

**Year 1**  
**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.  $3 + 4 = 7$

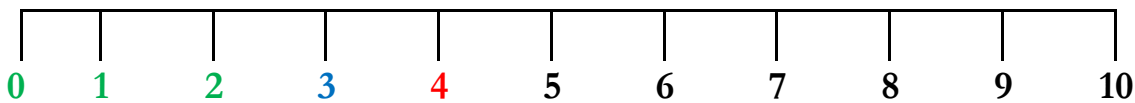
**Strategy Applied** refers to when a formal written method is used to calculate a number sentence  $25 - 5 = 20$

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

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

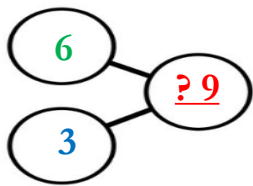
e.g.  $3 + 3 = 6$   +  = 

**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.

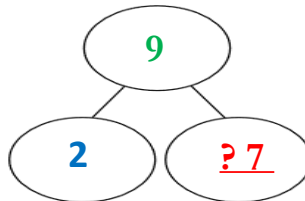


**Part Whole Models** are pictorial mathematical images to represent varied calculations and number sentences.

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

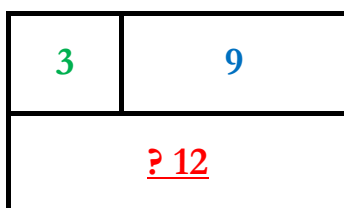


e.g.  $9 - 2 = ?7$

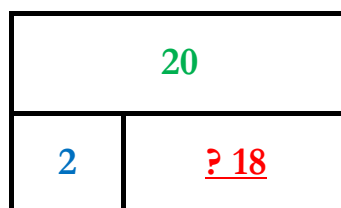


**Bar Models** are an image, that pictorially represents a number sentence.

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



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



## 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 **14** is made up of how many **10s** (tens) and **1s** (ones)?

1) **14** =     

In Maths a **number** or **figure** e.g. **14**, is made up of the **digits 1** and **4**.  
Each digit has a worth, otherwise known as its **place value**.

The number **fourteen** 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>
	<b>1</b>	<b>4</b>

### Strategy Applied

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

First, write **4** in the **1s** column place value, which is also how many **ones** there are in the **1s** column, **4 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 **4 ones**.

## Test Questions

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

1) 14 = \_\_\_

2) 15 = \_\_\_

3) 17 = \_\_\_

4) 19 = \_\_\_

5) 20 = \_\_\_

6) 23 = \_\_\_

7) 24 = \_\_\_

8) 32 = \_\_\_

9) 45 = \_\_\_

10) 57 = \_\_\_

11) 69 = \_\_\_

12) 70 = \_\_\_

13) 83 = \_\_\_

14) 94 = \_\_\_

## Digit Value

What is the digit value of the **10s** (tens) and **1s** (ones) digits in the number **14**

1) **14** =     

In Maths a **number** or **figure** e.g. **14**, is made up of the **digits 1** and **4**.

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

The number **fourteen** 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>
	<b>1</b>	<b>4</b>

### Strategy Applied

The number **fourteen** 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, **4** by 1 (**1s** column), which is **4**.

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 **4**.



## Test Questions

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

1) 14 = \_\_\_

2) 15 = \_\_\_

3) 17 = \_\_\_

4) 19 = \_\_\_

5) 20 = \_\_\_

6) 23 = \_\_\_

7) 24 = \_\_\_

8) 32 = \_\_\_

9) 45 = \_\_\_

10) 57 = \_\_\_

11) 69 = \_\_\_

12) 70 = \_\_\_

13) 83 = \_\_\_

14) 94 = \_\_\_

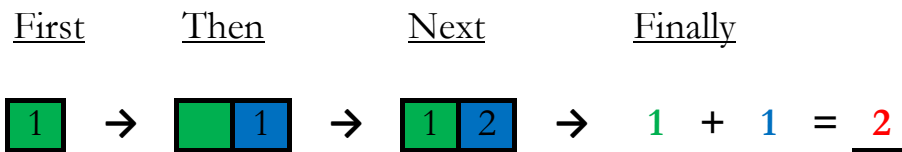
# 1 More Than

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

## Word Problem

Ameera puts together **one** cube and **one** cube.  
**Altogether** how many cubes does she have?

## Concrete Object



## Strategy Applied

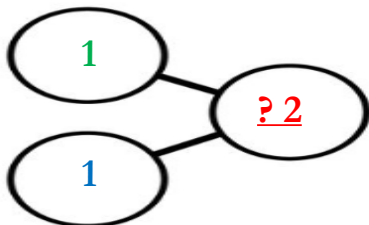
First, pick up **one** object and place it down.  
Now count aloud to check there is only **one** object; **one**.

Then, pick up **one** more object and place it next to the **one** object.

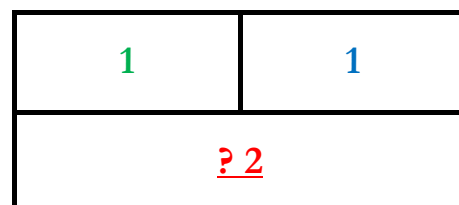
Next, count how many objects there are **altogether**.  
Whilst touching each object **count forwards** aloud in number order,  
saying one number name per object; **one**, **two**.

Finally, **one** add **one** equals **two**.

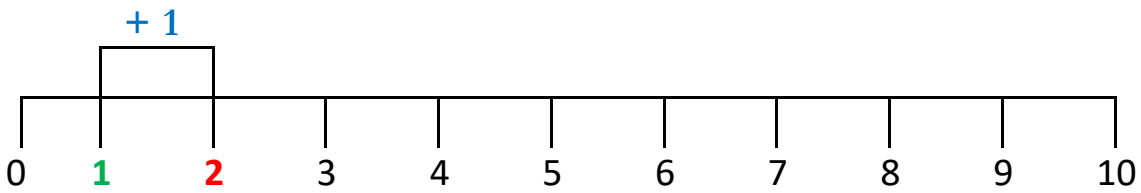
## Part Whole Model



## Bar Model



## Number Line



## Strategy Applied

First, find and touch the number **one** 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 **two**.

Finally, **one** add **one** equals **two**.

## Test Questions

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

6) One more than 5 is  $= \underline{\quad}$

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

7) Twelve is one more than  $= \underline{\quad}$

3)  $6 + 1 = \underline{\quad}$

8)  $3\text{mm} + 1\text{mm} = \underline{\quad}$

4)  $5 + 1 = \underline{\quad}$

9)  $27\text{cm} + 1\text{cm} = \underline{\quad}$

5) Add eight and one together  $= \underline{\quad}$  10)  $43\text{m} + 1\text{m} = \underline{\quad}$

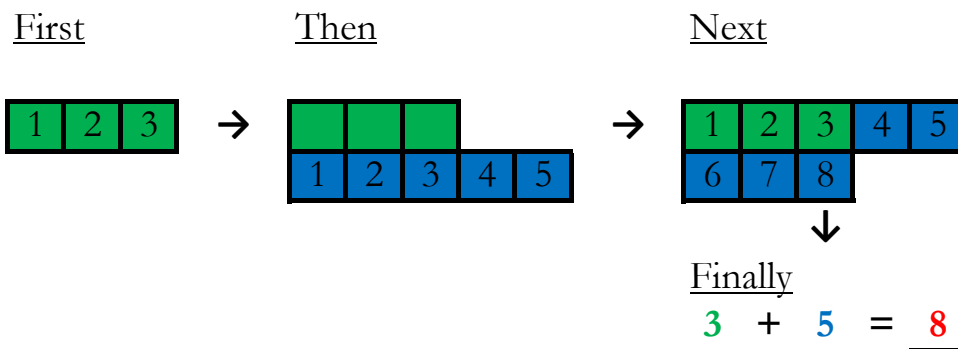
## More Than 1

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

### Word Problem

Tim has **three** cubes and Rachel has **five** cubes.  
they **put together** all of their cubes.  
**Altogether** how many cubes do they have?

### Concrete Object



### Strategy Applied

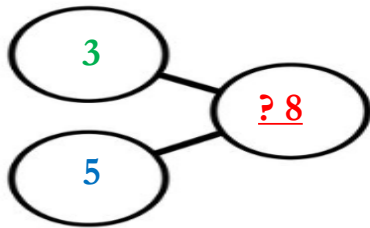
First, pick up **three** objects and place them together.  
Now count aloud to check there are only **three** objects; **one, two, three**.

Then, pick up **five** more objects and place them next to the **three** objects.

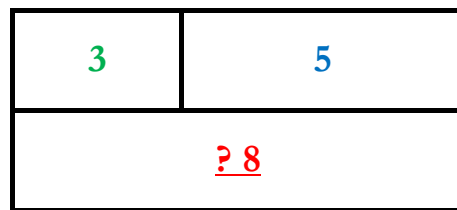
Next, count how many objects there are **altogether**.  
Whilst touching each object **count forwards** aloud in number order,  
saying one number name per object; **one, two, three, four, five, six, seven, eight**.

Finally, **three** add **five** equals **eight**.

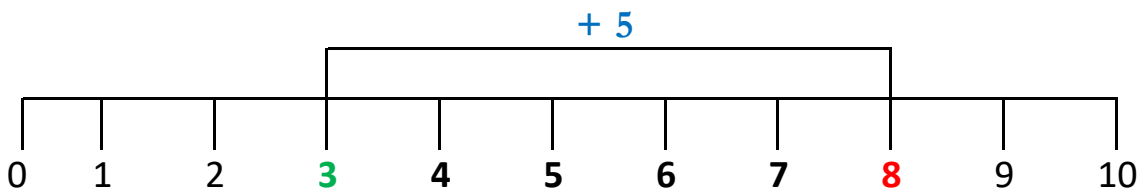
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

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

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

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

Finally, **three** add **five** equals **eight**.

### Test Questions

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

6) Add three and five together =  $\underline{\quad}$

2)  $7 + 3 = \underline{\quad}$

7)  $9 \text{ cm} + 10 \text{ cm} = \underline{\quad}$

3)  $8 + 6 = \underline{\quad}$

8)  $16 \text{ m} + 3 \text{ m} = \underline{\quad}$

4)  $9 + 6 = \underline{\quad}$

9) Add twelve and six together =  $\underline{\quad}$

5)  $7 \text{ m} + 7 \text{ m} = \underline{\quad}$

10) Add fourteen and five together =  $\underline{\quad}$

## More Than 1

$$1) \quad 7 + \underline{\quad ? \quad} = 9$$

### Word Problem

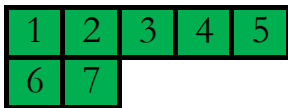
Kamal has **seven** objects and he is **given** some **more**.

**Altogether** he now has **nine** objects.

How many objects were given to him?

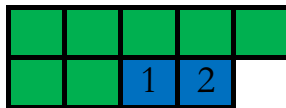
### Concrete Object

First



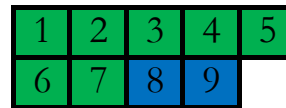
→

Then



→

Next



↓

Finally

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

### Strategy Applied

First, pick up **seven** objects and place them together.

Now count aloud to check there are only **seven** objects; **one, two, three, four, five, six, seven**.

Then, count aloud from the next number after **seven** on to **nine, 8, 9**.

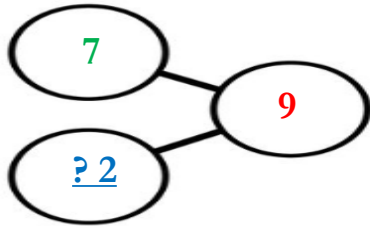
As **two** numbers were counted on, pick up **two** more objects and place them next to the **seven** objects.

Next, count how many objects there are **altogether**.

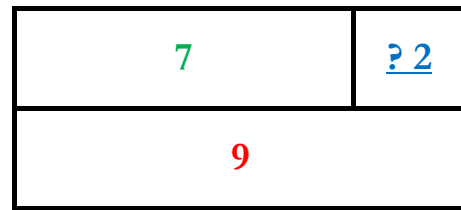
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one, two, three, four, five, six, seven, eight, nine**.

Finally, **seven** add **two** equals **nine**.

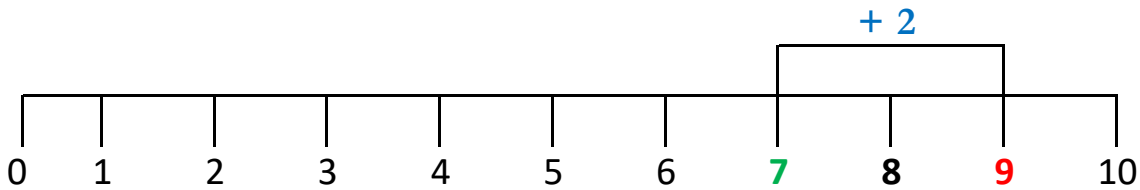
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

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

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

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

Finally, **seven** add **two** equals **nine**.

### Test Questions

1)  $7 + \underline{\quad} = 9$

2)  $4 + \underline{\quad} = 6$

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

4)  $\underline{\quad} + 9 = 11$

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

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

7)  $14 = 6 + \underline{\quad}$

8)  $13\text{ml} = 5\text{ml} + \underline{\quad}$

9)  $20\text{ml} = \underline{\quad} + 4\text{ml}$

10)  $30\text{L} = \underline{\quad} + 14\text{L}$

## 10 More

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

### Word Problem

Mica has **ten** blocks and she picks up **ten more** blocks.  
How many blocks does she have **altogether**?

### Concrete Object

First

1	2	3	4	5
6	7	8	9	10

→

Then

1	2	3	4	5
6	7	8	9	10

→

Next

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

↓

Finally

$10 + 10 = \underline{\quad 20 \quad}$

### Strategy Applied

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, pick up **ten** more objects and place it next to the **ten** objects.

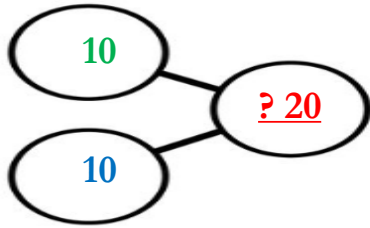
Next, count how many objects there are **altogether.**

Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen, twenty.**

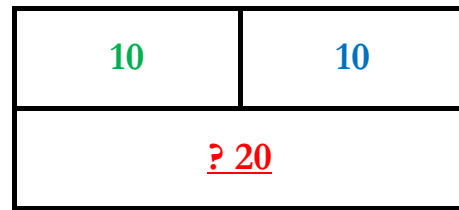
Finally, **ten** add **ten** equals **twenty.**



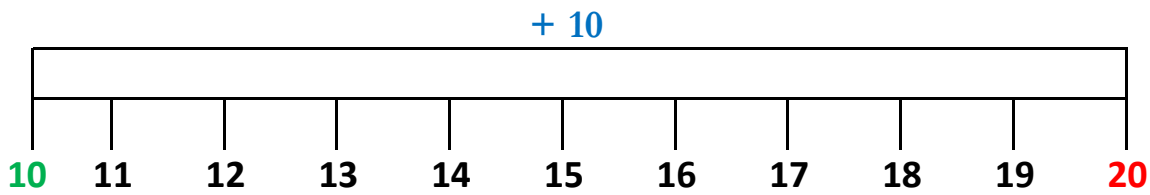
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

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

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

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

Finally, **ten** add **ten** equals **twenty**.

### Test Questions

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

6)  $40 + 10 = \underline{\quad}$

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

7)  $70 + 10 = \underline{\quad}$

3)  $30 + 10 = \underline{\quad}$

8)  $20\text{g} + 10\text{g} = \underline{\quad}$

4)  $60 + 10 = \underline{\quad}$

9)  $90\text{g} + 10\text{g} = \underline{\quad}$

5)  $50 + 10 = \underline{\quad}$

10)  $100\text{kg} + 10\text{kg} = \underline{\quad}$

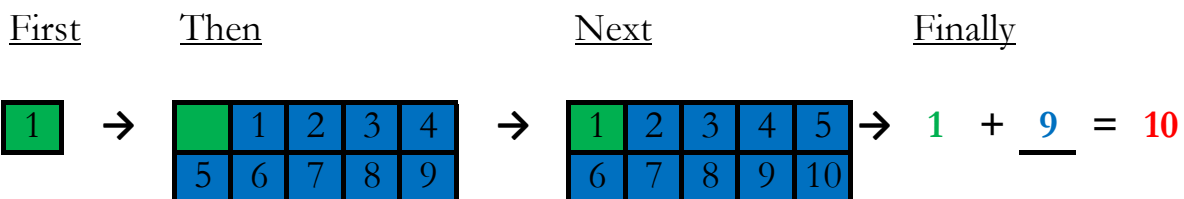
## Bonds to 10 and 20

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

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

**Number bonds to 20**, means two or more numbers added together that make the number **20**.

### Concrete Object



### Strategy Applied

First, pick up **one** object and place it down.

Now count aloud to check there is only **one** object; **one**.

Then, count aloud from the next number after **one** on to **ten, 2, 3, 4, 5, 6, 7, 8, 9, 10**.

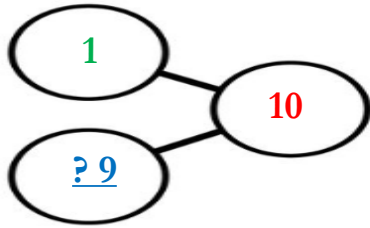
As **nine** numbers were counted on, pick up **nine** more objects and place them next to the **one** object.

Next, count how many objects there are **altogether**.

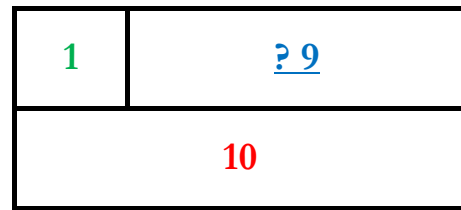
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one, two, three, four, five, six, seven, eight, nine, ten**.

Finally, **one** add **nine** equals **ten**.

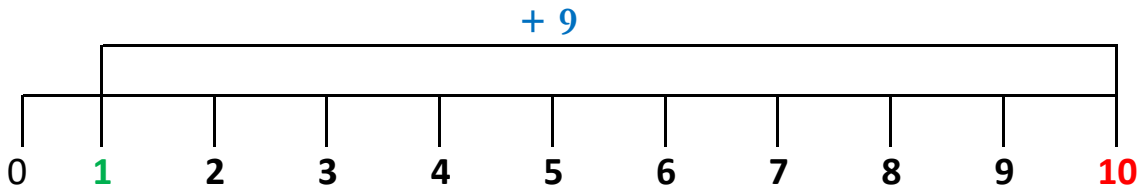
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

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

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

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

Finally, **one** add **nine** equals **ten**.

### Test Questions

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

6)  $\underline{\quad} + 6p = 10p$

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

7)  $\underline{\quad} + \pounds 14 = \pounds 20$

3)  $5 + \underline{\quad} = 10$

8)  $\underline{\quad} + \pounds 12 = \pounds 20$

4)  $7 + \underline{\quad} = 10$

9)  $\underline{\quad} + 0 = 20$

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

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

## Multiple Numbers

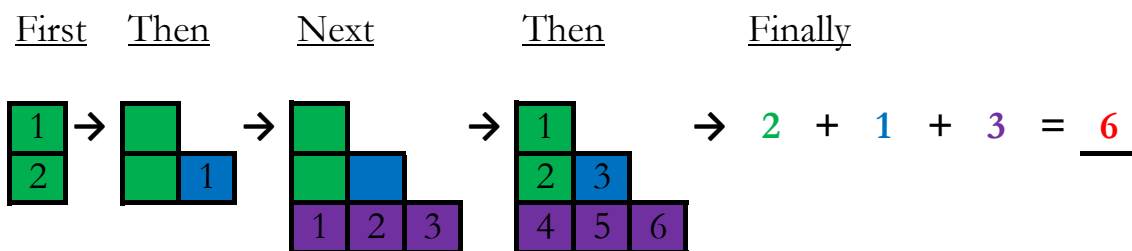
$$1) \quad 2 + 1 + 3 = \underline{\quad ? \quad}$$

### Word Problem

Three friends have sweets. Sue has **two** sweets and Daniel has **one** sweet and Peter has **three** sweets.

How many sweets do they have **altogether**?

### Concrete Object



### Strategy Applied

First, pick up **two** objects and place them together.

Then, pick up **one** more object and place it next to the **two** objects.

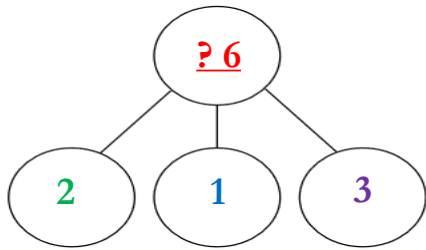
Next, pick up **three** more objects and place them next to the **two** and **one** objects.

Then, count how many objects there are **altogether**.

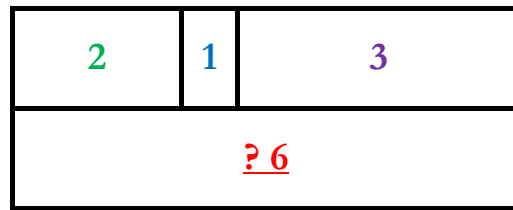
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**, **five**, **six**.

Finally, **two** add **one** add **three** equals **six**.

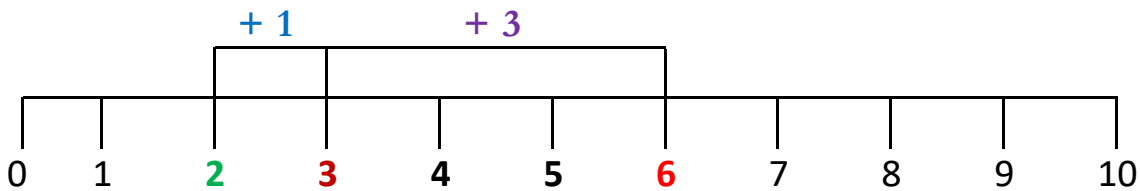
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

First, find and touch the number **two** 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 **three**.

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 **six**.

Finally, **two** add **one** add **three** equals **six**.

### Test Questions

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

6)  $10 + 10 + 10 = \underline{\quad}$

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

7)  $20 + 10 + 10 = \underline{\quad}$

3)  $5 + 5 + 7 = \underline{\quad}$

8)  $30\text{secs} + 10\text{secs} + 10\text{secs} = \underline{\quad}$

4)  $6 + 6 + 2 = \underline{\quad}$

9)  $50\text{secs} + 10\text{secs} + 10\text{secs} = \underline{\quad}$

5)  $8 + 3 + 9 = \underline{\quad}$

10)  $50\text{mins} + 10\text{mins} + 10\text{mins} = \underline{\quad}$

## Multiples of 1, 2, 5 and 10

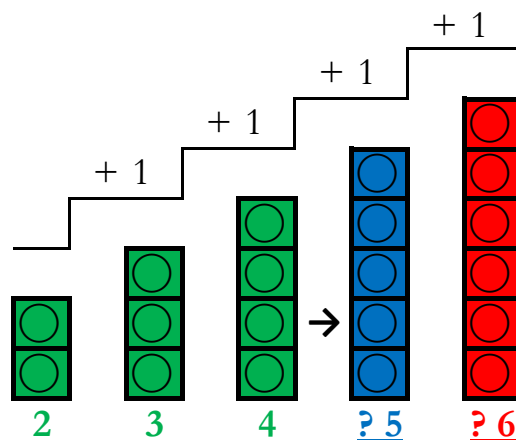
In the **number pattern** below, find the next two missing numbers.

1) 0, 1, 2, ?, ?

### Word Problem

Shannon uses cubes to make the **number pattern** of **two**, **three** and **four**. She calculates the next two missing numbers in the number pattern. How many cubes will she 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 **three** equalling **one**, the rule is **+1**.

Then, count forwards from **three** to **four** equalling **one**, the rule is **+1**.

The rule is **+1**, **count on one** from each of the numbers in the number pattern.

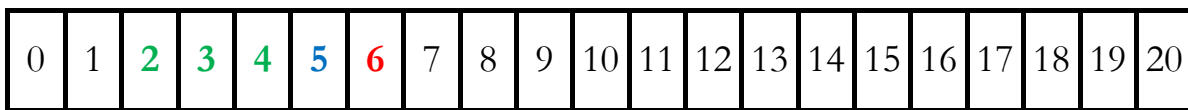
Continue this number pattern to find the next two missing numbers.

Next, find **four** on the number line and count on **one** more, total is **five**.

Then, find **five** on the number line and count on **one** more, total is **six**.

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

### Number Line



### Test Questions

In each **sequence** of numbers, find the next two missing numbers.

1) 2, 3, 4, \_\_, \_\_

8) 32, 34, 36, \_\_, \_\_

2) 5, 6, 7, \_\_, \_\_

9) 0, 5, 10, \_\_, \_\_

3) 13, 14, 15, \_\_, \_\_

10) 15, 20, 25, \_\_, \_\_

4) 20, 21, 22, \_\_, \_\_

11) 30, 35, 40, \_\_, \_\_

5) 0, 2, 4, \_\_, \_\_

12) 0, 10, 20, \_\_, \_\_

6) 10, 12, 14, \_\_, \_\_

13) 40, 50, 60, \_\_, \_\_

7) 20, 22, 24, \_\_, \_\_

14) 50, 60, 70, \_\_, \_\_

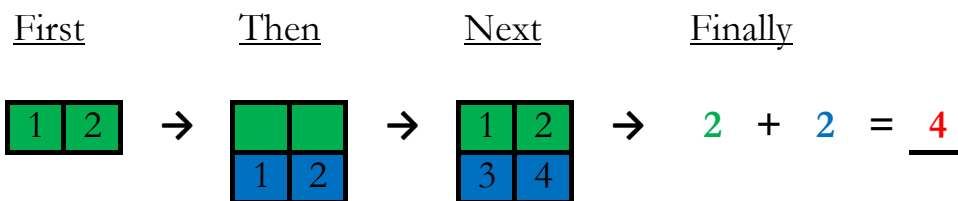
# Doubling

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

## Word Problem

Child A and Child B, both have **two** objects **each**.  
How many objects do they have in **total**?

## Concrete Object



## Strategy Applied

First, pick up **two** objects and place them together.

Now count aloud to check there is only **two** objects; **one, two**.

Then, pick up **two** more object and place it next to the **two** objects.

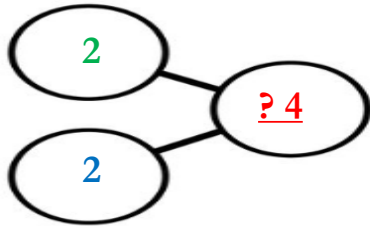
Next, count how many objects there are **altogether**.

Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one, two, three, four**.

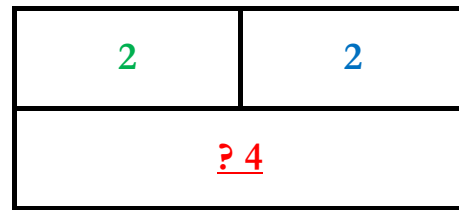
Finally, double **two** equals **four**.



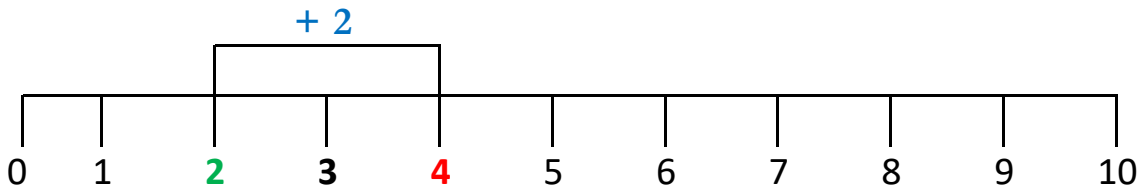
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

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

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

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

Finally, double **two** equals **four**.

### Test Questions

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

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

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

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

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

6)  $5 + 5 = \underline{\quad}$

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

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

9)  $0 + 0 = \underline{\quad}$

10)  $11 + 11 = \underline{\quad}$

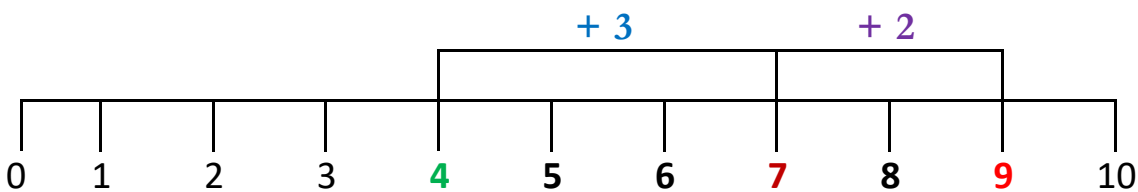
## Find The Missing Number

1)  $4 + 3 + \underline{\quad} = 9$

### Word Problem

In a classroom, there are **four** boys and **three** girls sat down at their tables. There are **more** children sat on the carpet. **Altogether** there are **nine** children in the classroom. How many children are sat on the carpet?

### Number Line



### Strategy Applied

First, find and touch the number **four** 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 **seven**.

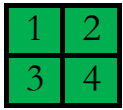
Then, from **seven** count forwards aloud in number order, whilst touching the numbers on the number line, on to the number **nine**.

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

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

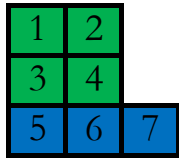
## Concrete Object

First



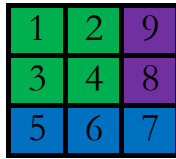
→

Then



→

Next

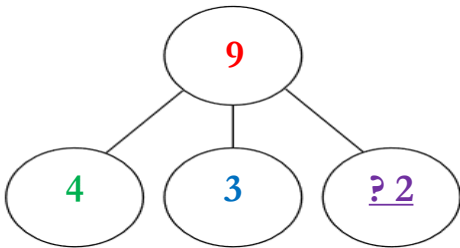


→

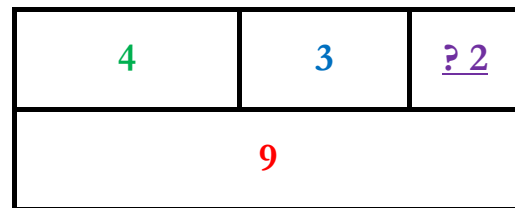
Finally

$$4 + 3 + \underline{\quad ? \quad} = 9$$

## Part Whole Model



## Bar Model



## Test Questions

1)  $4 + 3 + \underline{\quad} = 9$

2)  $7 + 2 + \underline{\quad} = 15$

3)  $\underline{\quad} + 4 + 12 = 22$

4)  $15 + \underline{\quad} + 10 = 29$

5)  $\underline{\quad} + 3 + 8 = 18$

6)  $23 = 9 + 8 + \underline{\quad}$

7)  $11 = 3 + 5 + \underline{\quad}$

8)  $16 = 9 + \underline{\quad} + 2$

9)  $20 = 1 + \underline{\quad} + 10$

10)  $25 = \underline{\quad} + 12 + 7$

11)  $8 + \underline{\quad} + 7 = 21$

12)  $9 + 4 + \underline{\quad} = 15$

13)  $33 = 13 + 15 + \underline{\quad}$

14)  $46 = 29 + \underline{\quad} + 12$

## Find The Missing Number

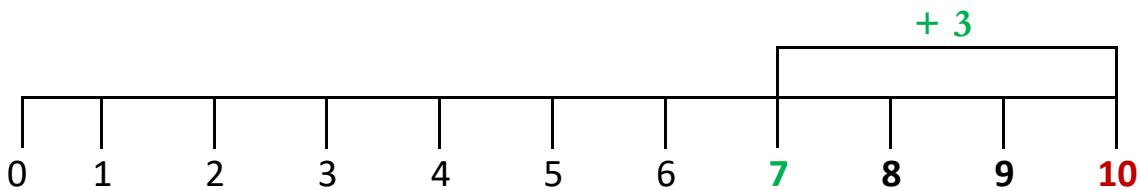
1)  $4 + \underline{\quad ? \quad} = 7 + 3$

### Word Problem

$4 + \underline{\quad ? \quad}$  is equal to or the same value as  $7 + 3$

or  $7 + 3$  is equal to or the same value as  $4 + \underline{\quad ? \quad}$

### Number Line



### Step 1

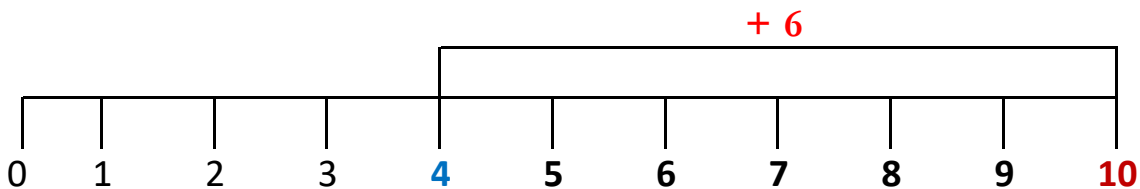
Out of the two **number sentences**, calculate the number sentence with all the **known** numbers first, which is  $7 + 3$ .

First, find and touch the number **seven** 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 **ten**.

### Number Line



## Step 2

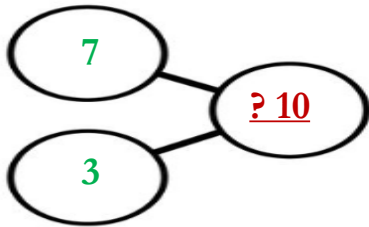
If  $7 + 3 = 10$ , then  $4 + ? = 10$ , as they are the **same value**  
Secondly, find and touch the number **four** on a number line.

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

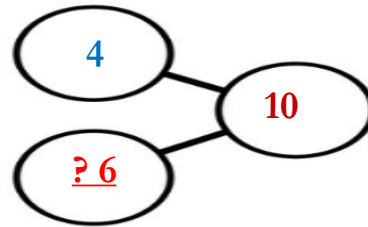
Next, say how many numbers were **counted on**, it should be **six** more.

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

### Part Whole Model



### Part Whole Model



### Test Questions

1)  $4 + \underline{\quad} = 7 + 3$

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

3)  $\underline{\quad} + 4 = 12 + 2$

4)  $15 + 4 = 10 + \underline{\quad}$

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

6)  $\underline{\quad} + 9 = 8 + 6$

7)  $\underline{\quad} + 5 = 11 + 4$

8)  $12 + 4 = \underline{\quad} + 6$

9)  $1 + 14 = \underline{\quad} + 3$

10)  $16 + 2 = \underline{\quad} + 7$

11)  $7 + 2 = \underline{\quad} + 5$

12)  $\underline{\quad} + 5 = 11 + 3$

13)  $15 + 4 = 10 + \underline{\quad}$

14)  $\underline{\quad} + 7 = 12 + 6$

# 1 Less Than

1)  $2 - 1 = \underline{\quad ? \quad}$

## Word Problem

Maja has **two** cubes.

How much is **one** fewer?

## Concrete Object

First

Then

Next

Finally



## Strategy Applied

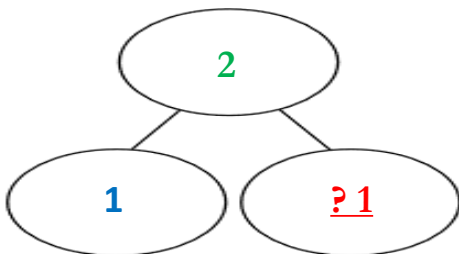
First, pick up **two** objects and place them together. Now count aloud to check there are only **two** objects; **one, two**.

Then, pick up **one** of the objects and take it away.

Next, count **altogether** how many objects are **left**. Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**.

Finally, **two** take away **one** equals **one**.

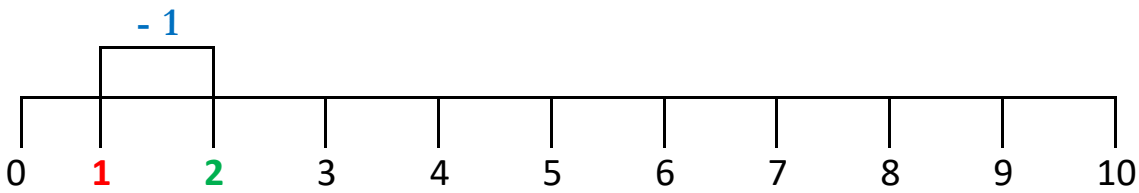
## Part Whole Model



## Bar Model



## Number Line



## Strategy Applied

First, find and touch the number **two** 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 **one**.

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

## Test Questions

1)  $2 - 1 = \underline{\quad}$

6) One less than 5 is  $= \underline{\quad}$

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

7) Twelve is one less than  $= \underline{\quad}$

3)  $8 - 1 = \underline{\quad}$

8)  $4\text{mm} - 1\text{mm} = \underline{\quad}$

4)  $5 - 1 = \underline{\quad}$

9)  $6\text{cm} - 1\text{cm} = \underline{\quad}$

5) Subtract one from nine  $= \underline{\quad}$

10)  $9\text{m} - 1\text{m} = \underline{\quad}$

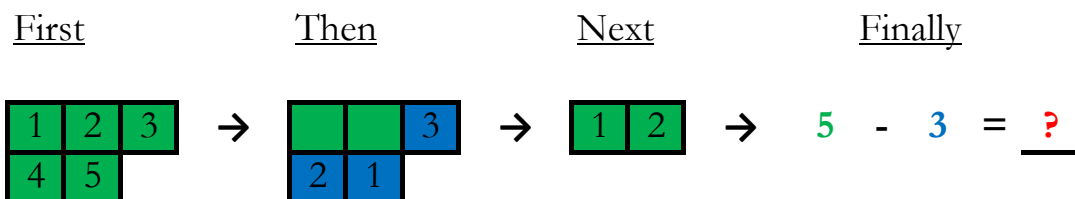
## More Than 1

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

### Word Problem

Ray has **five** pieces of fruit and he gives **three** pieces of fruit to Amy.  
How many pieces of fruit does he have **left**?

### Concrete Object



### Strategy Applied

First, pick up **five** objects and place them together.

Now count aloud to check there are only **five** objects; **one, two, three, four, five.**

Then, pick up **three** of the objects and take them away.

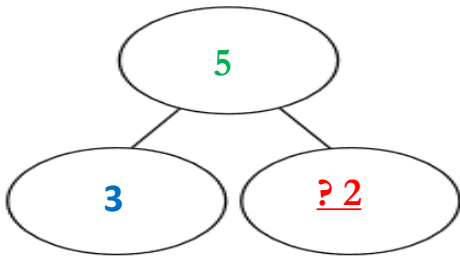
Next, count **altogether** how many objects are **left**.

Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one, two.**

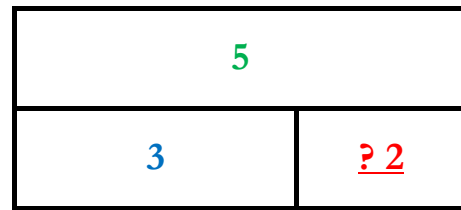
Finally, **five** take away **three** equals **two**.



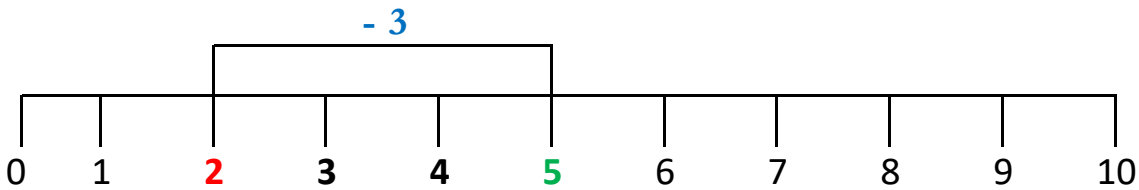
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

First, find and touch the number **five** 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 **two**.

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

### Test Questions

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

6)  $10 - 4 = \underline{\quad}$

2)  $9 - 7 = \underline{\quad}$

7)  $18 - 5 = \underline{\quad}$

3)  $14 - 7 = \underline{\quad}$

8)  $24\text{mm} - 6\text{mm} = \underline{\quad}$

4)  $8 - 5 = \underline{\quad}$

9)  $33\text{cm} - 8\text{cm} = \underline{\quad}$

5)  $9 - 0 = \underline{\quad}$

10)  $47\text{m} - 6\text{m} = \underline{\quad}$

## More Than 1

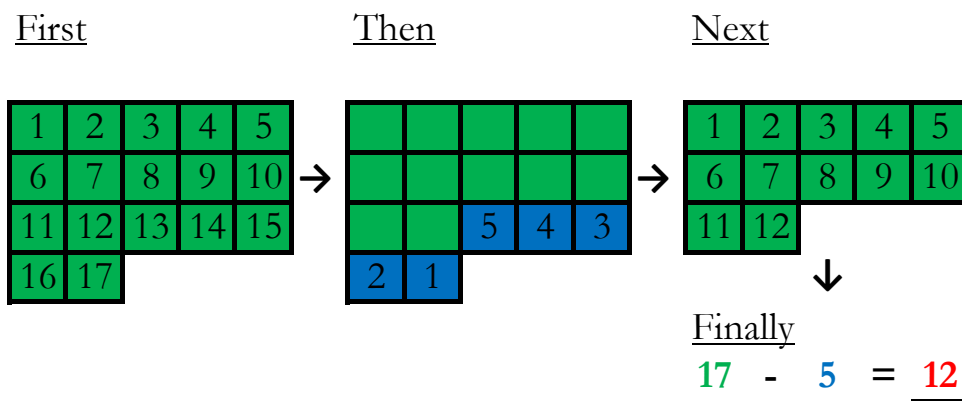
1)  $17 - 5 = \underline{\quad ? \quad}$

### Word Problem

Mica and James have a maths problem to solve.

What is the **distance between** **seventeen** metres and **five** metres?

### Concrete Object



### Strategy Applied

First, pick up **seventeen** objects and place them together.

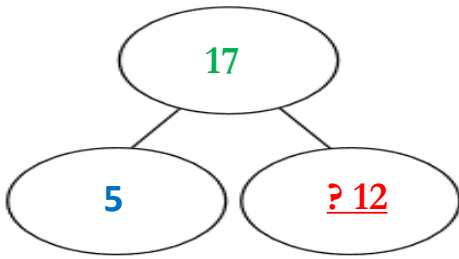
Now count aloud to check there are only **seventeen** objects; **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17.**

Then, pick up **five** of the objects and take them away.

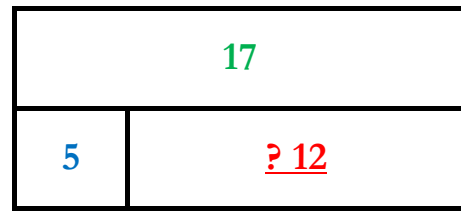
Next, count **altogether** how many objects are **left**. Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve.**

Finally, **seventeen** take away **five** equals **twelve.**

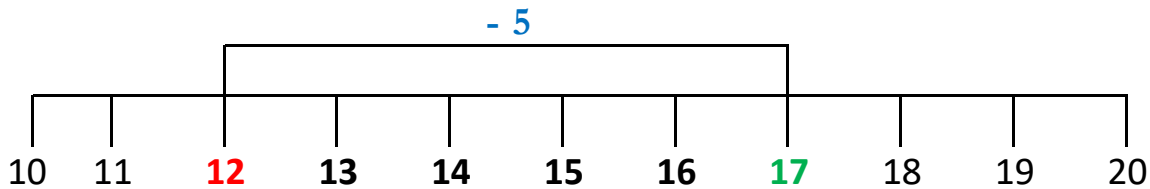
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

First, find and touch the number **seventeen** 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 **twelve**.

Finally, **seventeen** subtract **five** equals **twelve**.

### Test Questions

- 1)  $17 - 5 = \underline{\quad}$
- 2)  $20 - 11 = \underline{\quad}$
- 3)  $19\text{secs} - 11\text{secs} = \underline{\quad}$
- 4)  $20\text{secs} - 12\text{secs} = \underline{\quad}$
- 5)  $18\text{mins} - 17\text{mins} = \underline{\quad}$
- 6) Take away two from eleven =  $\underline{\quad}$
- 7)  $\underline{\quad} = 20\text{mins} - 8\text{mins}$
- 8)  $\underline{\quad} = 18\text{hrs} - 5\text{hrs}$
- 9)  $\underline{\quad} = 16\text{hrs} - 9\text{hrs}$
- 10) Take away four from fifteen =  $\underline{\quad}$

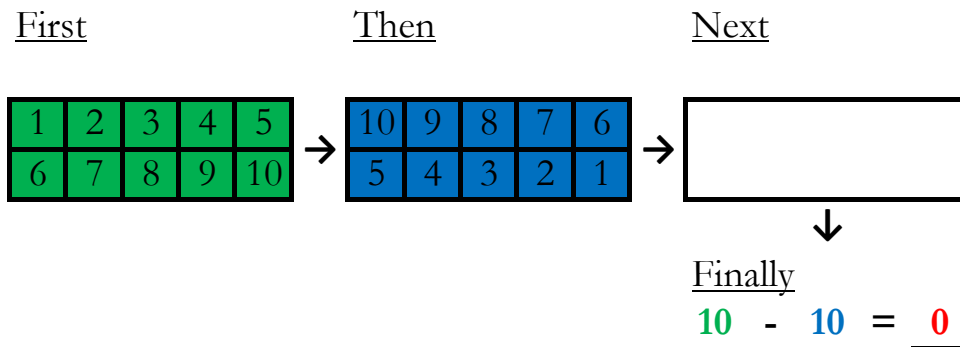
## 10 Less Than

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

### Word Problem

Josh has **ten** marbles and he gave all **ten** marbles to his friend Joseph.  
How many marbles does he have **left**?

### Concrete Object



### Strategy Applied

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.**

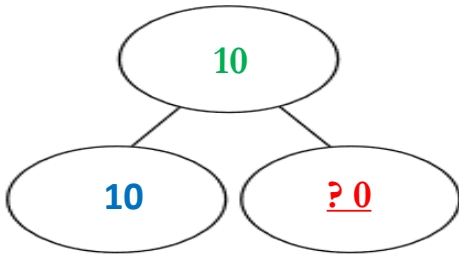
Then, pick up **ten** of the objects and take them away.

Next, count **altogether** how many objects are **left**.

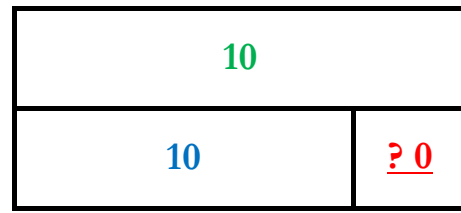
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **zero**, as there are no objects left.

Finally, **ten** take away **ten** equals **zero**.

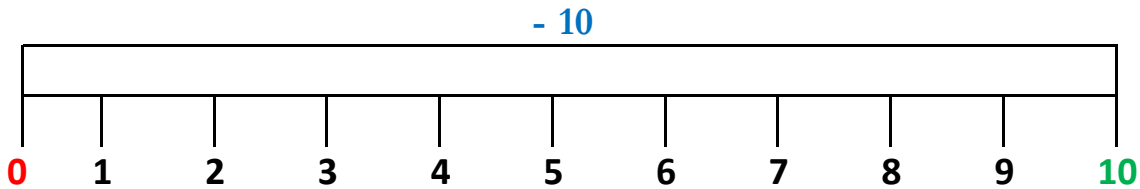
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

First, find and touch the number **ten** 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 **zero**.

Finally, **ten** subtract **ten** equals **zero**.

### Test Questions

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

6)  $20 - 10 = \underline{\quad}$

2)  $30 - 10 = \underline{\quad}$

7)  $40 - 10 = \underline{\quad}$

3)  $50 - 10 = \underline{\quad}$

8)  $60\text{g} - 10\text{g} = \underline{\quad}$

4)  $70 - 10 = \underline{\quad}$

9)  $80\text{g} - 10\text{g} = \underline{\quad}$

5)  $90 - 10 = \underline{\quad}$

10)  $100\text{kg} - 10\text{kg} = \underline{\quad}$

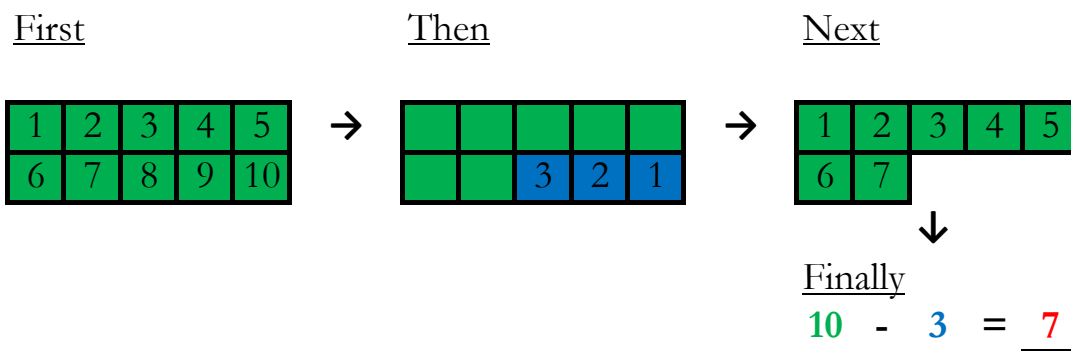
## Bonds to 10 and 20

1)  $10 - 3 = \underline{\quad ? \quad}$

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

**Number bonds to 20**, means two or more numbers added together that make the number 20.

### Concrete Object



### Strategy Applied

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**.

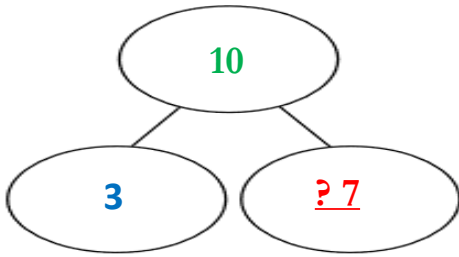
Then, pick up **three** of the objects and take them away.

Next, count **altogether** how many objects are **left**.

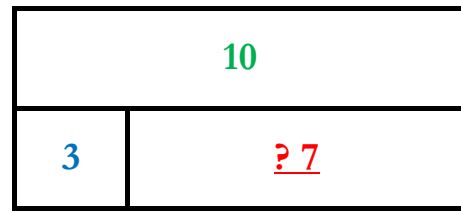
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one, two, three, four, five, six, seven**.

Finally, **ten** take away **three** equals **seven**.

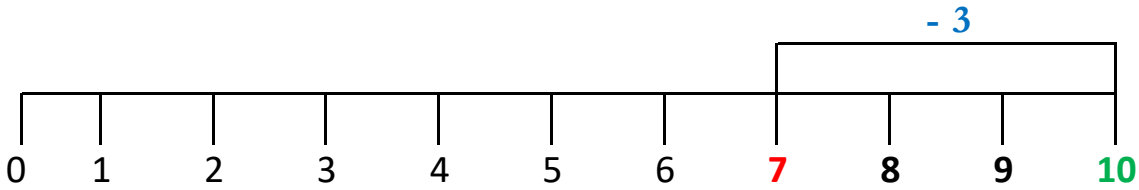
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

First, find and touch the number **ten** 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 **seven**.

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

### Test Questions

1)  $10 - 3 = \underline{\quad}$

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

3)  $10 - 8 = \underline{\quad}$

4)  $10 - 1 = \underline{\quad}$

5)  $10\text{p} - \underline{\quad} = 2\text{p}$

6)  $10\text{p} - \underline{\quad} = 4\text{p}$

7)  $20\text{p} - \underline{\quad} = 15\text{p}$

8)  $\pounds 20 - \underline{\quad} = \pounds 17$

9)  $\pounds 20 - \underline{\quad} = \pounds 4$

10)  $\pounds 20 - \underline{\quad} = \pounds 12$

## Multiple Numbers

$$1) \quad 9 - 3 - 2 = \underline{\quad ? \quad}$$

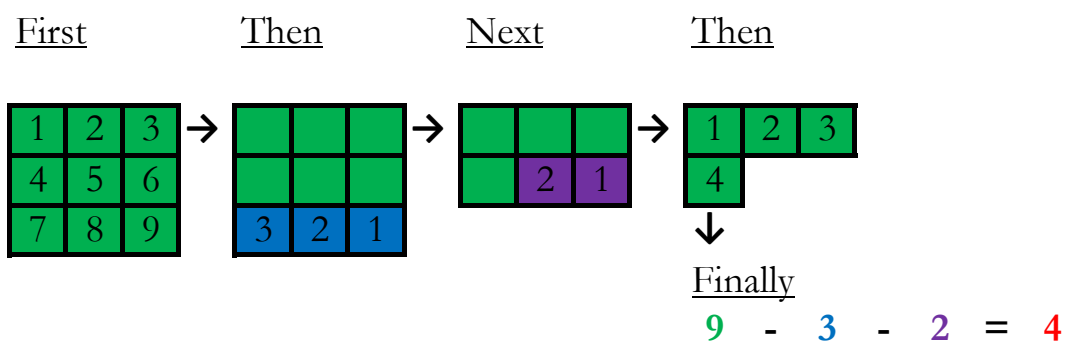
### Word Problem

There are **nine** apples in a basket. On Monday **three** apples are eaten.

On Tuesday **two** more apples are eaten.

How many apples are **left**?

### Concrete Object



### Strategy Applied

First, pick up **nine** objects and place them together.

Now count aloud to check there are only **nine** objects; **one, two, three, four, five, six, seven, eight, nine**.

Then, pick up **three** of the objects and take them away.

Next, pick up **two** more of the objects and take them away.

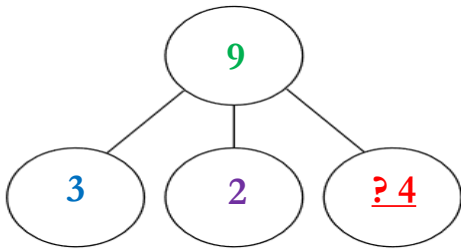
Then, count **altogether** how many objects are **left**.

Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one, two, three, four**.

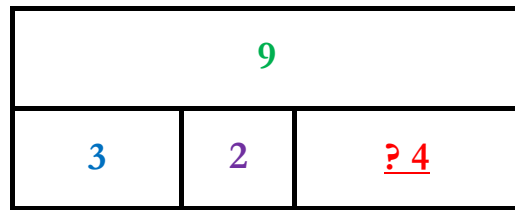
Finally, **nine** take away **three** take away **two** equals **four**.



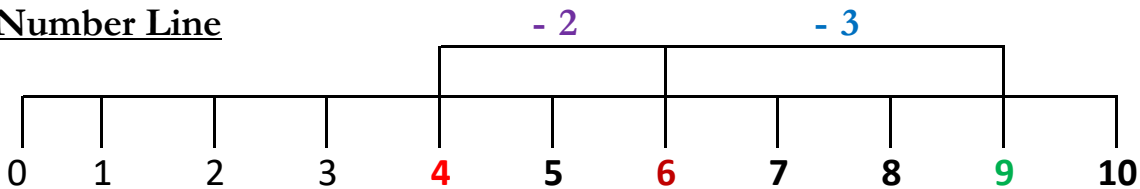
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

First, find and touch the number **nine** 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 **six**.

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

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

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

### Test Questions

1)  $9 - 3 - 2 = \underline{\quad}$

6)  $30 - 10 - 10 = \underline{\quad}$

2)  $11 - 2 - 4 = \underline{\quad}$

7)  $50 - 10 - 10 = \underline{\quad}$

3)  $15 - 4 - 7 = \underline{\quad}$

8)  $40\text{ml} - 10\text{ml} - 10\text{ml} = \underline{\quad}$

4)  $18 - 5 - 2 = \underline{\quad}$

9)  $60\text{ml} - 10\text{ml} - 10\text{ml} = \underline{\quad}$

5)  $20 - 1 - 9 = \underline{\quad}$

10)  $100\text{L} - 10\text{L} - 10\text{L} = \underline{\quad}$

## Multiples of 1, 2, 5 and 10

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

1) 5, 4, 3, ?, ?

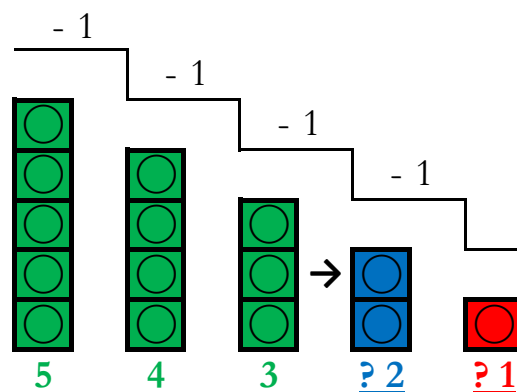
### Word Problem

The numbers **five**, **four** and **three** are written on part of a **number line**.

Missing of the number line, are the **two** numbers written before.

What are the **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 **five** to **four** equalling **one**, the rule is **-1**.

Then, count backwards from **four** to **three** equalling **one**, the rule is **-1**.

The rule is **-1**, **count back one** from each of the numbers in the number pattern.

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

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

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

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

### 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

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

1) 5, 4, 3,     ,     

8) 30, 28, 26,     ,     

2) 10, 9, 8,     ,     

9) 25, 20, 15,     ,     

3) 8, 7, 6,     ,     

10) 30, 25, 20,     ,     

4) 19, 18, 17,     ,     

11) 40, 45, 50,     ,     

5) 10, 8, 6,     ,     

12) 50, 40, 30,     ,     

6) 12, 10, 8,     ,     

13) 40, 30, 20,     ,     

7) 20, 18, 16,     ,     

14) 120, 110, 100,     ,

## Doubling

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

### Word Problem

There are **three** oranges in a bowl. On Wednesday **one** orange is eaten.  
On Thursday **one further** orange is eaten.  
How many oranges are left?

### Concrete Object

First



→

Then



→

Next



→

Finally

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

### Strategy Applied

First, pick up **three** objects and place them together.

Now count aloud to check there are only **three** objects; **one, two, three**.

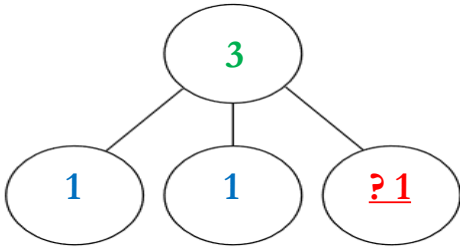
Then, pick up **one** and **one** of the objects equal to **two** objects and take them away.

Next, count **altogether** how many objects are **left**.

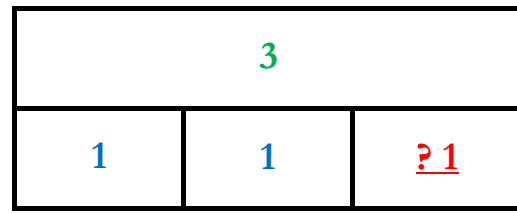
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**.

Finally, **three** take away double **one** equals **one**.

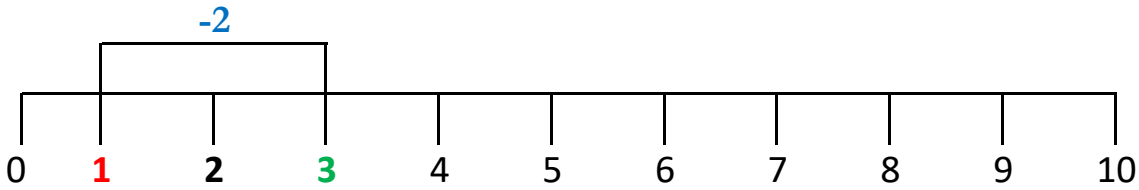
### Part Whole Model



### Bar Model



### Number Line



### Strategy Applied

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

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

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

Finally, **three** take away double **one** equals **one**.

### Test Questions

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

6)  $8 - 3 - 3 = \underline{\quad}$

2)  $4 - 1 - 1 = \underline{\quad}$

7)  $9 - 3 - 3 = \underline{\quad}$

3)  $5 - 2 - 2 = \underline{\quad}$

8)  $10 - 3 - 3 = \underline{\quad}$

4)  $6 - 2 - 2 = \underline{\quad}$

9)  $11 - 4 - 4 = \underline{\quad}$

5)  $7 - 2 - 2 = \underline{\quad}$

10)  $12 - 4 - 4 = \underline{\quad}$

## Find The Missing Number

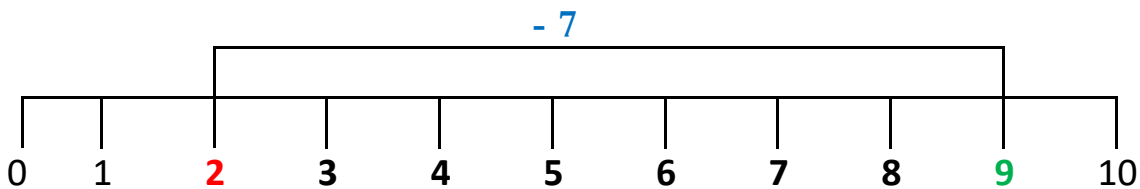
1)  $9 - \underline{\quad} = 2$

### Word Problem

**Nine** children are sat down at a table eating their lunch. A **number** of the children finish their lunch and go out to play. **Two** children are still sat at the table eating their lunch.

How many of the children went out to play?

### Number Line



### Strategy Applied

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

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

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

Finally, **nine** subtract **seven** equals **two**.

## Concrete Object

First

1	2	3
4	5	6
7	8	9

→

Then

		7
4	5	6
3	2	1

→

Next

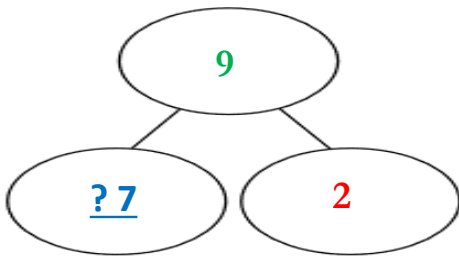
1	2
---	---

→

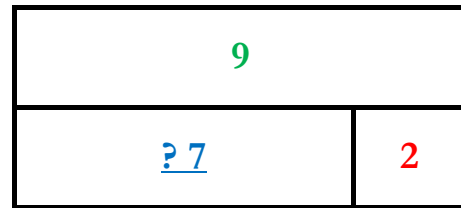
Finally

$$9 - \underline{7} = 2$$

## Part Whole Model



## Bar Model



## Test Questions

1)  $9 - \underline{\quad} = 2$

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

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

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

5)  $13 - \underline{\quad} = 8$

6)  $16 - \underline{\quad} = 6$

7)  $26 - \underline{\quad} = 6$

8)  $30 - \underline{\quad} = 10$

9)  $\underline{\quad} - 2 = 7$

10)  $\underline{\quad} - 4 = 6$

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

12)  $\underline{\quad} - 1 = 19$

13)  $\underline{\quad} - 40 = 7$

14)  $\underline{\quad} - 31 = 19$

## Find The Missing Number

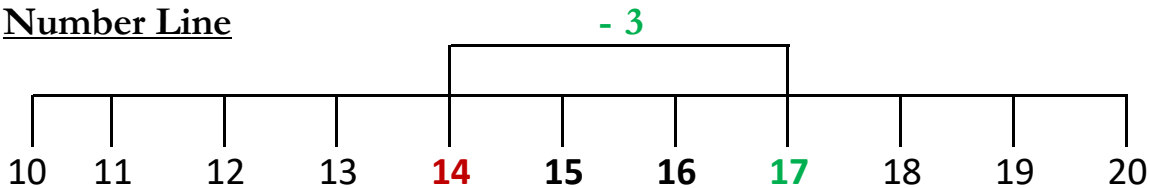
1)  $17 - 3 = \underline{\quad} - 2$

### Word Problem

$17 - 3$  is equal to or the same value as  $\underline{\quad} - 2$

or  $\underline{\quad} - 2$  is equal to or the same value as  $17 - 3$

### Number Line



### Step 1

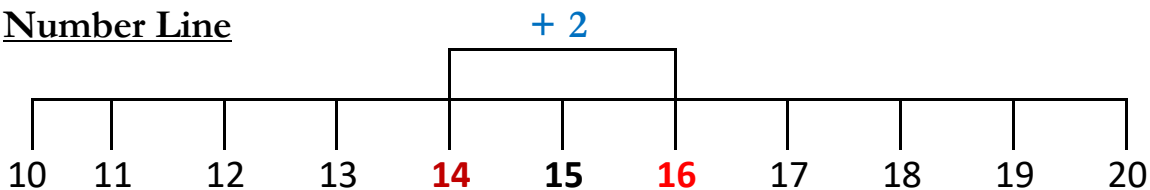
Out of the two **number sentences**, calculate the number sentence with all the **known** numbers first which is,  $17 - 3$ .

First, find and touch the number **seventeen** 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 **fourteen**.

### Number Line



### Step 2

If  $17 - 3 = 14$ , then  $\underline{\quad} - 2 = 14$ , as they are the **same value**  
Use the **inverse** of subtraction, which is addition,  $14 + 2 = \underline{\quad}$ .



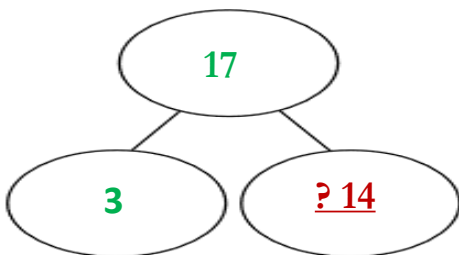
Secondly, find and touch the number **fourteen** on a number line.

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

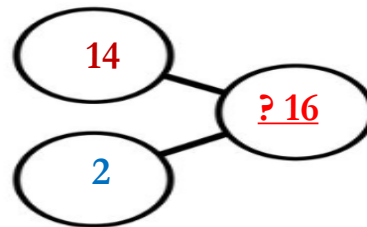
Next, the number counted on to should be **sixteen**.

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

### Part Whole Model



### Part Whole Model



### Test Questions

1)  $17 - 3 = \underline{\quad} - 2$

8)  $11 - 4 + 2 = \underline{\quad}$

2)  $20 - 5 = \underline{\quad} - 4$

9)  $13 - 2 + 5 = \underline{\quad}$

3)  $18 - \underline{\quad} = 6 + 5$

10)  $27 - 6 + 5 = \underline{\quad}$

4)  $24 - \underline{\quad} = 3 + 12$

11)  $24 - \underline{\quad} + 7 = 17$

5)  $19 - \underline{\quad} = 6 + 5$

12)  $13 - 10 - 3 = \underline{\quad}$

6)  $15 - \underline{\quad} - 6 = 6$

13)  $45 - 6 - \underline{\quad} = 31$

7)  $18 - \underline{\quad} - 4 = 12$

14)  $70 - 10 + 10 + 10 = \underline{\quad}$

## Repeated Addition

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

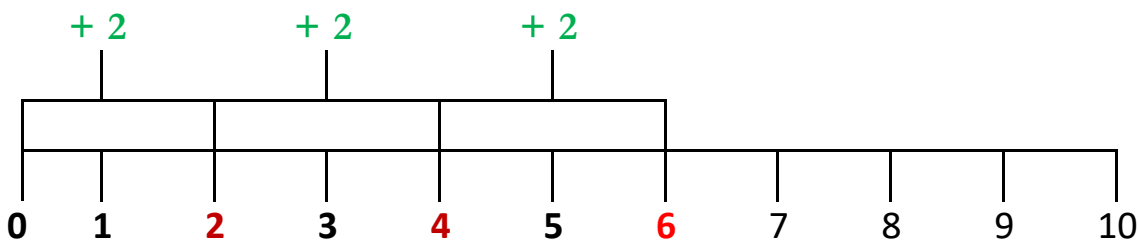
### Word Problem

Sam has **three** groups of **two** cubes.

Sam has **two** cubes, then **adds two** more cubes, then **adds two** more cubes, **repeated addition**.

How many cubes does Sam have **altogether**?

### Number Line



### Strategy Applied

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

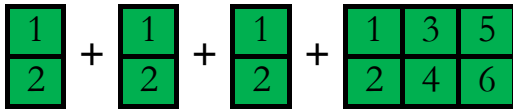
Then, **count forwards two** more aloud in number order, whilst touching the numbers on the number line, on to the number **two**.

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

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

Finally, **two** times **three** equals **six**.

### Concrete Object

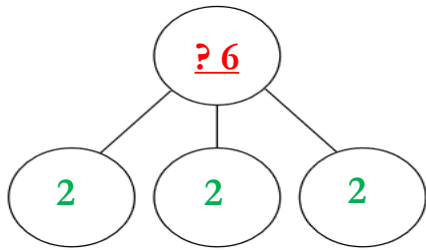


$$2 + 2 + 2 = \underline{6}$$

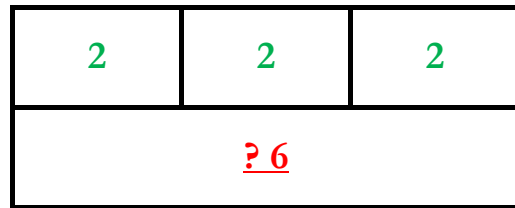
### Column Addition

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

### Part Whole Model



### Bar Model



### Test Questions

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

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

3)  $2 \times 5 = \underline{\quad}$

4)  $2 \times 8 = \underline{\quad}$

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

6)  $5 \times 4 = \underline{\quad}$

7)  $5 \times 6 = \underline{\quad}$

8)  $10 \times 2 = \underline{\quad}$

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

10)  $10 \times 5 = \underline{\quad}$

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

12)  $\underline{\quad} = 2 \times 9$

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

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

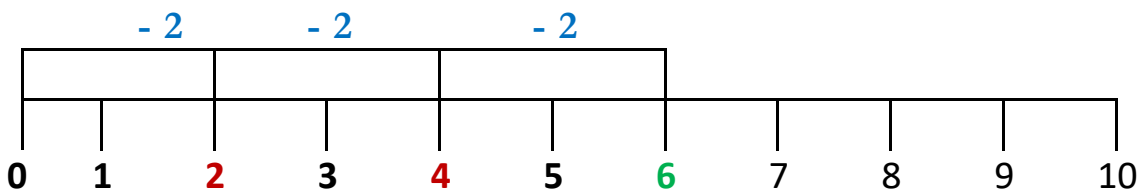
## Repeated Subtraction

1)  $6 \div 2 = \underline{\quad ? \quad}$

### Word Problem

**Six** toys are **equally shared** between **two** groups of children.  
How many toys will **each group** have?

### Number Line



### Strategy Applied

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

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

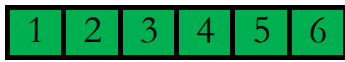
Next, **count backwards two** less aloud in number order, whilst touching the numbers on the number line, back to the number **two**.

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

Finally, **six** divided by **two** equals **three**.

## Concrete Object

Quantity



=

Group 1

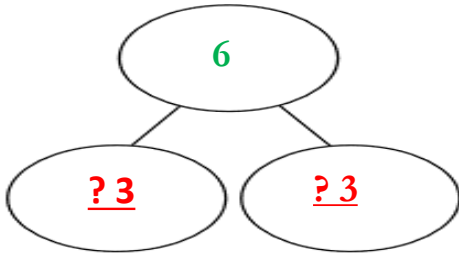


+

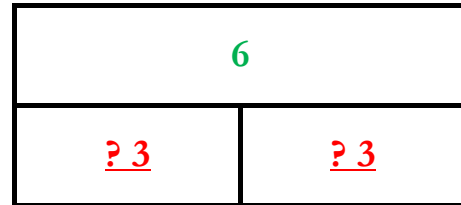
Group 2



## Part Whole Model



## Bar Model



## Test Questions

1)  $6 \div 2 = \underline{\quad}$

2)  $8 \div 2 = \underline{\quad}$

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

4)  $12 \div 2 = \underline{\quad}$

5)  $18 \div 2 = \underline{\quad}$

6)  $10 \div 5 = \underline{\quad}$

7)  $15 \div 5 = \underline{\quad}$

8)  $20 \div 5 = \underline{\quad}$

9)  $30 \div 10 = \underline{\quad}$

10)  $50 \div 10 = \underline{\quad}$

11)  $\underline{\quad} = 16 \div 2$

12)  $\underline{\quad} = 24 \div 2$

13)  $\underline{\quad} = 40 \div 5$

14)  $\underline{\quad} = 80 \div 10$

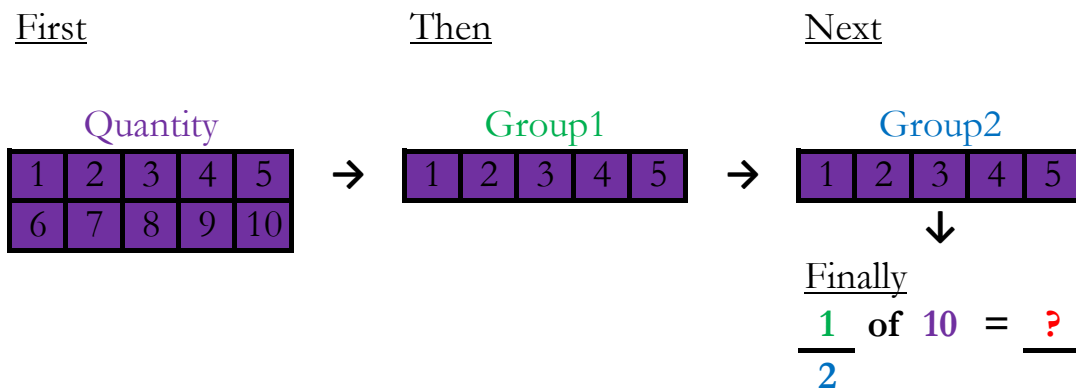
## Fraction of a Quantity

$$1) \frac{1}{2} \text{ of } 10 = \underline{\quad ? \quad}$$

### Word Problem

Lacey and Vanessa **equally** share **ten** cubes between the **two** of them.  
How many cubes will **one** of them have?

### Concrete Object



### Strategy Applied

A fraction is part of a **whole** or part of **1** and a **half** is 1 of 2 **equal groups**.

**10** 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**.

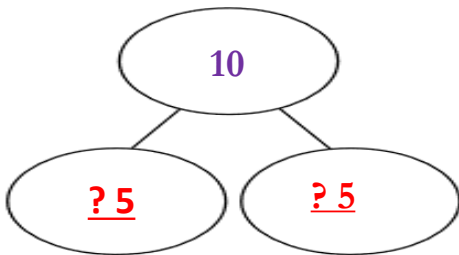
First, pick up **ten** objects and place them together. Now count aloud to check there are only **ten** objects; **1, 2, 3, 4, 5, 6, 7, 8, 9, 10**.

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

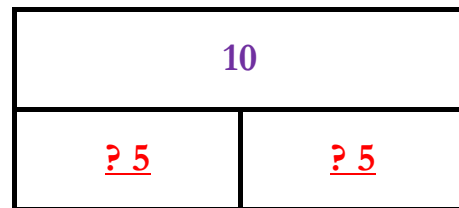
Next, count how many objects there are **altogether** in **one group**, there should be five objects; **one, two, three, four, five.**

Finally, **one half** of **ten** equals **five.**

### Part Whole Model



### Bar Model



### Test Questions

1)  $\frac{1}{2}$  of 10 = \_\_\_

2)  $\frac{1}{4}$  of 12 = \_\_\_

3)  $\frac{1}{4}$  of 20 = \_\_\_

4) A half of 4 = \_\_\_

5) A quarter of 4 = \_\_\_

6) Half of 20 = \_\_\_

7) \_\_\_ =  $\frac{1}{2}$  of 20g

8) \_\_\_ =  $\frac{1}{2}$  of 14kg

9) \_\_\_ =  $\frac{1}{4}$  of 16ml

10) \_\_\_ =  $\frac{1}{4}$  of 24L

## Answers

### P. 2

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

### P. 4

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

### P. 6

- 1) 2
- 2) 5
- 3) 7
- 4) 6
- 5) 9
- 6) 6
- 7) 11
- 8) 4mm
- 9) 28cm
- 10) 44m

### P. 8

- 1) 8
- 2) 10
- 3) 14
- 4) 15
- 5) 14mm
- 6) 8
- 7) 19cm
- 8) 19m
- 9) 18
- 10) 19

### P. 10

- 1) 2
- 2) 2
- 3) 5
- 4) 2
- 5) 4
- 6) 2
- 7) 8
- 8) 8ml
- 9) 16ml
- 10) 16L

### P. 12

- 1) 20
- 2) 11
- 3) 40
- 4) 70
- 5) 60
- 6) 50
- 7) 80
- 8) 30g
- 9) 100g
- 10) 110kg

### P. 14

- 1) 10
- 2) 7
- 3) 5
- 4) 3
- 5) 2p
- 6) 4p
- 7) £6
- 8) £8
- 9) 20
- 10) 12

### P. 16

- 1) 6
- 2) 9
- 3) 17
- 4) 14
- 5) 20
- 6) 30
- 7) 40
- 8) 50secs
- 9) 70secs
- 10) 100mins

### P. 18

- 1) 5, 6
- 2) 8, 9
- 3) 17, 18
- 4) 23, 24
- 5) 6, 8
- 6) 16, 18
- 7) 26, 28
- 8) 38, 40
- 9) 15, 20
- 10) 30, 35



## Answers

<u>P. 20</u>	<u>P. 22</u>	<u>P. 24</u>	<u>P. 26</u>	<u>P. 28</u>	<u>P. 30</u>
1) 4	1) 2	1) 6	1) 1	1) 2	1) 12
2) 8	2) 6	2) 4	2) 2	2) 2	2) 9
3) 12	3) 6	3) 10	3) 7	3) 7	3) 8secs
4) 2	4) 4	4) 9	4) 4	4) 3	4) 8secs
5) 6	5) 7	5) 10	5) 8	5) 9	5) 1mins
6) 10	6) 6	6) 5	6) 4	6) 6	6) 9
7) 16	7) 3	7) 10	7) 13	7) 13	7) 12mins
8) 20	8) 5	8) 10	8) 3mm	8) 18mm	8) 13hrs
9) 0	9) 9	9) 12	9) 5cm	9) 25cm	9) 7hrs
10) 22	10) 6	10) 11	10) 8m	10) 41m	10) 11

<u>P. 32</u>	<u>P. 34</u>	<u>P. 36</u>	<u>P. 38</u>	<u>P. 40</u>	<u>P. 42</u>
1) 0	1) 7	1) 4	1) 2, 1	1) 1	1) 7
2) 20	2) 4	2) 5	2) 7, 6	2) 2	2) 0
3) 40	3) 2	3) 4	3) 5, 4	3) 1	3) 8
4) 60	4) 9	4) 11	4) 16, 15	4) 2	4) 0
5) 80	5) 8p	5) 10	5) 4, 2	5) 3	5) 5
6) 10	6) 6p	6) 10	6) 6, 4	6) 2	6) 10
7) 30	7) 5p	7) 30	7) 14, 12	7) 3	7) 20
8) 50g	8) £3	8) 20ml	8) 24, 22	8) 4	8) 20
9) 70g	9) £16	9) 40ml	9) 10, 5	9) 3	9) 9
10) 90kg	10) £8	10) 80L	10) 15, 10	10) 4	10) 10
				11) 3	11) 17
				12) 5	12) 20
				13) 8	13) 47
				14) 10	14) 50

## Answers

### P. 44

- 1) 16
- 2) 19
- 3) 7
- 4) 9
- 5) 8
- 6) 3
- 7) 2
- 8) 5
- 9) 6
- 10) 16
- 11) 0
- 12) 0
- 13) 8
- 14) 40

### P. 46

- 1) 6
- 2) 8
- 3) 10
- 4) 16
- 5) 15
- 6) 20
- 7) 30
- 8) 20
- 9) 30
- 10) 50
- 11) 14
- 12) 18
- 13) 40
- 14) 80

### P. 48

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

### P. 50

- 1) 5
- 2) 3
- 3) 5
- 4) 2
- 5) 1
- 6) 10
- 7) 10g
- 8) 7kg
- 9) 4ml
- 10) 6L

## 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  $6 \times 4$ , 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  $5 \times 3$ , 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