Old Bank Primary Academy

Smart Strategies 2023-24

Chapter 1 – EYFS

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS **(1 and 10 x tables)** **PKS – Key Stage 1**	**Counting up to 20 in 1's** **Subitising to 3 using 5 frame** **Number recognition to 1 – 10**	**1 more** **1 less** **Subitising to 5 using 5 frame and introduce 10 frame** **Number recognition to 10 – 15** **Counting to 20 in 1's**	**Add 1 to any number within 20** **Subtract 1 from any number within 20** **Subitising to 6 using 10 frame and out of sequence** **Number recognition 15 – 20** **1 more / less** **Counting to 20 in 1's**	**Counting in 2's to 20** **Groups within 10** **Number recognition 15 – 20** **Subitising to 7 using 10 frame and out of sequence** **Add 1 to any number within 20** **Subtract 1 from any number within 20**	**Add / subtract 2 within 20** **Arrays within 10** **Counting in 1s, 2s, 10s** **1 more / less** **Subitising to 8 using 10 frame** **Add 1 to any number within 20** **Subtract 1 from any number within 20**	**Add / subtract 2 within 20** **Arrays within 10** **Counting in 1s, 2s, 10s** **1 more / less** **Subitising to 8 using 10 frame** **Add 1 to any number within 20** **Subtract 1 from any number within 20**

- All **green** concepts are new learning for the half term.
- All **black** concepts are revision of prior learning.
- There are 20 new concepts to learn and understand during EYFS, with summer 2 being a consolidation phase.

1x table

1	x 1	= 1
2	x 1	= 2
3	x 1	= 3
4	x 1	= 4
5	x 1	= 5
6	x 1	= 6
7	x 1	= 7
8	x 1	= 8
9	x 1	= 9
10	x 1	= 10
11	x 1	= 11
12	x 1	= 12

2x table

1	x 2	= 2
2	x 2	= 4
3	x 2	= 6
4	x 2	= 8
5	x 2	= 10
6	x 2	= 12
7	x 2	= 14
8	x 2	= 16
9	x 2	= 18
10	x 2	= 20
11	x 2	= 22
12	x 2	= 24

3x table

1	x 3	= 3
2	x 3	= 6
3	x 3	= 9
4	x 3	= 12
5	x 3	= 15
6	x 3	= 18
7	x 3	= 21
8	x 3	= 24
9	x 3	= 27
10	x 3	= 30
11	x 3	= 33
12	x 3	= 36

4x table

1	x 4	= 4
2	x 4	= 8
3	x 4	= 12
4	x 4	= 16
5	x 4	= 20
6	x 4	= 24
7	x 4	= 28
8	x 4	= 32
9	x 4	= 36
10	x 4	= 40
11	x 4	= 44
12	x 4	= 48

5x table

1	x 5	= 5
2	x 5	= 10
3	x 5	= 15
4	x 5	= 20
5	x 5	= 25
6	x 5	= 30
7	x 5	= 35
8	x 5	= 40
9	x 5	= 45
10	x 5	= 50
11	x 5	= 55
12	x 5	= 60

6x table

1	x 6	= 6
2	x 6	= 12
3	x 6	= 18
4	x 6	= 24
5	x 6	= 30
6	x 6	= 36
7	x 6	= 42
8	x 6	= 48
9	x 6	= 54
10	x 6	= 60
11	x 6	= 66
12	x 6	= 72

7x table

1	x 7	= 7
2	x 7	= 14
3	x 7	= 21
4	x 7	= 28
5	x 7	= 35
6	x 7	= 42
7	x 7	= 49
8	x 7	= 56
9	x 7	= 63
10	x 7	= 70
11	x 7	= 77
12	x 7	= 84

8x table

1	x 8	= 8
2	x 8	= 16
3	x 8	= 24
4	x 8	= 32
5	x 8	= 40
6	x 8	= 48
7	x 8	= 56
8	x 8	= 64
9	x 8	= 72
10	x 8	= 80
11	x 8	= 88
12	x 8	= 96

9x table

1	x 9	= 9
2	x 9	= 18
3	x 9	= 27
4	x 9	= 36
5	x 9	= 45
6	x 9	= 54
7	x 9	= 63
8	x 9	= 72
9	x 9	= 81
10	x 9	= 90
11	x 9	= 99
12	x 9	= 108

10x table

1	x 10	= 10
2	x 10	= 20
3	x 10	= 30
4	x 10	= 40
5	x 10	= 50
6	x 10	= 60
7	x 10	= 70
8	x 10	= 80
9	x 10	= 90
10	x 10	= 100
11	x 10	= 110
12	x 10	= 120

11x table

1	x 11	= 11
2	x 11	= 22
3	x 11	= 33
4	x 11	= 44
5	x 11	= 55
6	x 11	= 66
7	x 11	= 77
8	x 11	= 88
9	x 11	= 99
10	x 11	= 110
11	x 11	= 121
12	x 11	= 132

12x table

1	x 12	= 12
2	x 12	= 24
3	x 12	= 36
4	x 12	= 48
5	x 12	= 60
6	x 12	= 72
7	x 12	= 84
8	x 12	= 96
9	x 12	= 108
10	x 12	= 120
11	x 12	= 132
12	x 12	= 144

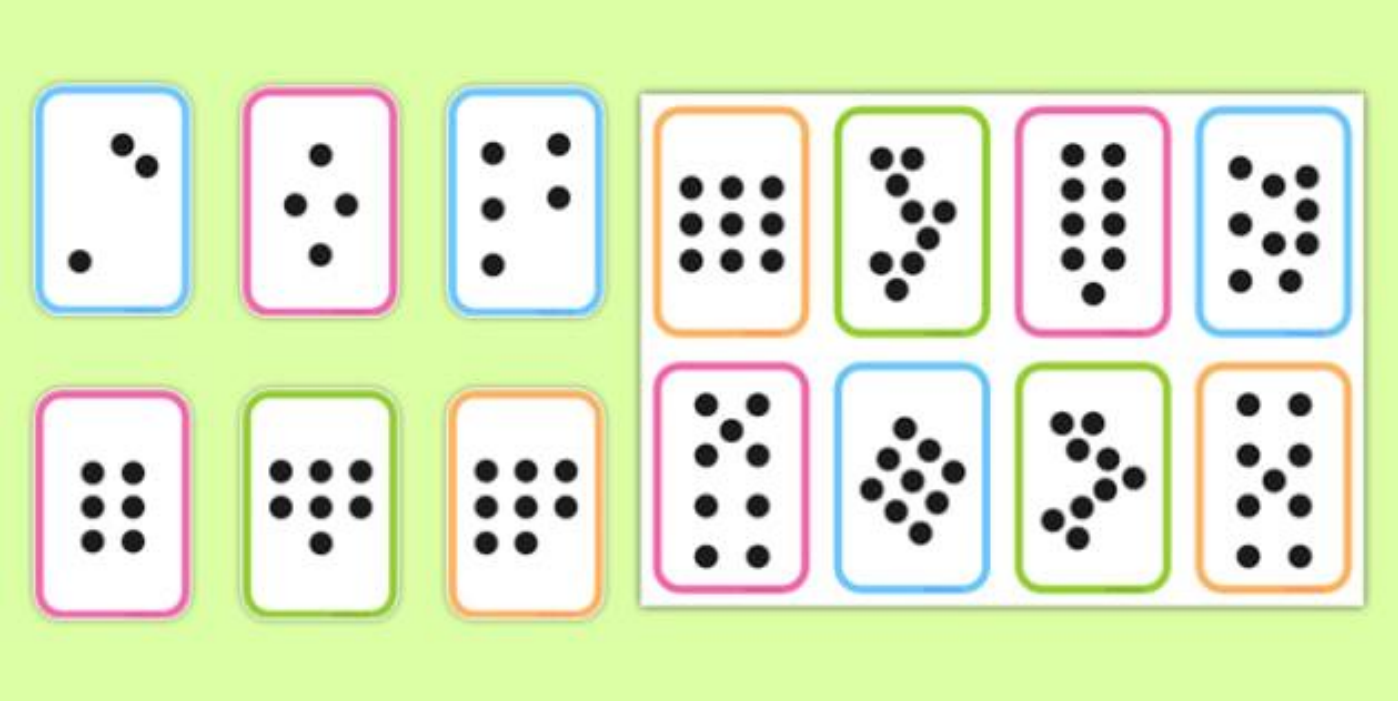
Number Recognition

1	2	3	4	5	6	7	8	9	10
one	***two***	***three***	***four***	***five***	***six***	***seven***	***eight***	***nine***	***ten***

11	12	13	14	15
eleven	***twelve***	***thirteen***	***fourteen***	***fifteen***

16	17	18	19	20
sixteen	***seventeen***	***eighteen***	***nineteen***	***twenty***

Subitising



What is subitising in EYFS? It is the ability to look at a small set of objects and instantly know how many there are without counting.

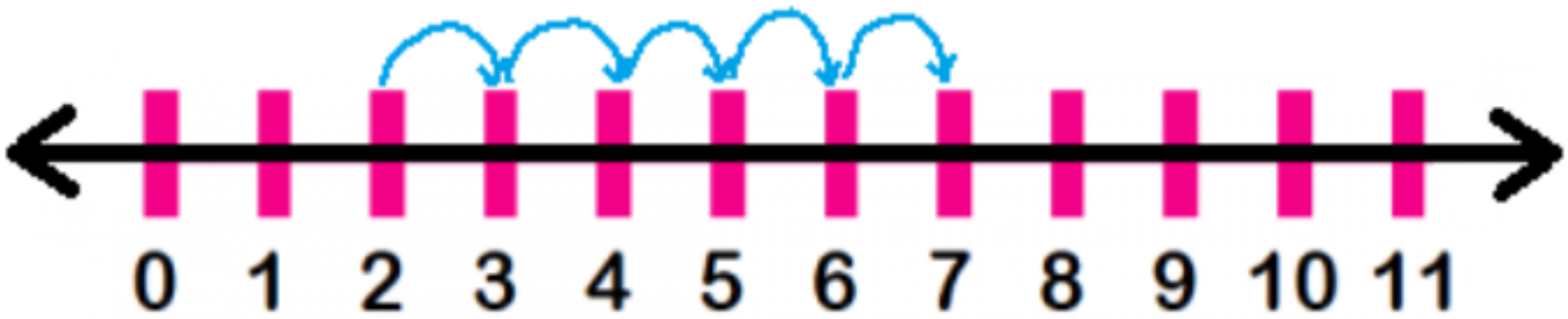
What is an example of subitising? Rolling a dice is an example of subitising. We don't need to count the individual dots to know what the number is, we just instinctively know.

Adding 1

Adding the number 1 to any number is the same as counting numbers like 1, 2, 3, 4, 5 and so on.

Here we are just constantly moving forward one by one. Let us consider number 4 is added to number 1, the answer is 4 + 1 = 5.

When we **add** 1, our number becomes 1 **larger** each time and we count **RIGHT** on our number line.

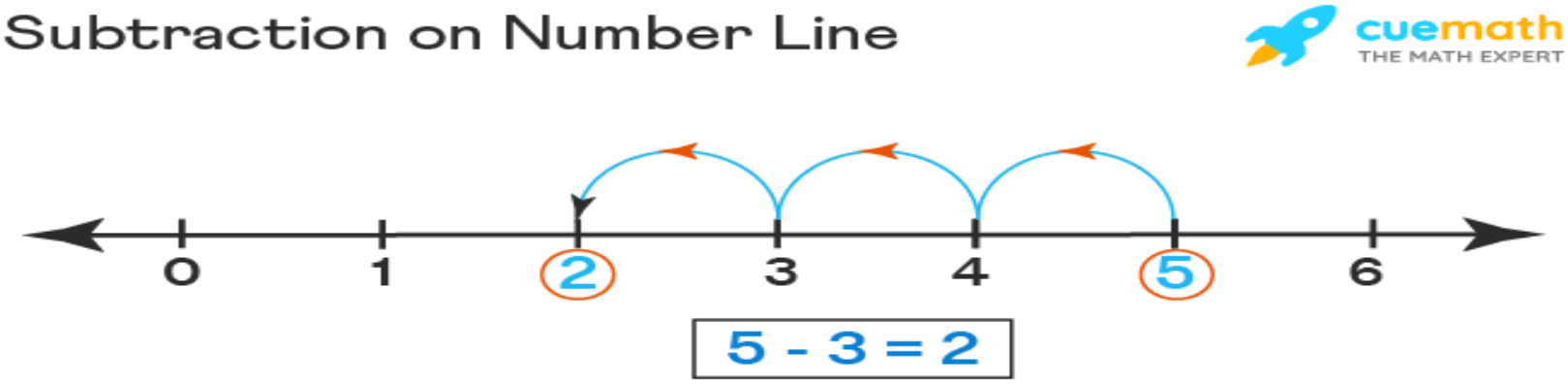


Subtracting 1

Subtracting the number 1 from any number is the same as counting backwards like 5, 4, 3, 2, 1 and so on.

One way to explain subtraction is that it is the opposite of addition. Children learn to add by counting forwards. To subtract, they now just need to count backwards.

When we **subtract** 1, our number becomes 1 **smaller** each time and we count **LEFT** on a number line.



Counting in 2s

Counting by twos is sometimes called "skip counting" because every other number or count is skipped. Each count is two more than the previous count.

Counting in twos or “skip counting” is very important to develop fluency in calculation, number sense and as the basis of multiplication and division.

It helps children to move from calculating or counting by ones to using number facts. They also need to identify a pair as having two matching objects.

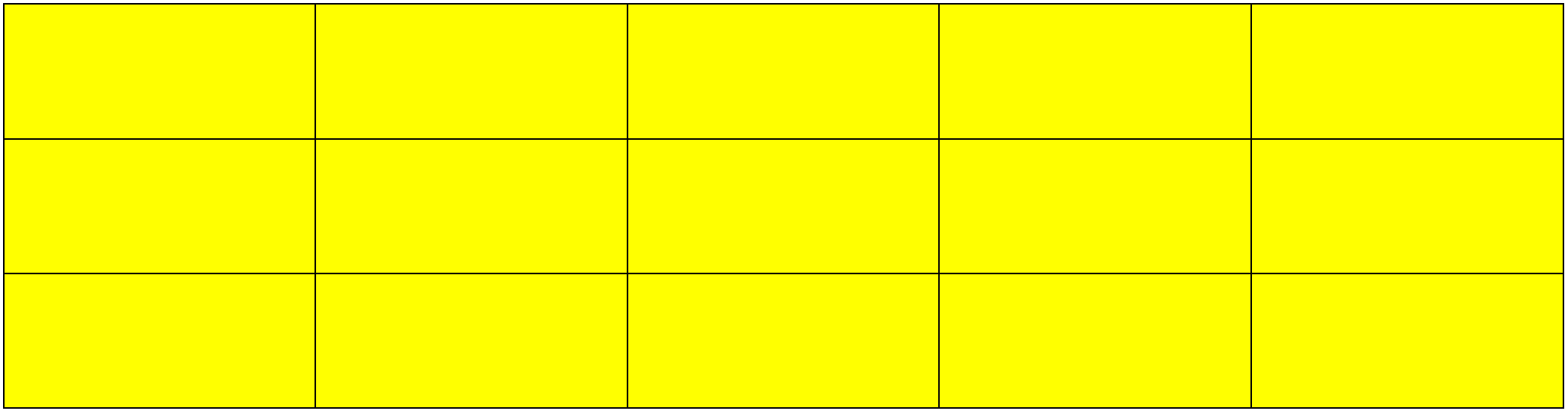
Arrays Within 10

An array is a way to show grouping or sharing using what we call '**rows**' and '**columns**'.

Rows, going from **left** to **right**, show us the **number of groups**.

Columns, going **up** or **down**, tell us the **number in each** group or the size of each group.

Below, we can see 5 groups of 3 because there are **5 rows** and **3 rectangles in each row**.



Chapter 2 – Year One

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1 **(1, 2, 10 x tables)**	**Revise EYFS Strategies** **Add 10 to any number.** **Subtract 10 any number.**	**Revise EYFS Strategies** **Add 10 to any number.** **Subtract 10 from any number.** **Add 9 to any number.**	**As per Autumn 2** **Subtract 9 from any number.**	**As per Spring 1** **Double numbers to 20.**	**Add 10 to any number.** **Add 9 to any number** **Subtract 10 from any number.** **Subtract 9 from any number.** **Double numbers to 20.**	**Add 10 to any number.** **Add 9 to any number** **Subtract 10 from any number.** **Subtract 9 from any number.** **Double numbers to 20.**

- All **green** concepts are new learning for the half term.
- All **black** concepts are revision of prior learning.
- There are **5** key concepts to learn and understand during Year One, with summer being a consolidation phase.
- In addition, the **2 x Table will be learned in and out of order and recited as number sentences, not products**.
- During Year One, **all EYFS concepts will be revised** and consolidated on a half-termly basis.

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Add 10 to any number	• Increase your tens by 1. • Leave the 1s alone.	• 65 + 10 • Add 1 ten to the 6 tens • This leaves 7 tens • 65 + 10 = 75	• Place value grids • Counters • Cubes
Subtract 10 from any number	• Reduce your tens by 1. • Leave the 1s alone.	• 65 – 10 • Take 1 ten from the 6 tens • This leaves 5 tens • 65 – 10 = 55	• Place value grids • Counters • Cubes
Add 9 to any number	• Add 10 to your starting number. • Subtract 1.	• 13 + 9 • 13 + 10 = 23 • 23 – 1 = 22 • So, 13 + 9 = 22	• Place value grids • Counters • Cubes
Subtract 9 from any number	• Subtract 10 from your starting number. • Add 1 back.	• 13 – 9 • 13 – 10 = 3 • 3 + 1 = 4 • So, 13 – 9 = 4	• Place value grids • Counters • Cubes
Double any number to 20	• For any number less than 10, use the 2x tables facts. • For numbers above 10, double 10 then use your 2x tables facts for the 1s. • Add your numbers!	• 13 x 2 • 10 x 2 = 20 • 3 x 2 = 6 • 20 + 6 = 26	• Place value grids • Counters • Cubes

Chapter 3 – Year Two

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2 **(1, 2, 5, 10 x tables)**	**Revise EYFS and Y1 Strategies.** **Add 100 to any number.** **Subtract 100 from any number.**	**Revise EYFS and Y1 Strategies.** **Add or subtract 100 to or from any number.** **Add 99 to any number.** **Subtract 99 from any number.**	**Revise EYFS and Y1 Strategies.** **Add or subtract 100 to or from any number.** **Add or subtract 99 to or from any number.** **Add 19 to any number.** **Subtract 19 from any number.**	**Revise Y1 Strategies.** **Add or subtract 100 to or from any number.** **Add or subtract 99 to or from any number.** **Add or subtract 19 to or from any number.** **Multiply by 10.**	**Revise Y1 Strategies.** **Add or subtract 100.** **Add or subtract 99 to or from any number.** **Add or subtract 19 to or from any number.** **Multiply by 10.** **Divide by 10.**	**Revise Y1 Strategies.** **Add or subtract 100.** **Add or subtract 99.** **Add or subtract 19.** **Multiply by 10.** **Divide by 10.** **Add 18** **Subtract 18**

- All **green** concepts are new learning for the half term.
- All **black** concepts are revision of prior learning.
- There are **10** key concepts to learn and understand during Year Two.
- In addition, the **5 x Table will be learned in and out of order and recited as number sentences, not products**.
- During Year Two, **all EYFS and Year One concepts will be revised** and consolidated on a half-termly basis.

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Add 100 to any number	• Increase your hundreds by 1. • Leave the 1s and 10s alone.	• 653 + 100 • Add 100 to the 600 • This leaves 7 hundreds • 653 + 100 = 753	• Place value grids • Counters • Cubes
Subtract 100 from any number	• Reduce your hundreds by 1. • Leave the 1s and 10s alone.	• 653 – 100 • Take 100 from the 600 • This leaves 5 hundreds • 653 – 100 = 553	• Place value grids • Counters • Cubes
Add 99 to any number	• Add 100 to your starting number. • Subtract 1.	• 13 + 99 • 13 + 100 = 113 • 113 – 1 = 112 • So, 13 + 99 = 112	• Place value grids • Counters • Cubes
Subtract 99 from any number	• Subtract 100 from your starting number. • Add 1 back.	• 130 – 99 • 130 – 100 = 30 • 30 + 1 = 31 • So, 130 – 99 = 31	• Place value grids • Counters • Cubes
Add 19 to any number	• Add 20 to your starting number (two tens) • Subtract 1.	• 13 + 19 • 13 + 20 = 33 • 33 – 1 = 32 • So, 13 + 19 = 32	• Place value grids • Counters • Cubes

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Subtract 19 from any number	• Subtract 20 from your starting number (two tens). • Add 1 back.	• 50 – 19 • 50 – 20 = 30 • 30 + 1 = 31 • So, 50 – 19 = 31	• Place value grids • Counters • Cubes
Multiply any number by 10	• All digits move one place left. • Never move the decimal. • We never 'add zero'.	• 125 x 10 • All digits move 1 place left • 0125 x 10 = 1250	• Place value grids • Counters • Cubes
Divide any number by 10	• All digits move one place right. • We never 'take away a zero'.	• 50 ÷ 10 • All digits move 1 place right • 50 ÷ 10 = 05	• Place value grids • Counters • Cubes
Add 18 to any number	• Add 20 to your starting number (two tens) • Subtract 2.	• 13 + 18 • 13 + 20 = 33 • 33 – 2 = 31 • So, 13 + 18 = 31	• Place value grids • Counters • Cubes
Subtract 18 from any number	• Subtract 20 from your starting number (two tens). • Add 2 back.	• 50 – 18 • 50 – 20 = 30 • 30 + 2 = 32 • So, 50 – 18 = 32	• Place value grids • Counters • Cubes

Chapter 4 – Year Three

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3 **(1-5, 9, 10 x tables)**	**Revise Y1-2 Strategies.** **Add 1000** **Subtract 1000**	**Revise Y1-2 Strategies.** **Add or subtract 1000** **Add 999** **Subtract 999**	**Revise Y1-2 Strategies.** **Add or subtract 1000** **Add or subtract 999** **Multiply by 100** **Divide by 100** **Multiply by 1000** **Divide by 1000**	**Revise Y1-2 Strategies.** **Add or subtract 1000** **Add or subtract 999** **X or ÷ by 100 or 1000** **Multiply by 9** **Multiply by 99**	**Revise Y1-2 Strategies.** **Add or subtract 1000** **Add or subtract 999** **X or ÷ by 100 or 1000** **Multiply by 9 or 99** **Multiply by 11**	**Revise Y1-2 Strategies.** **Add or subtract 1000** **Add or subtract 999** **X or ÷ by 100 or 1000** **Multiply by 9, 11 or 99** **Divide by 4**

- All **green** concepts are new learning for the half term.
- All **black** concepts are revision of prior learning.
- There are **12** key concepts to learn and understand during Year Three.
- In addition, the **3, 4 and 9 x Tables will be learned in and out of order and recited as number sentences**.
- During Year Three, **all Key Stage 1 concepts will be revised** and consolidated on a half-termly basis.

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Add 1,000 to any number	• Increase your thousands by 1. • Leave the 1s, 10s and 100s alone.	• 6,530 + 1,000 = ? • Add 1,000 to the 6,000 • This leaves 7 thousands • **6,**530 + 1,000 = **7,**530	• Place value grids • Counters • Cubes
Subtract 1,000 from any number	• Reduce your thousands by 1. • Leave the 1s, 10s and 100s alone.	• 6,530 – 1,000 = ? • Take 1,000 from the 6,000 • This leaves 5 thousands • **6,**530 – 1,000 = **5,**530	• Place value grids • Counters • Cubes
Add 999 to any number	• Add 1,000 to your starting number. • Subtract 1.	• 13 + 999 = ? • 13 + 1,000 = 1,013 • 1,013 – 1 = 1,012 • So, 13 + 999 = 1,012	• Place value grids • Counters • Cubes
Subtract 999 from any number	• Subtract 1,000 from your starting number. • Add 1 back.	• 1,300 – 999 = ? • 1,300 – 1,000 = 300 • 300 + 1 = 301 • So 1,300 – 999 = 301	• Place value grids • Counters • Cubes
Multiply any number by 100	• All digits move 2 places left. • Never move the decimal. • We never ‘add two zeros’.	• 125 x 100 = ? • All digits move 2 places left • 125 x 100 = 12,500	• Place value grids • Counters • Cubes
Divide any number by 100	• All digits move 2 places right. • We never ‘take away two zeros’.	• 500 ÷ 100 = ? • All digits move 2 places right • 500 ÷ 100 = 5	• Place value grids • Counters • Cubes

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Multiply any number by 1,000	• All digits move 3 places left. • Never move the decimal. • We never 'add three zeros'.	• 125 x 1,000 = ? • All digits move 3 places left • 125 x 1,**000** = 125,**000**	• Place value grids • Counters • Cubes
Divide any number by 1,000	• All digits move 3 places right. • We never 'take away three zeros'.	• 5,000 ÷ 1,000 = ? • All digits move 3 places right • 5,000 ÷ 1,000 = 5	• Place value grids • Counters • Cubes
Multiply any number by 9	• Use the Smart Strategy for multiplying by 10. • Subtract your original number.	• 14 x 9 = ? • 14 x 1**0** = 14**0** • 140 – 14 = 126 • 14 x 9 = 126	• Place value grids • Counters • Cubes
Multiply any number by 99	• Use the Smart Strategy for multiplying by 100. • Subtract your original number.	• 14 x 99 = ? • 14 x 1**00** = 1,4**00** • 1,400 – 14 = 1,386 • 14 x 99 = 1,386	• Place value grids • Counters • Cubes
Multiply any number by 11	• Use the Smart Strategy for multiplying by 10. • Add your original number.	• 14 x 11 = ? • 14 x 1**0** = 14**0** • 140 + 14 = 154 • 14 x 11 = 154	• Place value grids • Counters • Cubes
Divide any number by 4	• Halve your original, or divide it by 2. • Halve your answer.	• 500 ÷ 4 = ? • 500 ÷ 2 = 250 • 250 ÷ 2 = 125 • 500 ÷ 4 = 125	• Bar modelling apparatus • Cubes

Chapter 5 – Year Four

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4 (1 - 12 x tables, 5-second recall)	Revise Y1-2 Strategies. Revise Y3 Strategies. Add 9.9 to any number Add 0.9 to any number Subtract 9.9 Subtract 0.9	Revise Y1-2 Strategies. Revise Y3 Strategies. Add or subtract 9.9 Add or subtract 0.9 Adding fractions same denominator Subtracting fractions same denominator	Revise Y1-2 Strategies. Revise Y3 Strategies. Add / subtract 9.9 or 0.9 Adding or subtracting fractions same denom. Find 5% Find 10% Find 20%	As per Spring 1 Multiply by 999 Multiply by 20 Multiply by 21 Multiply by 19	As per Spring 2 Divide any number by 5 Divide any number by 8 Find 1% of any number	As per Summer 1 Multiply by 15 Multiply by 25

- All **green** concepts are new learning for the half term.
- All **black** concepts are revision of prior learning.
- There are **18** key concepts to learn and understand during Year Four.
- In addition, the **6, 7, 8, 11 and 12 x Tables will be learned in and out of order and recited as number sentences**.
- During Year Four, **all Key Stage 1 and Year 3 concepts will be revised** and consolidated on a half-termly basis.

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Add 9.9 to any number	• Add 10 to your starting number. • Subtract 0.1.	• 630 + 9.9 = ? • 630 + 10 = 640 • 640 – 0.1 = 639.9 • So, 630 + 9.9 = 639.9	• Place value grids to 1dp • Counters • Cubes • STS grids
Subtract 9.9 from any number	• Subtract 10 from your starting number. • Add 0.1 back.	• 286 – 9.9 = ? • 286 – 10 = 276 • 276 + 0.1 = 276.1 • 286 – 9.9 = 276.1	• Place value grids to 1dp • Counters • Cubes • STS grids
Add 0.9 to any number	• Add 1 to your starting number. • Subtract 0.1.	• 630 + 0.9 = ? • 630 + 1 = 631 • 631 – 0.1 = 630.9 • So, 630 + 0.9 = 630.9	• Place value grids to 1dp • Counters • Cubes • STS grids
Subtract 0.9 from any number	• Subtract 1 from your starting number. • Add 0.1 back.	• 16.3 – 0.9 = ? • 16.3 – 1 = 15.3 • 15.3 + 0.1 = 15.4 • So, 16.3 – 0.9 = 15.4	• Place value grids to 1dp • Counters • Cubes • STS grids
Adding fractions together with the same denominator	• Know that a numerator is the ‘top value’ in a fraction. • Add together the numerators • Leave the denominators alone!	• 4/7 + 2/7 = ? • 4 + 2 = 6 • So, 4/7 + 2/7 = 6/7	• Fraction shapes • Bar model apparatus
Subtracting fractions with the same denominator	• Know that a numerator is the ‘top value’ in a fraction. • Subtract the smaller numerator from the larger. • Leave the denominators alone!	• 5/7 - 2/7 = ? • 5 - 2 = 3 • So, 5/7 - 2/7 = 3/7	• Fraction shapes • Bar model apparatus

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Find 10% of any number	• Use our Smart Strategy for dividing any number by 10. • Know that 10% = 1/10 and we find this by diving by 10.	• 50 ÷ 10 • All digits move 1 place right • 50 ÷ 10 = 05	• Place value grids • Counters • Cubes
Find 20% of any number	• Know that 20% = 1/5 and we find this by diving by 5. • Or, divide by 10 then double your answer.	• 20% of 50 = 50 ÷ 5 • 50 ÷ 5 = 10 • 50 ÷ 10 = 5, doubled = 10 • 20% (or 1/5) of 50 = 10	• Place value grids • Counters • Cubes • STS grids
Find 5% of any number	• Use our Smart Strategy for dividing any number by 10. • Halve your answer. • Or, divide by 20 if you can!	• 5% of 300 = ? • 300 ÷ 10 = 30 • Half of 30 = 15 • So, 5% of 300 must be… 15	• Place value grids • Counters • Cubes • STS grids
Multiply any number by 999	• Use our Smart Strategy for multiplying by 1000 • Subtract the number you started with.	• 47 x 999 = ? • 47 x 1000 = 47,000 • 47,000 – 47 = 46,953 • So, 47 x 999 = 46,953	• Place value grids • Counters • Cubes • STS grids
Multiply any number by 20	• Use our Smart Strategy for multiplying by 10. • Double your answer. • Or, double your number then multiply the answer by 10.	• 36 x 20 = ? • 36 x 10 = 360 • 360 x 2 = 600 + 120 = 720 • So, 36 x 20 must be… 720	• Place value grids • Counters • Cubes • STS grids
Multiply any number by 19	• Use our Smart Strategy for multiplying by 20. • Subtract the number you started with.	• 37 x 19 = ? • 37 x 10 = 370 • 370 x 2 = 740 (600 + 140) • 740 – 37 = 703 • So, 37 x 19 = 703	• Place value grids • Counters • Cubes • STS grids

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Multiply any number by 21	• Use our Smart Strategy for multiplying by 20. • Add the number you started with.	• 37 x 19 = ? • 37 x 10 = 370 • 370 x 2 = 740 (600 + 140) • 740 – 37 = 703 • So, 37 x 19 = 703	• Place value grids • Counters • Cubes • STS grids
Divide any number by 5	• Use bus stop division and your 5x tables to divide by 5. • Or, divide by 10 quickly then double your answer.	• 840 ÷ 5 = ? • 840 ÷ 10 = 84 • 84 x 2 = 160 + 8 = 168 • 840 ÷ 5 = 168	• Multiplication tables / square • STS grids
Divide any number by 8	• Use our Smart Strategy for dividing by 4, then halve your answer. • Or, use your 8x tables to complete a bus stop division.	• 480 ÷ 8 = ? • ½ of 480 = 240 • ½ of 240 = 120 • ½ of 120 = 60 • 480 ÷ 8 = 60 (what is 6 x 8?)	• Multiplication tables / square • STS grids
Find 1% of any number	• Use our Smart Strategy for dividing by 100. • Know that 1% is the same as the fraction 1/100	• 1% of 700 • 1% = 1/100 • 700 ÷ 100 = 7 • 1% of 700 = 7	• Hundred square • Place value grids
Multiply any number by 15	• Use our Smart Strategy to quickly multiply by 10. • Halve this and add it to your answer.	• 84 x 15 = ? • 84 x 10 = 840 • ½ of 840 = 420 (84 x 5) • 84 x 15 = 840 + 420 = 1,260	• Multiplication tables / square • STS grids
Multiply any number by 25	• Use our Smart Strategy to quickly multiply by 15. • Multiply your starting number by 10. • Add the two together!	• 84 x 25 = ? • 84 x 15 = 1,260 (see above) • 84 x 10 = 840 • 1,260 + 840 = 2,100 • So, 84 x 25 = 2,100	• Multiplication tables / square • STS grids

Chapter 6 – Year Five

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5 **(1 – 12 x tables, 1 – 6 x tables inverses)**	**Revise Y1-2 Strategies.** **Revise Y3-4 Strategies.** **Add fractions with different denominators.** **Subtract fractions with different denominators.**	**Revise Y1-2 Strategies.** **Revise Y3-4 Strategies.** **Add / subtract fractions different denominators.** **Multiply by 0.9** **Multiply by 9.9**	**Revise Y1-2 Strategies.** **Revise Y3-4 Strategies.** **Add / subtract fractions different denominators.** **Multiply by 0.9 or 9.9** **Find 90%** **Find 80%** **Multiply by 0.8**	**As per Spring 1** **Multiply a fraction by a whole number.** **Multiply by 2.5** **Multiply by 12.5**	**As per Spring 2** **Increase and decrease integers by scale factors.** **Divide a fraction by a whole number.**	**As per Summer 1** **Divide by 8** **Find 12.5%** **Find 11%** **Find 2.5%**

- All **green** concepts are new learning for the half term.
- All **black** concepts are revision of prior learning.
- There are **16** key concepts to learn and understand during Year Five.
- In addition, the **1-6 x tables are expected to be known as inverses / times tables families with instant recall**.
- During Year Five, **all Key Stage 1 and LKS2 concepts will be revised** and consolidated on a half-termly basis.

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Adding fractions together with different denominators **What is a 'Common Denominator'?**	• Multiply or divide to find a common denominator. • Remember to do this to both the numerator and the denominators. • Add together the new numerators • Leave the denominators!	• 4/14 + 2/7 = ? • 4/14 can be made into 2/7 or 2/7 can be made into 4/14 • 4 + 2 = 6 • So, 4/14 + 4/14 = 8/14 • Or, 2/7 + 2/7 = 4/7	• Fraction shapes • Equivalent fractions charts • Bar model apparatus
Subtracting fractions with different denominators **What is a 'Common Denominator'?**	• Multiply or divide to find a common denominator. • Remember to do this to both the numerator and the denominators. • Subtract the new numerators • Leave the denominators!	• 10/14 - 2/7 = ? • 10/14 can be made into 5/7 or 2/7 can be made into 4/14 • 5 - 2 = 3 or 10 – 4 = 7 • So, 5/7 - 2/7 = 3/7 • Or, 10/14 – 4/14 = 6/14	• Fraction shapes • Equivalent fractions charts • Bar model apparatus
Multiply any number by 0.9	• Divide your starting number by 10. • Subtract this from your starting number.	• 70 x 0.9 = ? • 70 ÷ 10 = 7 • 70 – 7 = 63 • So, 70 x 0.9 = 63	• Place value grids • Counters • Cubes • STS grids
Multiply any number by 9.9	• Divide your starting number by 10 (answer 1) • Multiply your starting number by 10 (answer 2) • Subtract answer 2 from 1	• 60 x 9.9 = ? • 60 x 10 = 600 • 60 ÷ 10 = 6 • 600 – 6 = 594 • So, 60 x 9.9 = 594	• Place value grids • Counters • Cubes • STS grids
Find 90% of any number	• Understand that 90% = 9/10 • Understand that 90% = 0.9 • Follow our Smart Strategy for multiplying any number by 0.9	• 70 x 0.9 = ? • 70 ÷ 10 = 7 • 70 – 7 = 63 • So, 70 x 0.9 = 63	• Place value grids • Counters • Cubes • STS grids

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Find 80% of any number	• Understand that 80% = 8/10 • Divide your starting number by 10 then multiply by 8. • Or, because 8/10 = 4/5, divide by 5 and multiply by 4	• 80% of 90 = ? • 90 ÷ 10 = 9 • 9 x 8 = 72 • Or, 90 ÷ 5 = 18, 18 x 4 = 72 • So, 80% of 90 = 72	• Place value grids • Counters • Cubes • STS grids
Multiply any number by 0.8	• Understand that 0.8 = 8/10 and that 0.8 = 80% • Follow our Smart Strategy for finding 80% of any number	• 90 x 0.8 = ? • 90 ÷ 10 = 9 • 9 x 8 = 72 • Or, 90 ÷ 5 = 18, 18 x 4 = 72 • So, 90 x 0.8 = 72	• Place value grids • Counters • Cubes • STS grids
Multiply a fraction by a whole number.	• Multiply your numerator by the whole number, also known as a 'multiplier'. • Leave the denominator. • Simplify if / where possible	• 5/6 x 6 = ? • 5 x 6 = 30 • 5/6 x 6 = 30/6 • This can be simplified to 5/1 or simply '5'	• Fraction shapes • Equivalent fractions charts • Bar model apparatus
Multiply any Number by 2.5	• Double your starting number • Halve your starting number • Add your two answers together	• 240 x 2.5 = ? • 240 x 2 = 480 • ½ of 240 = 120 • 480 + 120 = 600 • So, 240 x 2.5 = 600	• Place value grids • Counters • Cubes • STS grids
Multiply any Number by 12.5	• Multiply your number by 10 • Follow our Smart Strategy to multiply any number by 2.5 • Add your two answers together.	• 240 x 12.5 = ? • 240 x 10 = 2,400 • 240 x 2 = 480 • ½ of 240 = 120 • 480 + 120 = 600 • 2,400 + 600 = 3,000 • So, 240 x 12.5 = 3,000	• Place value grids • Counters • Cubes • STS grids

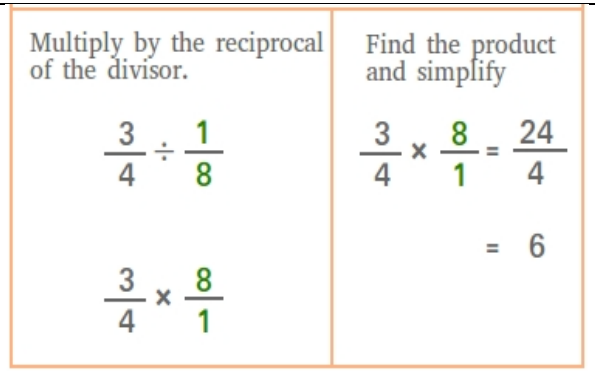
AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Increase and decrease integers by scale factors.	• Understand that 'increase' means to multiply by and 'decrease' means to divide by any given number.	• 8 increased by a scale factor of 7 = 8 x 7 = 56 • 72 decreased by a scale factor of 9 = 72 ÷ 9 = 8	• Multiplication tables • Inverses if needed
Divide a fraction by a whole number.	• Divide your numerator by the divisor (whole number). • If this is impossible, multiply your divisor by the denominator instead.	• 2/3 ÷ 2 = ? • 2 ÷ 2 = 1, so it's 1/3 • 4/7 ÷ 3 = ? • 7 x 3 = 21 so it's 4/21	• As required
Divide any number by 8	• Halve your starting number • Halve it again, then again. • Or, if you can, use a bus stop division and 8x tables facts	• 7,280 ÷ 8 = ? • 7,280 ÷ 2 = 3,640 • 3,640 ÷ 2 = 1,820 • 1,820 ÷ 2 = 910	• As required
Find 12.5% of any number	• Follow our Smart Strategy for dividing any number by 8 • Or, find 10% and then find 2.5%, adding them together	• 12.5% of 8,000 = ? • 8,000 ÷ 8 = 1,000 • Or, 10% = 800 and 2.5% = 200 so 800 + 200 = 1,000	• Place value grids • Counters • Cubes • STS grids
Find 11% of any number	• Divide starting number by 10 • Divide starting number by 100 • Add both answers together	• 11% of 3,400 = ? • 3,400 ÷ 10 = 340 • 3,400 ÷ 100 = 34 • 340 + 34 = 374	• Place value grids • Counters • Cubes • STS grids
Find 2.5% of any number	• Divide your starting number by 100 to find 1% • Follow our Smart Strategy to multiply any number by 2.5	• 2.5% of 2,600 = ? • 2,600 ÷ 100 = 26 • 26 x 2 = 52 • ½ of 26 = 13 • 52 + 13 = 65	• Place value grids • Counters • Cubes • STS grids

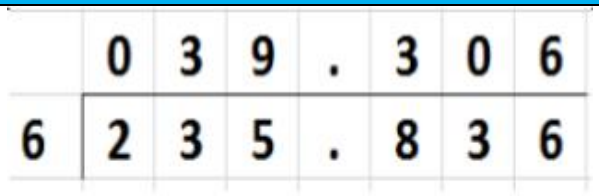
Chapter 7 – Year Six

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer term
Year 6 (1 – 12 x tables, 1 – 12 x tables inverses)	Revise Y1-2 Strategies. Revise Y3-4 Strategies. Revise Y5 Strategies. Fractions of amounts. Calculate percentages. Find 0.5% of a number.	As per Autumn 1 Multiply a fraction by a fraction. Convert a mixed number to an improper fraction	As per Autumn 2 Convert an improper fraction to a mixed number Divide a fraction by another fraction. Divide a decimal number by a one-digit divisor.	As per Spring 1 Apply X / ÷ by 10, 100 and 1000 to converting measures.	Revision of all Smart Strategies. Daily sessions, Mathsbot.com, SATs past paper workshops, targeted starter tasks.

- All **green** concepts are new learning for the half term.
- All **black** concepts are revision of prior learning.
- There are **9** key concepts to learn and understand during Year Six, including complex conversions knowledge.
- In addition, the **all x tables are expected to be known as inverses / times tables families with instant recall**.
- During Year Six, **all Years 1-5 concepts will be revised** and consolidated on a half-termly basis.

AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Calculate fractions of amounts	• Divide your starting number by the denominator (bottom) using a bus stop method. • Multiply the answer by your numerator (top). • Remember to use any unit of measure needed, eg: £, kg	• 4/7 of £5,635 = ? • 5,635 ÷ 7 = 805 • 805 x 4 = 3,220 • So, 4/7 of £5,635 = £3,220	• Multiplication grid • STS grids
Calculate percentages of amounts	• Divide your starting number by 100 to find 1% • Multiply the answer by whatever percentage you are looking for.	• 13% of 700 = ? • 700 ÷ 100 = 7 • 7 x 10 = 70, 7 x 3 = 21 • So, 7 x 13 must be 91 • 13% of 700 = 91	• Multiplication grid • STS grids
Calculate ***higher*** percentages of amounts	• For some percentages, it's easier to use number bonds to 100 and subtract. • For example, finding 98% is easier if you find 2% then subtract this from your starting number rather than multiplying by 98.	• 93% of 800 = ? • 100 – 93 = **7** • Let's find **7%** and subtract… • 800 ÷ 100 = 8 = 1% of 800 • 8 x **7** = 56 • 800 – **56** = 744 • So, 93% of 800 = 744	• Multiplication grid • STS grids
Find 0.5% of any number	• Divide your starting number by 100 to find 1%. • Halve your answer to find half of one percent.	• 0.5% of 680 • 680 ÷ 100 = 6.8 • ½ of 6.8 = 3.4 • So, 0.5% of 680 = 3.4	• Multiplication grid • STS grids

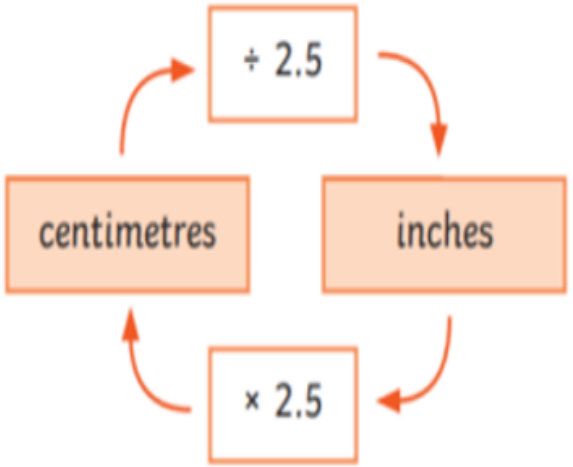
AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Multiply a fraction by another fraction	• Multiply the numerators • Multiply the denominators • Simplify if possible	• 2/3 x 4/5 = ? • 2 x 4 = 8 • 3 x 5 = 15 • 2/3 x 4/5 = 8/15	• As required
Convert a mixed number to an improper fraction	• Multiply the whole number by the denominator. • Add the numerator of the fraction.	• 5¼ = ? • 5 x 4 = 20 • 20 + 1 = 21 • 5¼ = 21/4	• As required
Convert an improper fraction to a mixed number	• Divide the denominator by the numerator to find the whole number. • Use the remainder to create a new numerator. • Keep the denominator.	• 23/5 = ? • 23 ÷ 5 = 4 r3 • 23/5 = 4 and 3/5	• As required
Divide a fraction by another fraction.	• For the fraction you are dividing by (divisor), swap the numerator and denominator around. • Follow our Smart Strategy for multiplying a fraction by another fraction.		• As required

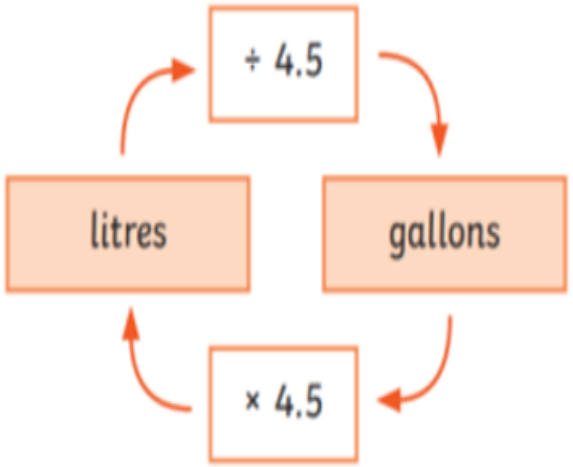
AIM	SMART STRATEGY (Tell me)	EXAMPLE (Show Me)	RESOURCES
Divide a decimal number by a one-digit divisor. **This method will give a decimal answer rather than a remainder**	• Place a decimal point at the end of your dividend. • Continue writing past the decimal point with '0' • Place a decimal point **directly** above the first, on top of the bus stop. • Continue the division.	 Success depends on the decimal points aligning and the ability to recognise the need to apply multiplication tables facts from Y1-4.	• Whiteboards • Pens

Converting smaller metric values into larger metric values: Scale factors of 1000	• To convert grams into kilograms, divide by 1000	• How many kg does 4000g equate to? • 4000 ÷ 1000 = 4, therefore 4000g = 4kg	• Place value grid or template • Cubes • Counters • Base 10 • Cuisinaire rods
	• To convert metres into kilometres, divide by 1000	• How many km does 5000m equate to? • 5000 ÷ 1000 = 5, therefore 5000m = 5km	
	• To convert kilograms into tonnes, divide by 1000	• How many tonnes does 3500kg equate to? • 3500 ÷ 1000 = 3.5, therefore 3500kg = 3.5tn	
	• To convert millilitres into litres, divide by 1000	• How many litres does 12500ml equate to? • 12500 ÷ 1000 = 12.5, therefore 12500ml = 12.5 litres	
Converting larger metric values into smaller metric values: Scale factors of 1000	• To convert kg into grams, multiply by 1000	• How many grams does 4kg equate to? • 4 x 1000 = 4000, therefore 4000g = 4kg	• Place value grid or template • Cubes • Counters • Base 10 • Cuisinaire rods
	• To convert km into metres, multiply by 1000	• How many metres does 5km equate to? • 5 x 1000 = 5000, therefore 5000g = 5kg	
	• To convert tonnes into kilograms, multiply by 1000	• How many kg does 3.5 tonnes equate to? • 3.5 x 1000 = 3500, therefore 3500kg = 3.5tn	
	• To convert litres into millilitres, multiply by 1000	• How many ml does 12.5 litres equate to? • 12.5 x 1000 = 12500, therefore 12500ml = 12.5 litres	

Metric to Imperial Conversions

metric (new)	imperial (old)
2.5 centimetres	1 inch
1 kilogram	2.2 pounds
4.5 litres	1 gallon

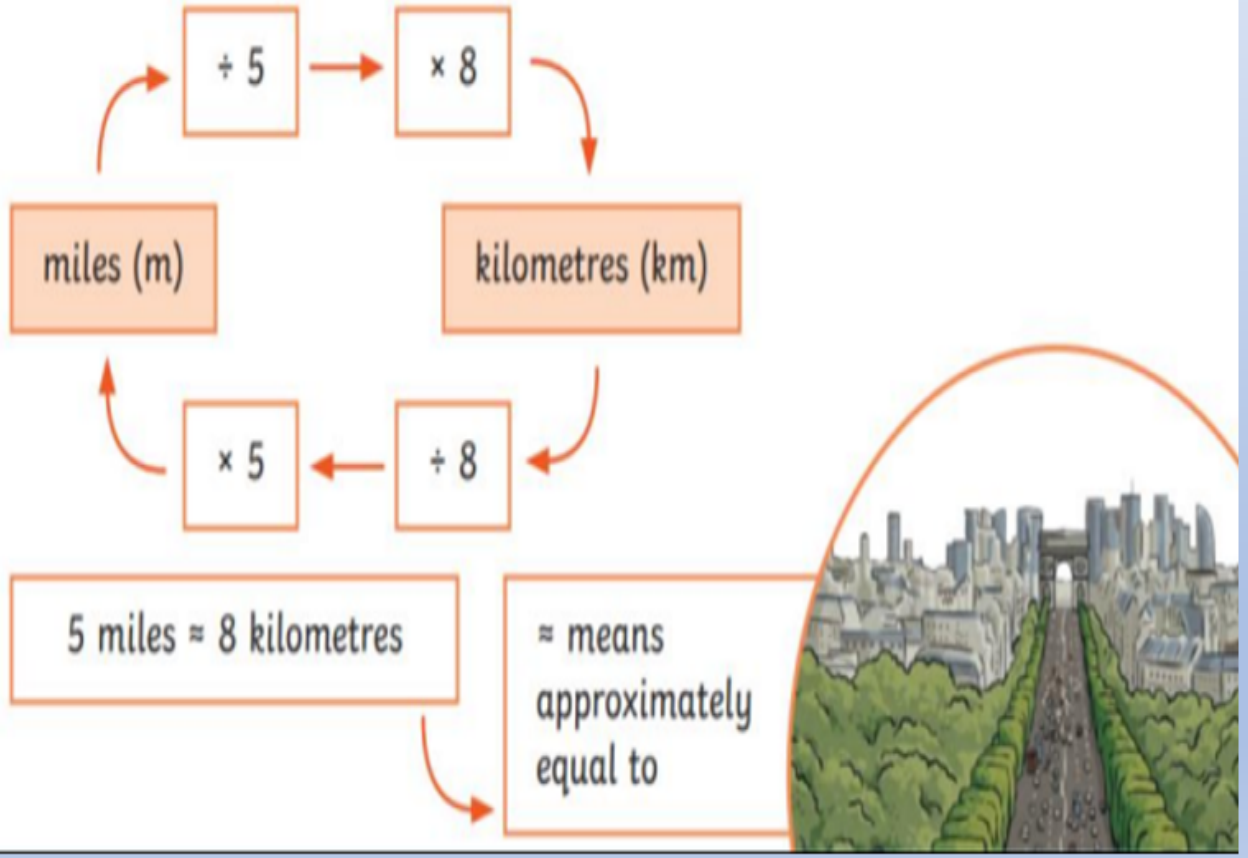




1. The easiest way to divide by 2.5 is to divide by 5 then just double your answer.
2. The easiest way to divide by 2.2 is to multiply your original number by 10 then divide by 22
3. Multiplying by 2.2 is the same as doubling then adding 1/5 of your starting number.
4. Multiplying by 4.5 is the same as multiplying by 4 then adding half of your original number.
5. The easiest way to divide by 4.5 is to divide by 9 then just double your answer.

Miles to Kilometres

You might measure the length of a road or the distance between two cities in miles or kilometres.



1. There are 8km in every 5 miles.
2. This means 1 mile = 1.6km
3. It also means, as a fraction, 1km = 5/8 of a mile.
4. It also means, as an improper fraction, 1 mile is 8/5 of a km.
5. To convert miles into km, you must divide by 5 then multiply by 8.
6. To convert km into miles, you need to divide by 8 then multiply by 5.

Time

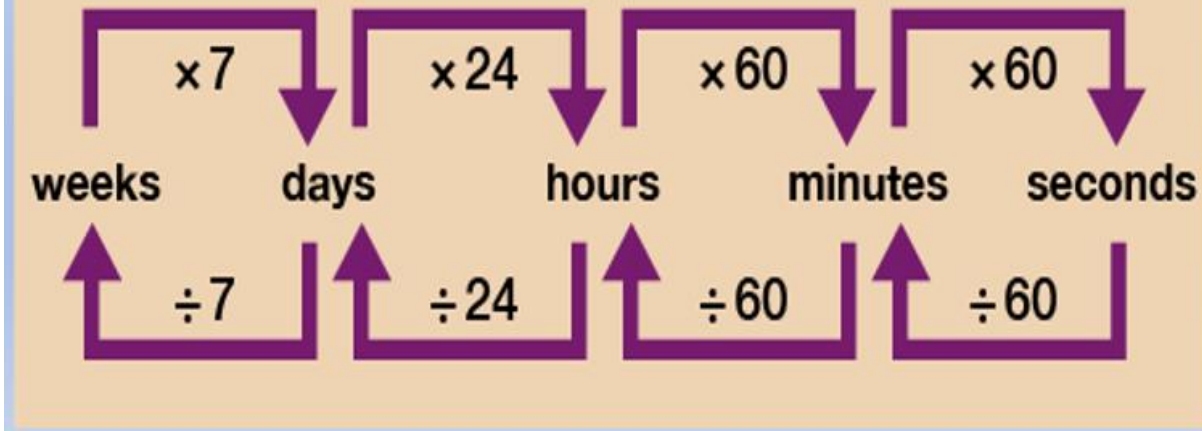
Minute 1 minute = 60 seconds

Hour 1 hour = 60 minutes

Day 1 day = 24 hours

Week 1 week = 7 days

Year 1 year = 12 months = 52 weeks = 365 days



1. To turn weeks into years, we divide by 52.
2. To turn years into weeks, we multiply by 52.
3. To turn days into years, we divide by 365.
4. To turn years into days, we multiply by 365
5. There is a misconception that a month lasts 4 weeks and this is not true – if it were true, there would be 13 months in a year instead of 12 because 52 ÷ 4 = 13, not 12.

Imperial Measures

Things that could be measured using imperial units:

- Someone's height in feet and inches
- The mass of a bag of sugar in ounces
- The mass of a sack of potatoes in pounds
- A person's mass in stones
- A carton of milk in pints
- The amount of water in a bath in gallons

1 foot = 12 inches

1 pound = 16 ounces

1 stone = 14 pounds

1 gallon = 8 pints

	METRIC	IMPERIAL
Length	millimetre, centimetre, metre, kilometre	inch, foot, yard, mile
Mass	milligram, gram, kilogram	ounce, pound, stone
Capacity	millilitre, centilitre, litre	pint, gallon

1. To turn stones into pounds, we must multiply by 14.
2. To turn pounds into stones, we must divide by 14.
3. To turn ounces into pounds, we must divide by 16.
4. To turn pounds into ounces, we multiply by 16.
5. To turn gallons into pints, we must multiply by 8.
6. To turn pints into gallons, we must divide by 8.

÷1	÷2	÷3	÷4	÷5	÷6
1 ÷ 1 = 1	2 ÷ 2 = 1	3 ÷ 3 = 1	4 ÷ 4 = 1	5 ÷ 5 = 1	6 ÷ 6 = 1
2 ÷ 1 = 2	4 ÷ 2 = 2	6 ÷ 3 = 2	8 ÷ 4 = 2	10 ÷ 5 = 2	12 ÷ 6 = 2
3 ÷ 1 = 3	6 ÷ 2 = 3	9 ÷ 3 = 3	12 ÷ 4 = 3	15 ÷ 5 = 3	18 ÷ 6 = 3
4 ÷ 1 = 4	8 ÷ 2 = 4	12 ÷ 3 = 4	16 ÷ 4 = 4	20 ÷ 5 = 4	24 ÷ 6 = 4
5 ÷ 1 = 5	10 ÷ 2 = 5	15 ÷ 3 = 5	20 ÷ 4 = 5	25 ÷ 5 = 5	30 ÷ 6 = 5
6 ÷ 1 = 6	12 ÷ 2 = 6	18÷ 3 = 6	24 ÷ 4 = 6	30 ÷ 5 = 6	36 ÷ 6 = 6
7 ÷ 1 = 7	14 ÷ 2 = 7	21 ÷ 3 = 7	28 ÷ 4 = 7	35 ÷ 5 = 7	42 ÷ 6 = 7
8 ÷ 1 = 8	16 ÷ 2 = 8	24 ÷ 3 = 8	32 ÷ 4 = 8	40 ÷ 5 = 8	48 ÷ 6 = 8
9 ÷ 1 = 9	18 ÷ 2 = 9	27 ÷ 3 = 9	36 ÷ 4 = 9	45 ÷ 5 = 9	54 ÷ 6 = 9
10 ÷ 1 = 10	20 ÷ 2 = 10	30 ÷ 3 = 10	40 ÷ 4 = 10	50 ÷ 5 = 10	60 ÷ 6 = 10
11 ÷ 1 = 11	22 ÷ 2 = 11	33 ÷ 3 = 11	44 ÷ 4 = 11	55 ÷ 5 = 11	66 ÷ 6 = 11
12 ÷ 1 = 12	24 ÷ 2 = 12	36 ÷ 3 = 12	48 ÷ 4 = 12	60 ÷ 5 = 12	72 ÷ 6 = 12

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

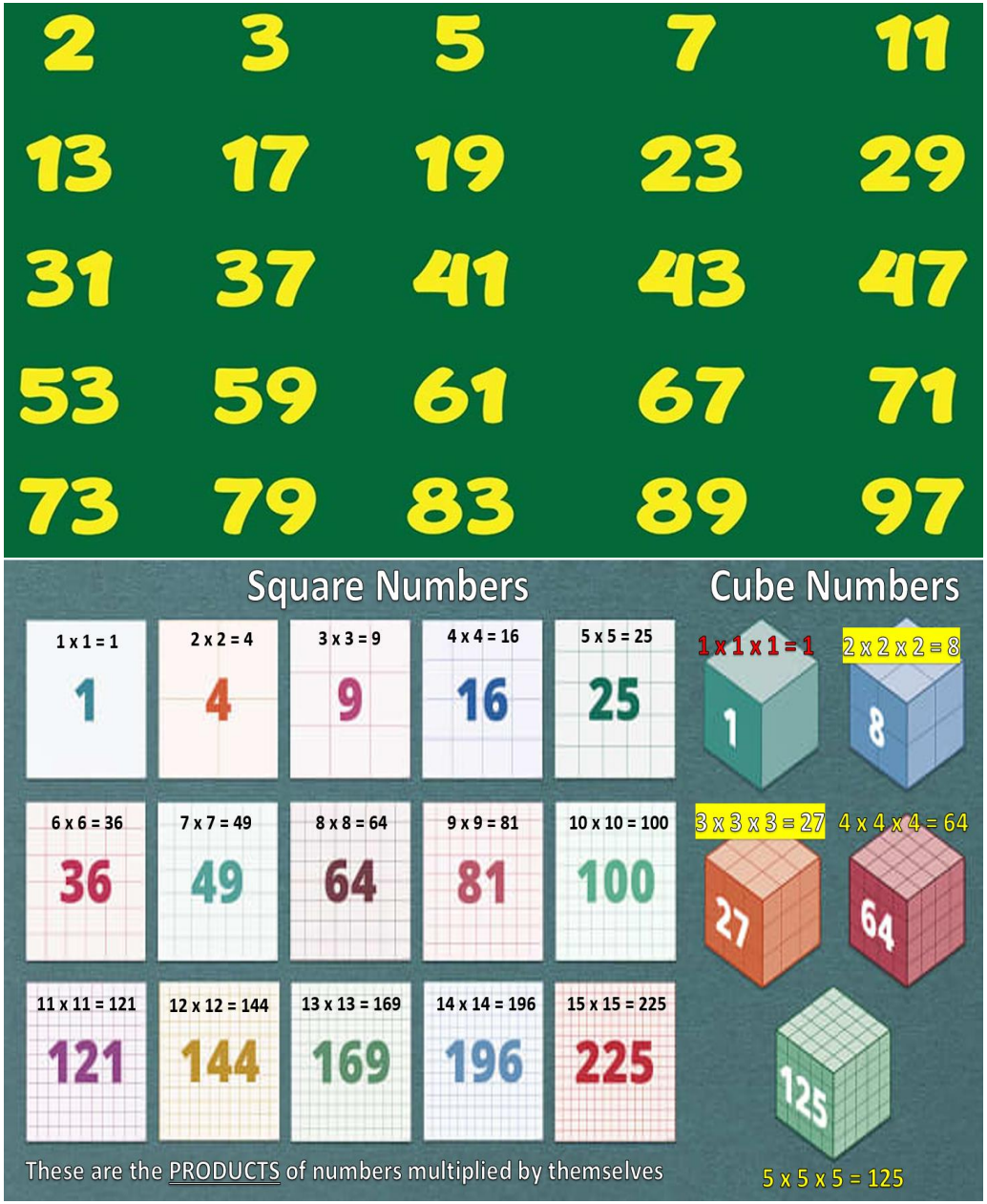
Roman Numerals: 1 - 1000

I	V	X	L	C	D	M
1	5	10	50	100	500	1000

1	I
2	II
3	III
4	IV
5	V
6	VI
7	VII
8	VIII
9	IX
10	X

11	XI
20	XX
30	XXX
40	XL
50	L
60	LX
70	LXX
80	LXXX
90	XC
100	C

200	CC
300	CCC
400	CD
500	D
600	DC
700	DCC
800	DCCC
900	CM
1000	M
1001	MI



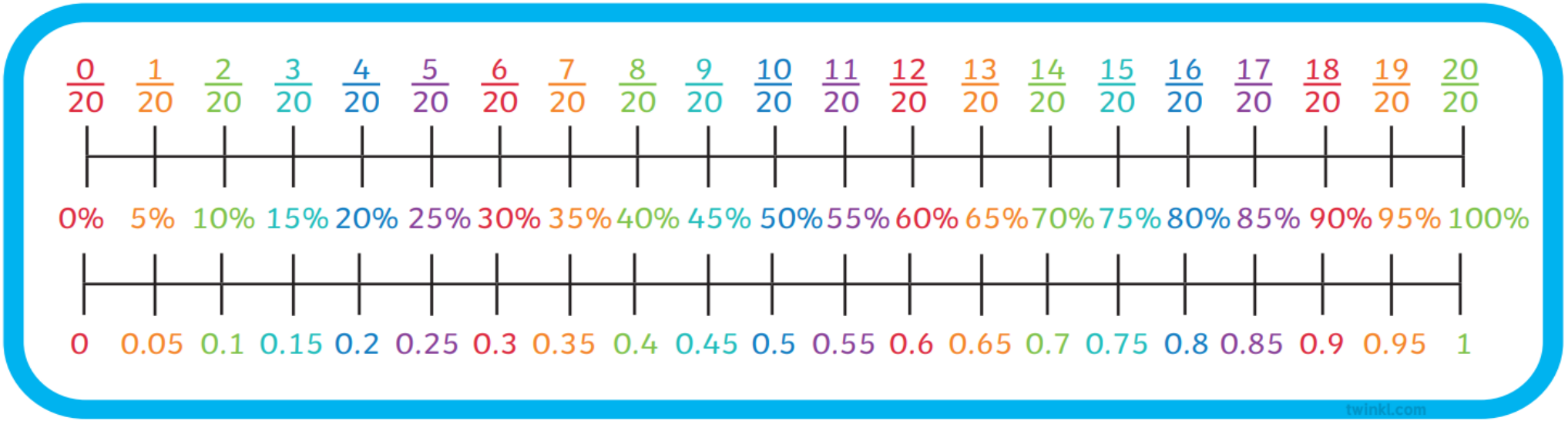
Prime, Square and Cube Numbers

Prime numbers are numbers that do not appear in any times table other than their own or the 1 x table – they are only ever divisible by themselves or 1.

A square number is the result of a number being multiplied by itself.

A square root is the number that was multiplied by itself to make a square number (3 x 3 = 9, root = 3)

A cube number is the product of a square number being multiplied by its root.


0/20 1/20 2/20 3/20 4/20 5/20 6/20 7/20 8/20 9/20 10/20 11/20 12/20 13/20 14/20 15/20 16/20 17/20 18/20 19/20 20/20
0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50% 55% 60% 65% 70% 75% 80% 85% 90% 95% 100%
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95 1
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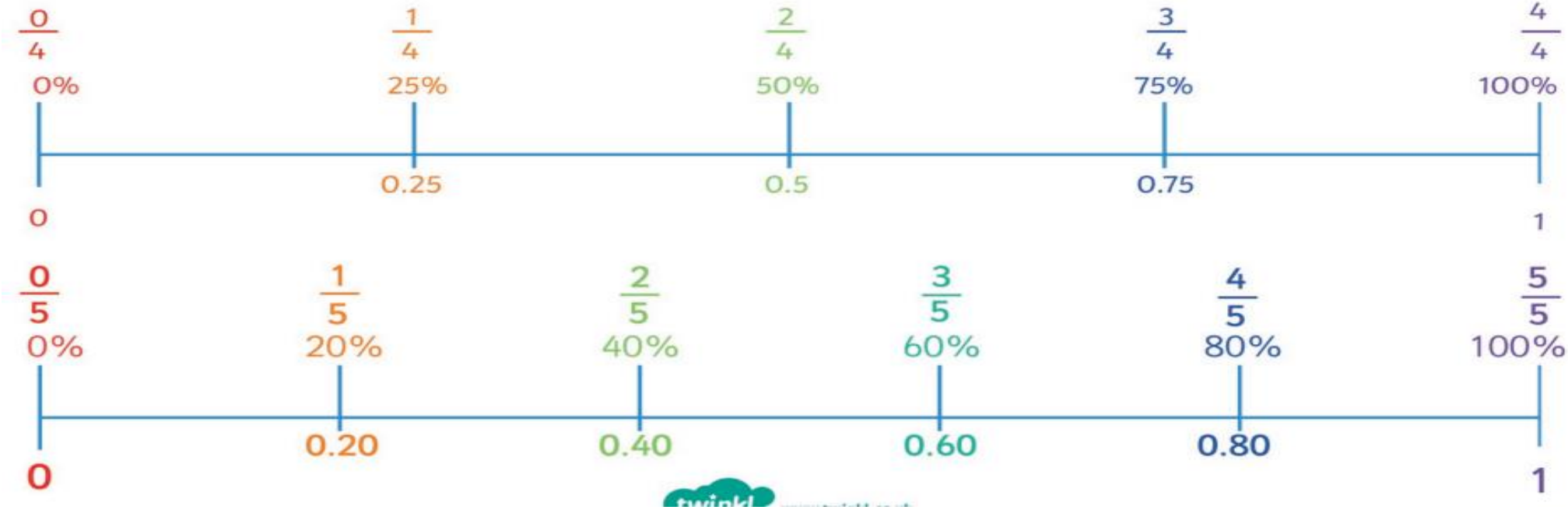

0/4 1/4 2/4 3/4 4/4
0% 25% 50% 75% 100%
0 0.25 0.5 0.75 1
0/5 1/5 2/5 3/5 4/5 5/5
0% 20% 40% 60% 80% 100%
0 0.20 0.40 0.60 0.80 1

One	1	10^0
Ten	10	10^1
Hundred	100	10^2
Thousand	1,000	10^3
Ten Thousand	10,000	10^4
Hundred Thousand	100,000	10^5
Million	1,000,000	10^6
Ten Million	10,000,000	10^7
Hundred Million	100,000,000	10^8

Powers of 10

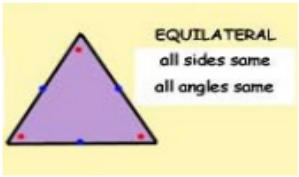
The powers of ten are numbers that can be formed by multiplying 10 by itself.

The powers of 10 are often represented by a base number of 10 with an **exponent**.

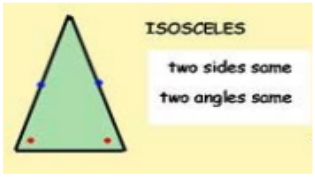
The **exponent** tells you how many times the 10 is multiplied by itself to create the power of 10.

2d Shape

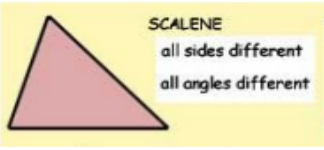
Equilateral Triangle
All sides and internal angles are equal



Isosceles Triangle
2 equal length sides and 2 equal angles



Scalene Triangle
All 3 sides are different lengths, all angles are different.

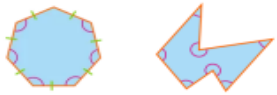


Regular shapes - shapes which have equal length sides and equal angles
Irregular Shapes—shapes which have unequal length sides and unequal angles.

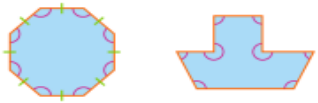
Pentagon—5 sides
Regular Irregular

Hexagon—6 sides
Regular Irregular

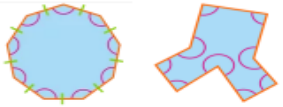
Heptagon—7 sides
Regular Irregular



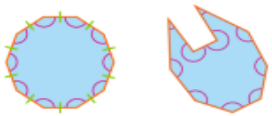
Octagon—8 sides
Regular Irregular



Nonagon—9 sides
Regulaar Irregular

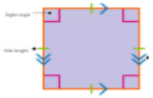


Decagon—10 sides
Regular Irregular

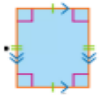


Quadrilaterals—4 sided shapes with straight lines

Square

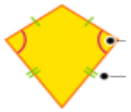


Oblong/Rectangle



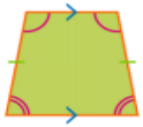
Rhombus

Kite



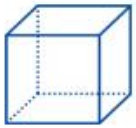
Parallelogram

Trapezium

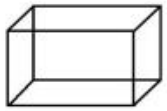


3d Shape

Cube



Cuboid



Cylinder

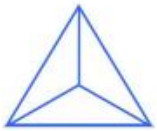
Cone

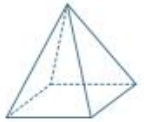
Triangular Based Pyramid

Square based pyramid

Pentagonal based pyramid

Triangular Prism



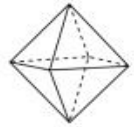


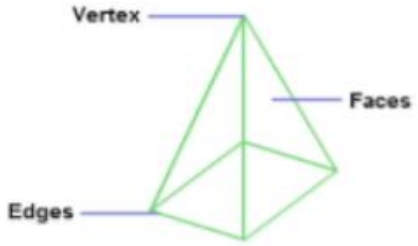
Hexagonal prism

Sphere

Hemisphere

Octahedron





Vertex—the 'corners' of the shape.

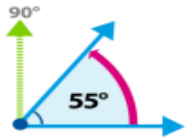
Face—the side of the shape

Edge—the joint of two faces

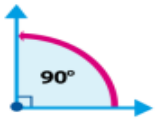
Angles

- The angles on a straight line add up to 180°
- The angles around a point add up to 360°
- Internal angles of a triangle add up to 180°
- The angles of a quadrilateral add up to 360°
- Other 2d shapes—for every additional angle add a further 180° (Pentagon, 5 angles = 360° +180° = 540°, hexagon, 6 angles = 540° + 180° = 720°, and so on)
  The formula (n-2) x 180 can be used to calculate the interior angles of any regular shape (n= the number of sides on the shape)

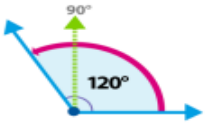
Acute angle = less than 90°



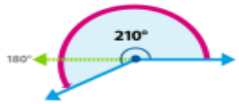
Right angle = 90°



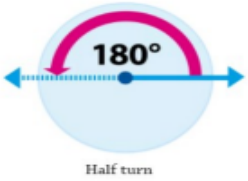
Obtuse angle = greater than 90° but less than 180°



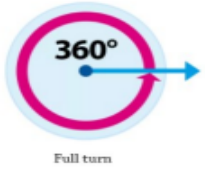
Reflex angle = greater than 180°



Half turn or angle on a straight line



Full turn



Place Value and multiplying/dividing by 10, 100 and 1000

TM	M	HTH	TTH	TH	H	T	U	.	ths	hths	thths
Tens of Millions	Millions	Hun-dred of Thou-sands	Tens of Thou-sands	Thou-sands	Hun-dred	Tens	Units/ Ones	Dec ima l Poi nt	Tenths	Hun-dredths	thou-sandths
4	2	7	5	6	4	6	2	.	5	4	3

Forty-Two million, seven hundred and fifty-six thousand four hundred and sixty-two point five four three

Multiplying by 10, 100 and 1000—count the zeroes then move the digits the same number of places to the left. The decimal point DOES NOT MOVE it is a fixed point. Gaps are plugged with a zero (you do not ADD a zero—ever!).

					4	5	3	.	6		
X10				4	5	3	6				
X100			4	5	3	6	0				
x1000		4	5	3	6	0	0				

Dividing by 10, 100 and 1000—count the zeroes the move the digits the same number of places to the right. The decimal point DOES NOT MOVE it is a fixed point. Gaps are plugged with a zero.

					4	5	3				
÷10						4	5	.	3		
÷100							4	.	5	3	
÷100							0	.	4	5	3

Rounding

Rounding is skill which can be extremely useful when estimating answers to complex calculations but it also a skill tested within SATs papers.

TH	H	T	U	.	ths
2	4	6	5	.	9

To round to the nearest ten first we must look at the tens column. We have 6 tens so we know the number will either round up to 2470 or down to 2460. Next we must look in the units column. If it is 5 or more then we round up, if it is 4 or less we round down. As 5 is in the units, we round up to 2470.

This procedure follows for rounding to nearest thousand, hundred, unit, or tenth. The only thing that alters is the column we look in so:

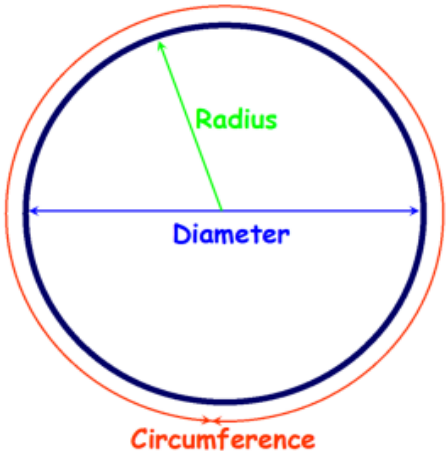
2465.9 rounded is:

2000—to the nearest thousand
2500—to the nearest hundred
2470—to the nearest ten
2455—to the nearest unit

Rounding to the nearest tenth/hundredth.
Example:

3.456 rounded to 2 decimal places/nearest hundredth = 3.46
3.456 round to 1 decimal place/nearest tenth = 3.5

Circle

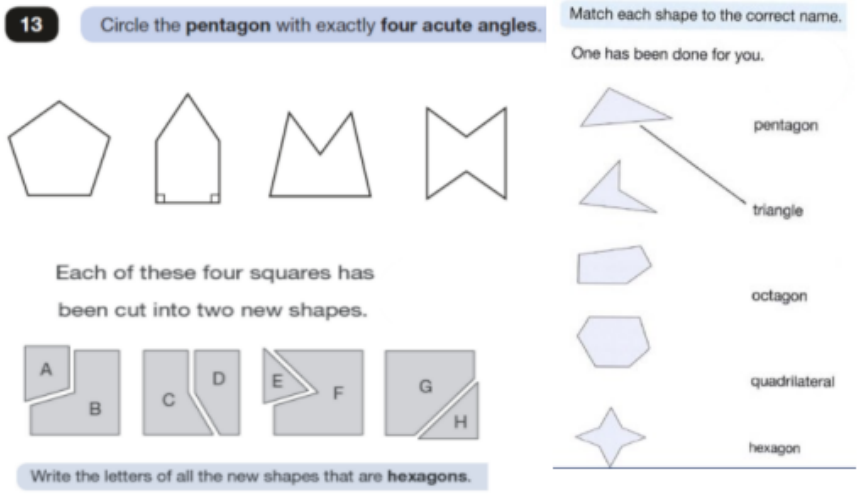


Circumference—the distance around the outside of the circle (it's perimeter).

Diameter—the width of the circle crossing the centre from one side to the other.

Radius—the distance from the centre of the circle to

Example SATs questions



Fraction	Decimal	Percentage
1/2	0.5	50%
1/4	0.25	25%
3/4	0.75	75%
1/10	0.1	10%
1/5	0.2	20%
3/10	0.3	30%
2/5	0.4	40%
3/5	0.6	60%
7/10	0.7	70%
4/5	0.8	80%
9/10	0.9	90%
1/100	0.01	1%
2/100	0.02	2%
3/100	0.03	3%
4/100	0.04	4%
5/100	0.05	5%

BODMAS

BODMAS is the order in which operations within a calculation must be completed.

B = Brackets
O/I= Orders (also known as powers)/ Indices
D = Division
M = Multiplication
A = Addition
S = Subtraction

$7^2 \times 2 - (6 + 3) =$

Brackets first— $6 + 3 = 9$
Orders/indices second— $7^2 = 49$
Division/Multiplication next— $49 \times 2 = 98$
Addition/Subtraction last— $98 - 9 = 89$

You might not see all the BODMAS steps in one questions so you just need to figure which step must come first, for example:

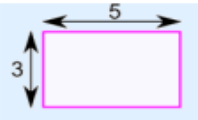
$60-42\div6 =$

If completed in left to right order the answer would be 3—this is IN-CORRECT!

Under BODMAS $42 \div 6$ must be completed first ($42\div6 = 7$) then this answer taken away from 60 so the CORRECT answer is 53.

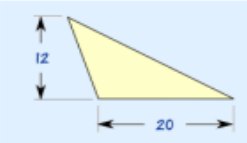
Area, Perimeter and Volume

Area:
Area is the amount of space covered by a 2d shape. Area of a rectilinear shape (square, oblong) is calculated by the formula length x width. The area of a compound shape can be calculated by splitting the shape into its constituent parts, calculating their area and then adding them back together.



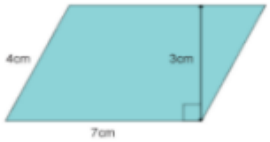
Assuming these are in cm 3cm x 5cm = 15cm²

Area of a triangle is calculated by the formula (base x height) ÷ 2



(12cmx20cm) ÷ 2 = 120cm²

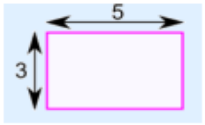
Area of a parallelogram is calculated by the formula base x height.



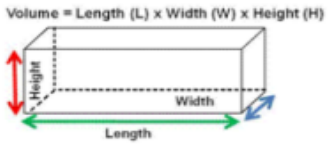
3cm x 7cm = 21cm²

Perimeter is the total outside length of sides of a shape added together

So the perimeter for this shape would be 16cm as the two longer sides are 5cm and the two shorter sides are 3cm.



Volume is the internal space of a 3d object (i.e. how much it could contain). It is calculated by the formula length x width x height.



So if h = 3cm, width = 2cm and l = 6cm the volume would be:

3 x 2 x 6 = 36cm³

Factors and Multiples

Factors are all the numbers which, when multiplied together in pairs, produce the original number. i.e.

The factors of 12 are:

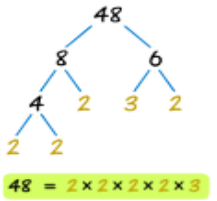
1 and 12 (1x12=12)
2 and 6 (2x6=12)
3 and 4 (3x4=12)

Numbers which have only one pair of factors (1 and itself) are known as prime numbers: 17 is prime number because the only pair of factors are 1 and 17.

Common factors—these are numbers which are factors for two different numbers i.e. the common factors of 12 and 20 are 1, 2 and 4 because these number divide exactly into both original numbers. This is important when working with fractions.

Prime factors are the factors of a given number which, when taken to its full extent, are prime. They can be shown as a prime factor tree and, when all of them are multiplied together, they will produce the original number.

Tip:
Factors are always the number or smaller
Multiples are always the number or bigger.



Multiples

Multiples are effectively extended times tables. The multiples of any number are the numbers into which the original number can be divided exactly. For example:

The multiples of 2 are 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 and any other number which can be divided by 2.

The multiples of 5 are 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80 and any other number which can be divided by 5.

Common multiples are the multiples which apply to two different numbers. I.E. the common multiples for 3 and 4 below 30 are:

312 and 24 as these are multiples for both 3 and 4.