

# Year 6 SATs Booster

## Maths 2

### Multiplication and Division Part 1

## Objectives:

- Multiply and divide mentally by 10, 100 and 1 000 and explain the effect.
- Use jottings to help with multiplication.

## Vocabulary:

**digit**

**hundreds**

**product**

**tens**

**thousands**

**partition**

# Place value chart

Moving left, each column is 10 x bigger than the one before.

Moving right, each column is 10 x smaller than the one before.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Units	Decimal point	Tenths	Hundredths	Thousandths
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# Multiplication

$$9 \times 10$$

thousands

hundreds

tens

units

9

When we multiply the digits move to the **left**



When we multiply by **10** the digits move **one** place to the **left**

thousands

hundreds

tens

units

9

0

**Zero** is the **place holder**.

$$91 \times 10$$

thousands

hundreds

tens

units

9

1



thousands

hundreds

tens

units

9

1

0

$$20 \times 100$$

thousands

hundreds

tens

units

2

0

When we multiply the digits move to the **left**



thousands

hundreds

tens

units

2

0

0

0

When we multiply by **100** the digits move **two** places to the **left**

**Try these...**



$$28 \times 10$$

**thousands**

**hundreds**

**tens**

**units**

**2**

**8**

$$32 \times 100$$

**thousands**

**hundreds**

**tens**

**units**

**3**

**2**

$$75 \times 100$$

**thousands**

**hundreds**

**tens**

**units**

**7**

**5**

$$81 \times 100$$

**thousands**

**hundreds**

**tens**

**units**

**8**

**1**

$$781 \times 10$$

**thousands**

**hundreds**

**tens**

**units**

**7**

**8**

**1**

$$404 \times 10$$

**thousands**

**hundreds**

**tens**

**units**

**4**

**0**

**4**

When we use decimals, the columns headings are

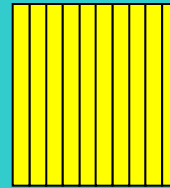
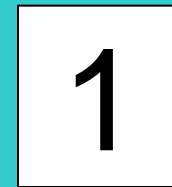
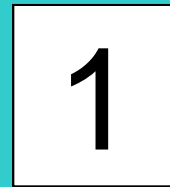
thousands

hundreds

tens

units

tenths



one unit or one whole one

one tenth of a whole one

$$2.1 \times 10$$

thousands

hundreds

tens

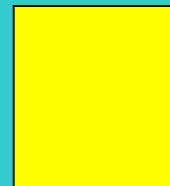
units

tenths

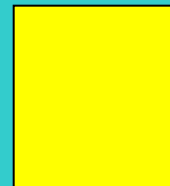
2

.

1



.





$$2.3 \times 10$$

thousands

hundreds

tens

units

tenths

hundredths

2

.

3

$$55.4 \times 10$$

thousands

hundreds

tens

units

tenths

hundredths

5

5

.

4

$$7.25 \times 10$$

thousands

hundreds

tens

units

tenths

hundredths

7

.

2

5

$$28.9 \times 100$$

thousands

hundreds

tens

units

tenths

hundredths

2

8

.

9

$$205.03 \times 10$$

thousands

hundreds

tens

units

tenths

hundredths

2

0

5

.

0

3

$$179.25 \times 100$$

thousands

hundreds

tens

units

tenths

hundredths

1

7

9

.

2

5

# **Some multiplication calculations ...**

**Write digits in the boxes to make the calculation correct.**

$$\square \times \square = 81$$



**Write digits in the boxes to make the calculation correct.**

$$\left( 5 \times 4 \right) + \square = 30$$

**Write digits in the boxes to make the calculation correct.**

$$\left( 6 \times 4 \right) - \square = 16$$

**Write digits in the boxes to make the calculation correct.**

$$\square - (3 \times 7) = 40$$

**What might the missing numbers be?**

$$\square \times \square = 90$$

**What is the missing digit?**

$$\begin{array}{r} \phantom{2}4\boxed{\phantom{0}} \\ \times \phantom{2}6 \\ \hline 276 \end{array}$$

**Division**

$$4200 \div 10$$

thousands

hundreds

tens

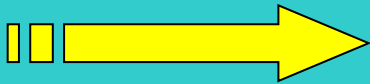
units

4

2

0

0



thousands

hundreds

tens

units

4

2

0

When we divide the digits move to the **right**

When we divide by **10** the digits move **one** place to the **right**

$$3\ 500 \div 100$$

thousands

hundreds

tens

units

3

5

0

0



thousands

hundreds

tens

units

3

5

When we divide by **100** the digits move **two** places to the **right**



**Try these...**

$$7\ 600 \div 100$$

**thousands**

**hundreds**

**tens**

**units**

7

6

0

0

$$30 \div 10$$

**thousands**

**hundreds**

**tens**

**units**

**3**

**0**

$$310 \div 10$$

thousands

hundreds

tens

units

3

1

0

$$570 \div 10$$

**thousands**

**hundreds**

**tens**

**units**

**5**

**7**

**0**

$$9\ 000 \div 100$$

**thousands**

**hundreds**

**tens**

**units**

9

0

0

0

$$990 \div 10$$

**thousands**

**hundreds**

**tens**

**units**

9

9

0

$$8\ 000 \div 10$$

thousands

hundreds

tens

units

8

0

0

0



$$2\ 400 \div 100$$

**thousands**

**hundreds**

**tens**

**units**

2

4

0

0

$$5\ 170 \div 10$$

**thousands**

**5**

**hundreds**

**1**

**tens**

**7**

**units**

**0**

$$4\ 010 \div 10$$

**thousands**

4

**hundreds**

0

**tens**

1

**units**

0

When we use decimals, the columns headings are

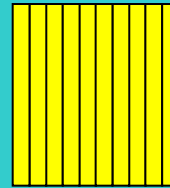
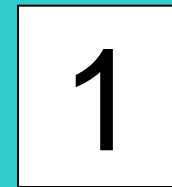
thousands

hundreds

tens

units

tenths



one unit or one whole one

one tenth of a whole one

$$21 \div 10$$

thousands

hundreds

tens

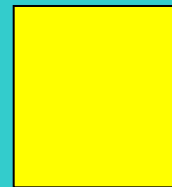
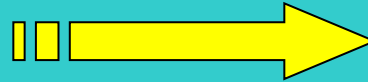
units

tenths

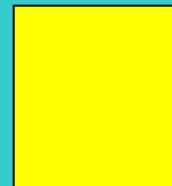
2

1

.



.



thousands

hundreds

tens

units

tenths

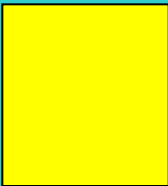
hundredths

1



1

1



**Try these...**

$$2 \div 10$$

thousands

hundreds

tens

units

tenths

hundredths

2





$$55 \div 10$$

thousands

hundreds

tens

units

tenths

hundredths

5

5

.

$$25 \div 100$$

thousands

hundreds

tens

units

tenths

hundredths

2

5

.

$$7 \div 10$$

thousands

hundreds

tens

units

tenths

hundredths

7



$$35 \div 100$$

thousands

hundreds

tens

units

tenths

hundredths

3

5

.

$$5 \div 10$$

thousands

hundreds

tens

units

tenths

hundredths

5



$$26 \div 10$$

thousands

hundreds

tens

units

tenths

hundredths

2

6

.

$$92 \div 10$$

thousands

hundreds

tens

units

tenths

hundredths

9

2

.

$$125 \div 100$$

thousands

hundreds

tens

units

tenths

hundredths

1

2

5

.



$$671 \div 10$$

thousands

hundreds

tens

units

tenths

hundredths

6

7

1

.

$$5 \div 100$$

thousands

hundreds

tens

units

tenths

hundredths

5

.

0

$$992 \div 10$$

thousands

hundreds

tens

units

tenths

hundredths

9

9

2

.

$$6 \div 100$$

thousands

hundreds

tens

units

tenths

hundredths

6

.

0

$$4 \div 100$$

thousands

hundreds

tens

units

tenths

hundredths

4

.

0

$$347 \div 100$$

thousands

hundreds

tens

units

tenths

hundredths

3

4

7

•

$$2\ 460 \div 1\ 000$$

thousands

hundreds

tens

units

tenths

hundredths

thousandths

2

4

6

0



$$3\ 829 \div 1\ 000$$

thousands

hundreds

tens

units

tenths

hundredths

thousandths

3

8

2

9





$$4\ 151 \div 1\ 000$$

thousands

hundreds

tens

units

tenths

hundredths

thousandths

4

1

5

1



$$5\ 670 \div 1\ 000$$

thousands

hundreds

tens

units

tenths

hundredths

thousandths

5

6

7

0



**Some division calculations ...**

**What is the missing number?**

$$40 \div \square = 8$$

**What is the missing number?**

$$45 \div \boxed{\phantom{000}} = 5$$

**What is the missing number?**

$$\square \div 14 = 6$$

**What is the missing number?**

$$77 \div \boxed{\phantom{000}} = 7$$

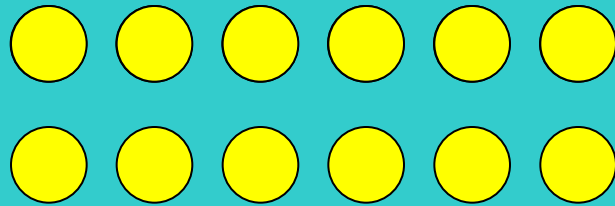
**Multiplication tables...learn these!**



X 2

**Doubling**

Two times



2 times 6 is 12

6 doubled is 12

8 16

9 18

0 0

4 8

10 20

6 12

5 10

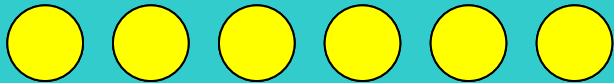
7 14

3 6

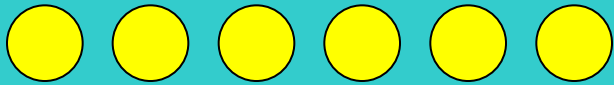
2 4

1 2

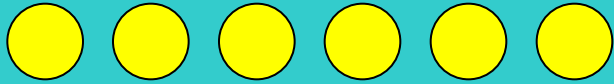
Let's look at the 3 times table.



Here is 6 again



2 times 6 is 12



3 times 6 is 18

So to find 3 times 6

we double 6 and add another 6.

To find 3 times 7

we double 7 and add a 7.



Here is 7



2 times 7 is 14

To get three times we  
must add another 7  
to give 21

So 3 times 7 is 21

Find 3 times the numbers in the yellow squares.

$9 \times 3 = 27$

$0 \times 3 = 0$

$4 \times 3 = 12$

$8 \times 3 = 24$

$10 \times 3 = 30$

$6 \times 3 = 18$

$5 \times 3 = 15$

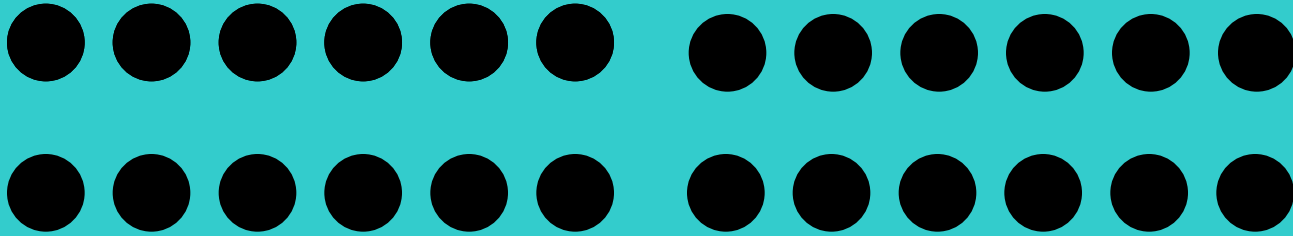
$7 \times 3 = 21$

$3 \times 3 = 9$

$2 \times 3 = 6$

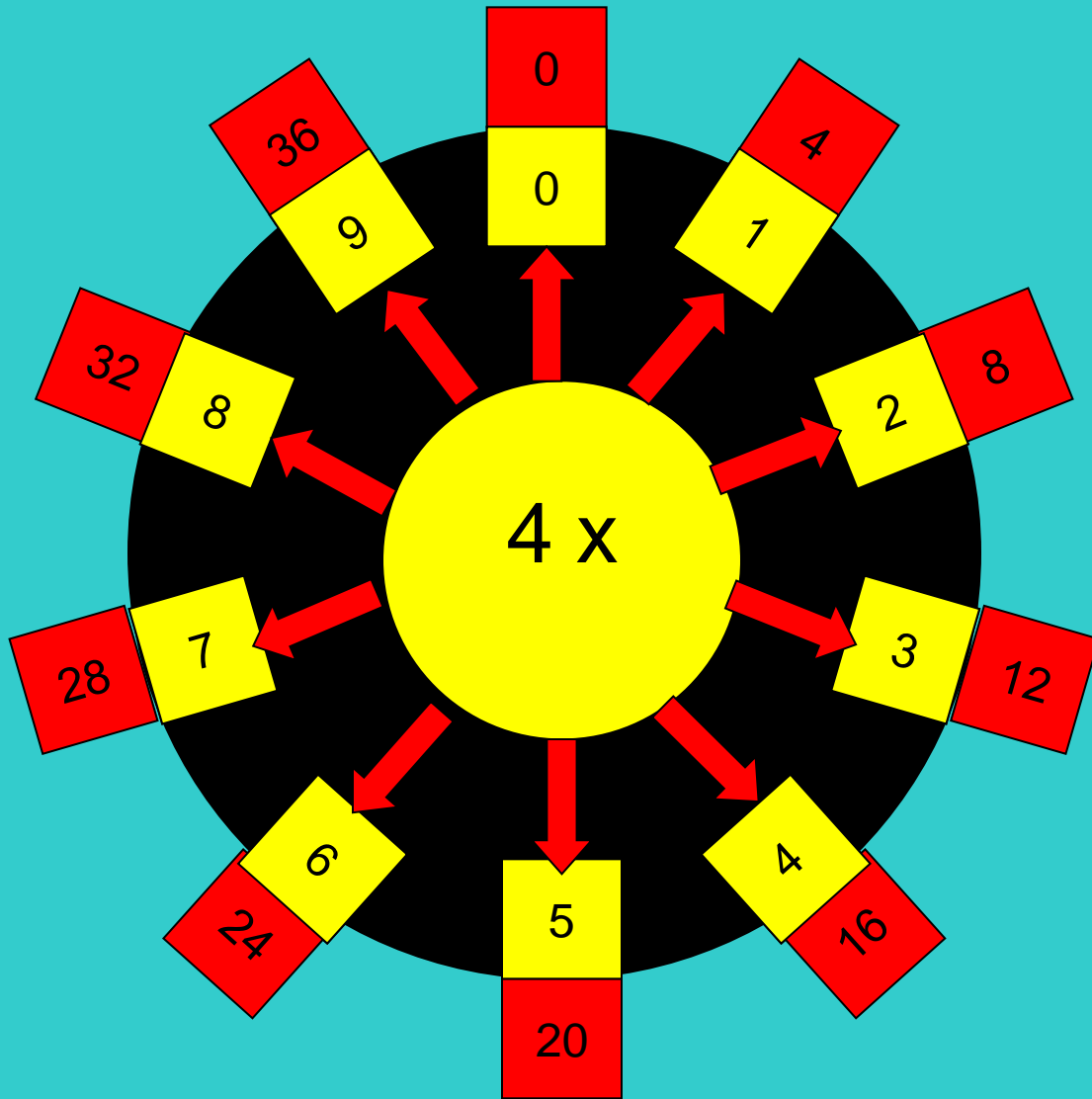
$1 \times 3 = 3$

4 times



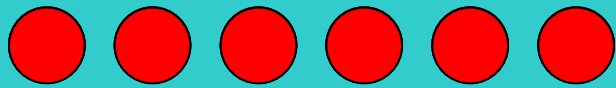
$$4 \times 6 = 24$$

Double and double again.

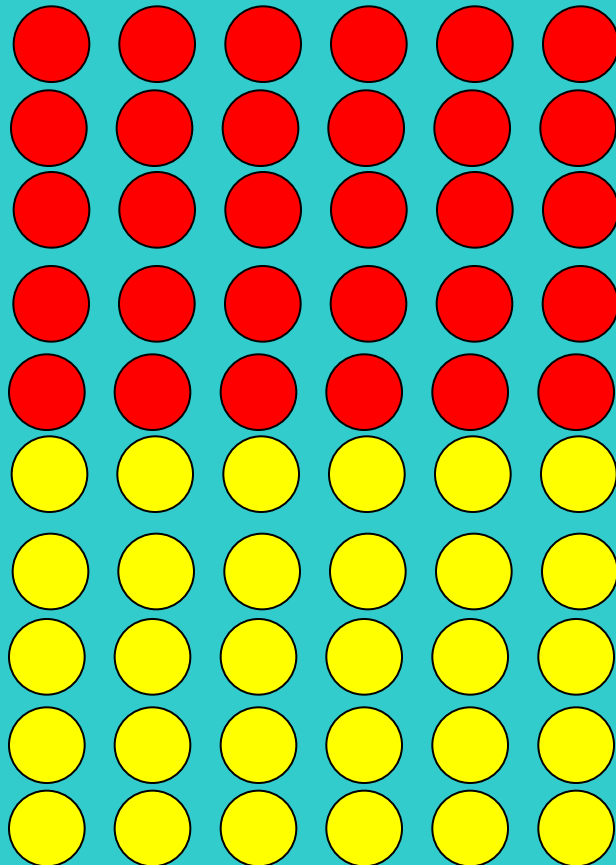




# 5 times



← Here is 1 times 6



← Here is 10 times 6

We know 10 times 6 is 60

5 times 6 is half as much.

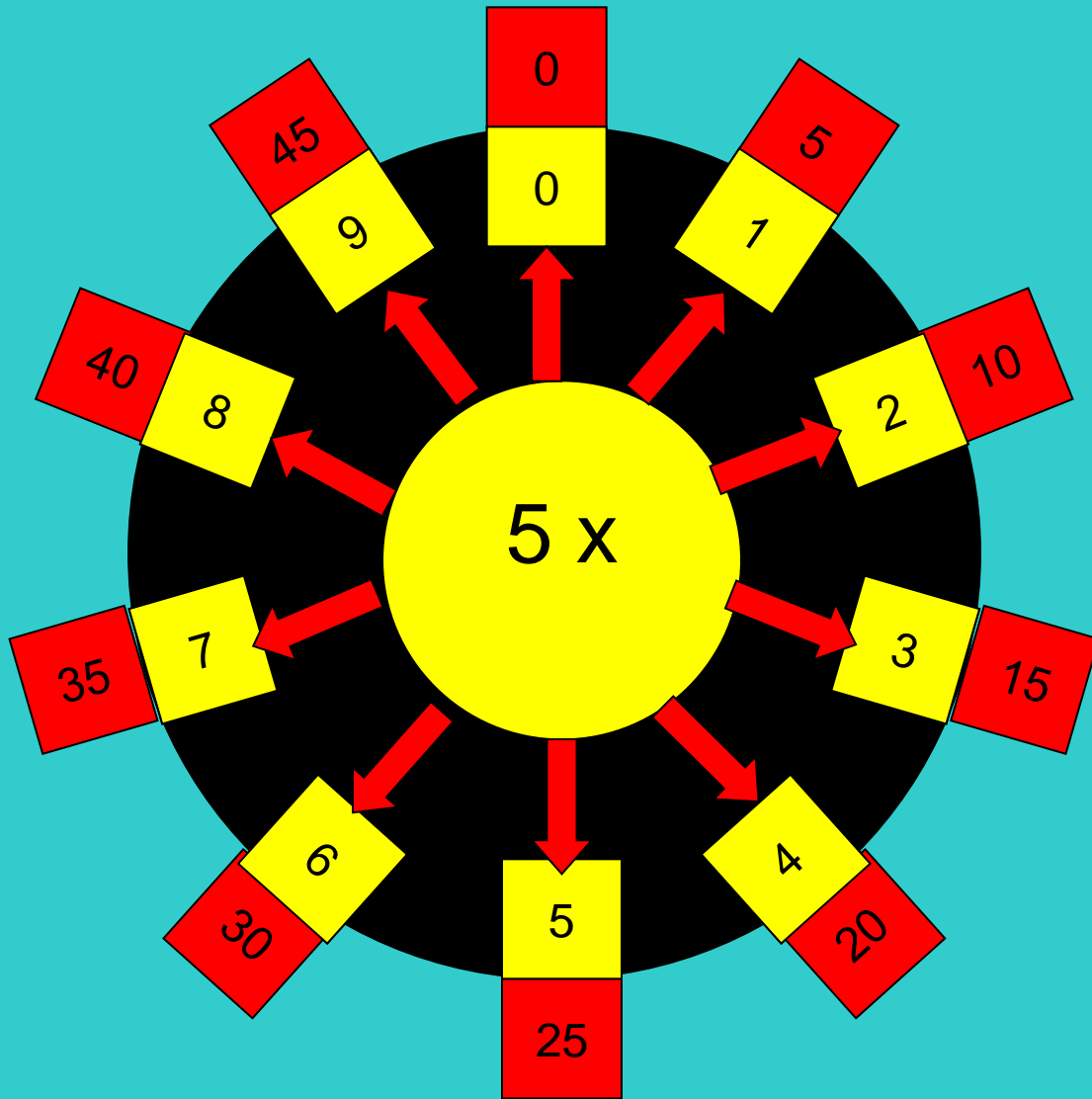
**It is 30.**

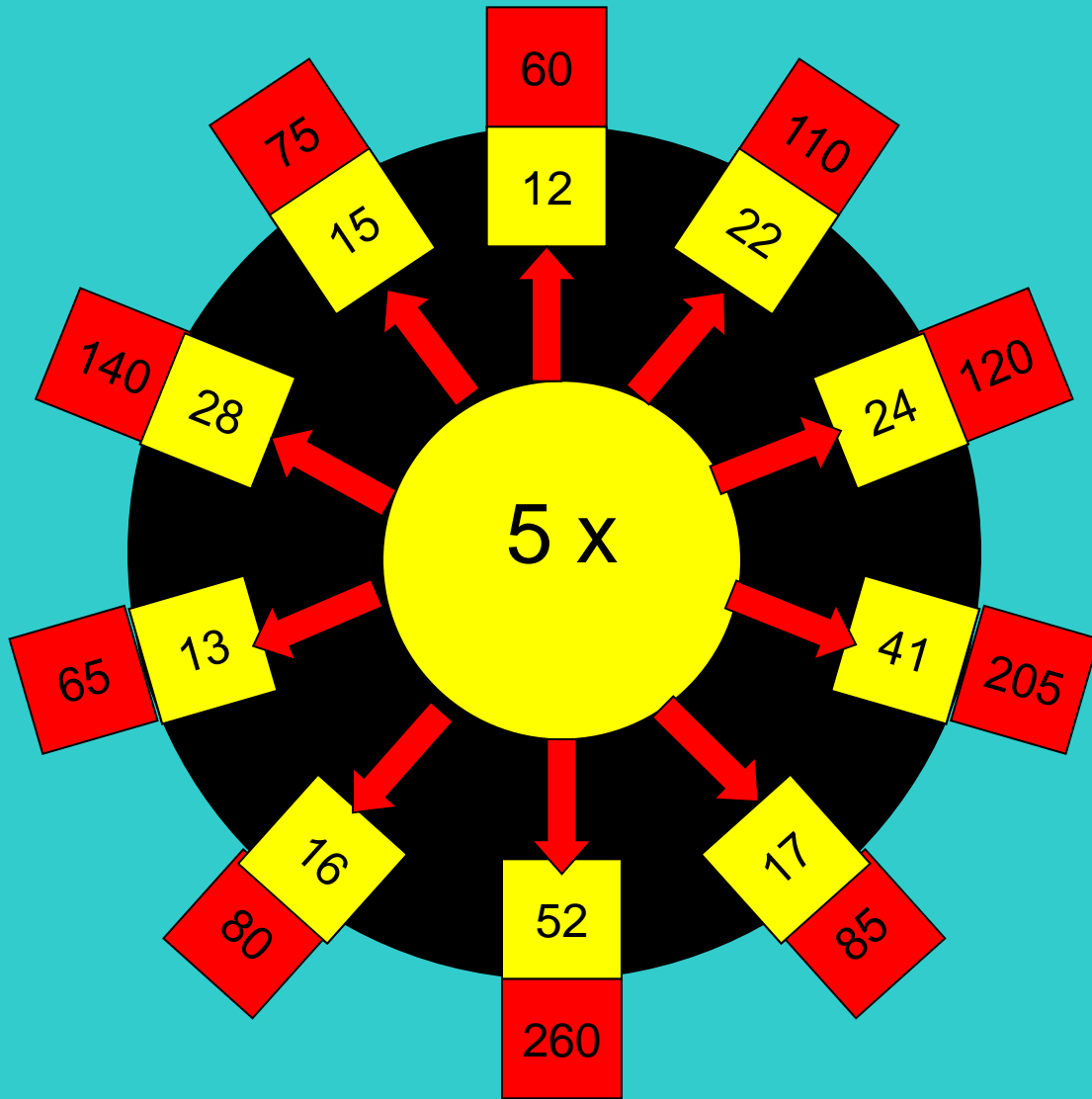
**To multiply by 5 we multiply by 10 and then halve.**

$$5 \times 6$$

$$10 \times 6 = 60$$

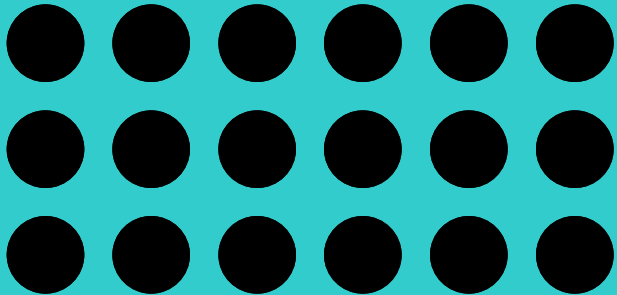
**Then we halve 60 to get 30.**





# 6 times

To multiply by 6 we multiply by 3 and then double.



Here is  $3 \times 6 = 18$

Double and we get  $6 \times 6 = 36$

# Remember

$6 \times 1 = 6$  that's easy

$6 \times 2 = 2 \times 6$  so we double 6

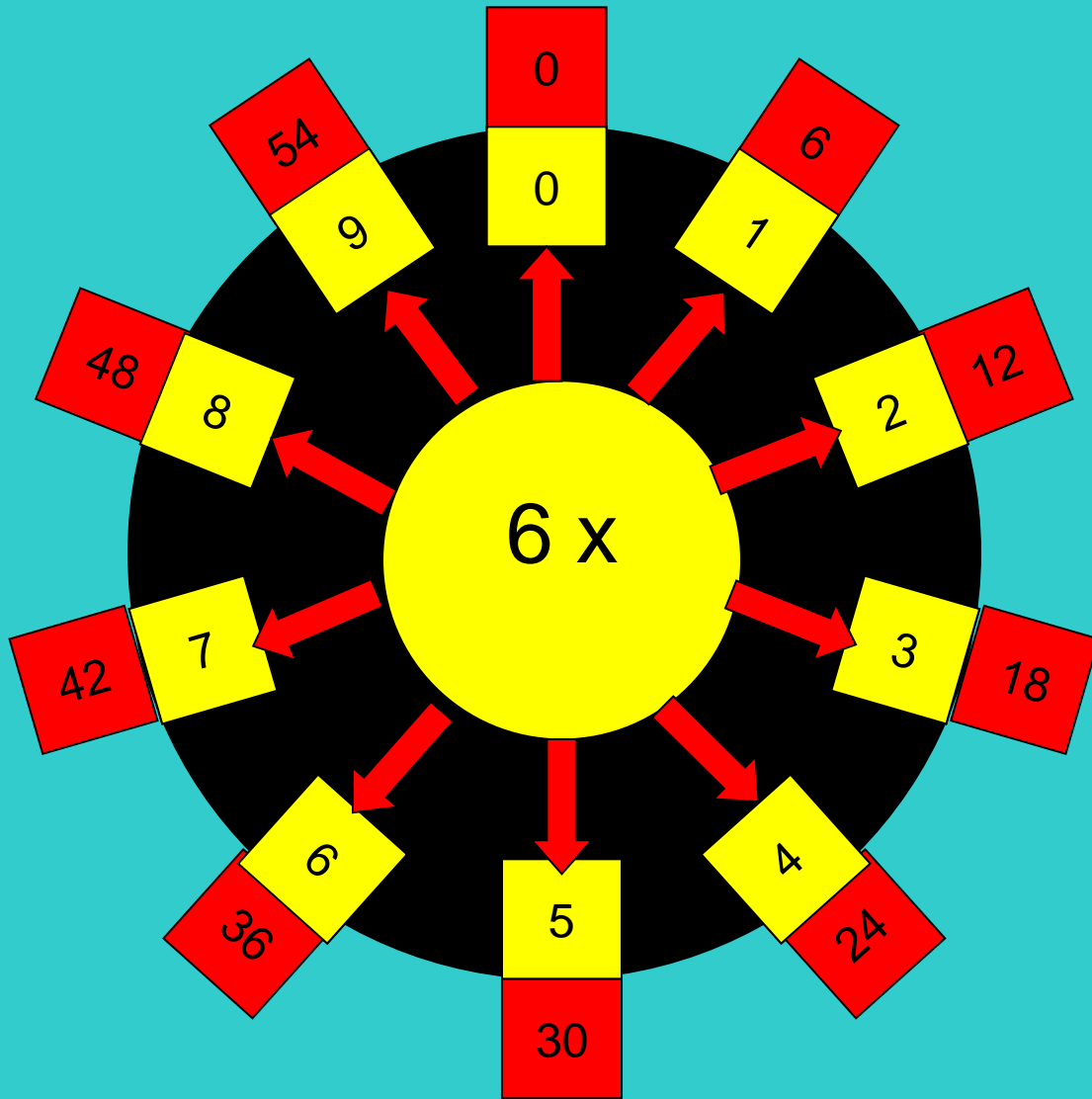
$6 \times 3 = 3 \times 6$  we can do that

$6 \times 4 = 4 \times 6$  we can do that

$6 \times 5 = 5 \times 6$  we can do that

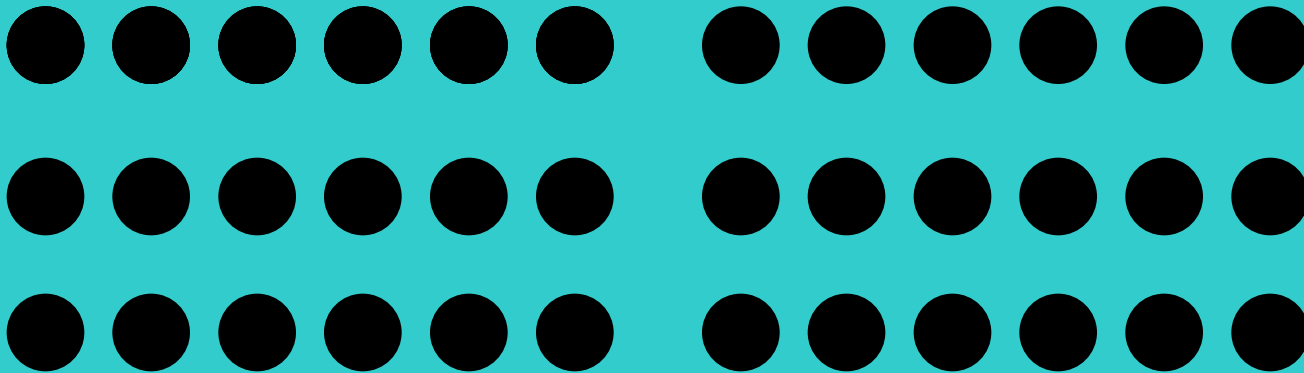
So we only really need to use 3 times and double  
for

$6 \times 6$ ,  $6 \times 7$ ,  $6 \times 8$ , and  $6 \times 9$

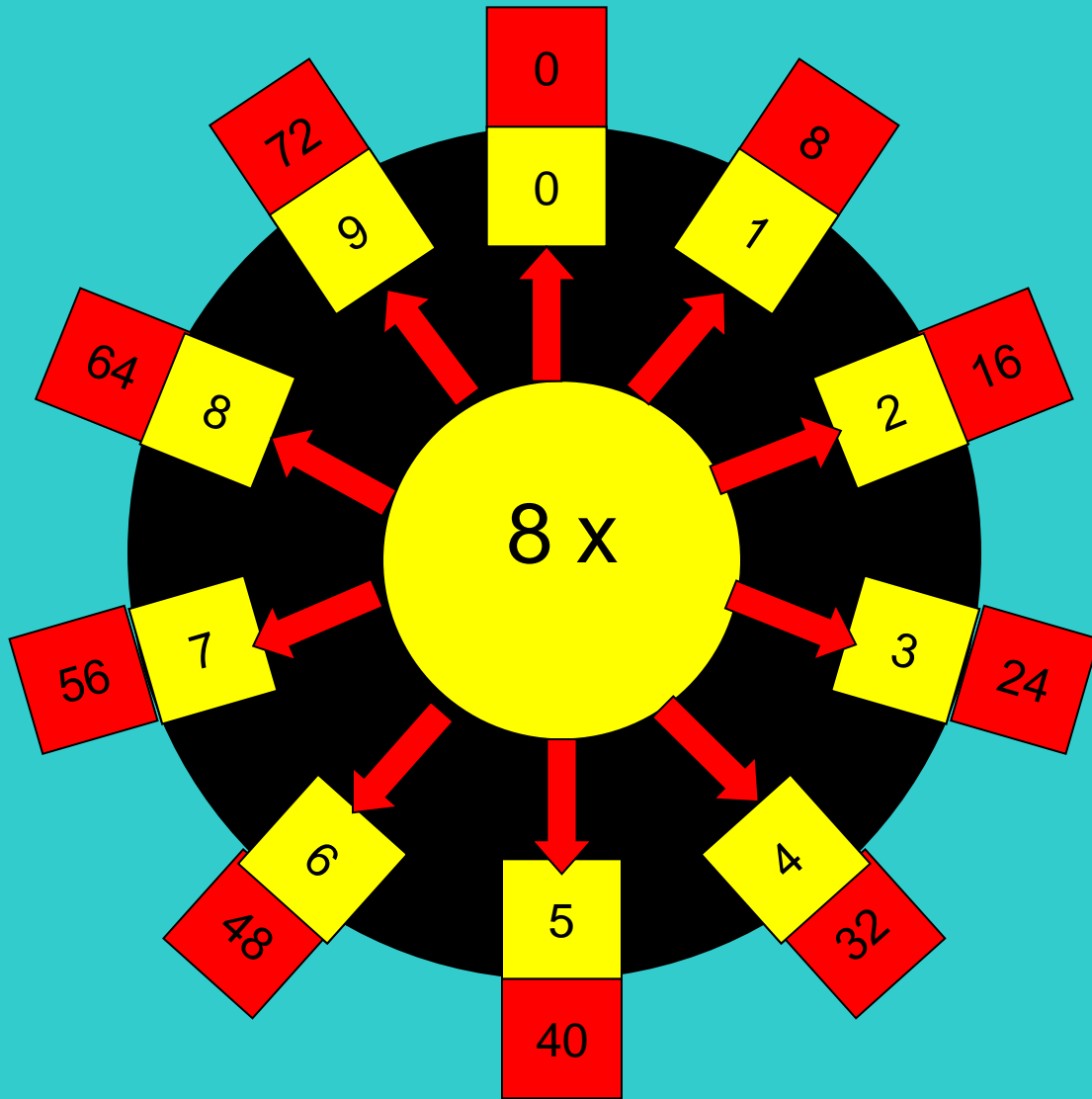


# 8 times

To find 8 times we double and then double and then double again.







# 9 times

$10 \times 9 = 90$  so  $9 \times 9$  must be less. It is eighty something

$10 \times 8 = 80$  so  $9 \times 8$  must be less. It is seventy something

What must these be?

$9 \times 7$       Sixty something

$9 \times 6$       Fifty something

$9 \times 5$       Forty something

$9 \times 4$       Thirty something

$9 \times 3$       Twenty something

# 9 times

9 x 9	8? Eighty something
9 x 8	7? Seventy something
9 x 7	6? Sixty something
9 x 6	5? Fifty something
9 x 5	4? Forty something
9 x 4	3? Thirty something
9 x 3	2? Twenty something

# 9 times

$9 \times 9 = 81 \quad 8 + 1 = 9$

$9 \times 8 = 72 \quad 7 + 2 = 9$

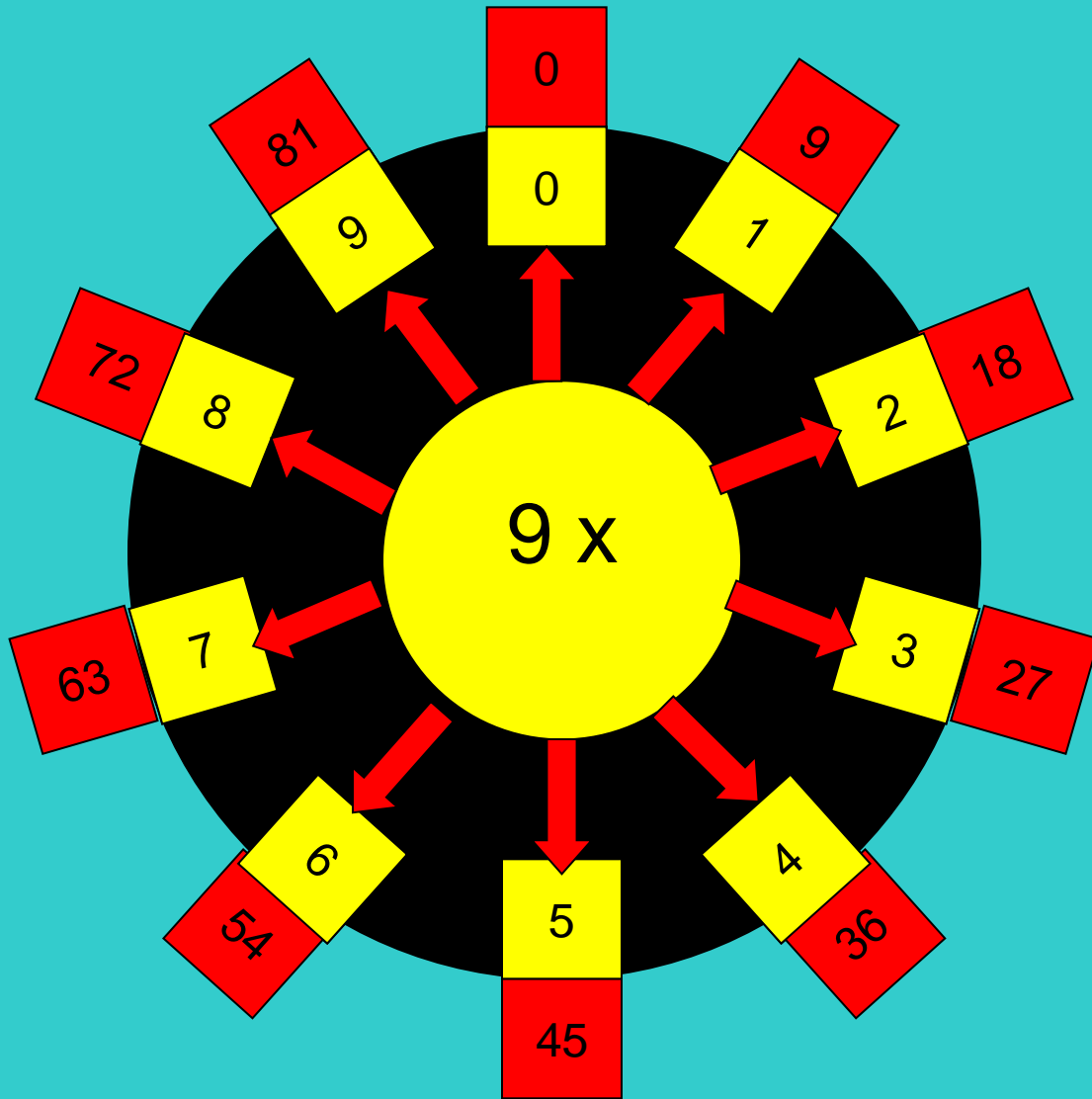
$9 \times 7 = 63 \quad 6 + 3 = 9$

$9 \times 6 = 54 \quad 5 + 4 = 9$

$9 \times 5 = 45 \quad 4 + 5 = 9$

$9 \times 4 = 36 \quad 3 + 6 = 9$

$9 \times 3 = 27 \quad 2 + 7 = 9$



# 7 times

$7 \times 1 = \checkmark$

$7 \times 2 = \checkmark$

$7 \times 3 = \checkmark$

$7 \times 4 = \checkmark$

$7 \times 5 = \checkmark$

$7 \times 6 = \checkmark$

$7 \times 7 =$

$7 \times 8 = \checkmark$

$7 \times 9 = \checkmark$

✓ Means we already know it!

$$7 \times 7 = 49$$

Problems...



Ben has some pieces of paper with numbers written on them.

He points to one piece of paper.  
He says 'If I divide the number on this piece of paper by **seven**, the answer is **three**.'

What number is on the piece of paper?

Ben points to a different piece of paper.

He says 'If I multiply the number on this piece of paper by five, the answer is forty.'

What number is on this piece of paper?

Ben points to one piece of paper.

He says 'If I multiply the number on this piece of paper by eight, the answer is thirty-two.'

What number is on the piece of paper?

Ben points to a different piece of paper.

He says 'If I **square the number on this piece of paper, the answer is **sixty-four.****'

What number is on this piece of paper?