

Year 2

Arithmetic

Workbook

by Richard Brown

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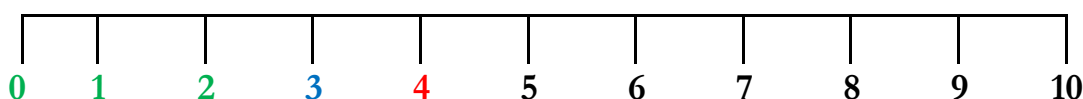
Key Language and Representations

Word Problems are the arithmetic number sentences written in a real-life reasoning and problem solving scenario. e.g. $15 + 9 = 24$

Concrete Objects are manipulated or handled to calculate and represent a number sentence i.e. multilink cubes, numicon, counters, number line.

e.g. $3 + 3 = 6$  +  = 

Number Lines are used to count forwards e.g. 0, 1, 2, 3, 4, 5 and also to count backwards e.g. 10, 9, 8, 7, 6, 5.



Column Addition is the formal written method of adding two or more numbers together, using a vertical arrangement in a columnar format.

$$\begin{array}{r} \underline{1s} \\ 3 \\ + 5 \\ \hline 8 \end{array}$$

$$\begin{array}{r} \underline{1s} \\ 2 \\ 1 \\ + 3 \\ \hline 6 \end{array}$$

$$\begin{array}{r} \underline{10s} \ \underline{1s} \\ 1 \ 9 \\ + 1 \ 2 \\ \hline 3 \ 1 \\ \hline 1 \end{array}$$

Regroup 10 ones into 1 ten.

Column Subtraction is the formal written method of subtracting a smaller number from a bigger number, using a vertical arrangement in a columnar format.

$$\begin{array}{r} \underline{1s} \\ 3 \\ - 1 \\ \hline 2 \end{array}$$

$$\begin{array}{r} \underline{10s} \ \underline{1s} \\ 2 \ 0 \\ - 1 \ 0 \\ \hline 1 \ 0 \end{array}$$

$$\begin{array}{r} \underline{10s} \ \underline{1s} \\ 1 \ 0 \\ - 1 \ 1 \\ \hline 0 \ 9 \end{array}$$

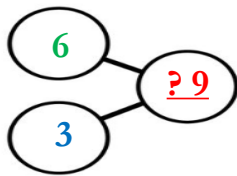
Regroup 1 ten into 10 ones.

Strategy Applied refers to when a formal written method is used to calculate a number sentence $25 - 5 = 20$

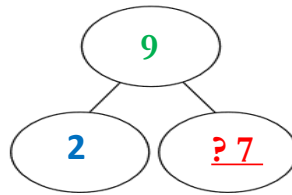
Explained using appropriate mathematical language, proven using concrete objects that can be handled, shown with pictorial representations visualising the calculations, to ensure a greater understanding of a mathematical concept

Part Whole Models are pictorial mathematical images to represent **varied** calculations and number sentences.

e.g. $6 + 3 = ?9$

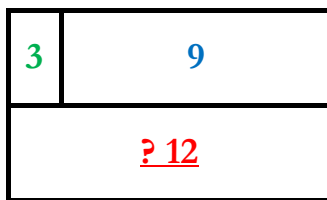


e.g. $9 - 2 = ?7$

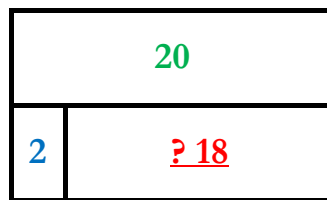


Bar Models are an image, that pictorially represents a number sentence.

e.g. $3 + 9 = ?12$

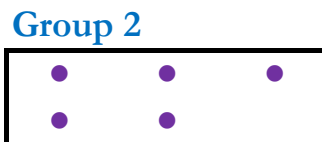
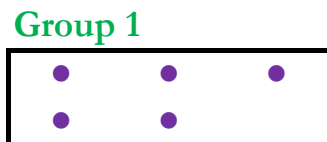


e.g. $20 - 2 = ?18$



Groups of objects represents a total number of objects shared or divided into two or more groups of an equal number of the objects.

$$\frac{1}{2} \text{ of } 10 = \underline{5}$$



Number Grid

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108	109
110	111	112	113	114	115	116	117	118	119
120	121	122	123	124	125	126	127	128	129
130	131	132	133	134	135	136	137	138	139
140	141	142	143	144	145	146	147	148	149
150	151	152	153	154	155	156	157	158	159

Multiplication Square

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

How Many

The number **18** is made up of how many **10s** (tens) and **1s** (ones)?

1) **18** =

In Maths a **number** or **figure** e.g. **18**, is made up of the **digits 1** and **8**.

Each digit has a worth, otherwise known as its **place value**.

The number **eighteen** is a **2-digit** number.

The two digits represent the **10s** and **1s column place values**.

Place Value Grid

<u>Hundreds</u>	<u>Tens</u>	<u>Ones</u>
<u>100s</u>	<u>10s</u>	<u>1s</u>
	1	8

Strategy Applied

The number **eighteen** is represented on a **Place Value Grid** as above.

First, write **8** in the **1s** column place value, which is also how many **ones** there are in the **1s** column, **8 ones**.

Then, write **1** in the **10s** column place value, which is also how many **tens** there are in the **10s** column, **1 ten**.

Finally, the **Place Value Grid** above shows how many **10s** and **1s** there are, **1 ten** and **8 ones**.

Test Questions

How many **10s** (tens) and **1s** (ones) make up each number?

1) 18 =

2) 21 =

3) 32 =

4) 45 =

5) 57 =

6) 69 =

7) 70 =

8) 83 =

9) 94 =

10) 99 =

11) 101 =

12) 106 =

13) 110 =

14) 120 =

Digit Value

What is the digit value of the **10s** (tens) and **1s** (ones) digits in the number **18**

1) **18** =

In Maths a **number** or **figure** e.g. **18**, is made up of the **digits 1** and **8**.

Each digit has a worth, otherwise known as its **place value**.

The number **eighteen** is a **2-digit** number.

The two digits represent the **10s** and **1s column place values**.

Place Value Grid

<u>Hundreds</u>	<u>Tens</u>	<u>Ones</u>
<u>100s</u>	<u>10s</u>	<u>1s</u>
	1	8

Strategy Applied

The number **eighteen** is represented on a **Place Value Grid** as above.

First, in the **1s** column the value of the digit is worked out by multiplying how many **ones** there are, **8** by 1 (**1s** column), which is **8**.

Next, in the **10s** column the value of the digit is worked out by multiplying how many **tens** there are, **1** by 10 (**10s** column), which is **10**.

Finally, the digit value of the **10s** and **1s** digits is **10** and **8**.

Test Questions

What is the digit value of the **10s** (tens) and **1s** (ones) digits in each number?

1) 18 =

2) 21 =

3) 32 =

4) 45 =

5) 57 =

6) 69 =

7) 70 =

8) 83 =

9) 94 =

10) 99 =

11) 101 =

12) 106 =

13) 110 =

14) 120 =

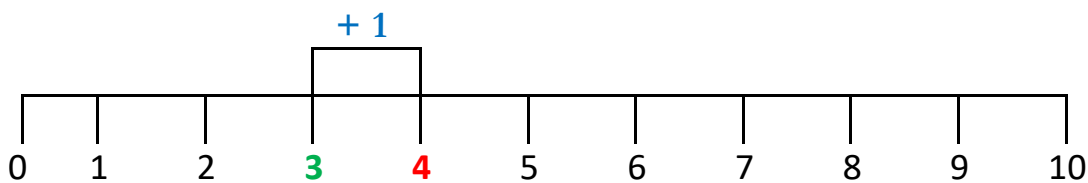
1 More Than

1) $3 + 1 = \underline{\quad ? \quad}$

Word Problem

Beulah is thinking of a number. Her number is **one more than three**.
What is her number?

Number Line



Strategy Applied

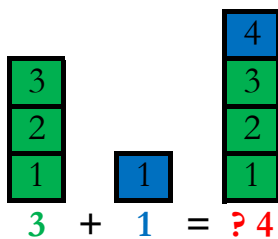
First, find and touch the number **three** on the number line.

Then, **count forwards one** more aloud in number order, whilst touching the numbers on the number line.

Next, the number counted on to should be **four**.

Finally, **three** plus **one** equals **four**.

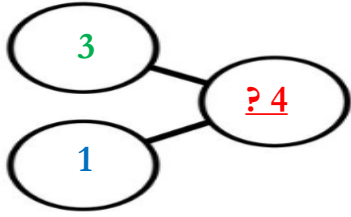
Concrete Object



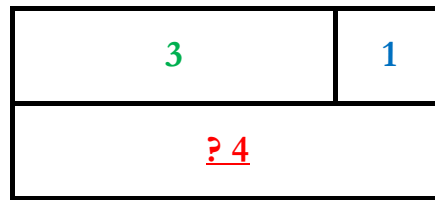
Column Addition

$$\begin{array}{r} \underline{1s} \\ 3 \\ + 1 \\ \hline 4 \end{array}$$

Part Whole Model



Bar Model



Test Questions

- 1) $3 + 1 = \underline{\quad}$
- 2) $5 + 1 = \underline{\quad}$
- 3) $12 + 1 = \underline{\quad}$
- 4) $19 + 1 = \underline{\quad}$
- 5) $24 + 1 = \underline{\quad}$
- 6) $33 + 1 = \underline{\quad}$
- 7) $57 + 1 = \underline{\quad}$
- 8) $86 + 1 = \underline{\quad}$
- 9) $99 + 1 = \underline{\quad}$
- 10) $100 + 1 = \underline{\quad}$
- 11) $\underline{\quad} = 111 + 1$
- 12) $\underline{\quad} = 121 + 1$
- 13) 1 more than 13 is $= \underline{\quad}$
- 14) 1 more than $\underline{\quad} = 40$

More Than 1

1) $16 + 3 = \underline{\quad ? \quad}$

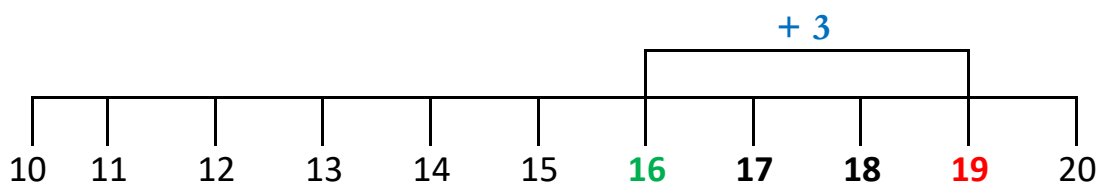
Word Problem

Uncle Washington has **three more** grapes than Auntie Merlin.

Aunty Merlin has **sixteen** grapes.

How many grapes does Uncle Washington have?

Number Line



Strategy Applied

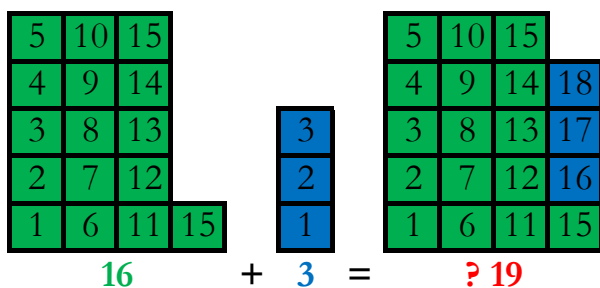
First, find and touch the number **sixteen** on the number line.

Then, **count forwards three** more aloud in number order, whilst touching the numbers on the number line.

Next, the number counted on to should be **nineteen**.

Finally, **sixteen** plus **three** equals **nineteen**.

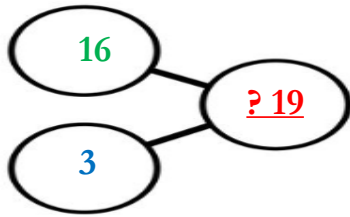
Concrete Object



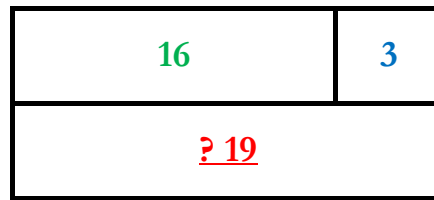
Column Addition

$$\begin{array}{r} \text{10s} \quad \text{1s} \\ 16 \\ + 3 \\ \hline 19 \end{array}$$

Part Whole Model



Bar Model



Test Questions

- 1) $16 + 3 = \underline{\quad}$
- 2) $2 + 9 = \underline{\quad}$
- 3) $4 + 21 = \underline{\quad}$
- 4) $57 + 7 = \underline{\quad}$
- 5) $14 + 5 = \underline{\quad}$
- 6) 1 more than 13 = $\underline{\quad}$
- 7) $68 + 8 = \underline{\quad}$
- 8) $44 + 6 = \underline{\quad}$
- 9) $5 + 86 = \underline{\quad}$
- 10) $97 + 8 = \underline{\quad}$
- 11) $\underline{\quad} = 4 + 81$
- 12) $\underline{\quad} = 7 + 52$
- 13) $\underline{\quad} = 5 + 97$
- 14) $\underline{\quad} = 8 + 103$

10 More Than

1) $13 + 10 = \underline{\quad ? \quad}$

Word Problem

Barry is thinking of a number. His number is **ten more than thirteen**.
What is his number?

Number Grid

10	11	12	13	14	15	16	17	18	19
20	21	22	↓ 23	24	25	26	27	28	29

Strategy Applied

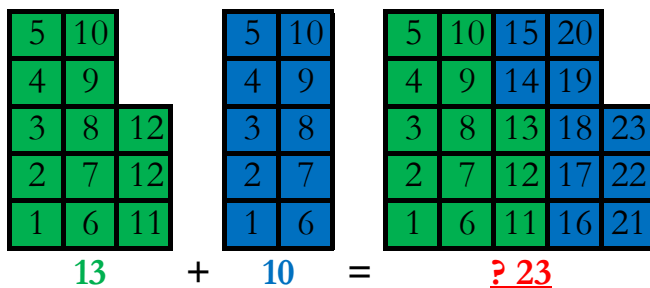
First, find and touch the number **thirteen** on a number grid.

Then, **count down one square** which is **ten** more, aloud in number order, whilst touching the numbers on the number grid.

Next, the number counted on to should be **twenty three**.

Finally, **thirteen** plus **ten** equals **twenty three**.

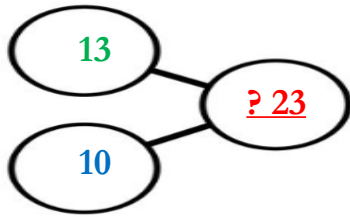
Concrete Object



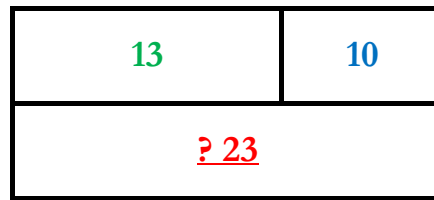
Column Addition

$$\begin{array}{r}
 \text{10s} \quad \text{1s} \\
 \text{1} \quad \text{3} \\
 + \quad \text{1} \quad \text{0} \\
 \hline
 \text{2} \quad \text{3} \\
 \hline
 \end{array}$$

Part Whole Model



Bar Model



Test Questions

- 1) $13 + 10 = \underline{\quad}$
- 2) $21 + 10 = \underline{\quad}$
- 3) $10 + 10 = \underline{\quad}$
- 4) $49 + 10 = \underline{\quad}$
- 5) $20 + 10 = \underline{\quad}$
- 6) $47 + 10 = \underline{\quad}$
- 7) $73 + 10 = \underline{\quad}$
- 8) $50 + 10 = \underline{\quad}$
- 9) $99 + 10 = \underline{\quad}$
- 10) $120 + 10 = \underline{\quad}$
- 11) $\underline{\quad} = 10 + 20$
- 12) $\underline{\quad} = 10 + 45$
- 13) $\underline{\quad} = 10 + 83$
- 14) $\underline{\quad} = 10 + 100$

Multiples of 10s

1) $8 + 20 = \underline{\quad ? \quad}$

Word Problem

Lynchy has **eight** football stickers. Rodney has **twenty** more.
How many football stickers does Rodney have?

Number Grid

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	↓ 18	19
20	21	22	23	24	25	26	27	↓ 28	29

Strategy Applied

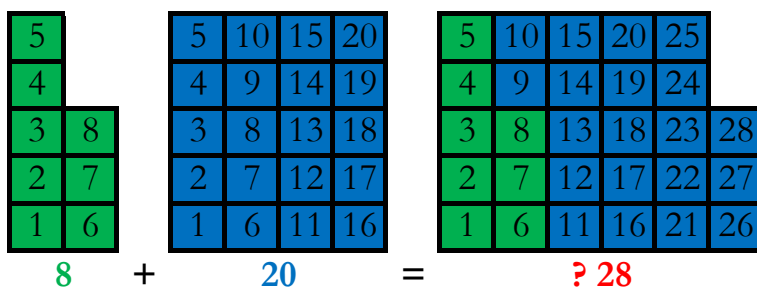
First, find and touch the number **eight** on a number grid.

Then, **count down one, two squares** which is **ten, twenty** more, aloud in number order whilst touching the numbers on the number grid.

Next, the number counted on to should be **twenty eight**.

Finally, **eight** add **twenty** equals **twenty eight**.

Concrete Object

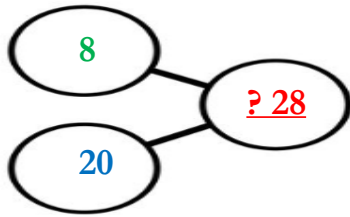


Column Addition

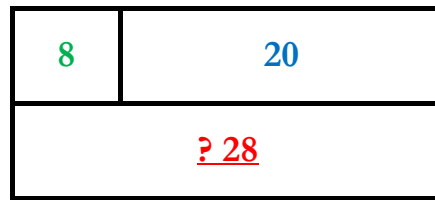
$$\begin{array}{r}
 \text{10s} \quad \text{1s} \\
 \\
 + \\
 \hline
 \\
 \\
 \hline

 \end{array}$$

Part Whole Model



Bar Model



Test Questions

1) $8 + 20 = \underline{\quad}$

2) $18 + 90 = \underline{\quad}$

3) $30 + 20 = \underline{\quad}$

4) $34 + 40 = \underline{\quad}$

5) $20 + 70 = \underline{\quad}$

6) $50 + 40 = \underline{\quad}$

7) $57 + 60 = \underline{\quad}$

8) $26 + 50 = \underline{\quad}$

9) $62 + 30 = \underline{\quad}$

10) $99 + 10 = \underline{\quad}$

11) $\underline{\quad} = 20 + 70$

12) $\underline{\quad} = 47 + 50$

13) $\underline{\quad} = 20 + 100$

14) $\underline{\quad} = 50 + 80$

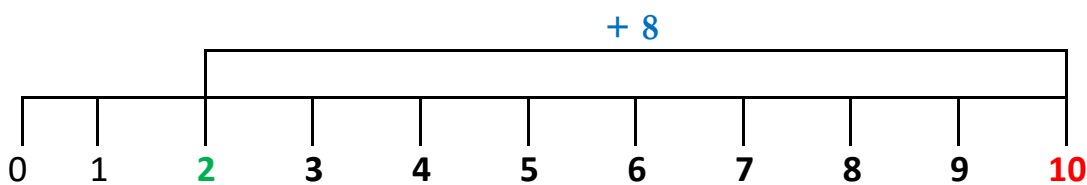
Bonds to 10 and 100

$$1) \quad 2 + \underline{\quad ? \quad} = 10$$

Number bonds to 10, means two or more numbers added together that make the number 10.

Number bonds to 100, means two or more numbers added together that make the number 100.

Number Line



Strategy Applied

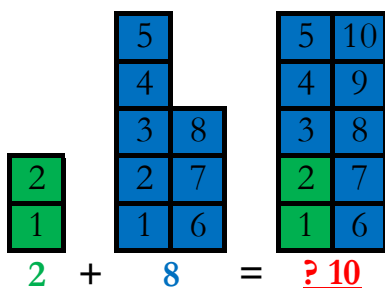
First, find and touch the number **two** on the number line.

Then, **count forwards** aloud from the next number after **two** on to **ten** in number order, whilst touching the numbers on the number line.

Next, the amount of numbers counted on should be **eight**.

Finally, **two** plus **eight** equals **ten**.

Concrete Object

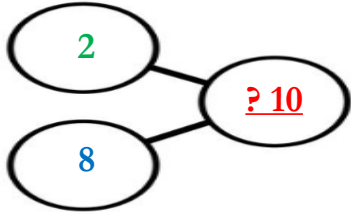


Column Addition

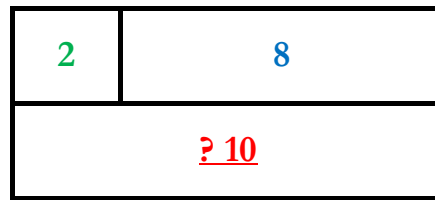
$$\begin{array}{r} \text{10s} \quad \text{1s} \\ \quad \quad 2 \\ + \quad \quad 8 \\ \hline \quad \text{1} \quad \text{0} \\ \hline \quad 1 \end{array}$$

Regroup 1 ten into 10 ones

Part Whole Model



Bar Model



Test Questions

- 1) $2 + \underline{\quad} = 10$
- 2) $4 + \underline{\quad} = 10$
- 3) $6 + \underline{\quad} = 10$
- 4) $8 + \underline{\quad} = 10$
- 5) $\underline{\quad} + 9\text{p} = 10\text{p}$
- 6) $\underline{\quad} + 7\text{p} = 10\text{p}$
- 7) $\underline{\quad} + \text{£}40 = \text{£}100$
- 8) $\underline{\quad} + \text{£}20 = \text{£}100$
- 9) $\underline{\quad} + 0 = 10$
- 10) $\underline{\quad} + 80 = 100$
- 11) $\underline{\quad} + 10 = 100$
- 12) $\underline{\quad} + 50 = 100$
- 13) $\underline{\quad} + 30 = 100$
- 14) $\underline{\quad} + 70 = 100$

Multiple Numbers

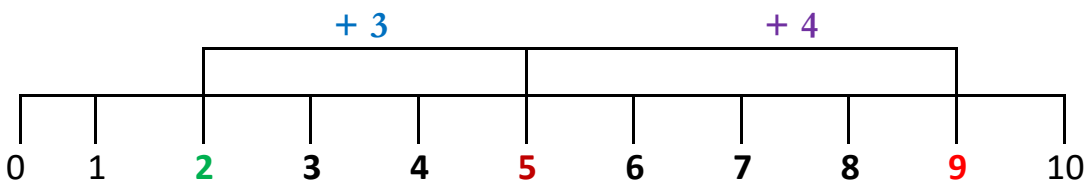
$$1) \quad 2 + 3 + 4 = \underline{\quad ? \quad}$$

Word Problem

Three children walked to school. Barbara walked 2 miles, Faye walked 3 miles and Doreen walked 4 miles.

How many miles did all the children walk in **total**?

Number Line



Strategy Applied

First, find and touch the number **two** on the number line.

Then, **count forwards three** more aloud in number order, whilst touching the numbers on the number line.

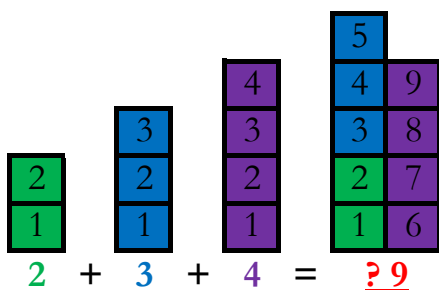
Next, the number counted on to should be **five**.

Then, **count forwards four** more aloud in number order, whilst touching the numbers on the number line.

Next, the number counted on to should be **nine**.

Finally, **two** plus **three** plus **four** equals **nine**.

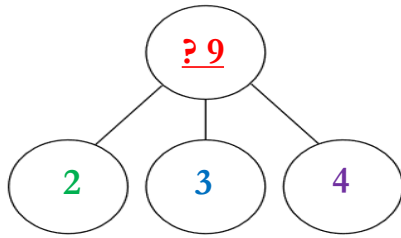
Concrete Object



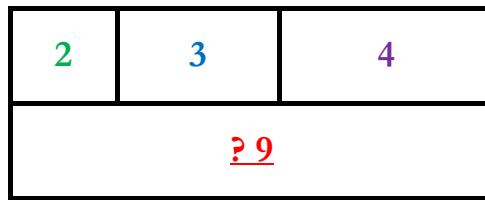
Column Addition

$$\begin{array}{r} \underline{1s} \\ 2 \\ + 3 \\ 4 \\ \hline 9 \end{array}$$

Part Whole Model



Bar Model



Test Questions

1) $2 + 3 + 4 = \underline{\quad}$

2) $9 + 8 + 7 = \underline{\quad}$

3) $6 + 3 + 3 = \underline{\quad}$

4) $3 + 30 + 3 = \underline{\quad}$

5) $10 + 40 + 20 = \underline{\quad}$

6) $20 + 30 + 50 = \underline{\quad}$

7) $10p + 5p + 2p = \underline{\quad}$

8) $£4 + £5 + £9 = \underline{\quad}$

9) $2cr + 4cr + 3cr = \underline{\quad}$

10) $4m + 5m + 6m = \underline{\quad}$

11) $\underline{\quad} = 7 + 9 + 6$

12) $\underline{\quad} = 15 + 15 + 15$

13) $\underline{\quad} = 9 + 9 + 7$

14) $\underline{\quad} = 60 + 20 + 10$

Multiples of 2, 3, 5 and 10

In the **number pattern** below, find the next two missing numbers.

1) 2, 4, 6, ?, ?

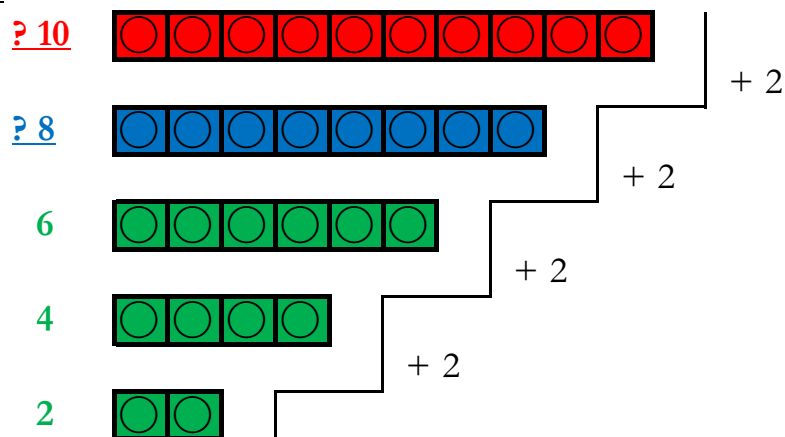
Word Problem

Sebert uses cubes to make the **number pattern** of **two**, **four** and **six**.

He calculates the next two missing numbers in the number pattern.

How many cubes will he need, to make the next two numbers?

Concrete Object



Strategy Applied

Work out the **number pattern**, by finding out the **difference between** the **three** numbers.

The difference between each of the **three** numbers is known as the **rule**.

First, **count forwards** from **two** to **four** equalling **two**, the rule is **+2**.

Then, count forwards from **four** to **six** equalling **two**, the rule is **+2**.

The rule is **+2 (count on two)** to each of the numbers in the number pattern.

Continue this number pattern to find the next two missing numbers.

Next, find **six** on the number line and count on **two** more, total is **eight**.

Then, find **eight** on the number line and count on **two** more, total is **ten**.

Finally, the next two missing numbers in the number pattern are **eight** and **ten**.

Number Line

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

Test Questions

1) 2, 4, 6, __, __

2) 18, 20, 22, __, __

3) 32, 34, 36, __, __

4) 68, 70, 72, __, __

5) 3, 6, 9, __, __

6) 15, 18, 21, __, __

7) 24, 27, 30, __, __

8) 33, 36, 39, __, __

9) 35, 40, 45, __, __

10) 45, 45, 50, __, __

11) 55, 60, 65, __, __

12) 70, 80, 90, __, __

13) 90, 100, 110, __, __

14) 120, 130, 140, __, __

More Than 10

1) $28 + 11 = \underline{\quad ? \quad}$

Word Problem

The temperature was **twenty eight** degrees in the morning and **eleven** degrees warmer in the evening.

What was the temperature in the evening?

Number Grid

20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	↓ 38	→ 39

Strategy Applied

Partition 11 into **multiples of 10s** and **1s**, which is $10 + 1$.

First, find and touch the number **twenty eight** on a number grid.

Then, **count down one square** which is **ten** more, aloud in number order whilst touching the numbers on the number grid.

Next, the number counted on to should be **thirty eight**.

Then, **count forwards one** more aloud in number order, whilst touching the numbers on the number grid.

Next, the number counted on to should be **thirty nine**.

Finally, **twenty eight** plus **eleven** equals **thirty nine**.

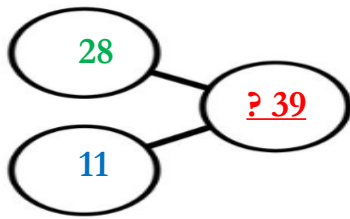
Partitioning

$$\begin{array}{r} 20 + 10 = 30 \\ 8 + 1 = 9 \\ \hline 39 \end{array}$$

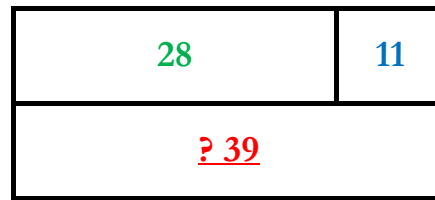
Column Addition

$$\begin{array}{r} \text{10s} \quad \text{1s} \\ 28 \\ + 11 \\ \hline 39 \end{array}$$

Part Whole Model



Bar Model



Test Questions

- 1) $28 + 11 = \underline{\quad}$
- 2) $65 + 29 = \underline{\quad}$
- 3) $26 + 66 = \underline{\quad}$
- 4) $75 + 14 = \underline{\quad}$
- 5) $68 + 17 = \underline{\quad}$
- 6) $47 + 21 = \underline{\quad}$
- 7) $37 + 44 = \underline{\quad}$
- 8) $61\text{cm} + 39\text{cm} = \underline{\quad}$
- 9) $19\text{m} + 81\text{m} = \underline{\quad}$
- 10) $\pounds 36 + \pounds 32 = \underline{\quad}$
- 11) $\underline{\quad} = 54 + 22$
- 12) $\underline{\quad} = 67 + 33$
- 13) $\underline{\quad} = 55 + 17$
- 14) $\underline{\quad} = 72 + 19$

Doubling

1) $21 + 4 + 4 = \underline{\quad ? \quad}$

Word Problem

At 9 a.m., there are **twenty one** cars in a car park. At 9.30 a.m., **four** cars drive in and park. An hour later, **four more** cars drive in and park..
How many cars are now in the car park in **total?**

Number Grid

20	21	→	22	23	→	24	→	25	26	27	→	28	→	29
----	----	---	----	----	---	----	---	----	----	----	---	----	---	----

Strategy Applied

Use **doubling**, **four** add **four** equals **eight**.
First, find and touch the number **twenty one** on a number grid.
Then, **count forwards eight** more aloud in number order, whilst touching the numbers on the number grid.
Next, the number counted on to should be **twenty nine**.
Finally, **twenty one** plus **eight** equals **twenty nine**.

Concrete Object

21	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21									

+

8	1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---	---

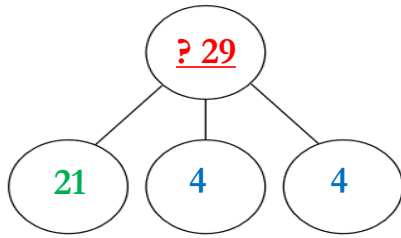
=

? 29	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	21	22	23	24	25	26	27	28	29	

Column Addition

	<u>10s</u>	<u>1s</u>
	2	1
+	8	
	2	9

Part Whole Model



Bar Model



Test Questions

1) $21 + 4 + 4 = \underline{\quad}$

2) $58 + 2 + 2 = \underline{\quad}$

3) $25 + 5 + 5 = \underline{\quad}$

4) $36 + 3 + 3 = \underline{\quad}$

5) $50 + 5 + 50 = \underline{\quad}$

6) $150 + 30 + 30 = \underline{\quad}$

7) $117 + 20 + 20 = \underline{\quad}$

8) $45p + 10p + 10p = \underline{\quad}$

9) $50p + 20p + 20p = \underline{\quad}$

10) $27r + 35r + 35r = \underline{\quad}$

11) $£69 + £30 + £30 = \underline{\quad}$

12) $£99 + £40 + £40 = \underline{\quad}$

13) $\underline{\quad} = 3 + 30 + 3$

14) $\underline{\quad} = 63 + 10 + 10$

Column Addition

1) $19 + 12 = \underline{\quad ? \quad}$

Word Problem

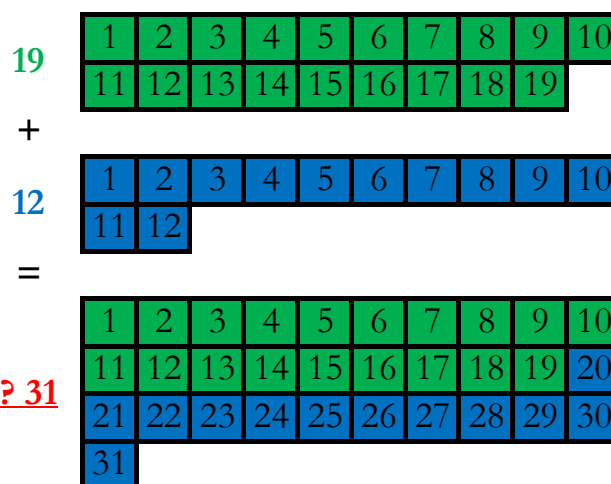
Nineteen children voted for football, **twelve** children voted for tennis.
How many children voted for a sport?

Column Addition

$$\begin{array}{r}
 \text{10s} \ \text{1s} \\
 1 \ 9 \\
 + 1 \ 2 \\
 \hline
 3 \ 1 \\
 \hline
 1
 \end{array}$$

Regroup **10** ones into **1** ten.

Concrete Object



Strategy Applied

First, in the **1s** column, **9 + 2**, equals 11 ones (**10 + 1**).

Then, write **1** in the **total value** of the **1s** column.

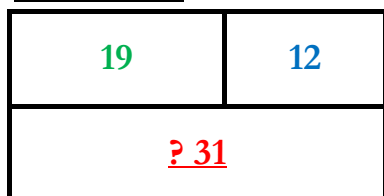
Next, **exchange/regroup** the **10 ones** into **1 ten** from the **1s** column to the **10s** column and write **1 ten** below the **total value** line of the **10s** column.

Then, in the **10s** column, **1 + 1 + 1**, equals 3 tens (**30**).

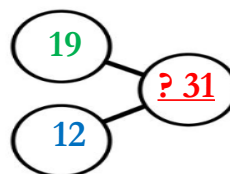
Next, write **3** in the **total value** of the **10s** column.

Finally, **nineteen** plus **twelve** equals **thirty one**.

Bar Model



Part Whole Model



Test Questions

$$\begin{array}{r} 1) \quad 1 \ 9 \\ + \quad 1 \ 2 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 6) \quad 4 \ 7 \\ + \quad 2 \ 1 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 11) \ 2 \ 9 \\ + \quad 1 \ 6 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 16) \ 5 \ 7 \\ + \quad 2 \ 3 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 2) \quad 1 \ 5 \\ + \quad 2 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 7) \quad 3 \ 4 \\ + \quad 3 \ 7 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 12) \ 5 \ 7 \\ + \quad 2 \ 6 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 17) \ 4 \ 6 \\ + \quad 3 \ 7 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 3) \quad 1 \ 6 \\ + \quad 6 \ 6 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 8) \quad 4 \ 1 \\ + \quad 3 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 13) \ 2 \ 8 \\ + \quad 6 \ 6 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 18) \ 6 \ 3 \\ + \quad 3 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 4) \quad 2 \ 5 \\ + \quad 1 \ 4 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 9) \quad 5 \ 1 \\ + \quad 1 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 14) \ 7 \ 7 \\ + \quad 1 \ 4 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 19) \ 8 \ 3 \\ + \quad 1 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 5) \quad 2 \ 8 \\ + \quad 1 \ 7 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 10) \ 2 \ 6 \\ + \quad 3 \ 2 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 15) \ 6 \ 0 \\ + \quad 1 \ 7 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 20) \ 3 \ 8 \\ + \quad 3 \ 2 \\ \hline \hline \end{array}$$

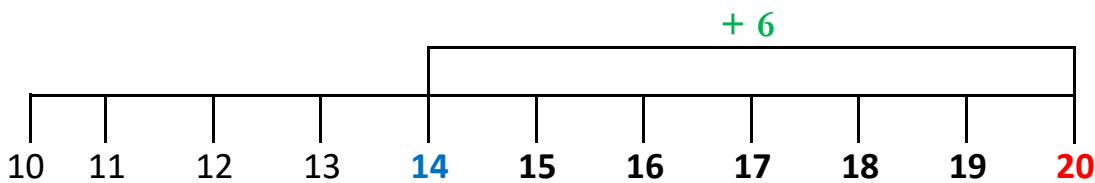
Find the Missing Number

1) $20 = \underline{\quad ? \quad} + 14$

Word Problem

Altogether Donald and Dennis have £20. Dennis has £14.
How much money does Donald have?

Number Line



Strategy Applied

$20 = \underline{\quad ? \quad} + 14$ can be written as $14 + \underline{\quad ? \quad} = 20$.

First, find and touch the number **fourteen** on the number line.

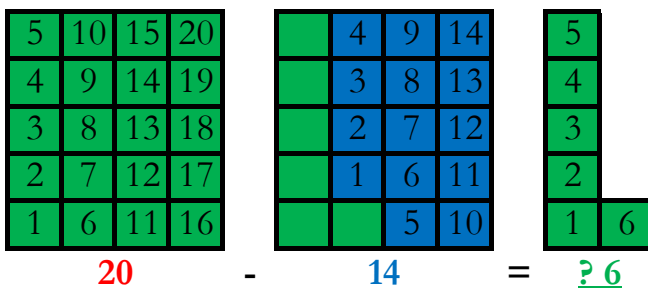
Then, count aloud from the next number after **fourteen** on to **twenty**.

Next, say how many numbers were **counted on**, it should be **six** more.

Finally, the **value** of the missing number is **six**.

Or use the **inverse** of addition, which is subtraction, $20 - 14 = \underline{\quad ? \quad}$.

Concrete Object

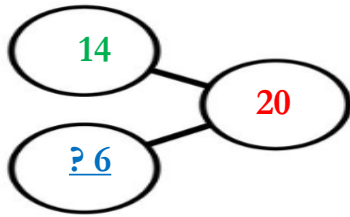


Column Addition

$$\begin{array}{r}
 \text{10s} \ \text{1s} \\
 0 \\
 2 \ 10 \\
 - \ 1 \ 4 \\
 \hline
 0 \ 6
 \end{array}$$

Regroup **1** ten into **10** ones.

Part Whole Model



Bar Model



Test Questions

- 1) $20 = \underline{\quad} + 14$
- 2) $72 + \underline{\quad} = 92$
- 3) $20 + \underline{\quad} = 100$
- 4) $5 + \underline{\quad} + 3 = 15$
- 5) 1 more than $\underline{\quad} = 40$
- 6) $80 = 30 + \underline{\quad}$
- 7) $\pounds 16 + \underline{\quad} = \pounds 20$
- 8) $59\text{L} + \underline{\quad} = 90\text{L}$
- 9) $30\text{cm} + \underline{\quad} = 70\text{cm}$
- 10) $50\text{p} + \underline{\quad} = 75\text{p}$
- 11) $6\text{mm} + \underline{\quad} + 6\text{mm} = 24\text{mm}$
- 12) $5\text{m} + 8\text{m} + \underline{\quad} = 80\text{m}$
- 13) $3 + \underline{\quad} + 6 = 27$
- 14) $\underline{\quad} = 12 + 47 + 38$

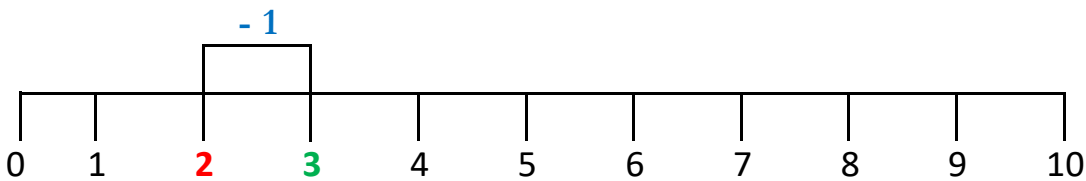
1 Less Than

$$1) \quad 3 - 1 = \underline{\quad ? \quad}$$

Word Problem

Uncle Nelson is thinking of a number. His number is **one** fewer than **three**.
What is his number?

Number Line



Strategy Applied

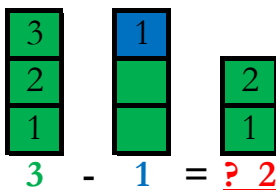
First, find and touch the number **three** on the number line.

Then, **count backwards one** less aloud in number order, whilst touching the numbers on the number line.

Next, the number counted back to should be **two**.

Finally, **three** subtract **one** equals **two**.

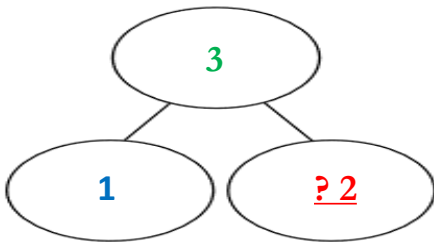
Concrete Object



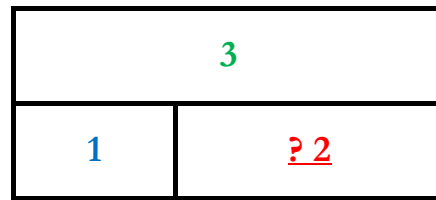
Column Subtraction

$$\begin{array}{r} \underline{1s} \\ 3 \\ - 1 \\ \hline 2 \end{array}$$

Part Whole Model



Bar Model



Test Questions

- 1) $3 - 1 = \underline{\quad}$
- 2) $4 - 1 = \underline{\quad}$
- 3) $6 - 1 = \underline{\quad}$
- 4) $9 - 1 = \underline{\quad}$
- 5) Subtract one from eleven = $\underline{\quad}$
- 6) One less than 7 is = $\underline{\quad}$
- 7) Fourteen is one less than = $\underline{\quad}$
- 8) $5\text{mm} - 1\text{mm} = \underline{\quad}$
- 9) $7\text{cm} - 1\text{cm} = \underline{\quad}$
- 10) $15\text{m} - 1\text{m} = \underline{\quad}$
- 11) One less than 27 is = $\underline{\quad}$
- 12) 19 is one less than = $\underline{\quad}$
- 13) One less than 53 is = $\underline{\quad}$
- 14) $\underline{\quad} - 1\text{km} = 29\text{km}$

More Than 1

1) $19 - 7 = \underline{\quad ? \quad}$

Word Problem

Berty buys a badminton set and a cricket set, costing £7.

How much **change** does he get from £19.

Number Grid

0	1	2	3	4	5	6	7	8	9
10	11	12 ←	13	14	15 ←	16	17	18 ←	19

Strategy Applied

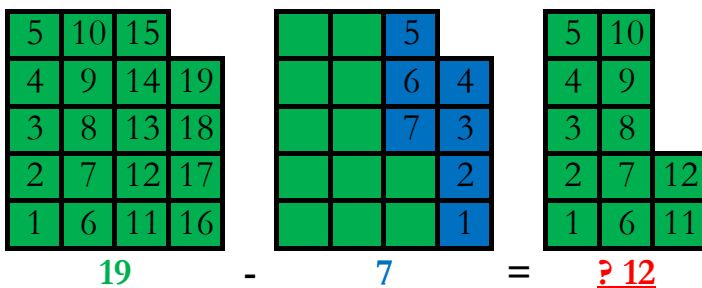
First, find and touch the number **nineteen** on a number grid.

Then, **count backwards seven** less aloud in number order, whilst touching the numbers on the number grid.

Next, the number counted back to should be **twelve**.

Finally, **nineteen** minus **seven** equals **twelve**.

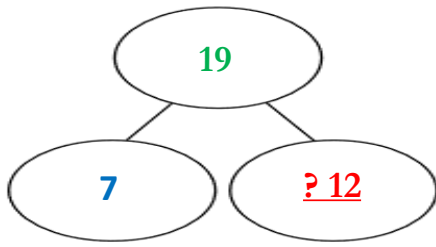
Concrete Object



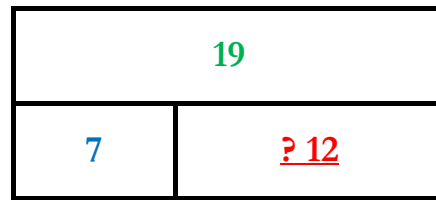
Column Subtraction

$$\begin{array}{r}
 \text{10s} \quad \text{1s} \\
 19 \\
 - \quad 7 \\
 \hline
 12
 \end{array}$$

Part Whole Model



Bar Model



Test Questions

- 1) $19 - 7 = \underline{\quad}$
- 2) $13 - 7 = \underline{\quad}$
- 3) $52 - 5 = \underline{\quad}$
- 4) $18\text{secs} - 9\text{secs} = \underline{\quad}$
- 5) $8\text{secs} - 3\text{secs} = \underline{\quad}$
- 6) $91\text{mins} - 7\text{mins} = \underline{\quad}$
- 7) $83\text{mins} - 9\text{mins} = \underline{\quad}$
- 8) $46 - 3 = \underline{\quad}$
- 9) $9\text{hrs} - 7\text{hrs} = \underline{\quad}$
- 10) $5\text{hrs} - 4\text{hrs} = \underline{\quad}$
- 11) $\underline{\quad} = 33 - 8$
- 12) $\underline{\quad} = 47 - 6$
- 13) $\underline{\quad} = 56 - 3$
- 14) $\underline{\quad} = 60 - 6$

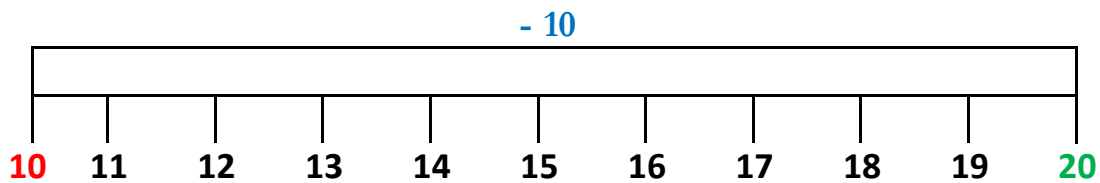
10 Less Than

1) $20 - 10 = \underline{\quad ? \quad}$

Word Problem

Evelyn is thinking of a number. Her number is **ten** fewer than **twenty**.
What is her number?

Number Line



Strategy Applied

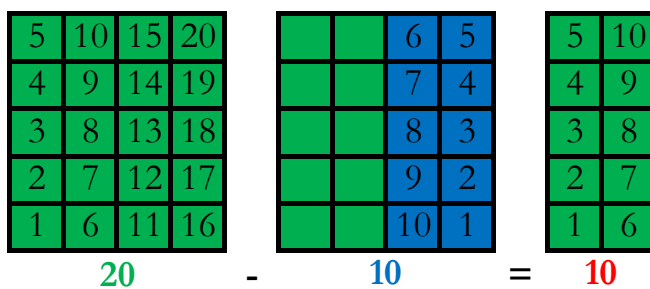
First, find and touch the number **twenty** on the number line.

Then, **count backwards ten** less aloud in number order, whilst touching the numbers on the number line.

Next, the number counted back to should be **ten**.

Finally, **twenty** subtract **ten** equals **ten**.

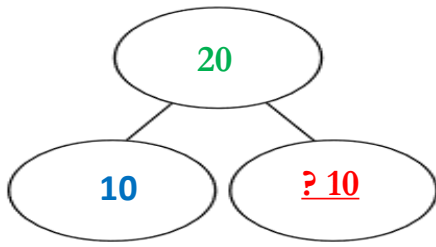
Concrete Object



Column Subtraction

$$\begin{array}{r} \text{10s} \quad \text{1s} \\ 20 \\ - 10 \\ \hline 10 \end{array}$$

Part Whole Model



Bar Model



Test Questions

- 1) $20 - 10 = \underline{\quad}$
- 2) $30 - 10 = \underline{\quad}$
- 3) $52 - 10 = \underline{\quad}$
- 4) $70 - 10 = \underline{\quad}$
- 5) $93 - 10 = \underline{\quad}$
- 6) $20 - 10 = \underline{\quad}$
- 7) $46 - 10 = \underline{\quad}$
- 8) $60\text{g} - 10\text{g} = \underline{\quad}$
- 9) $83\text{g} - 10\text{g} = \underline{\quad}$
- 10) $109\text{kg} - 10\text{kg} = \underline{\quad}$
- 11) $\underline{\quad} = 20\text{k} - 10\text{kg}$
- 12) $\underline{\quad} = 157 - 10$
- 13) $\underline{\quad} = 180 - 10$
- 14) $\underline{\quad} = 201 - 10$

Multiples of 10s

1) $91 - 20 = \underline{\quad ? \quad}$

Word Problem

A bottle contains **ninety one** millilitres of a liquid.

Twenty millilitres are poured out, to use in an experiment.

How many millilitres are **left** in the bottle?

Number Grid

70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Strategy Applied

First, find and touch the number **ninety one** on a number grid.

Then, **count up one, two squares** which is **ten, twenty** less, aloud in number order whilst touching the numbers on the number grid.

Next, the number counted back to should be **seventy one**.

Finally, **ninety one** subtract **twenty** equals **seventy one**.

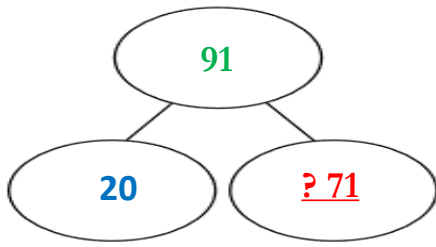
Partitioning

$$\begin{array}{r} 90 - 20 = 70 \\ 1 - 0 = 1 \\ \hline 71 \end{array} +$$

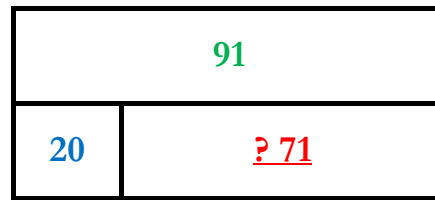
Column Subtraction

$$\begin{array}{r} \text{10s} \text{ 1s} \\ 91 \\ - 20 \\ \hline 71 \end{array}$$

Part Whole Model



Bar Model



Test Questions

1) $91 - 20 = \underline{\quad}$

2) $86 - 30 = \underline{\quad}$

3) $60 - 50 = \underline{\quad}$

4) $94 - 60 = \underline{\quad}$

5) $78 - 70 = \underline{\quad}$

6) $70 - 30 = \underline{\quad}$

7) $43 - 20 = \underline{\quad}$

8) $20 - 10 = \underline{\quad}$

9) $52 - 40 = \underline{\quad}$

10) $80 - 40 = \underline{\quad}$

11) $\underline{\quad} = 36 - 20$

12) $\underline{\quad} = 49 - 30$

13) $\underline{\quad} = 50 - 40$

14) $\underline{\quad} = 88 - 50$

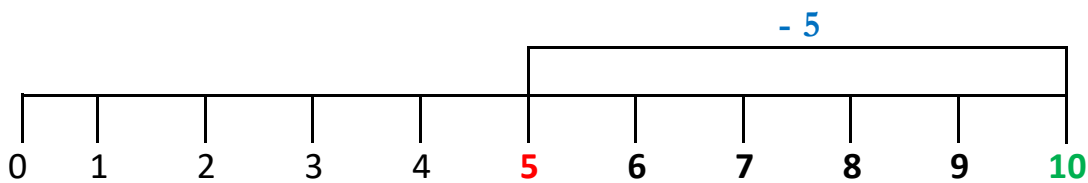
Bonds to 10 and 100

1) $10 - 5 = \underline{\quad ? \quad}$

Number bonds to 10, means two or more numbers added together that make the number 10.

Number bonds to 100, means two or more numbers added together that make the number 100.

Number Line



Strategy Applied

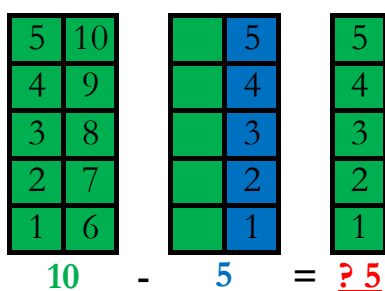
First, find and touch the number **ten** on the number line.

Then, **count backwards five** less aloud in number order, whilst touching the numbers on the number line.

Next, the number counted back to should be **five**.

Finally, **ten** subtract **five** equals **five**.

Concrete Object

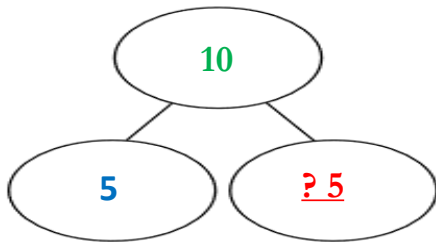


Column Addition

$$\begin{array}{r} \text{10s} \quad \text{1s} \\ 0 \\ + 10 \\ - \quad 5 \\ \hline 5 \end{array}$$

Regroup 1 ten into 10 ones.

Part Whole Model



Bar Model



Test Questions

1) $10 - 5 = \underline{\quad}$

2) $10 - 6 = \underline{\quad}$

3) $10 - 7 = \underline{\quad}$

4) $10 - 9 = \underline{\quad}$

5) $10\text{p} - \underline{\quad} = 4\text{p}$

6) $10\text{f} - \underline{\quad} = 6\text{p}$

7) $100\text{f} - \underline{\quad} = 18\text{p}$

8) $\pounds 100 - \underline{\quad} = \pounds 29$

9) $\pounds 100 - \underline{\quad} = \pounds 10$

10) $\pounds 100 - \underline{\quad} = \pounds 42$

11) $100 - 32 = \underline{\quad}$

12) $100 - 55 = \underline{\quad}$

13) $100 - 44 = \underline{\quad}$

14) $100 - 68 = \underline{\quad}$

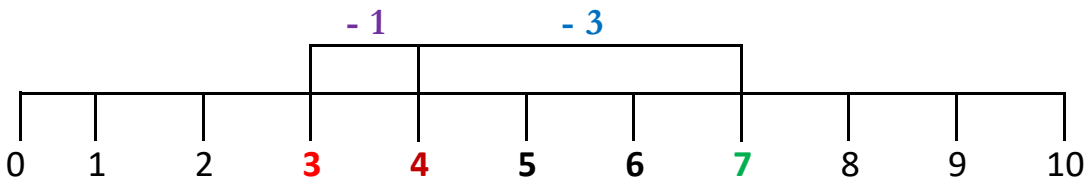
Multiple Numbers

$$1) \quad 7 - 3 - 1 = \underline{\quad ? \quad}$$

Word Problem

A toy box contains **seven** coins. Angus borrows **three** coins and Colin takes **one** coin. How many coins are **left** in the toy box?

Number Line



Strategy Applied

First, find and touch the number **seven** on the number line.

Then, **count backwards three** less aloud in number order, whilst touching the numbers on the number line.

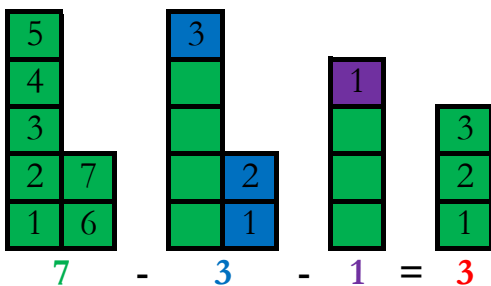
Next, the number counted back to should be **four**.

Then, **count backwards one** less aloud in number order, whilst touching the numbers on the number line.

Next, the number counted back to should be **three**.

Finally, **seven** subtract **three** subtract **one** equals **three**.

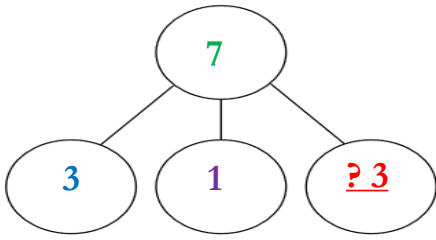
Concrete Object



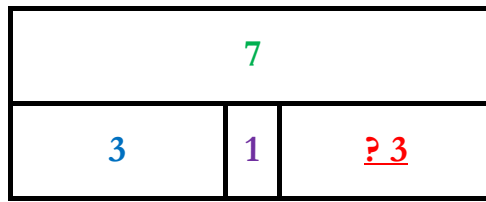
Column Subtraction

$$\begin{array}{r} \underline{1s} \\ 7 \\ - 3 \\ \hline 4 \end{array} \qquad \begin{array}{r} \underline{1s} \\ 4 \\ - 1 \\ \hline 3 \end{array}$$

Part Whole Model



Bar Model



Test Questions

- 1) $7 - 3 - 1 = \underline{\quad}$
- 2) $9 - 5 - 2 = \underline{\quad}$
- 3) $12 - 6 - 3 = \underline{\quad}$
- 4) $20 - 3 - 4 = \underline{\quad}$
- 5) $24 - 6 - 5 = \underline{\quad}$
- 6) $30 - 8 - 2 = \underline{\quad}$
- 7) $36 - 5 - 7 = \underline{\quad}$
- 8) $48 - 6 - 3 = \underline{\quad}$
- 9) $55 - 5 - 4 = \underline{\quad}$
- 10) $67 - 4 - 5 = \underline{\quad}$
- 11) $\underline{\quad} = 50 - 30 - 20$
- 12) $\underline{\quad} = 40 - 10 - 20$
- 13) $\underline{\quad} = 63 - 10 - 10$
- 14) $\underline{\quad} = 100 - 0 - 80$

Multiples of 2, 3, 5 and 10

In the **number pattern** below, find the next two missing numbers.

1) 12 10 8 ?, ?

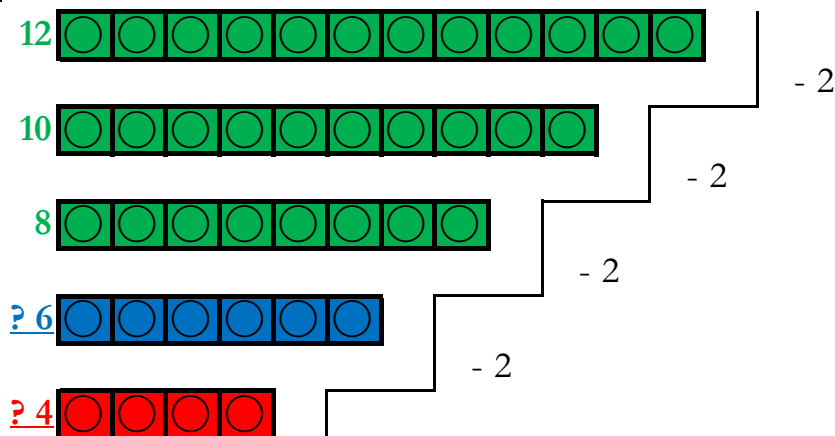
Word Problem

The three numbers are written down in a **number pattern**.

Twelve is the **greatest** number, **ten** is the **next biggest** number and **eight** is the **smallest** number.

What are the next **two** missing numbers?

Concrete Object



Strategy Applied

Work out the **number pattern**, by finding out the **difference between** the **three** numbers.

The difference between each of the **three** numbers is known as the **rule**.

First, **count backwards** from **twelve** to **ten** equalling **one**, the rule is **-2**.

Then, count backwards from **ten** to **eight** equalling **one**, the rule is **-2**.

The rule is **-2** (**count back two**) from each of the numbers in the number pattern.

Continue this number pattern to find the next two missing numbers.

Next, find **eight** on the number line and count back **two** less, total is **six**.

Then, find **six** on the number line and count back **two** less, total is **four**.

Finally, the next two missing numbers in the number pattern are **six** and

four.

Number Line

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

Test Questions

1) 12, 10, 8, ,

2) 28, 26, 24, ,

3) 40, 38, 36, ,

4) 60, 58, 56, ,

5) 18, 15, 12, ,

6) 27, 24, 21, ,

7) 36, 33, 30, ,

8) 42, 39, 36, ,

9) 20, 15, 10, ,

10) 30, 25, 20, ,

11) 60, 55, 50, ,

12) 40, 30, 20, ,

13) 100, 90, 80, ,

14) 200, 190, 180, ,

Multiples of 10s and 1s

1) $53 - 14 = \underline{\quad ? \quad}$

Word Problem

Sheridan needs **fifty three grams** of gluten free wheat to make bread.

There are **fourteen grams** left in the cupboard.

How many more grams does she need?

Number Grid

30	31	32	33	34	35	36	37	38	39
← 40	41	42 ←	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59

Strategy Applied

Partition 14 into multiples of 10s and 1s, which is **10 + 4**.

First, find and touch the number **fifty three** on a number grid.

Then, **count up one square** which is **ten** less, aloud in number order whilst touching the numbers on the number grid.

Next, the number counted back to should be **forty three**.

Then, **count backwards four** less aloud in number order, whilst touching the numbers on the number grid.

Next, the number counted on to should be **thirty nine**.

Finally, **fifty three** subtract **four** equals **thirty nine**.

Bar Model

53		
10	4	? 39

Test Questions

- 1) $53 - 14 = \underline{\quad}$
- 2) $26 - 12 = \underline{\quad}$
- 3) $19 - 16 = \underline{\quad}$
- 4) $77 - 48 = \underline{\quad}$
- 5) $24 - 13 = \underline{\quad}$
- 6) $98 - 84 = \underline{\quad}$
- 7) $56 - 36 = \underline{\quad}$
- 8) $93 - 67 = \underline{\quad}$
- 9) $32 - 19 = \underline{\quad}$
- 10) $82 - 54 = \underline{\quad}$
- 11) $64 - 32 = \underline{\quad}$
- 12) $87 - 51 = \underline{\quad}$
- 13) $\underline{\quad} = 54 - 22$
- 14) $\underline{\quad} = 79 - 15$

Column Subtraction

$$\begin{array}{r} \text{10s} \ \text{1s} \\ 4 \\ 5 \ 13 \\ - 1 \ 4 \\ \hline 3 \ 9 \end{array}$$

Regroup **1** ten into **10** ones.

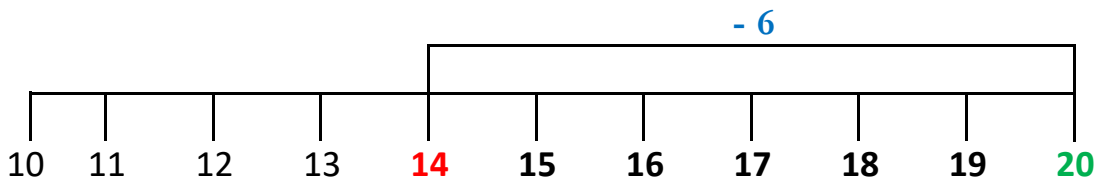
Doubling

1) $20 - 3 - 3 = \underline{\quad ? \quad}$

Word Problem

Joyce and Lance **each** take **three** of Richard's **twenty** colouring pens.
How many are **left**?

Number Line



Strategy Applied

Use **doubling**, minus **three** and minus **three**, equals minus **six**.

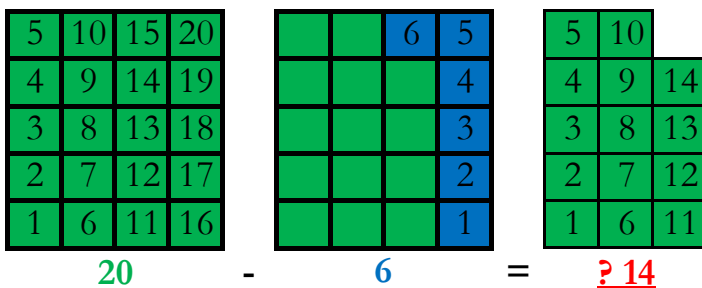
First, find and touch the number **twenty** on the number line.

Then, **count backwards six** less aloud in number order, whilst touching the numbers on the number line.

Next, the number counted back to should be **fourteen**.

Finally, **twenty** subtract **six** equals **fourteen**.

Concrete Object

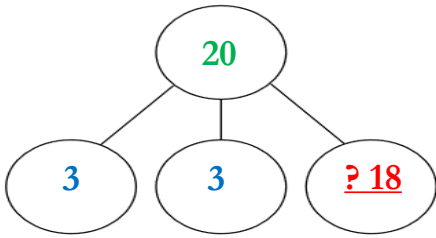


Column Subtraction

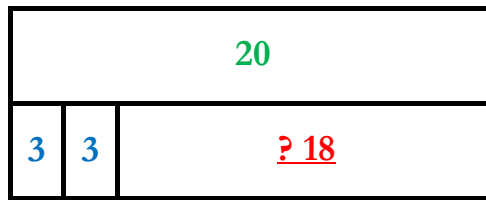
$$\begin{array}{r}
 \text{10s} \quad \text{1s} \\
 20 \\
 - 6 \\
 \hline
 14
 \end{array}$$

Regroup **1** ten into **10** ones.

Part Whole Model



Bar Model



Test Questions

1) $20 - 3 - 3 = \underline{\quad}$

2) $44 - 2 - 2 = \underline{\quad}$

3) $28 - 3 - 3 = \underline{\quad}$

4) $16 - 4 - 4 = \underline{\quad}$

5) $40 - 5 - 5 = \underline{\quad}$

6) $56 - 6 - 6 = \underline{\quad}$

7) $25 - 7 - 7 = \underline{\quad}$

8) $75 - 8 - 8 = \underline{\quad}$

9) $20 - 9 - 9 = \underline{\quad}$

10) $70 - 10 - 10 = \underline{\quad}$

11) $\underline{\quad} = 47 - 2 - 2$

12) $\underline{\quad} = 59 - 2 - 2$

13) $\underline{\quad} = 66 - 5 - 5$

14) $\underline{\quad} = 78 - 10 - 10$

Column Subtraction

$$1) \ 52 - 15 = \underline{\quad ? \quad}$$

Word Problem

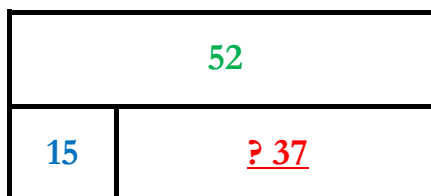
Fifty two children are on two coaches. **Fifteen** of them are on **Coach B**.
How many children are on **Coach A**?

Column Subtraction

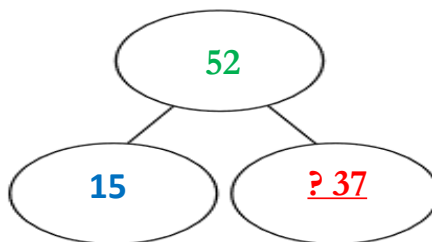
$$\begin{array}{r} \text{10s} \ \text{1s} \\ 4 \\ 5 \ 12 \\ - 1 \ 5 \\ \hline 3 \ 7 \end{array}$$

Regroup 1 ten into 10 ones.

Bar Model



Part Whole Model



Strategy Applied

First, in **1s column**, **2** subtract **5**, you cannot do as **2** is a **lower value** than **5**.
Then, **exchange/regroup 1 ten into 10 ones** from the **10s** column to the **1s** column.

Next, cross out the **5 tens** and write **4 tens** above, then write the **exchanged/regrouped 1 ten** next to the **2 ones** to make **12 ones**.

Then, in the **1s column**, **12** subtract **5**, equals **7 ones (7)**, write **7** in the **total value** of the **1s column**.

Next, in the **10s column**, **4** subtract **1**, equals **3 tens (30)**, write **3** in the **total value** of the **10s column**.

Finally, **fifty two** subtract **fifteen** equals **thirty seven**.

Test Questions

$$\begin{array}{r} 1) \quad 5 \ 2 \\ - \quad 1 \ 5 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 6) \quad 2 \ 6 \\ - \quad 1 \ 2 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 11) \ 4 \ 2 \\ - \quad 1 \ 6 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 16) \ 2 \ 7 \\ - \quad 1 \ 3 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 2) \quad 3 \ 6 \\ - \quad 1 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 7) \quad 7 \ 7 \\ - \quad 4 \ 8 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 12) \ 2 \ 6 \\ - \quad 1 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 17) \ 7 \ 8 \\ - \quad 4 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 3) \quad 2 \ 4 \\ - \quad 1 \ 3 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 8) \quad 9 \ 8 \\ - \quad 8 \ 4 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 13) \ 1 \ 4 \\ - \quad 1 \ 3 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 18) \ 9 \ 9 \\ - \quad 8 \ 5 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 4) \quad 9 \ 3 \\ - \quad 6 \ 7 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 9) \quad 5 \ 6 \\ - \quad 3 \ 6 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 14) \ 8 \ 3 \\ - \quad 6 \ 8 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 19) \ 5 \ 7 \\ - \quad 3 \ 7 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 5) \quad 3 \ 2 \\ - \quad 1 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 10) \ 8 \ 2 \\ - \quad 5 \ 4 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 15) \ 2 \ 2 \\ - \quad 1 \ 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 20) \ 8 \ 3 \\ - \quad 5 \ 5 \\ \hline \hline \end{array}$$

Find the Missing Number

$$1) \ 36 - \underline{\quad ?} - 5 = 23$$

Word Problem

Rodney goes into a shop with **thirty six** pence. He buys two items and has **twenty three** pence in change. One item cost **five** pence.

What is the cost of the other item?

Number Grid

20	21	22	23 ←	24	25	26	27	28 ←	29
30 ←	31	32	33	34	35 ←	36	37	38	39

Strategy Applied

First, find and touch the number **thirty six** on a number grid.

Then, **count backwards five** less aloud in number order, whilst touching the numbers on the number grid.

Next, the number counted back to should be **thirty one**.

Then, **count backwards** aloud from the next number before **thirty one** back to **twenty three**, whilst touching the numbers on the number grid.

Next, say how many numbers were **counted back**, it should be **eight** less.

Finally, the **value** of the missing number is **eight**.

Column Subtraction

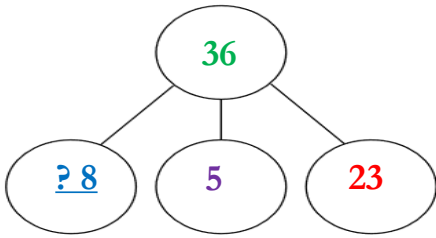
$$\begin{array}{r} \text{10s} \ \text{1s} \\ 36 \\ - \quad 5 \\ \hline 31 \end{array}$$

Column Subtraction

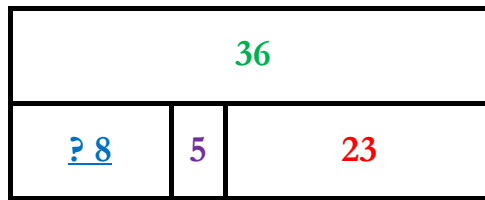
$$\begin{array}{r} \text{10s} \ \text{1s} \\ 23 \\ - \quad 23 \\ \hline 08 \end{array}$$

Regroup **1** ten into **10** ones.

Part Whole Model



Bar Model



Test Questions

- 1) $36 - \underline{\quad} - 5 = 23$
- 2) $\underline{\quad} - 31 = 16$
- 3) $54 - \underline{\quad} = 13$
- 4) $21 + 35 = 100 - \underline{\quad}$
- 5) $10 - \underline{\quad} = 4$
- 6) $62 - 10 - 10 = \underline{\quad}$
- 7) $74 - \underline{\quad} = 39$
- 8) $100 - 42 - \underline{\quad} = 48$
- 9) $100 - \underline{\quad} = 60$
- 10) $34 + 13 = 100 - \underline{\quad}$
- 11) $67 - \underline{\quad} = 59$
- 12) $100 - 19 = \underline{\quad}$
- 13) $98 - \underline{\quad} = 28$
- 14) $\underline{\quad} = 15 - 2$

Repeated Addition

$$1) \quad 5 \times 3 = \underline{\quad ? \quad}$$

Word Problem

Sarah is counting on in **fives** starting at **zero**. She counts on **three fives**.
What number has she counted on to?

Number Line



Strategy Applied

Five times **three** is the same as **three groups of** or **lots of five**.

First, find and touch the number **zero** on a number line.

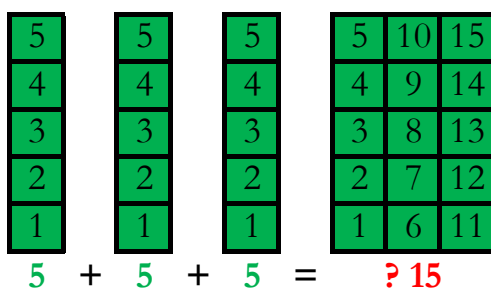
Then, **count forwards five** more aloud in number order, whilst touching the numbers on the number line, on to the number **five**.

Next, **count forwards five** more aloud in number order, whilst touching the numbers on the number line, on to the number **ten**.

Then, **count forwards five** more aloud in number order, whilst touching the numbers on the number line, on to the number **fifteen**.

Finally, **five** times **three** equals **fifteen**.

Concrete Object

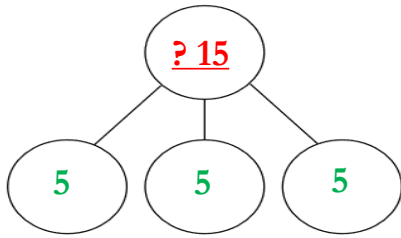


Column Addition

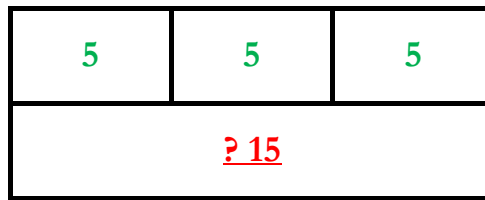
$$\begin{array}{r} \text{10s} \quad \text{1s} \\ \quad \quad 5 \\ \quad \quad 5 \\ + \quad \quad 5 \\ \hline \quad \text{1} \quad \text{5} \\ \hline \quad \text{1} \end{array}$$

Regroup **10** ones into **1** ten

Part Whole Model



Bar Model



Test Questions

1) $5 \times 3 = \underline{\quad}$

2) $5 \times 12 = \underline{\quad}$

3) $2 \times 10 = \underline{\quad}$

4) $10 \times 8 = \underline{\quad}$

5) $5 \times 9 = \underline{\quad}$

6) $2 \times 12 = \underline{\quad}$

7) $10 \times 11 = \underline{\quad}$

8) $5 \times 6 = \underline{\quad}$

9) $5 \times 7 = \underline{\quad}$

10) $2 \times 7 = \underline{\quad}$

11) $10 \times 3 = \underline{\quad}$

12) $2 \times 11 = \underline{\quad}$

13) $5 \times 4 = \underline{\quad}$

14) $12 \times 10 = \underline{\quad}$

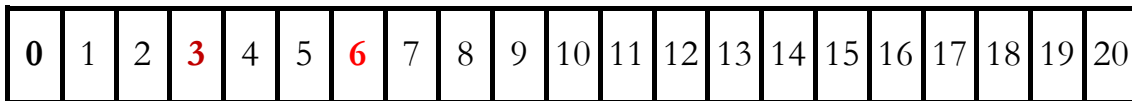
Step Counting

1) $3 \times 2 = \underline{\quad ? \quad}$

Word Problem

There are **two** tricycles on the playground. Each tricycle has **three** wheels.
How many wheels are there **altogether**?

Number Line



Strategy Applied

For **step counting** each **lot of three** is **added on** one at a time, expressing the **number value** as it is **counted on**.

First, find and touch the number **zero** on a number line.

Then, **count forwards three** more aloud in number order, whilst touching the numbers on the number line, on to the number **three**.

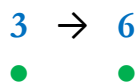
Next, **count forwards three** more aloud in number order, whilst touching the numbers on the number line, on to the number **six**.

Finally, **two** groups of **three** equals **six**.

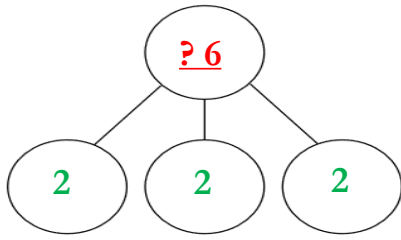
Concrete Object



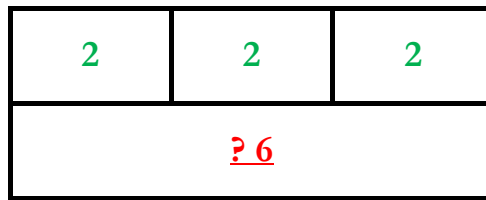
Step Counting



Part Whole Model



Bar Model



Test Questions

1) $2 \times 3 = \underline{\quad}$

2) $2 \times 4 = \underline{\quad}$

3) $4 \times 6 = \underline{\quad}$

4) $4 \times 4 = \underline{\quad}$

5) $3 \times 8 = \underline{\quad}$

6) $3 \times 4 = \underline{\quad}$

7) $4 \times 9 = \underline{\quad}$

8) $3 \times 9 = \underline{\quad}$

9) $3 \times 10 = \underline{\quad}$

10) $4 \times 10 = \underline{\quad}$

11) $4 \times 11 = \underline{\quad}$

12) $3 \times 7 = \underline{\quad}$

13) $3 \times 12 = \underline{\quad}$

14) $4 \times 7 = \underline{\quad}$

Find the Missing Number

$$1) \quad \underline{\quad} \times 5 = 25$$

Word Problem

Linda has **five** objects in one bag. The **same** number of objects are in each of the bags. There are **twenty five** objects in **total**.

How many bags of objects does Linda have?

Number Line

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39

Strategy Applied

Apply **step counting** to calculate the **missing number**, the **multiplicand**, by counting on in **lots of five** up to **twenty five**.

First, find and touch the number **zero** on a number line.

Then, **count forwards five** more aloud in number order, whilst touching the numbers on the number line, on to the number **five**.

Next, **count forwards five** more aloud in number order, whilst touching the numbers on the number line, on to the number **ten**.

Then, **count forwards five** more aloud in number order, whilst touching the numbers on the number line, on to the number **fifteen**.

Next, **count forwards five** more aloud in number order, whilst touching the numbers on the number line, on to the number **twenty**.

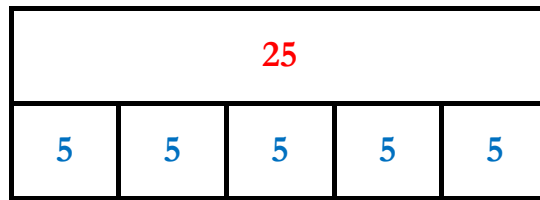
Then, **count forwards five** more aloud in number order, whilst touching the numbers on the number line, on to the number **twenty five**.

Finally, **five** groups of **five** equals **twenty five**.

Step Counting

5 → 10 → 15 → 20 → 25
● ● ● ● ●

Bar Model



Test Questions

- 1) ___ x 5 = 25
- 2) ___ x 6 = 60
- 3) 2 x 5 = ___ x 2
- 4) 30 = 5 x ___
- 5) ___ x 5 = 45
- 6) 4 x ___ = 40
- 7) 3 x 10 = ___
- 8) 12 x ___ = 6 x 10
- 9) 7 x 2 = 2 x ___
- 10) 8 x 2 = ___ x 4
- 11) 5 x 12 = ___ x 5
- 12) 10 x ___ = 9 x 10
- 13) 4 x ___ = 8 x 5
- 14) 6 x 4 = 2 x ___

Repeated Subtraction

1) $15 \div 5 = \underline{\quad ? \quad}$

Word Problem

Cookies come in **packs (groups) of five**. **Fifteen** cookies are placed on a plate.

How many **packs (groups) of cookies** were used?

Number Line



Strategy Applied

Count backwards in lots of **fives** from **fifteen** to **zero** and the amount of **fives** counted back will be the **missing number**.

First, find and touch the number **fifteen** on a number line.

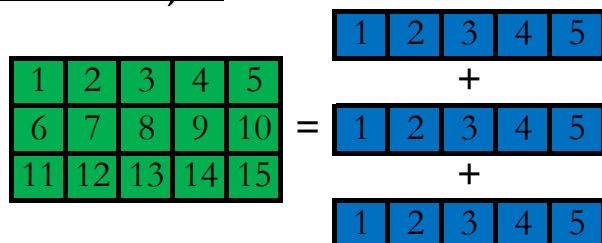
Then, **count backwards five** less aloud in number order, whilst touching the numbers on the number line, back to the number **ten**.

Next, **count backwards five** less aloud in number order, whilst touching the numbers on the number line, back to the number **five**.

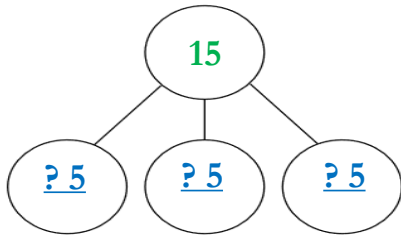
Then, **count backwards five** less aloud in number order, whilst touching the numbers on the number line, back to the number **zero**.

Finally, the **value** of the missing number is **three**.

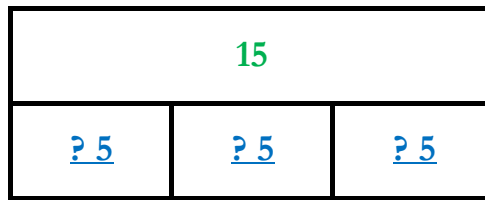
Concrete Object



Part Whole Model



Bar Model



Test Questions

- 1) $15 \div 5 = \underline{\quad}$
- 2) $70 \div 10 = \underline{\quad}$
- 3) $60 \div 5 = \underline{\quad}$
- 4) $18 \div 2 = \underline{\quad}$
- 5) $90 \div 10 = \underline{\quad}$
- 6) $55 \div 5 = \underline{\quad}$
- 7) $16 \div 2 = \underline{\quad}$
- 8) $40 \div 5 = \underline{\quad}$
- 9) $22 \div 2 = \underline{\quad}$
- 10) $100 \div 10 = \underline{\quad}$
- 11) $24 \div 2 = \underline{\quad}$
- 12) $120 \div 10 = \underline{\quad}$
- 13) $80 \div 10 = \underline{\quad}$
- 14) $60 \div 5 = \underline{\quad}$

Inverse of Division

$$1) \ 18 \div \underline{\quad ? \quad} = 6$$

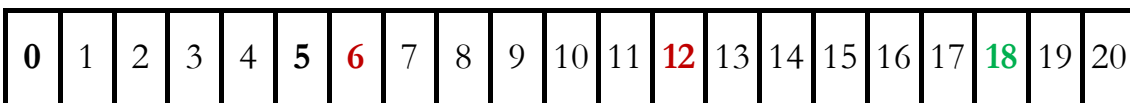
Word Problem

At break time, friends **equally share** out **eighteen** marbles.

They **each** receive **six** marbles.

How many friends are there?

Number Line



Strategy Applied

Use the **inverse** of **division** which is **multiplication**. $6 \times ? = 18$

Apply **step counting** to calculate the **missing number**, which is how many **lots of sixes** counted on from **zero** on to **eighteen**.

First, find and touch the number **zero** on a number line.

Then, **count forwards six** more aloud in number order, whilst touching the numbers on the number line, on to the number **six**.

Then, **count forwards six** more aloud in number order, whilst touching the numbers on the number line, on to the number **twelve**.

Then, **count forwards six** more aloud in number order, whilst touching the numbers on the number line, on to the number **eighteen**.

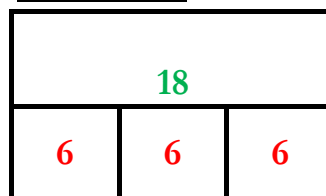
Finally, **three** groups of **six** equals **eighteen**.

Step Counting

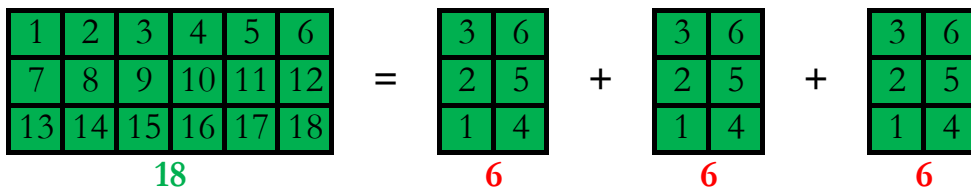
$$6 \rightarrow 12 \rightarrow 18$$

• • •

Bar Model



Concrete Object



Test Questions

- 1) $18 \div \underline{\quad} = 6$
- 2) $15 \div \underline{\quad} = 5$
- 3) $90 \div \underline{\quad} = 10$
- 4) $25 \div \underline{\quad} = 5$
- 5) $14 \div \underline{\quad} = 2$
- 6) $5 \div \underline{\quad} = 5$
- 7) $30 \div \underline{\quad} = 10$
- 8) $40 \div \underline{\quad} = 5$
- 9) $22 \div \underline{\quad} = 2$
- 10) $100 \div \underline{\quad} = 10$
- 11) $2 = 8 \div \underline{\quad}$
- 12) $10 = 40 \div \underline{\quad}$
- 13) $10 = 110 \div \underline{\quad}$
- 14) $5 = 5 \div \underline{\quad}$

Find the Missing Number

1) $2 \times 4 = 16 \div \underline{\quad ? \quad}$

Word Problem

2×4 is equal to or the same value as $16 \div \underline{\quad ? \quad}$

or $16 \div \underline{\quad ? \quad}$ is equal to or the same value as 2×4

Strategy Applied

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

Step 1

Out of the two **number sentences**, calculate the number sentence with all the **known** numbers first, 2×4 .

Apply **step counting** to calculate the **product** of **two times four**.

First, find and touch the number **zero** on a number line.

Then, **count forwards two** more aloud in number order, **four** times whilst touching the numbers on the number line, **2, 4, 6, 8**.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

Step 2

If $2 \times 4 = 8$, then $8 = 16 \div \underline{\quad ? \quad}$, as they are the **same value**

Use the **inverse** of **division**, which is **multiplication**, $8 \times \underline{\quad ? \quad} = 16$

Apply **step counting** to calculate the **missing number**, by counting on in **lots of eight** up to **sixteen**.

First, find and touch the number **zero** on a number line.

Then, **count forwards** in **lots of eight** more aloud in number order, whilst touching the numbers on the number line, up to the number **sixteen**.

Finally, **two** lots of **eight** equals to **sixteen**.

Step 1

$$\begin{array}{cccc} 2 & \rightarrow & 4 & \rightarrow & 6 & \rightarrow & 8 \\ \bullet & & \bullet & & \bullet & & \bullet \end{array}$$

Step 2

$$\begin{array}{ccc} 8 & \rightarrow & 16 \\ \bullet & & \bullet \end{array}$$

Test Questions

- 1) $2 \times 4 = 16 \div \underline{\quad}$
- 2) $5 \times 2 = \underline{\quad} \div 10$
- 3) $2 \times 1 = \underline{\quad} \div 2$
- 4) $1 \times 8 = 40 \div \underline{\quad}$
- 5) $2 \times 3 = \underline{\quad} \div 2$
- 6) $2 \times 10 = \underline{\quad} \div 2$
- 7) $10 \times 1 = 100 \div \underline{\quad}$
- 8) $60 \div \underline{\quad} = 5 \times 6$
- 9) $30 \div \underline{\quad} = 5 \times 3$
- 10) $16 \div \underline{\quad} = 2 \times 4$
- 11) $6 \div \underline{\quad} = 1 \times 3$
- 12) $4 \div \underline{\quad} = 2 \times 1$
- 13) $40 \div \underline{\quad} = 5 \times 4$
- 14) $60 \div \underline{\quad} = 3 \times 10$

Fraction of a Quantity

1) $\frac{1}{2}$ of 16 = ?

Word Problem

Grandad bought a bag of 16 cherries.

Grandad ate **half** of the number of cherries in the bag.

How many cherries did Grandad eat?

Concrete Object

First

Quantity

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

→

Then

Group1

1	2	3	4
5	6	7	8

→

Next

Group2

1	2	3	4
5	6	7	8

↓

Finally

$$\frac{1}{2} \text{ of } 16 = \underline{8}$$

Strategy Applied

A fraction is part of a **whole** or part of 1 and a **half** is 1 of 2 **equal groups**.
16 is the **quantity** shared **equally** between the **total** number of **equal groups**.

2 is the **denominator**, represents the **total** number of **equal groups**.

1 is the **numerator**, represents **one** of the **equal groups**.

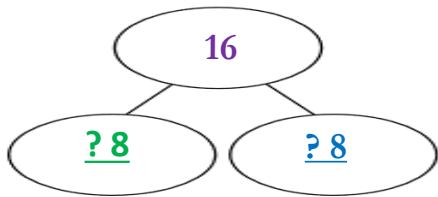
First, pick up **sixteen** objects and place them together. Now count aloud to check there are only **sixteen** objects; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16.

Then, **share** the **sixteen** objects one at a time **equally between** the **two** groups, until exactly the **same quantity** of objects are in **each** of the groups

Next, count how many objects there are **altogether** in **one group**, there should be five objects; **one, two, three, four, five, six, seven, eight**.

Finally, **one half** of **sixteen** equals **eight**.

Part Whole Model



Test Questions

1) $\frac{1}{2}$ of 16 = ___

2) $\frac{1}{3}$ of 9 = ___

3) $\frac{1}{2}$ of 6 = ___

4) $\frac{1}{3}$ of 18 = ___

5) $\frac{1}{4}$ of 12 = ___

6) $\frac{2}{4}$ of 8 = ___

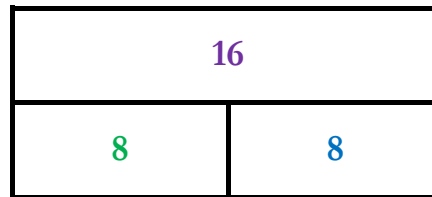
7) $\frac{1}{2}$ of 18 = ___

8) $\frac{3}{4}$ of 20 = ___

9) ___ = $\frac{1}{2}$ of 24

10) ___ = $\frac{1}{4}$ of 20

Bar Model



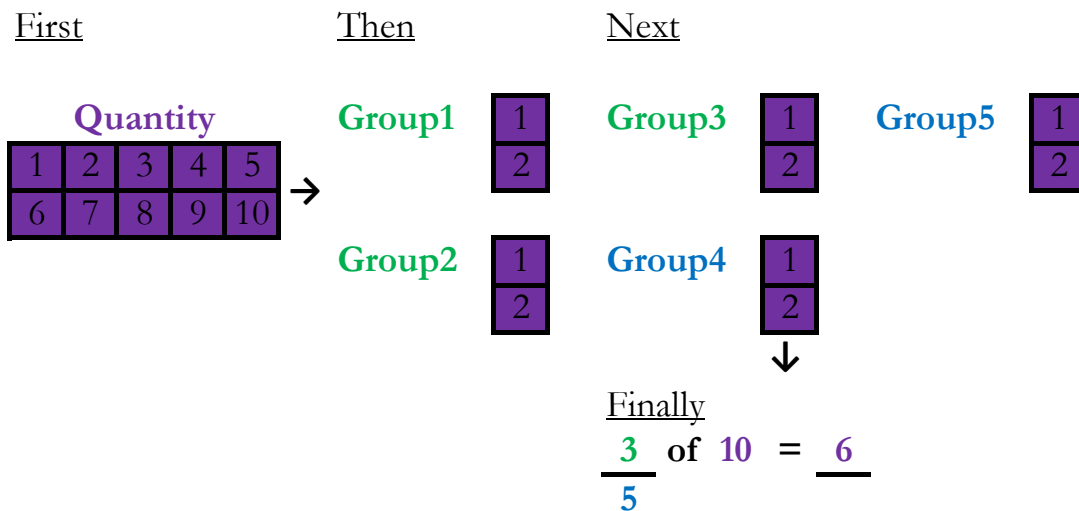
Fraction of a Quantity

1) $\frac{3}{5}$ of 10 = ?

Word Problem

Mrs O'Neal shared **ten** stickers **equally** between **five** children.
How many stickers did **three** of the children get in **altogether**?

Concrete Object



Strategy Applied

A fraction is part of a **whole** or part of **1** and a **fifth** is 1 of 5 **equal groups**.
10 is the **quantity** shared **equally** between the **total** number of **equal groups**.

5 is the **denominator**, represents the **total** number of **equal groups**.

3 is the **numerator**, represents **three** of the **equal groups**.

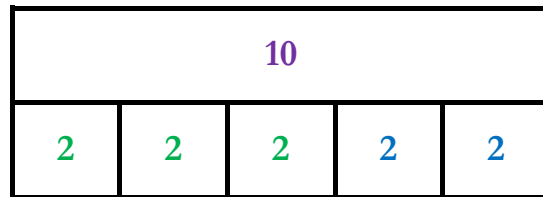
First, pick up **ten** objects and place them together. Now count aloud to check there are only **ten** objects; **1, 2, 3, 4, 5, 6, 7, 8, 9, 10**.

Then, **share** the **ten** objects one at a time **equally between** the **five** groups, until exactly the **same quantity** of objects are in **each** of the groups.

Next, count how many objects there are **altogether** in **three** of the **groups**, should be six objects; **one, two, three, four, five, six**.

Finally, **three fifths** of **ten** equals **six**.

Bar Model



Test Questions

1) $\frac{3}{5}$ of 10 = ___

2) $\frac{1}{2}$ of 2 = ___

3) $\frac{3}{4}$ of 40 = ___

4) $\frac{2}{3}$ of 21 = ___

5) $\frac{1}{2}$ of 24 = ___

6) $\frac{2}{3}$ of 18 = ___

7) $\frac{2}{4}$ of 16 = ___

8) $\frac{1}{2}$ of 20 = ___

9) ___ = $\frac{1}{3}$ of 12

10) ___ = $\frac{1}{4}$ of 8

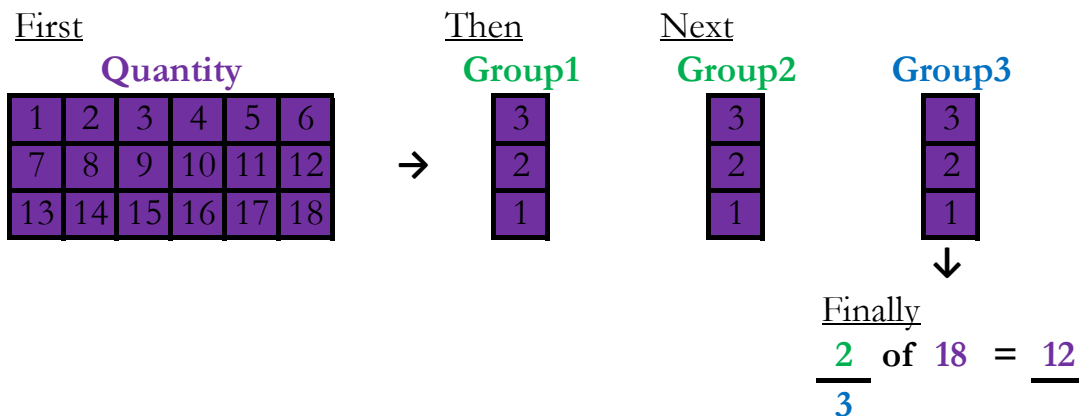
Fraction of a Quantity

1) $\frac{2}{3}$ of 18 = ?

Word Problem

Three adults share **eighteen** new reading books **equally** between them.
How many of the books will **two** of the adults have in **altogether**?

Concrete Object



Strategy Applied

A fraction is part of a **whole** or part of **1** and a **third** is 1 of 3 **equal groups**.
18 is the **quantity** shared **equally** between the **total** number of **equal groups**.

3 is the **denominator**, represents the **total** number of **equal groups**.

2 is the **numerator**, represents **two** of the **equal groups**.

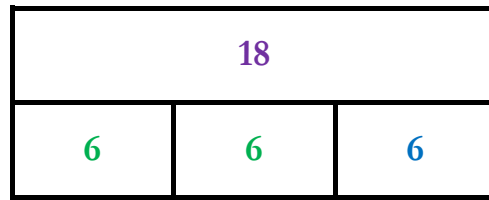
First, pick up **eighteen** objects and place them together. Now count aloud to check there are only eighteen objects; **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18**.

Then, **share** the **eighteen** objects one at a time **equally** between the **three** groups, until exactly the **same quantity** of objects are in **each** of the groups

Next, count how many objects there are **altogether** in **two** of the **groups**, there should be twelve objects; **one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve**.

Finally, **two thirds** of **eighteen** equals **twelve**.

Bar Model



Test Questions

1) $\frac{2}{3}$ of 18 = ___

2) $\frac{2}{4}$ of 4 = ___

3) $\frac{3}{4}$ of 24 = ___

4) $\frac{1}{2}$ of 18 = ___

5) $\frac{2}{3}$ of 30 = ___

6) $\frac{3}{4}$ of 16 = ___

7) $\frac{1}{2}$ of ___ = 9

8) $\frac{1}{4}$ of ___ = 5

9) $\frac{1}{3}$ of ___ = 5

10) $\frac{3}{4}$ of ___ = 12

Answers

P. 2

- 1) 1 ten and 8 ones
- 2) 2 tens and 1 ones
- 3) 3 tens and 2 ones
- 4) 4 tens and 5 ones
- 5) 5 tens and 7 ones
- 6) 6 tens and 9 ones
- 7) 7 tens and 0 ones
- 8) 8 tens and 3 ones
- 9) 9 tens and 4 ones
- 10) 9 tens and 9 ones
- 11) 0 tens and 1 ones
- 12) 0 tens and 6 ones
- 13) 1 ten and 1 ones
- 14) 2 tens and 0 ones

P. 4

- 1) $10 + 8$
- 2) $20+1$
- 3) $30+2$
- 4) $40+5$
- 5) $50+7$
- 6) $60+9$
- 7) $70+0$
- 8) $80+3$
- 9) $90+4$
- 10) $90+9$
- 11) $0+1$
- 12) $0+6$
- 13) $10+1$
- 14) $20+0$

P. 6

- 1) 4
- 2) 6
- 3) 13
- 4) 20
- 5) 25
- 6) 34
- 7) 58
- 8) 87
- 9) 100
- 10) 101
- 11) 112
- 12) 122
- 13) 14
- 14) 39

P. 8

- 1) 19
- 2) 11
- 3) 25
- 4) 64
- 5) 19
- 6) 14
- 7) 76
- 8) 50
- 9) 91
- 10) 105
- 11) 85
- 12) 59
- 13) 102
- 14) 111

P. 10

- 1) 23
- 2) 31
- 3) 20
- 4) 59
- 5) 30
- 6) 57
- 7) 83
- 8) 60
- 9) 109
- 10) 130
- 11) 30
- 12) 55
- 13) 93
- 14) 110

P. 12

- 1) 28
- 2) 108
- 3) 50
- 4) 74
- 5) 90
- 6) 90
- 7) 117
- 8) 76
- 9) 92
- 10) 109
- 11) 90
- 12) 97
- 13) 120
- 14) 130

P. 14

- 1) 8
- 2) 6
- 3) 4
- 4) 2
- 5) 1p
- 6) 3p
- 7) £60
- 8) £80
- 9) 10
- 10) 20
- 11) 90
- 12) 50
- 13) 70
- 14) 30

P. 16

- 1) 9
- 2) 24
- 3) 12
- 4) 36
- 5) 70
- 6) 100
- 7) 17p
- 8) 18
- 9) 9cm
- 10) 15m
- 11) 22
- 12) 45
- 13) 25
- 14) 90

P. 18

- 1) 8, 10
- 2) 24, 26
- 3) 38, 40
- 4) 74, 76
- 5) 12, 15
- 6) 24, 27
- 7) 33, 36
- 8) 42, 45
- 9) 50, 55
- 10) 55, 60
- 11) 70, 75
- 12) 100, 110
- 13) 120, 130
- 14) 150, 160

P. 20

- 1) 39
- 2) 94
- 3) 92
- 4) 89
- 5) 85
- 6) 68
- 7) 81
- 8) 100cm
- 9) 100m
- 10) £68
- 11) 76
- 12) 100
- 13) 72
- 14) 91

Answers

P. 22

- 1) 29
- 2) 62
- 3) 35
- 4) 42
- 5) 105
- 6) 210
- 7) 157
- 8) 65p
- 9) 90p
- 10) 97m
- 11) £129
- 12) £179
- 13) 36
- 14) 83

P. 24

- 1) 31
- 2) 44
- 3) 82
- 4) 39
- 5) 45
- 6) 68
- 7) 71
- 8) 80
- 9) 70
- 10) 58

P. 24

- 11) 45
- 12) 83
- 13) 94
- 14) 91
- 15) 77
- 16) 80
- 17) 83
- 18) 102
- 19) 102
- 20) 70

P. 26

- 1) 6
- 2) 20
- 3) 80
- 4) 7
- 5) 39
- 6) 50
- 7) 4
- 8) 31L
- 9) 40cm
- 10) 25p
- 11) 12mm
- 12) 93m
- 13) 18
- 14) 97

P. 28

- 1) 2
- 2) 3
- 3) 5
- 4) 8
- 5) 10
- 6) 6
- 7) 15
- 8) 4mm
- 9) 6cm
- 10) 14m
- 11) 26
- 12) 20
- 13) 52
- 14) 30km

P. 30

- 1) 12
- 2) 6
- 3) 47
- 4) 9secs
- 5) 5secs
- 6) 84mins
- 7) 74mins
- 8) 43
- 9) 2hrs
- 10) 1hrs
- 11) 25
- 12) 41
- 13) 53
- 14) 54

P. 32

- 1) 10
- 2) 20
- 3) 42
- 4) 60
- 5) 83
- 6) 10
- 7) 36
- 8) 50g
- 9) 73g
- 10) 99kg
- 11) 110kg
- 12) 147
- 13) 170
- 14) 191

P. 34

- 1) 71
- 2) 56
- 3) 10
- 4) 34
- 5) 8
- 6) 40
- 7) 23
- 8) 10
- 9) 12
- 10) 40
- 11) 16
- 12) 19
- 13) 10
- 14) 38

P. 36

- 1) 5
- 2) 4
- 3) 3
- 4) 1
- 5) 6p
- 6) 4p
- 7) 82p
- 8) £71
- 9) £90
- 10) £58
- 11) 68
- 12) 45
- 13) 56
- 14) 32

P. 38

- 1) 1
- 2) 2
- 3) 3
- 4) 13
- 5) 13
- 6) 20
- 7) 24
- 8) 39
- 9) 46
- 10) 58
- 11) 0
- 12) 10
- 13) 43
- 14) 20

Answers

P. 40

- 1) 6, 4
- 2) 22, 20
- 3) 34, 32
- 4) 54, 52
- 5) 9, 6
- 6) 18, 15
- 7) 27, 24
- 8) 33, 30
- 9) 5, 0
- 10) 15, 10
- 11) 45, 40
- 12) 10, 0
- 13) 70, 60
- 14) 170, 160

P. 42

- 1) 39
- 2) 14
- 3) 3
- 4) 29
- 5) 11
- 6) 14
- 7) 20
- 8) 26
- 9) 13
- 10) 28
- 11) 32
- 12) 36
- 13) 32
- 14) 64

P. 44

- 1) 14
- 2) 40
- 3) 22
- 4) 8
- 5) 30
- 6) 44
- 7) 11
- 8) 59
- 9) 2
- 10) 50
- 11) 43
- 12) 55
- 13) 56
- 14) 58

P. 46

- 1) 8
- 2) 47
- 3) 41
- 4) 44
- 5) 6
- 6) 42
- 7) 35
- 8) 10
- 9) 40
- 10) 53
- 11) 8
- 12) 81
- 13) 70
- 14) 13

P. 48

- 1) 37
- 2) 17
- 3) 11
- 4) 26
- 5) 13
- 6) 14
- 7) 29
- 8) 14
- 9) 20
- 10) 28

P. 48

- 11) 26
- 12) 13
- 13) 11
- 14) 15
- 15) 3
- 16) 14
- 17) 29
- 18) 14
- 19) 20
- 20) 28

P. 50

- 1) 15
- 2) 60
- 3) 20
- 4) 80
- 5) 45
- 6) 24
- 7) 110
- 8) 30
- 9) 35
- 10) 14
- 11) 30
- 12) 22
- 13) 20
- 14) 120

P. 52

- 1) 6
- 2) 8
- 3) 24
- 4) 16
- 5) 24
- 6) 12
- 7) 36
- 8) 27
- 9) 30
- 10) 40
- 11) 44
- 12) 21
- 13) 36
- 14) 28

P. 54

- 1) 5
- 2) 10
- 3) 5
- 4) 6
- 5) 9
- 6) 10
- 7) 30
- 8) 5
- 9) 7
- 10) 4
- 11) 12
- 12) 9
- 13) 10
- 14) 12

P. 56

- 1) 3
- 2) 7
- 3) 12
- 4) 9
- 5) 9
- 6) 11
- 7) 8
- 8) 8
- 9) 11
- 10) 10
- 11) 12
- 12) 12
- 13) 8
- 14) 12

P. 58

- 1) 2
- 2) 3
- 3) 9
- 4) 5
- 5) 7
- 6) 1
- 7) 3
- 8) 8
- 9) 11
- 10) 10
- 11) 4
- 12) 4
- 13) 11
- 14) 1

P. 60

- 1) 2
- 2) 100
- 3) 4
- 4) 5
- 5) 12
- 6) 40
- 7) 10
- 8) 2
- 9) 2
- 10) 2
- 11) 2
- 12) 2
- 13) 2
- 14) 2

P. 62

- 1) 8
- 2) 3
- 3) 3
- 4) 6
- 5) 3
- 6) 4
- 7) 9
- 8) 15
- 9) 12
- 10) 5

Answers

P. 64

- 1) 6
- 2) 1
- 3) 30
- 4) 14
- 5) 12
- 6) 12
- 7) 8
- 8) 10
- 9) 4
- 10) 2

P. 66

- 1) 12
- 2) 2
- 3) 18
- 4) 9
- 5) 20
- 6) 12
- 7) 18
- 8) 20
- 9) 15
- 10) 16

Glossary

Amount is something that has a numerical value, for e.g. 10 cubes

Bar Model is a pictorial representation of a number sentence in the form of bars or boxes used to solve number problems.

Column is a vertical arrangement for example, in a table the cells arranged vertically.

Column Place Value is the value of a digit that relates to its position or place in a number within a column.

Concrete Objects are objects that can be handled and manipulated to support understanding of the structure of a mathematical concept. Materials such as Dienes(Base 10 materials), Cuisenaire, Numicon, are all examples of concrete objects.

Denominator is the number written below the line i.e. the divisor. e.g. in the fraction $\frac{2}{3}$ the denominator is 3.

Digit is one of the symbols of a number system most commonly the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. Examples: the number 29 is a 2-digit number; there are three digits in 2.95. The position or place of a digit in a number conveys its value.

Digit Value is the value of a digit that relates to its position or place **in a** number. e.g. in 82 the digits represent 8 tens and 2 ones.

Dividend in division, is the number that is divided. e.g. in $15 \div 3$, 15 is the dividend.

Divisor is the number by which another is divided. e.g. In the calculation $30 \div 6 = 5$, the divisor is 6. In this example, 30 is the dividend and 5 is the quotient.

Glossary

Efficient Methods A means of calculation (which can be mental or written) that achieves a correct answer with as few steps as possible.

In written calculations this often involves setting out calculations in a columnar layout.

Equals is the symbol: $=$, read as 'is equal to' or 'equals'. and meaning 'having the same value as'. e.g. $7 - 2 = 4 + 1$ since both expressions, $7 - 2$ and $4 + 1$ have the same value, 5.

Expanded Form is a way to break up a number to show the value of each digit (Partition).

Fraction is the result of dividing one integer by a second integer, which must be non-zero. The dividend is the numerator and the non-zero divisor is the denominator. See also decimal fraction, equivalent fraction, improper fraction, proper fraction, unit fraction and vulgar fraction.

Formal Written Method is the way of setting out working in columnar form. In addition and subtraction, the formal written methods can be referred to as expanded and column addition and/or subtraction. In multiplication, the formal written methods are called short or long multiplication depending on the size of the numbers involved. Similarly in division the formal written methods are called short or long division.

Grid a lattice created with two sets of parallel lines. Lines in each set are usually equally spaced. If the sets of lines are at right angles and lines in both sets are equally spaced, a square grid is created.

Hundred Square is a 10 by 10 square grid numbered 1 to 100. A similar grid could be numbered as a 0 – 99 grid.

Inverse is the opposite or reverse operation.

Glossary

Mental Calculations refer to calculations that are largely carried out mentally, but may be supported with a few simple written jottings.

Multiple is the result of multiplying a number by an integer,
e.g. 12 is a multiple of 3 because $3 \times 4 = 12$.

Multiplicand is a number to be multiplied by another.
e.g. in 6×4 , 4 is the multiplier as it is how many lots/groups of 6.

Multiplier is a number to be multiplied by another.
e.g. in 5×3 , 5 is the multiplicand as it is the number to be multiplied by 3.

Number Bond is a pair of numbers with a particular total.

Number Line is a line where numbers are represented by points upon it.

Number Sentence is a mathematical sentence involving numbers.
e.g. $3 + 6 = 9$ and $9 > 3$

Numerator is the number written on the top– the dividend (the part that is divided). In the fraction $\frac{2}{3}$, the numerator is 2.

Operations that, when they are combined, leave the entity on which they operate unchanged. Examples: addition and subtraction are inverse operations e.g. $5 + 6 - 6 = 5$. Multiplication and division are inverse operations e.g. $6 \times 10 \div 10 = 6$.

Part Whole Model is a pictorial representation of the relationship between a number or number sentence and its component parts.

Glossary

Partition 1) To separate a set into subsets. 2) To split a number into component parts. e.g. the two-digit number 38 can be partitioned into $30 + 8$ or $19 + 19$. 3) A model of division. e.g. $21 \div 7$ is treated as 'how many sevens in 21?'

Pictorial Representations do enable learners to use pictures and images to represent the structure of a mathematical concept.

The pictorial representation may build on the familiarity with concrete objects. e.g. a square to represent a Dienes 'flat' (representing 100).

Pupils may interpret pictorial representations provided to them or create a pictorial representation themselves to help solve a mathematical problem.

Place Holder In decimal notation, the zero numeral is used as a place holder to denote the absence of a power of 10.

Place Value is the value of a digit that relates to its position or place in a number. e.g. in 1482 the digits represent 1 thousand, 4 hundred, 8 tens and 2 ones respectively; in 12.34 the digits represent 1 ten, 2 ones, 3 tenths and 4 hundredths respectively.

Product is the result of multiplying one number by another.
e.g. the product of 2 and 3 is 6 since $2 \times 3 = 6$.

Quotient is the result of a division. e.g. $46 \div 3 = 15\frac{1}{3}$ and $15\frac{1}{3}$ is the quotient of 46 by 3. Where the operation of division is applied to the set of integers, and the result expressed in integers.

e.g. $46 \div 3 = 15$ remainder 1 then 15 is the quotient of 46 by 3 and 1 is the remainder.

Glossary

Regrouping is to exchange a number for another of equal value. The process of regrouping is used in some standard compact methods of calculation. e.g.: ‘carrying figures/exchanging’ in addition, multiplication or division; and ‘decomposition’ in subtraction.

Remainder in the context of division requiring a whole number answer (quotient), the amount remaining after the operation.

e.g. 29 divided by 7 = 4 remainder 1.

Repeated Addition is the process of repeatedly adding the same number or amount. One model for multiplication. e.g. $5 + 5 + 5 + 5 = 5 \times 4$.

Repeated Subtraction is The process of repeatedly subtracting the same number or amount. One model for division.

e.g. $20 - 5 - 5 - 5 - 5 = 0$ so $20 \div 4 = 5$ remainder 0.

Sequence is succession of terms formed according to a rule. There is a definite relation between one term and the next and between each term and its position in the sequence. e.g. 0, 4, 8, 12, 16 etc.

Step Counting is the process of repeatedly adding the same number or amount. One model for multiplication. e.g. $5 + 10 + 15 + 20 = 5 \times 4$.

Total Value is the sum to a calculation.

Zero in a place value system, a place-holder. e.g. 105