIT TO THE RIGHT
EITHER 1, 2 OR 3 PLACES

- $410 \div 10 =$
- $4,120 \div 10 =$
- $34,100 \div 100 =$
- $756,000 \div 1000 =$

ADDING AND SUBTRACTING USING KNOWN FACTS

Key Learning: to add and subtract multiples of 10, 100, 1000, 10 000 and 100 000

Task for teachers

$$11\ 000 = ? + 7000$$

$$7000 + 4000 = ?$$

If I know

$$11 = 7 + 4$$

then I know...

$$4000 = 11\ 000 - ?$$

$$11\ 000 - ? = 7000$$

$$70\ 000 + 40\ 000 = 11\ \text{ten thousands}$$

$$? - 70\ 000 = 40\ 000$$

EXAMPLES OF ARITHMETICAL FLUENCY QUESTIONS

$$51,750 - 1,000 - 1,000 =$$

$$630,000 - 410,000 =$$

$$37,000 + 46,000 =$$

EFFICIENCY

- Not being bogged down with too many steps
- Using the most efficient strategy.
- E.g.

- $602 - ? = 594$

$$8391 - 1000 =$$

$$87 - 65 =$$

$$3057 - 100 =$$

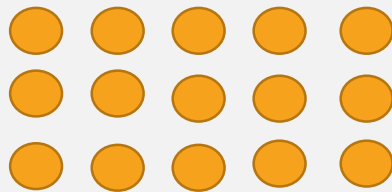
TIMES TABLES

- Possible activities at home:
- Chanting times tables
- Quick fire questions
- Counting in multiples
- Times Table Rockstars (online)
-

IF I KNOW _____, THEN I KNOW...

- Learning table facts is often mistaken for rote-learning (memorising)
- Children need to understand what a multiplication sentence means

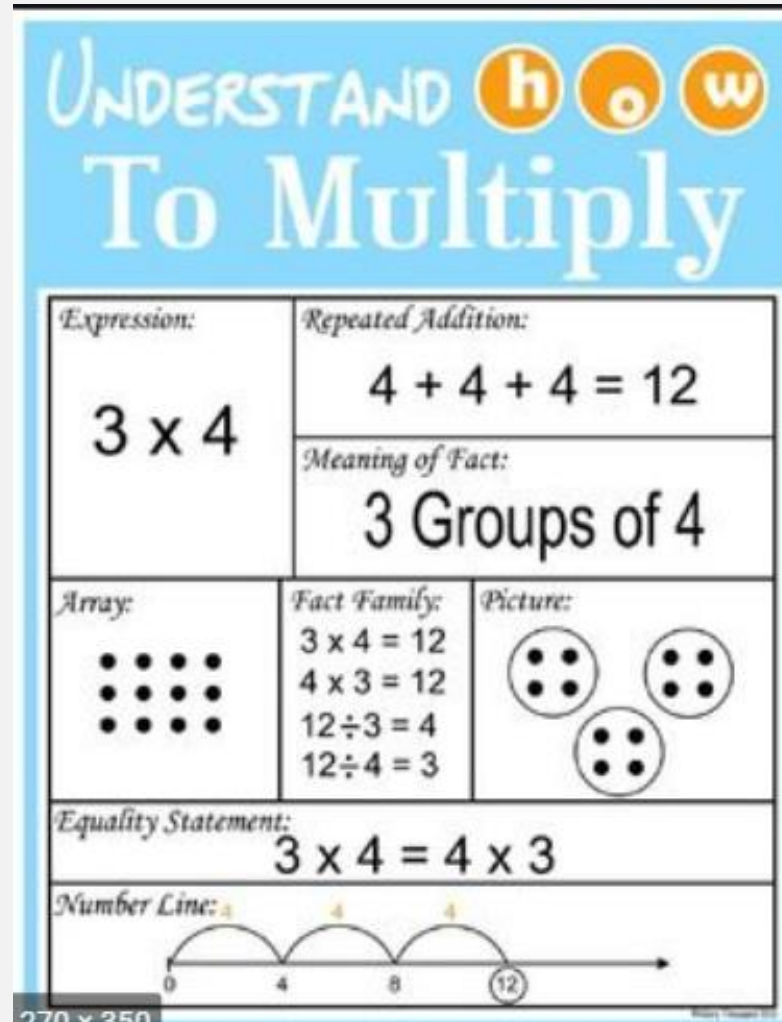
E.g. $3 \times 4 = 12$



3 groups of 4

If I know $3 \times 4 = 12$, I know $3 \times 5 = 15$ because it is one more 'group' of three

MAKING TIMES TABLES FACT POSTERS



MULTIPLICATION AND DIVISION FACTS

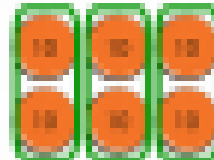
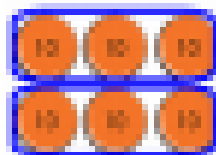
Key Learning: To multiply and divide mentally using derived facts

How Learning

The value of each part is ten times greater, so the whole is ten times greater.

$$2 \times 30 = 60$$

$$30 \times 2 = 60$$



$$3 \times 20 = 60$$

$$20 \times 3 = 60$$

If one of the factors is ten times greater, the product will be ten times greater.

$$60 \div 2 = 30$$

$$60 \div 30 = 2$$

$$60 \div 3 = 20$$

$$60 \div 20 = 3$$

EXAMPLES OF ARITHMETICAL FLUENCY QUESTIONS

$$132 \div 12 =$$

$$4 \times 110 =$$

$$8 \times 6 =$$

$$480 \div 4 =$$

$$54 \div 6 =$$

$$7,200 \div 80 =$$

MULTIPLICATION WAR GAME

- <https://youtu.be/nhOdnvcrc0I>
- Fun, quick game with a pack of playing cards
- Two player game (a parent and child or siblings)
- Good for rapid recall of times tables fact
- Could be adapted to be an addition game instead.

TAKING TIMES TABLES FURTHER...

- Ask your child if they know $4 \times 8 = 32$
- What else do they know if they know $4 \times 8 = 32$?
 - $40 \times 8 = 320$
 - $4 \times 80 = 320$
 - $40 \times 80 = 3200$
 - $32 \div 4 = 8$
 - $3.2 \div 4 = 0.8$
 - $320 \div 4 = 80$

EXAMPLE OF USING TIMES TABLES FOR EFFICIENCY

22

$$1,320 \div 12 =$$

METHOD 2 $132 \div 12 = 11 \longrightarrow 1320 \div 12 = 110$

METHOD 1

$$\begin{array}{r} 110 \\ 12 \overline{) 1320} \end{array}$$

110



1 mark

FACTORS AND MULTIPLES

TIMES TABLE GRID

12 X 12 Multiplication Table													
X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

FACTORS ARE THE SUMS MULTIPLES ARE THE ANSWERS

- $6 \times 7 = 42$
- 6 and 7 are factors of 42
- 42 is a multiple of 6 and 7
- However, factors are not always just times table facts ie. 3 is a factor of 42 because if you count on in 3's beyond 36, you will say 42.

FACTOR AND MULTIPLE QUESTIONS

Tick the numbers that are common factors of both **12 and 18**

2 ☐

3 ☐

6 ☐

9 ☐

12 ☐

2 marks

FACTOR AND MULTIPLE QUESTIONS

Here are six digit cards.



Use **all six** digit cards to make three multiples of 3

Three empty boxes are shown in a horizontal row. Each box is a rounded rectangle with a black border, divided into two equal halves by a vertical line, intended for writing two-digit numbers.

1 mark

FACTOR AND MULTIPLE QUESTIONS

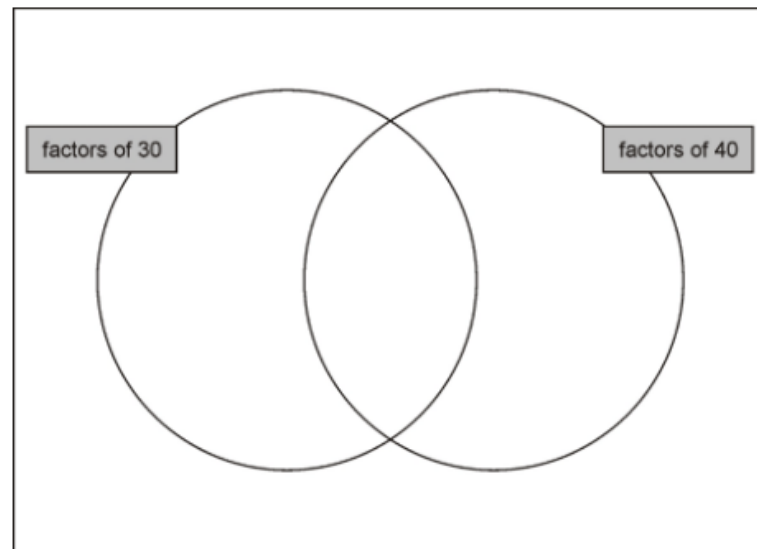
Write these numbers in the correct places on the diagram.

5

6

7

8



2 marks

Complete these fractions to make each equivalent to $\frac{3}{5}$

$$\frac{\boxed{}}{10}$$

$$\frac{\boxed{}}{15}$$

$$\frac{12}{\boxed{}}$$

the two missing values to make these equivalent fractions correct.

$$\frac{\boxed{}}{3} = \frac{8}{12} = \frac{4}{\boxed{}}$$

12 X 12 Multiplication Table													
X	0	1	2	3	4	5	6	7	8	9	10	11	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10	11	12
2	0	2	4	6	8	10	12	14	16	18	20	22	24
3	0	3	6	9	12	15	18	21	24	27	30	33	36
4	0	4	8	12	16	20	24	28	32	36	40	44	48
5	0	5	10	15	20	25	30	35	40	45	50	55	60
6	0	6	12	18	24	30	36	42	48	54	60	66	72
7	0	7	14	21	28	35	42	49	56	63	70	77	84
8	0	8	16	24	32	40	48	56	64	72	80	88	96
9	0	9	18	27	36	45	54	63	72	81	90	99	108
10	0	10	20	30	40	50	60	70	80	90	100	110	120
11	0	11	22	33	44	55	66	77	88	99	110	121	132
12	0	12	24	36	48	60	72	84	96	108	120	132	144

TIMES TABLES AND FRACTIONS

TEACHING TIME

NOW	◀ 9.00AM		9.30AM	10.00AM	10.30AM	11.00AM	11.30AM ▶
 	Break 6am	Morning Live 9:15am		Homes Under the Hammer 10am		Claimed and Shamed 11am	Close Calls: 11:45am
 	BBC News at 9 9am			BBC News 10am			
 	Lorraine 9am			This Morning 10am			
 	...	Everybody Loves 9:05am	Frasier 9:35am	Frasier 10:05am	Undercover Boss USA 10:35am	...	Ramsay's Kitchen 11:35am
 	...	...	Jeremy Vine 9:15am				Can't Pay? We'll Take It Away! 11:15am
 	Motorway Patrol 9am		Motorway Patrol 9:30am	MacGyver 10am		NCIS: Los Angeles 11am	

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Here is part of the bus timetable from Riverdale to Mott Haven.

Riverdale	10:02	10:12	10:31	10:48
Kingsbridge	10:11	10:21	10:38	10:55
Fordham	10:28	10:38	10:54	11:11
Tremont	10:36	10:44	11:00	11:17
Mott Haven	10:53	11:01	11:17	11:34

How many minutes does it take the 10:31 bus from Riverdale to reach Mott Haven?

minutes

1 mark

TEACHING TIME CONT...

- Ask your child to keep a record of how long he/she watches TV each week.
- Ask them to work out the total amount of time for the week.
- Challenge – find the average watching time for a day (this is the total divided by 7)
- Look at how long it takes to travel/fly to different countries.
- Work out what time they would arrive at these places if they left 'now' or at different times.
- Read and write the time in 12 and 24 hour clocks
- Different time zones around the world – work out the differences between two time zones – smart phone clocks have clocks from all around the world.

OUT SHOPPING OR ONLINE SHOPPING

- Look at offers – If you see any items such as ‘2 for £3.50’, ask your child to work out the cost of 1 item or 3, 4, 5, 6 etc
- Sale prices – pretend that an item is in the sale: ask your child what would the cost be with: 50% off, 25% off, 10% off
- When shopping, look at prices (£3.98, use 398p), can you round it to the nearest £1? £10? £100
- Keep track of a total when shopping
- Calculate change in a shop

ORDERING A TAKEAWAY

- Use a takeaway menu to order a pretend meal or one that you planning to have soon.
- Ask your child to work out the cost of your order.
- Your child could estimate the cost first then calculate the cost of the order.
- Create a problem story: I only have £20 pound to spend, what can I order? How much change?
- Compare the order/price with a similar take away.

Which one is cheaper?

MATHS GAMES AND RESOURCES

- A great app for your child's phone is 'Combine 24 –Your child will have to use all four numbers to make the number 24 (using either $\times$, $\div$, $+$ or $-$)
- <https://www.coolmathgames.com/0-make-24>
- [Corbett maths primary - https://corbettmathsprimary.com/](https://corbettmathsprimary.com/)
- <https://www.topmarks.co.uk/maths-games/hit-the-button>
- <https://www.topmarks.co.uk/>
- <https://www.bbc.co.uk/bitesize>
- www.ttrockstars.com
- www.mathsbot.com
- [White Rose Maths parent workbooks - https://whiteroseeducation.com/parent-pupil-resources/maths/free-downloads](https://whiteroseeducation.com/parent-pupil-resources/maths/free-downloads)