Year 1

Arithmetic

Workbook

by Richard Brown

Contents Page

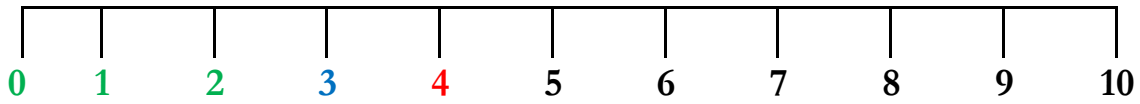
Key Language and Representations

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 senter 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 concep

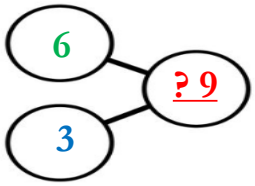
Concrete Objects are manipulated or handled to calculate and represent a number sentence i.e. multilink cubes, numicon, counters, number line.
e.g. 3 + 3 = 6

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.

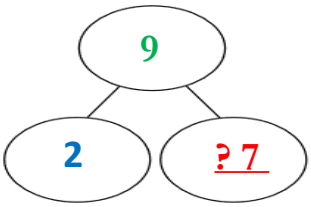


Part Whole Models are pictorial mathematical images to represent varied calculations and number sentences.

e.g. 6 + 3 = ? 9

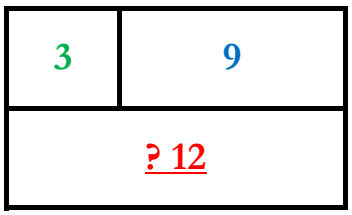


e.g. 9 - 2 = ? 7

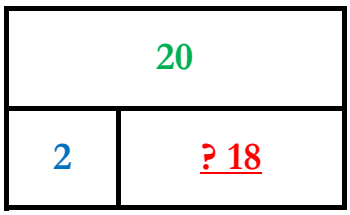


Bar Models are an image, that pictorially represents a number sentence.

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

Hundreds 100s	Tens 10s	Ones 1s
	1	4

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

Hundreds 100s	Tens 10s	Ones 1s
	1	4

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 = ___

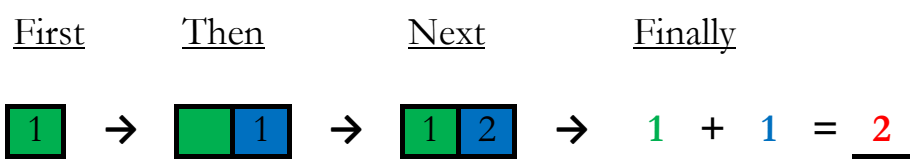
1 More Than

1) 1 + 1 = ?

Word Problem

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

Concrete Object



Strategy Applied

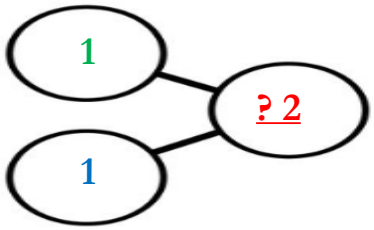
First, pick up **one** object and place it down.
Now count aloud to check there is only **one** object; **one**.

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

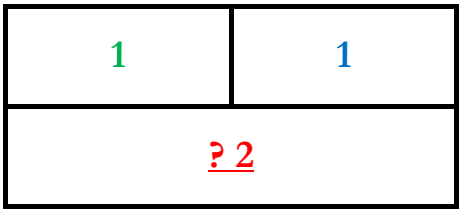
Next, count how many objects there are **altogether**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**.

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

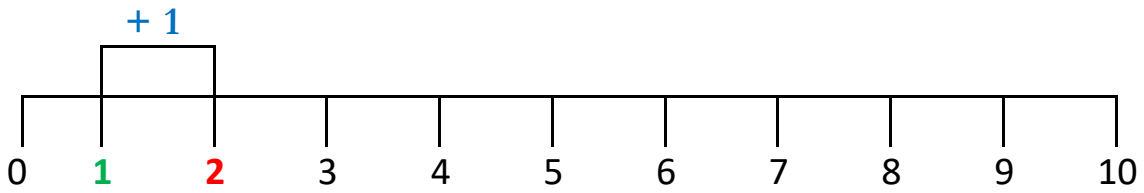
Part Whole Model



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 = ___

2) 4 + 1 = ___

3) 6 + 1 = ___

4) 5 + 1 = ___

5) Add eight and one together = ___

6) One more than 5 is = ___

7) Twelve is one more than = ___

8) 3mm + 1mm = ___

9) 27cm + 1cm = ___

10) 43m + 1m = ___

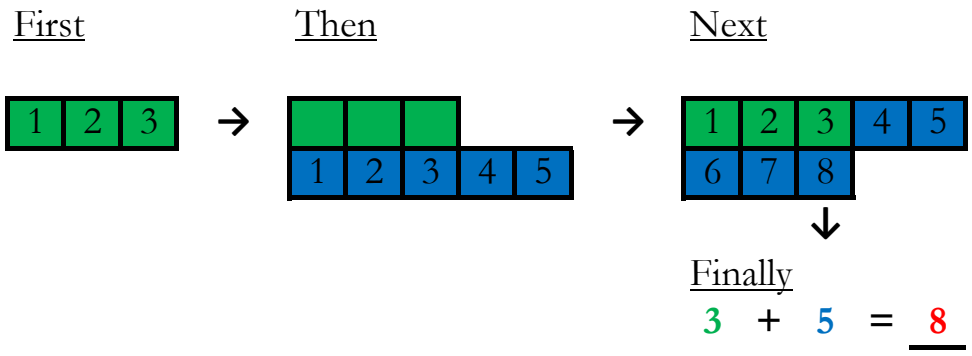
More Than 1

1) 3 + 5 = ?

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

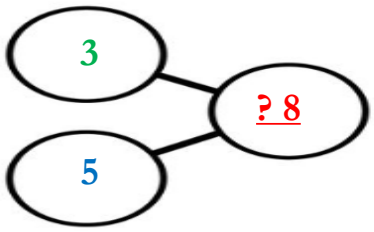
First, pick up **three** objects and place them together.
Now count aloud to check there are only **three** objects; **one**, **two**, **three**.

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

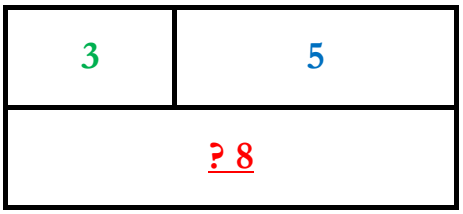
Next, count how many objects there are **altogether**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**, **five**, **six**, **seven**, **eight**.

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

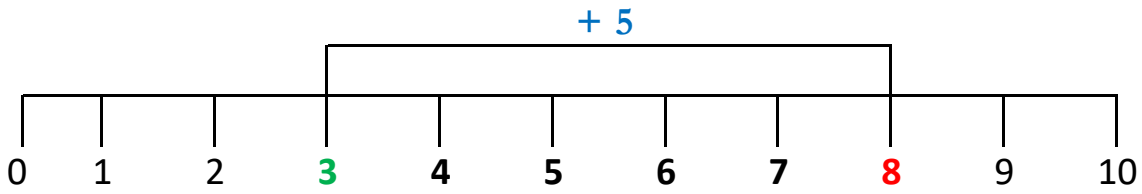
Part Whole Model



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 = ___

2) 7 + 3 = ___

3) 8 + 6 = ___

4) 9 + 6 = ___

5) 7m + 7m = ___

6) Add three and five together = ___

7) 9 cm + 10cm = ___

8) 16m + 3m = ___

9) Add twelve and six together = ___

10) Add fourteen and five together = ___

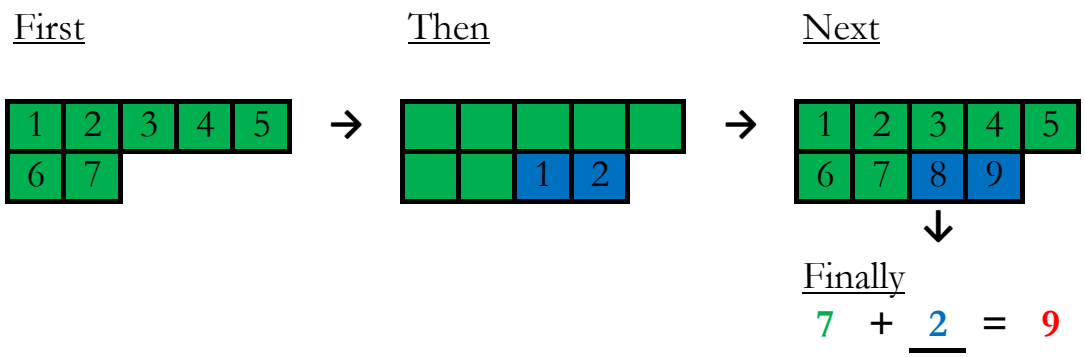
More Than 1

1) 7 + ? = 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



Strategy Applied

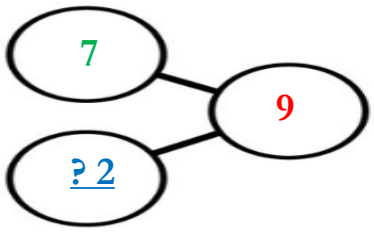
First, pick up **seven** objects and place them together.
Now count aloud to check there are only **seven** objects; **one**, **two**, **three**, **four**, **five**, **six**, **seven**.

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.

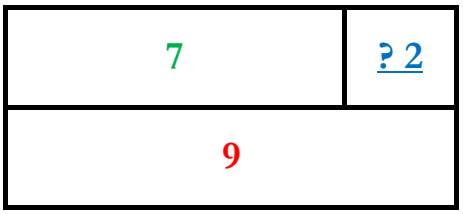
Next, count how many objects there are **altogether**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**, **five**, **six**, **seven**, **eight**, **nine**.

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

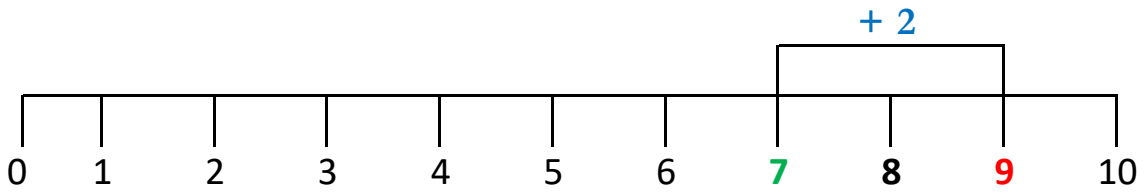
Part Whole Model



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 + ___ = 9

2) 4 + ___ = 6

3) 4 + ___ = 9

4) ___ + 9 = 11

5) ___ + 6 = 10

6) ___ + 9 = 11

7) 14 = 6 + ___

8) 13ml = 5ml + ___

9) 20ml = ___ + 4ml

10) 30L = ___ + 14L

10 More

1) 10 + 10 = ?

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 = 20

Strategy Applied

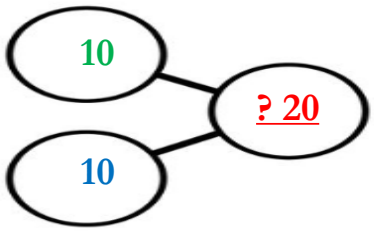
First, pick up **ten** objects and place them together.
Now count aloud to check there are only **ten** objects; **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8**, **9**, **10**.

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

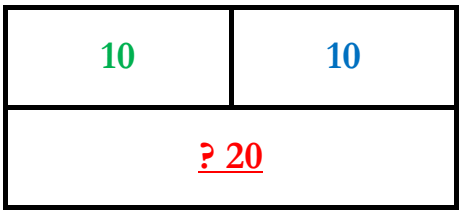
Next, count how many objects there are **altogether**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**, **five**, **six**, **seven**, **eight**, nine, **ten**, **eleven**, **twelve**, **thirteen**, **fourteen**,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

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

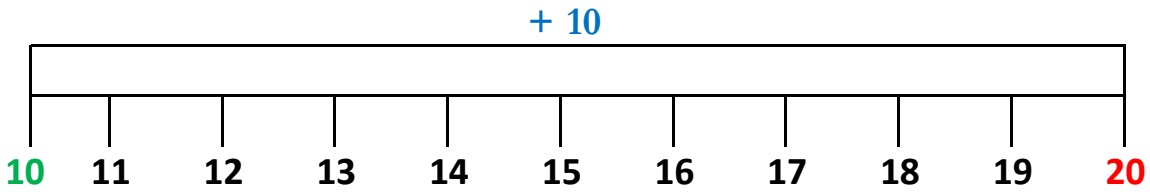
Part Whole Model



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 = ___

2) 1 + 10 = ___

3) 30 + 10 = ___

4) 60 + 10 = ___

5) 50 + 10 = ___

6) 40 + 10 = ___

7) 70 + 10 = ___

8) 20g + 10g = ___

9) 90g + 10g = ___

10) 100kg + 10kg = ___

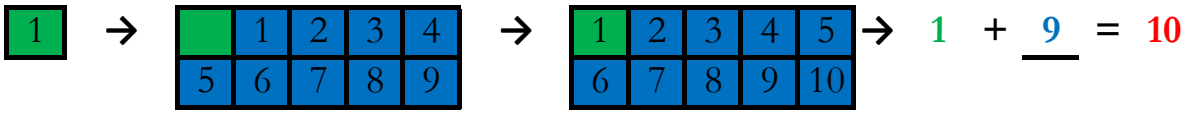
Bonds to 10 and 20

1) 1 + ? = 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

First Then Next Finally



Strategy Applied

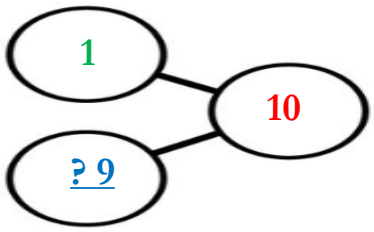
First, pick up **one** object and place it down.
Now count aloud to check there is only **one** object; **one**.

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.

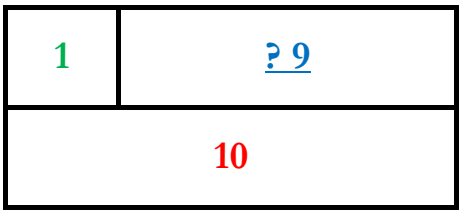
Next, count how many objects there are **altogether**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**, **five**, **six**, **seven**, **eight**, **nine**, **ten**.

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

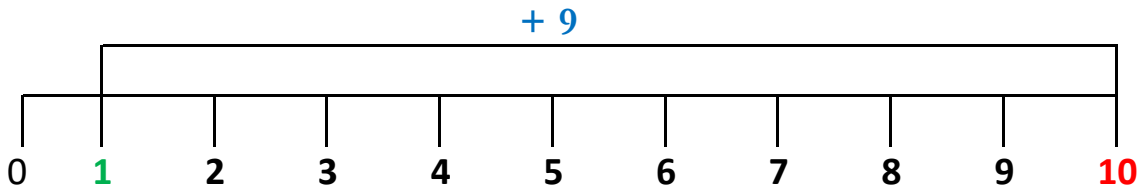
Part Whole Model



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 + ___ = 10

2) 3 + ___ = 10

3) 5 + ___ = 10

4) 7 + ___ = 10

5) ___ + 8p = 10p

6) ___ + 6p = 10p

7) ___ + £14 = £20

8) ___ + £12 = £20

9) ___ + 0 = 20

10) ___ + 8 = 20

Multiple Numbers

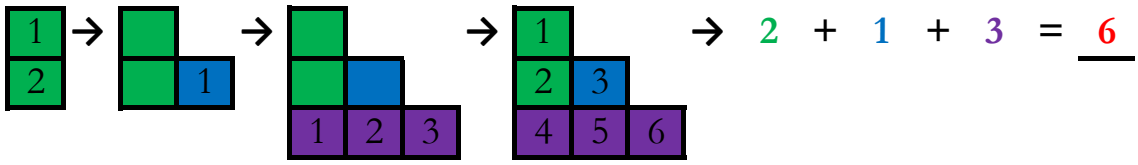
1) 2 + 1 + 3 = ?

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

First Then Next Then Finally



Strategy Applied

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

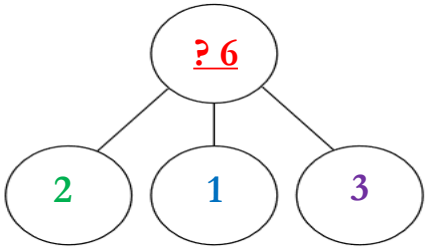
Then, pick up **one** more object and place it next to the **two** objects.

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

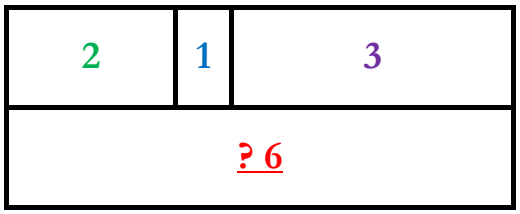
Then, count how many objects there are **altogether**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**, **five**, **six**.

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

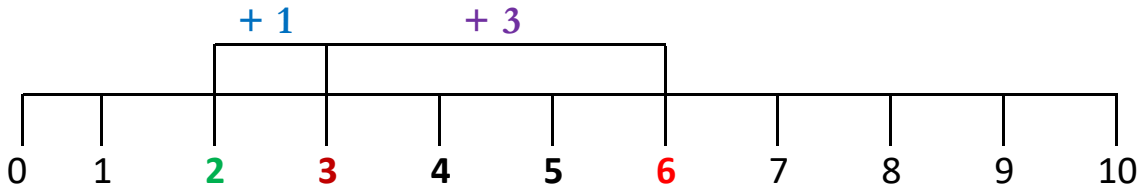
Part Whole Model



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 = ___

2) 3 + 2 + 4 = ___

3) 5 + 5 + 7 = ___

4) 6 + 6 + 2 = ___

5) 8 + 3 + 9 = ___

6) 10 + 10 + 10 = ___

7) 20 + 10 + 10 = ___

8) 30secs + 10secs + 10secs = ___

9) 50secs + 10secs + 10secs = ___

10) 50mins + 10mins + 10mins = ___

Multiples of 1, 2, 5 and 10

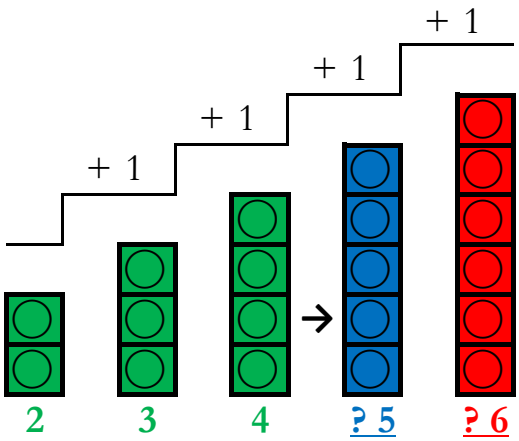
In the **number pattern** below, find the next two missing numbers.

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

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

1) 2, 3, 4, __, __

2) 5, 6, 7, __, __

3) 13, 14, 15, __, __

4) 20, 21, 22, __, __

5) 0, 2, 4, __, __

6) 10, 12, 14, __, __

7) 20, 22, 24, __, __

8) 32, 34, 36, __, __

9) 0, 5, 10, __, __

10) 15, 20, 25, __, __

11) 30, 35, 40, __, __

12) 0, 10, 20, __, __

13) 40, 50, 60, __, __

14) 50, 60, 70, __, __

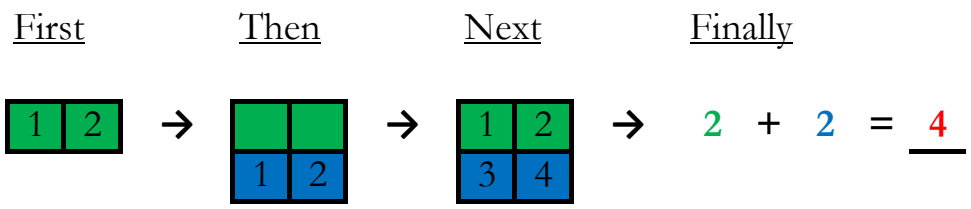
Doubling

1) 2 + 2 = ?

Word Problem

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

Concrete Object



Strategy Applied

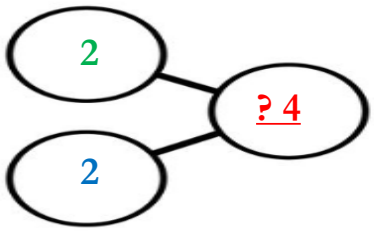
First, pick up **two** objects and place them together.
Now count aloud to check there is only **two** objects; **one**, **two**.

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

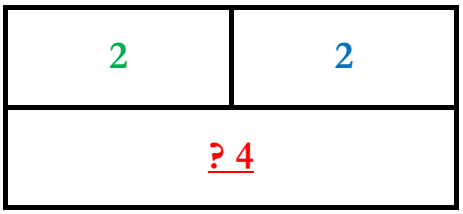
Next, count how many objects there are **altogether**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**.

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

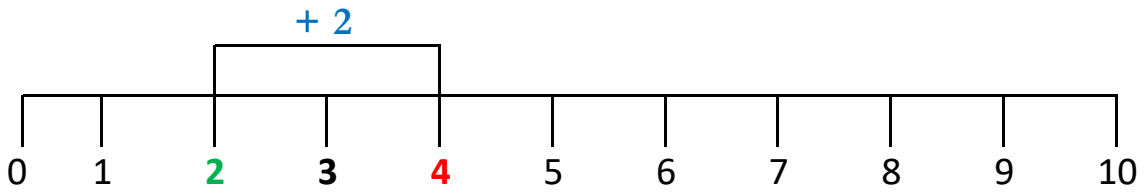
Part Whole Model



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 = ___

2) 4 + 4 = ___

3) 6 + 6 = ___

4) 1 + 1 = ___

5) 3 + 3 = ___

6) 5 + 5 = ___

7) 8 + 8 = ___

8) 10 + 10 = ___

9) 0 + 0 = ___

10) 11 + 11 = ___

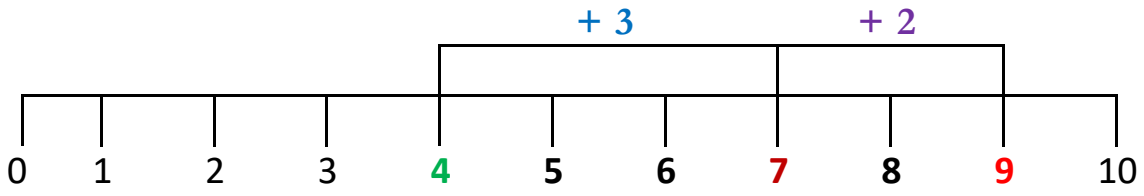
Find The Missing Number

1) 4 + 3 + ? = 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**.

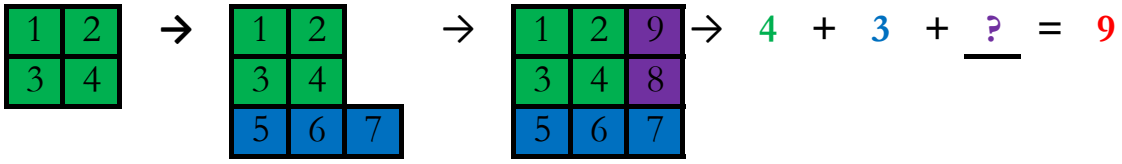
Then, from **seven** count forwards aloud in number order, whilst touching the numbers on the number line, on to the number **nine**.

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

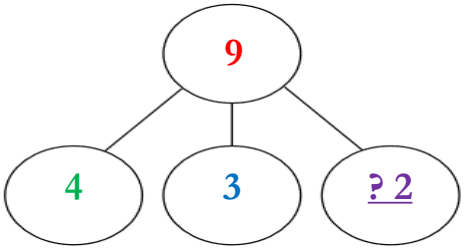
Finally, the **value** of the missing number is **two**.

Concrete Object

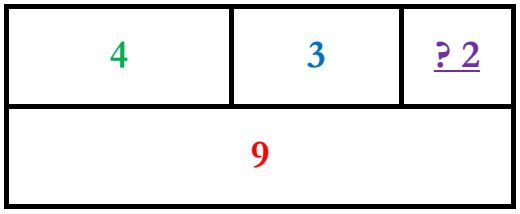
First Then Next Finally



Part Whole Model



Bar Model



Test Questions

1) 4 + 3 + ___ = 9

2) 7 + 2 + ___ = 15

3) ___ + 4 + 12 = 22

4) 15 + ___ + 10 = 29

5) ___ + 3 + 8 = 18

6) 23 = 9 + 8 + ___

7) 11 = 3 + 5 + ___

8) 16 = 9 + ___ + 2

9) 20 = 1 + ___ + 10

10) 25 = ___ + 12 + 7

11) 8 + ___ + 7 = 21

12) 9 + 4 + ___ = 15

13) 33 = 13 + 15 + ___

14) 46 = 29 + ___ + 12

Find The Missing Number

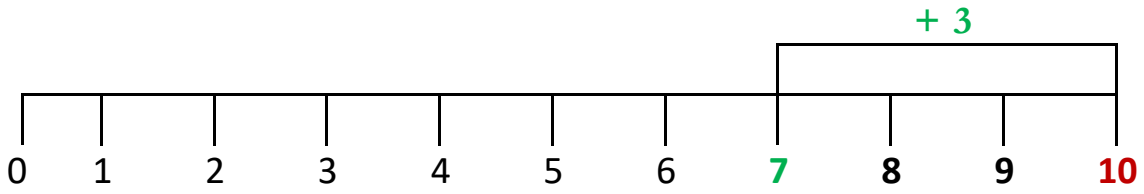
1) 4 + ? = 7 + 3

Word Problem

4 + ? is **equal to** or the **same value** as 7 + 3

or 7 + 3 is **equal to** or the **same value** as 4 + ?

Number Line



Step 1

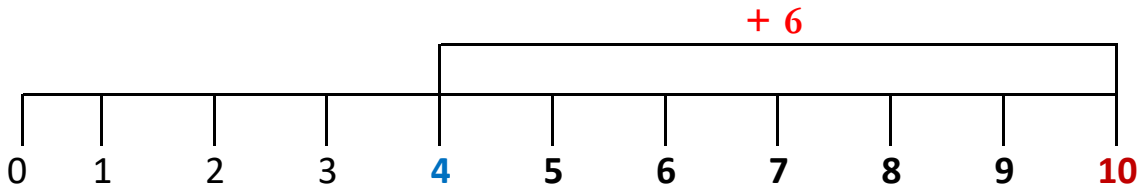
Out of the two **number sentences**, calculate the number sentence with all the **known** numbers first, which is 7 + 3 .

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

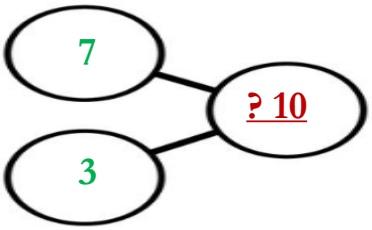
If 7 + 3 = 10 , then 4 + ? = 10 , as they are the **same value**
Secondly, find and touch the number **four** on a number line.

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

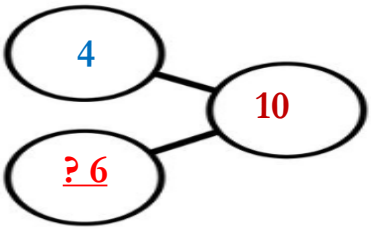
Next, say how many numbers were **counted on**, it should be **six** more.

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

Part Whole Model



Part Whole Model



Test Questions

1) 4 + ___ = 7 + 3

2) 7 + 2 = ___ + 5

3) ___ + 4 = 12 + 2

4) 15 + 4 = 10 + ___

5) ___ + 3 = 8 + 5

6) ___ + 9 = 8 + 6

7) ___ + 5 = 11 + 4

8) 12 + 4 = ___ + 6

9) 1 + 14 = ___ + 3

10) 16 + 2 = ___ + 7

11) 7 + 2 = ___ + 5

12) ___ + 5 = 11 + 3

13) 15 + 4 = 10 + ___

14) ___ + 7 = 12 + 6

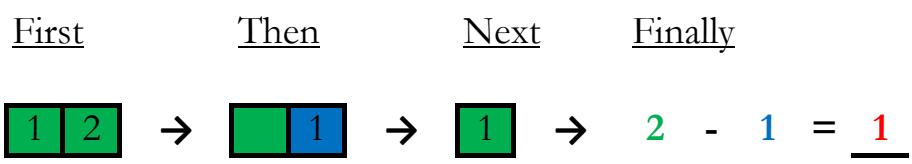
1 Less Than

1) 2 - 1 = ?

Word Problem

Maja has **two** cubes.
How much is **one** **fewer?**

Concrete Object



Strategy Applied

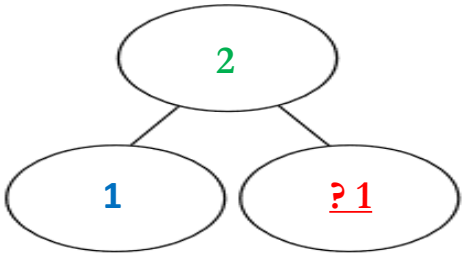
First, pick up **two** objects and place them together. Now count aloud to check there are only **two** objects; **one**, **two.**

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

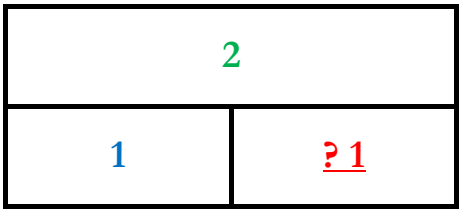
Next, count **altogether** how many objects are **left**. Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**.

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

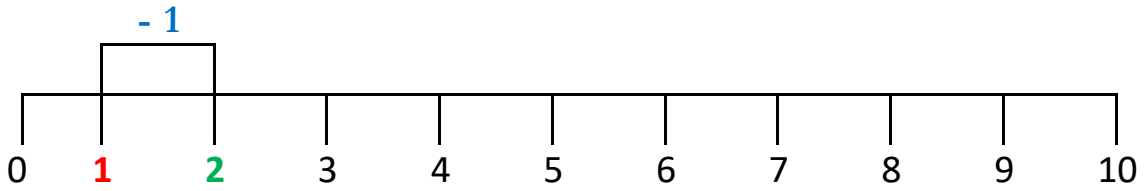
Part Whole Model



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 = ___

2) 3 - 1 = ___

3) 8 - 1 = ___

4) 5 - 1 = ___

5) Subtract one from nine = ___

6) One less than 5 is = ___

7) Twelve is one less than = ___

8) 4mm - 1mm = ___

9) 6cm - 1cm = ___

10) 9m - 1m = ___

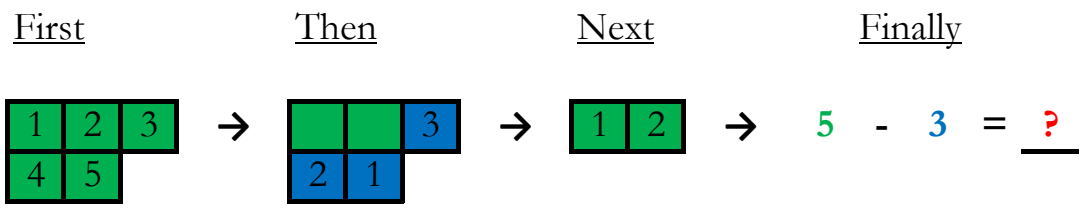
More Than 1

1) 5 - 3 = ?

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

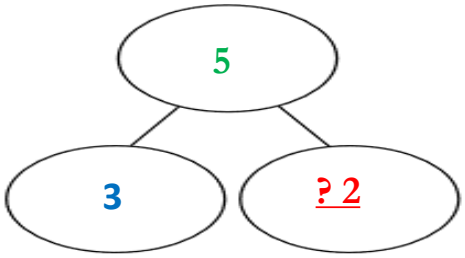
First, pick up **five** objects and place them together.
Now count aloud to check there are only **five** objects; **one**, **two, three, four, five.**

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

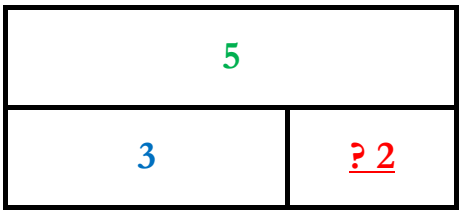
Next, count **altogether** how many objects are **left**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**.

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

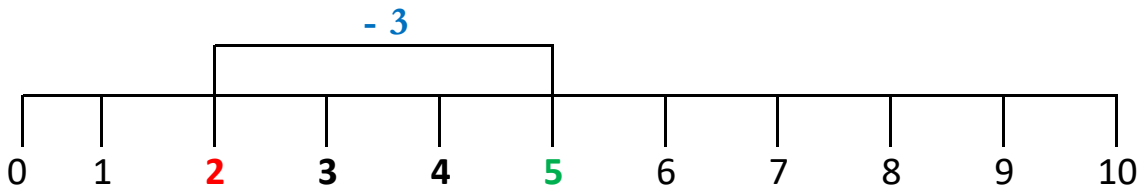
Part Whole Model



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 = ___

2) 9 - 7 = ___

3) 14 - 7 = ___

4) 8 - 5 = ___

5) 9 - 0 = ___

6) 10 - 4 = ___

7) 18 - 5 = ___

8) 24mm - 6mm = ___

9) 33cm - 8cm = ___

10) 47m - 6m = ___

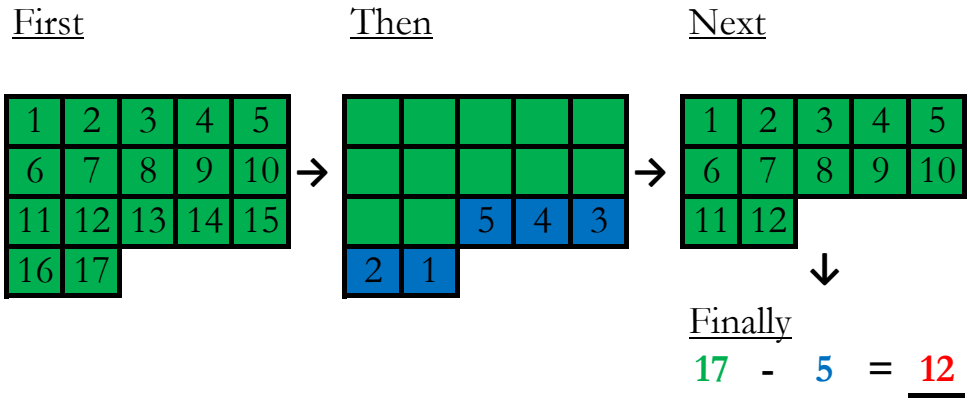
More Than 1

1) 17 - 5 = ?

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

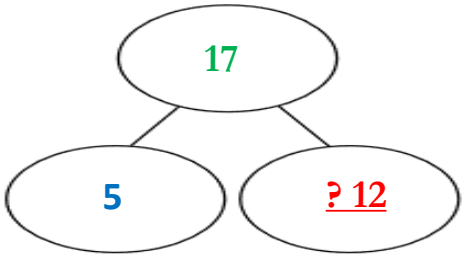
First, pick up seventeen objects and place them together.
Now count aloud to check there are only seventeen objects; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17.

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

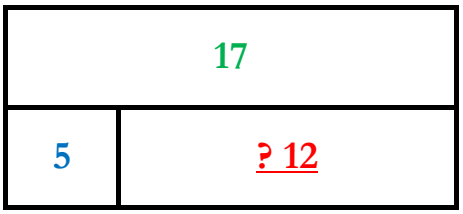
Next, count **altogether** how many objects are **left**. Whilst touching each object **count forwards** aloud in number order, saying one number name per object; one, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve.

Finally, seventeen take away five equals twelve.

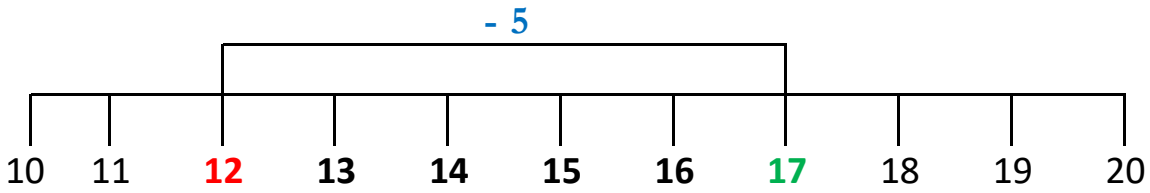
Part Whole Model



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 = ___

2) 20 - 11 = ___

3) 19secs - 11secs = ___

4) 20secs - 12secs = ___

5) 18mins - 17mins = ___

6) Take away two from eleven = ___

7) ___ = 20mins - 8mins

8) ___ = 18hrs - 5hrs

9) ___ = 16hrs - 9hrs

10) Take away four from fifteen = ___

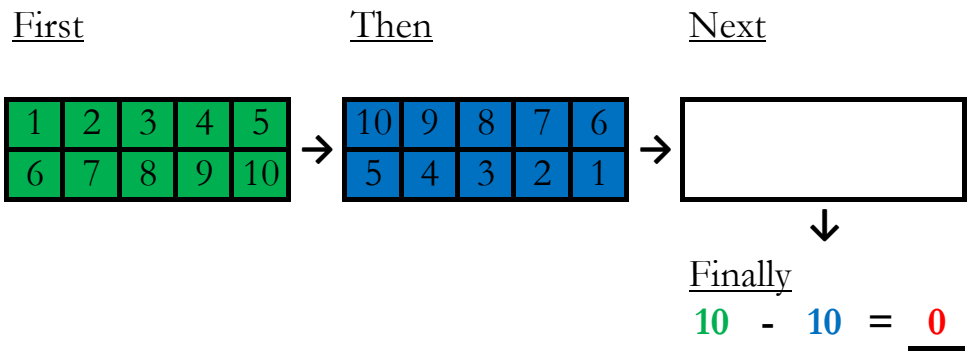
10 Less Than

1) 10 - 10 = ?

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

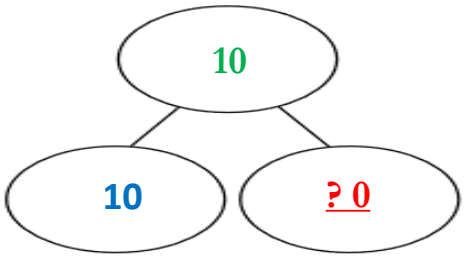
First, pick up ten objects and place them together.
Now count aloud to check there are only ten objects; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

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.

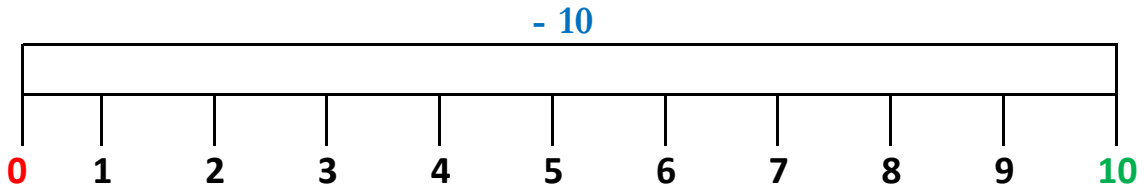
Finally, ten take away ten equals zero.

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 = ___

2) 30 - 10 = ___

3) 50 - 10 = ___

4) 70 - 10 = ___

5) 90 - 10 = ___

6) 20 - 10 = ___

7) 40 - 10 = ___

8) 60g - 10g = ___

9) 80g - 10g = ___

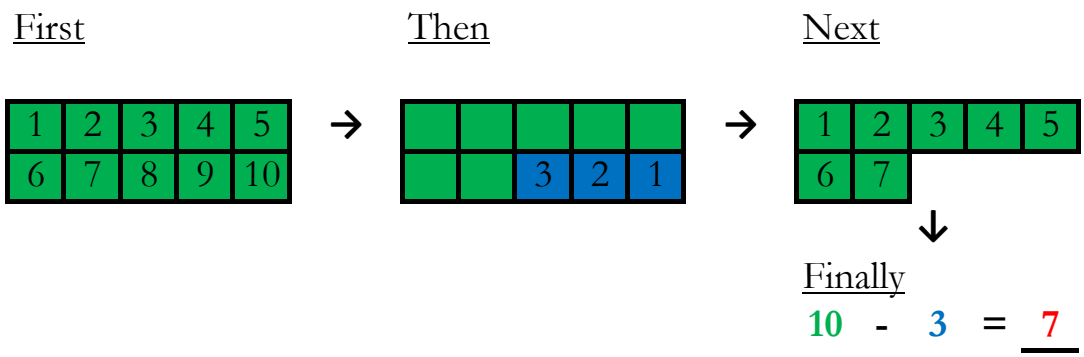
10) 100kg - 10kg = ___

Bonds to 10 and 20

1) 10 - 3 = ?

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

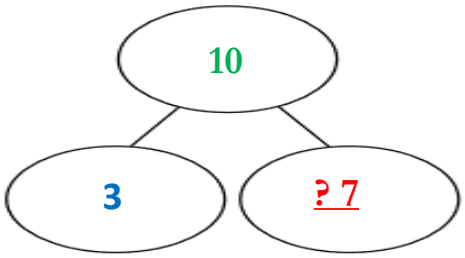
First, pick up **ten** objects and place them together.
Now count aloud to check there are only **ten** objects; **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8**, **9**, **10**.

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

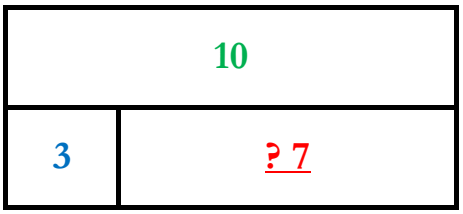
Next, count **altogether** how many objects are **left**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**, **five**, **six**, **seven.**

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

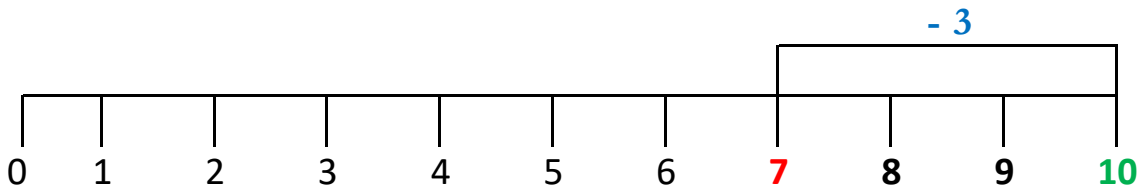
Part Whole Model



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 = ___

2) 10 - 6 = ___

3) 10 - 8 = ___

4) 10 - 1 = ___

5) 10p - ___ = 2p

6) 10p - ___ = 4p

7) 20p - ___ = 15p

8) £20 - ___ = £17

9) £20 - ___ = £4

10) £20 - ___ = £12

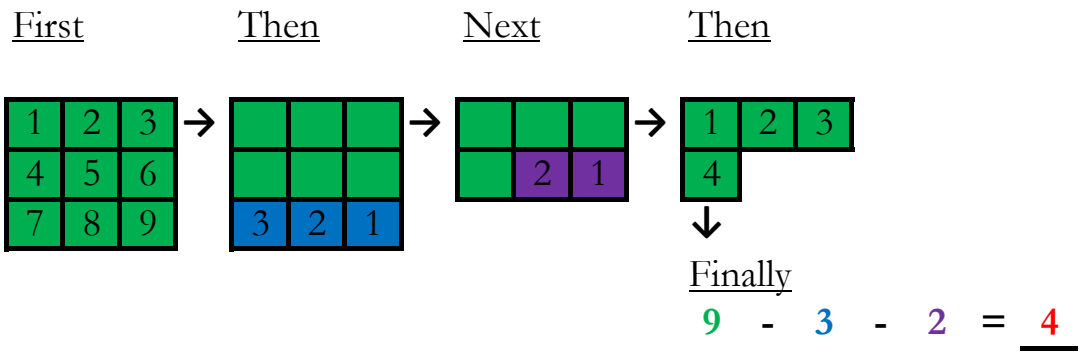
Multiple Numbers

1) 9 - 3 - 2 = ?

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**.

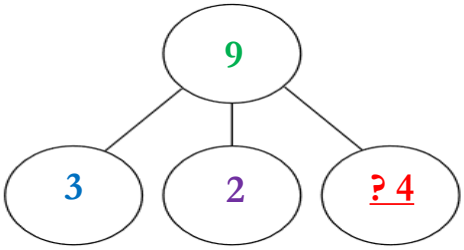
Then, pick up **three** of the objects and take them away.

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

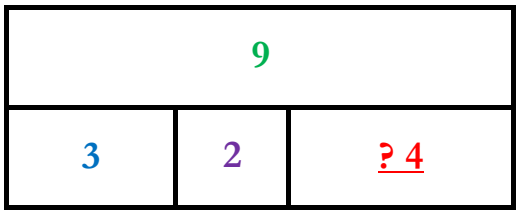
Then, count **altogether** how many objects are **left**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**, **two**, **three**, **four**.

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

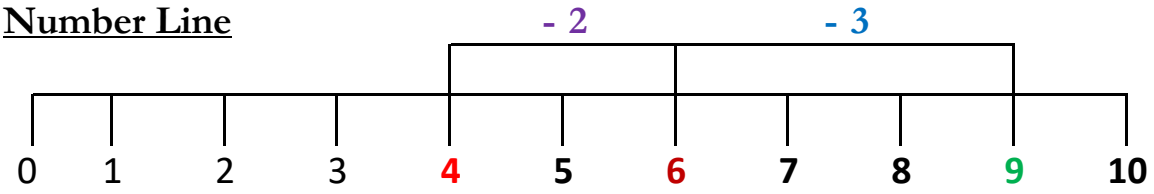
Part Whole Model



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 = ___

2) 11 - 2 - 4 = ___

3) 15 - 4 - 7 = ___

4) 18 - 5 - 2 = ___

5) 20 - 1 - 9 = ___

6) 30 - 10 - 10 = ___

7) 50 - 10 - 10 = ___

8) 40ml - 10ml - 10ml = ___

9) 60ml - 10ml - 10ml = ___

10) 100L - 10L - 10L = ___

Multiples of 1, 2, 5 and 10

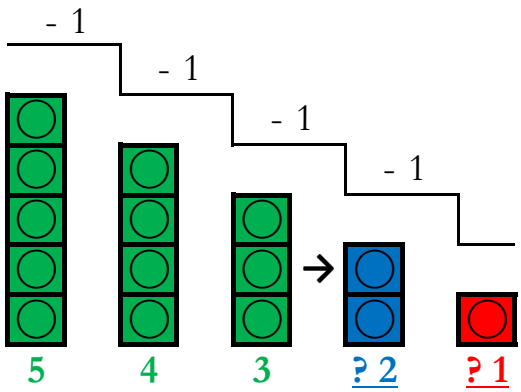
In the **number pattern** below, find the next two missing numbers.

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, ___, ___

2) 10, 9, 8, ___, ___

3) 8, 7, 6, ___, ___

4) 19, 18, 17, ___, ___

5) 10, 8, 6, ___, ___

6) 12, 10, 8, ___, ___

7) 20, 18, 16, ___, ___

8) 30, 28, 26, ___, ___

9) 25, 20, 15, ___, ___

10) 30, 25, 20, ___, ___

11) 40, 45, 50, ___, ___

12) 50, 40, 30, ___, ___

13) 40, 30, 20, ___, ___

14) 120, 110, 100, ___, ___

Doubling

1) 3 - 1 - 1 = ?

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

Strategy Applied

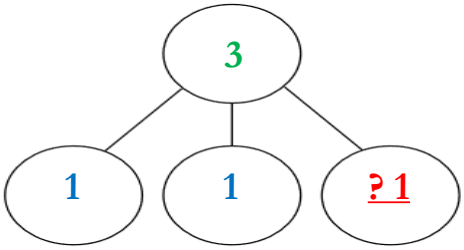
First, pick up **three** objects and place them together.
Now count aloud to check there are only **three** objects; **one**, **two, three.**

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

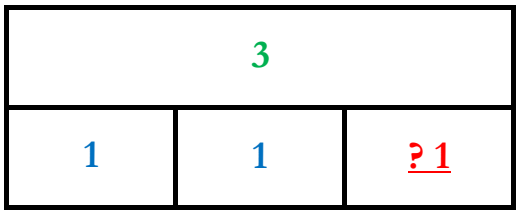
Next, count **altogether** how many objects are **left**.
Whilst touching each object **count forwards** aloud in number order, saying one number name per object; **one**.

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

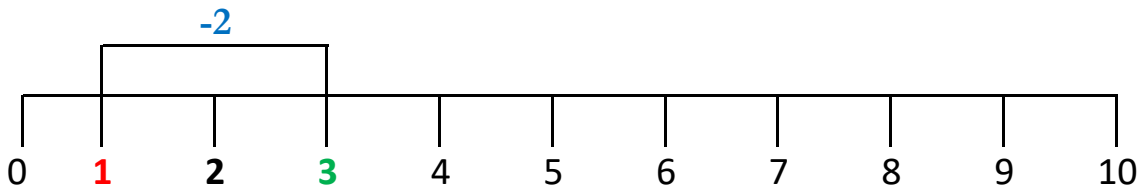
Part Whole Model



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 = ___

2) 4 - 1 - 1 = ___

3) 5 - 2 - 2 = ___

4) 6 - 2 - 2 = ___

5) 7 - 2 - 2 = ___

6) 8 - 3 - 3 = ___

7) 9 - 3 - 3 = ___

8) 10 - 3 - 3 = ___

9) 11 - 4 - 4 = ___

10) 12 - 4 - 4 = ___

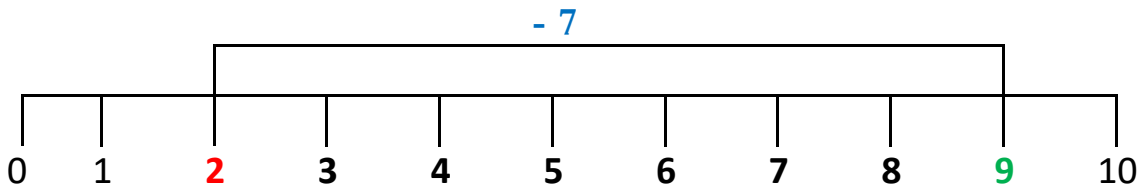
Find The Missing Number

1) 9 - ? = 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.

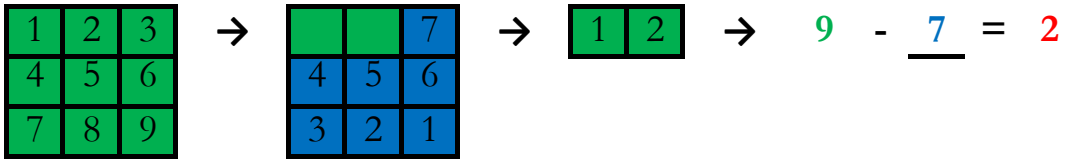
Then, **count backwards** seven less aloud in number order, whilst touching the numbers on the number line.

Next, the number counted back to should be two.

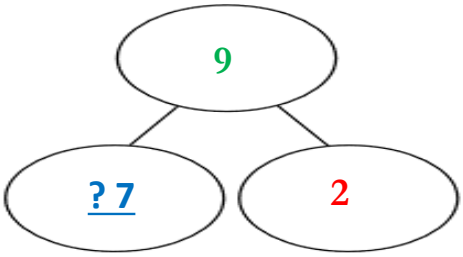
Finally, nine subtract seven equals two.

Concrete Object

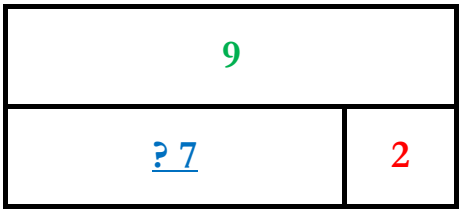
First → Then → Next → Finally



Part Whole Model



Bar Model



Test Questions

1) 9 - ___ = 2

2) 6 - ___ = 6

3) 10 - ___ = 2

4) 10 - ___ = 10

5) 13 - ___ = 8

6) 16 - ___ = 6

7) 26 - ___ = 6

8) 30 - ___ = 10

9) ___ - 2 = 7

10) ___ - 4 = 6

11) ___ - 10 = 7

12) ___ - 1 = 19

13) ___ - 40 = 7

14) ___ - 31 = 19

Find The Missing Number

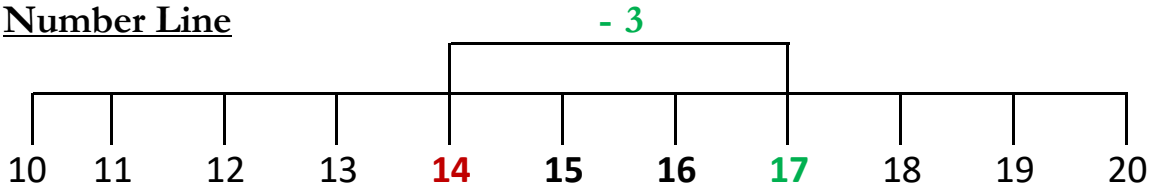
1) 17 - 3 = ? - 2

Word Problem

17 - 3 is **equal to** or the **same value** as ? - 2

or ? - 2 is **equal to** or the **same value** as 17 - 3

Number Line



Step 1

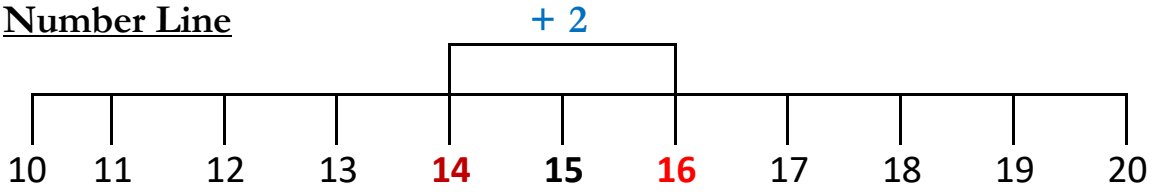
Out of the two **number sentences**, calculate the number sentence with all the **known** numbers first which is, 17 - 3 .

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 ? - 2 = 14 , as they are the **same value**

Use the **inverse** of subtraction, which is addition, 14 + 2 = ? .

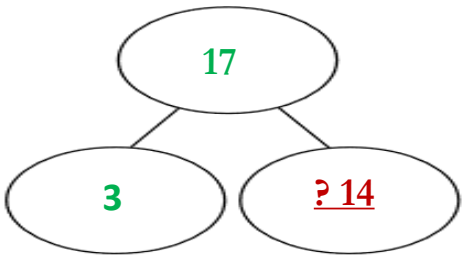
Secondly, find and touch the number **fourteen** on a number line.

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

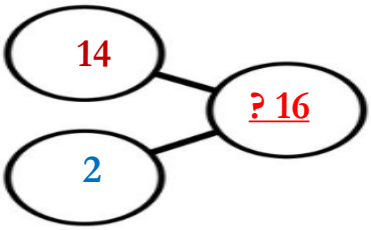
Next, the number counted on to should be **sixteen**.

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

Part Whole Model



Part Whole Model



Test Questions

1) 17 - 3 = ___ - 2

2) 20 - 5 = ___ - 4

3) 18 - ___ = 6 + 5

4) 24 - ___ = 3 + 12

5) 19 - ___ = 6 + 5

6) 15 - ___ - 6 = 6

7) 18 - ___ - 4 = 12

8) 11 - 4 + 2 = ___

9) 13 - 2 + 5 = ___

10) 27 - 6 + 5 = ___

11) 24 - ___ + 7 = 17

12) 13 - 10 - 3 = ___

13) 45 - 6 - ___ = 31

14) 70 - 10 + 10 + 10 = ___

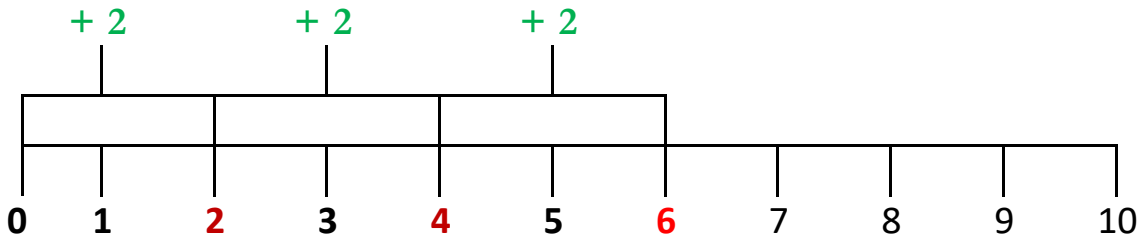
Repeated Addition

1) 2 x 3 = ?

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.

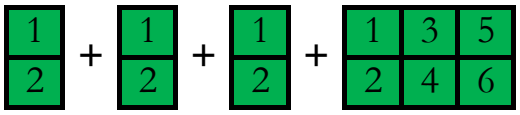
Then, **count forwards** two more aloud in number order, whilst touching the numbers on the number line, on to the number **two**.

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

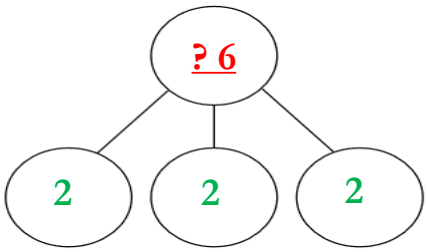


2 + 2 + 2 = ? 6

Column Addition

1s
2
2
+ 2
6

Part Whole Model



Bar Model

2	2	2
? 6		

Test Questions

1) 2 x 3 = ___

2) 2 x 4 = ___

3) 2 x 5 = ___

4) 2 x 8 = ___

5) 5 x 3 = ___

6) 5 x 4 = ___

7) 5 x 6 = ___

8) 10 x 2 = ___

9) 10 x 3 = ___

10) 10 x 5 = ___

11) ___ = 2 x 7

12) ___ = 2 x 9

13) ___ = 5 x 8

14) ___ = 10 x 8

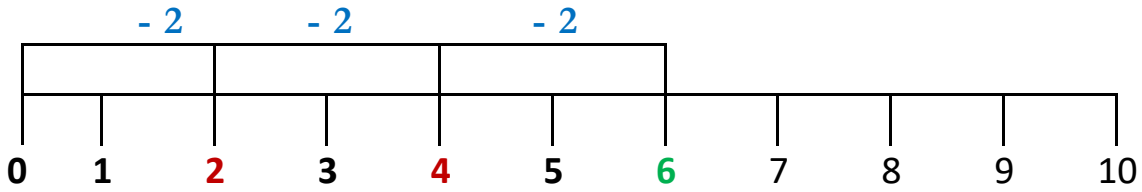
Repeated Subtraction

1) 6 ÷ 2 = ?

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.

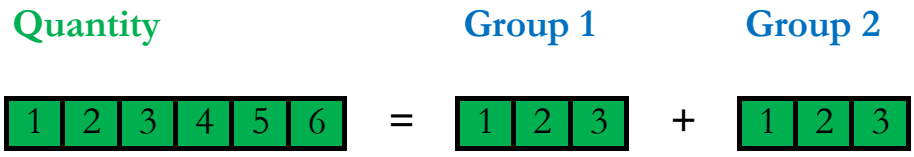
Then, **count backwards** two less aloud in number order, whilst touching the numbers on the number line, back to the number **four**.

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

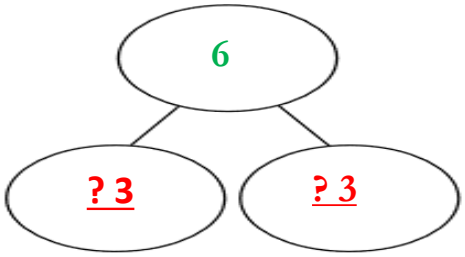
Then, **count backwards** two less aloud in number order, whilst touching the numbers on the number line, back to the number **zero**.

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

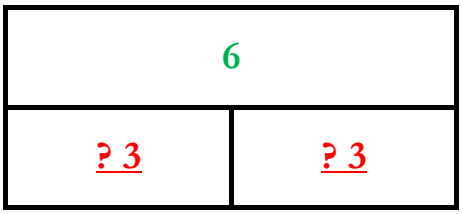
Concrete Object



Part Whole Model



Bar Model



Test Questions

1) 6 ÷ 2 = ___

2) 8 ÷ 2 = ___

3) 10 ÷ 2 = ___

4) 12 ÷ 2 = ___

5) 18 ÷ 2 = ___

6) 10 ÷ 5 = ___

7) 15 ÷ 5 = ___

8) 20 ÷ 5 = ___

9) 30 ÷ 10 = ___

10) 50 ÷ 10 = ___

11) ___ = 16 ÷ 2

12) ___ = 24 ÷ 2

13) ___ = 40 ÷ 5

14) ___ = 80 ÷ 10

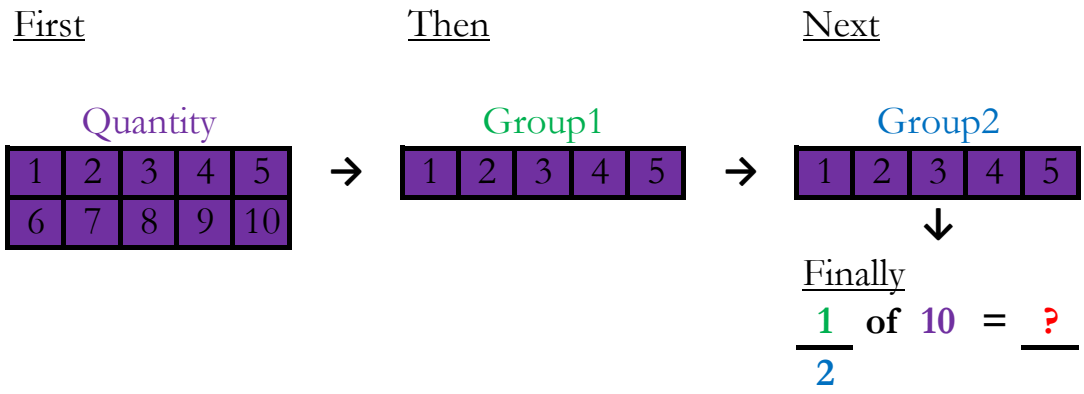
Fraction of a Quantity

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

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**.

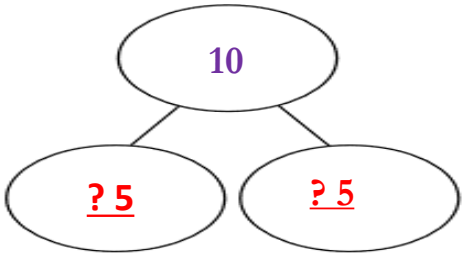
First, pick up **ten** objects and place them together. Now count aloud to check there are only **ten** objects; **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8**, **9**, **10**.

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.

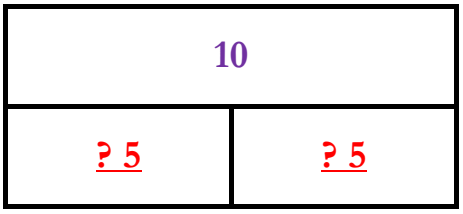
Next, count how many objects there are **altogether** in **one** **group**, there should be five objects; **one, two, three, four, five.**

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

P. 20	P. 22	P. 24	P. 26	P. 28	P. 30
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

P. 32	P. 34	P. 36	P. 38	P. 40	P. 42
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 ⅔ 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 ÷ 3, 15 is the dividend.

Divisor is the number by which another is divided. e.g. In the calculation 30 ÷ 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 ⅔, 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 ÷ 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 × 3 = 6.

Quotient is the result of a division. e.g. 46 ÷ 3 = 15⅓ and 15⅓ 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 ÷ 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 x 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 ÷ 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 x 4.

Total Value is the sum to a calculation.

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