Year 4

Arithmetic

Workbook

by Richard Brown

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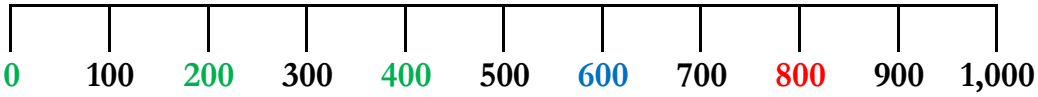
Key Language and Representations

Word Problems are the arithmetic number sentences written in a real-life reasoning and problem solving scenario.

Concrete Objects are manipulated or handled to calculate and represent a number sentence i.e. counters, multilink cubes, fraction tiles, metric rulers.

e.g. 2,000 + 3,000 = 5,000

Metric Ruler used to count forwards e.g. 0, 6, 12, 18, 24, 30 and also to count backwards e.g. 54, 45, 36, 27, 18, 9.



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

	100s	10s	1s
	4	2	0
	2	3	0
+	1	4	0
	7	9	0

	1,000s	100s	10s	1s
	5,000	200	70	4
	2,000	100	50	8
+	7,000	400	30	2
		100	10	

	1,000s	100s	10s	1s
	6	3	8	5
	1	2	4	7
+	7	6	3	2
		1	1	

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

	10s	1s
	1	5
-		4
	1	1

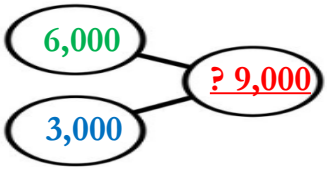
	1,000s	100s	10s	1s
	4,000		70	
	~~5,000~~	^{1}700	~~80~~	^{1}5
-	2,000	900	40	6
	2,000	800	30	9

	1,000s	100s	10s	1s
		5	9	
	9	~~6~~	^{1}~~0~~	^{1}4
-		3	9	4
	9	2	0	6

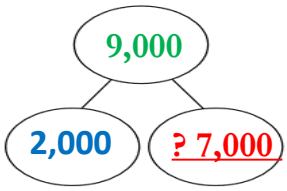
Strategy Applied refers to when a formal written method is used to calculate a number sentence e.g. 30,250 - 5,000 = 25,250
Explained using appropriate mathematical language, proven using concrete objects that can be handled, shown with pictorial representations visualising the calculations, to ensure a greater understanding of a mathematical concept.

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

e.g. 6,000 + 3,000 = ? 9,000



e.g. 9,000 - 2,000 = ? 7,000



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

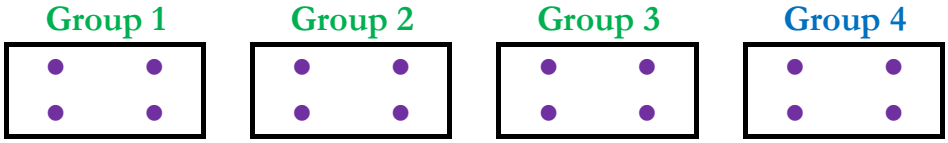
e.g. 3,000 + 9,000 = ? 12,000

e.g. 20,000 - 2,000 = ? 18,000

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

$\frac{3}{4}$ of 1,600 = 1,200

- **represents the value of 100**



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

Decimal Number Grid

0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9
3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9
4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9
5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9
6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9
7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9
8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9
9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9
10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9
11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9
12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9
13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9
14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9
15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9

Fraction Walls

1 Whole															
$\frac{1}{2}$								$\frac{1}{2}$							
$\frac{1}{4}$				$\frac{1}{4}$				$\frac{1}{4}$				$\frac{1}{4}$			
$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$	
$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$

1 Whole					
$\frac{1}{2}$				$\frac{1}{2}$	
$\frac{1}{3}$		$\frac{1}{3}$		$\frac{1}{3}$	
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

1 Whole																			
$\frac{1}{2}$										$\frac{1}{2}$									
$\frac{1}{5}$				$\frac{1}{5}$				$\frac{1}{5}$				$\frac{1}{5}$				$\frac{1}{5}$			
$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$	
$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$

How Many

How many **1,000s** (thousands), **100s** (hundreds), **10s** (tens), **1s** (ones), **10ths** (tenths) and **100ths** (hundredths) are there in the number **1,234.56**?

1) 1 2 3 4 . 5 6 = ___

Word Problem

The number **one thousand, two hundred and thirty four point five six** is a **6-digit decimal number**.
The **digits** represent the following **column place values** the **1,000s**, **100s**, **10s**, **1s**, **10ths** and **100ths**.
Work out how many **1,000s**, **100s**, **10s, 1s, 10ths** and **100ths**, there are in each **column**.

Strategy Applied

On a **Place Value Grid** show the number **one thousand, two hundred and thirty four point five six**.

1 represents how many **thousands** in the **1,000s** column place value.
2 represents how many **hundreds** in the **100s** column place value.
3 represents how many **tens** in the **10s** column place value.
4 represents how many **ones** in the **1s** column place value.
5 represents how many **tenths** in the **10ths** column place value.
6 represents how many **hundredths** in the **100ths** column place value.

First, write 1 in the **1,000s** column, the amount of **thousands**.
Then, write 2 in the **100s** column, the amount of **hundreds**.
Next, write 3 in the **10s** column, the amount of **tens**.
Then, write 4 in the **1s** column, the amount of **ones**.
Next, write 5 in the **10ths** column, the amount of **tenths**.
Then, write 6 in the **100ths** column, the amount of **hundredths**.
Finally, there are 1 **thousands**, 2 **hundreds**, 3 **tens**, 4 **ones**, 5 **tenths** and 6 **hundredths**.

Place Value Grid

1000s	100s	10s	1s	.	10ths	100ths
1	2	3	4	.	5	6

Test Questions

How many **1,000s** (thousands), **100s** (hundreds), **10s** (tens), **1s** (ones), **10ths** (tenths) and **100ths** (hundredths) in each number?

1) 1,234.56 = ___

2) 1,246.19 = ___

3) 2,179.83 = ___

4) 3,537.74 = ___

5) 4,068.61 = ___

6) 5,379.02 = ___

7) 6,513.93 = ___

8) 7,215.48 = ___

9) 8,346.57 = ___

10) 9,537.20 = ___

Digit Value

What is the digit value of the **1,000s** (thousands), **100s** (hundreds), **10s** (tens), **1s** (ones), **10ths** (tenths) and **100th**s (hundredths) in the number **1,234.56**?

1) **1 2 3 4 . 5 6 = ___**

Word Problem

The number **one thousand, two hundred and thirty four point five six** is a **6-digit decimal number**.
Each **digit** represents the **1s**, **10s**, **100s** and **1,000s column place values**.
What is the **digit value** of **each digit** in the number **one thousand and two hundred and thirty four point five six**?

Strategy Applied

On a **Place Value Grid** show the number **one thousand, two hundred and thirty four**.
The **6** represents the digit value of the **hundredths** in the **100ths** column.
The **5** represents the digit value of the **tenths** in the **10ths** column.
The **4** represents the digit value of the **ones** in the **1s** column.
The **3** represents the digit value of the **tens** in the **10s** column.
The **2** represents the digit value of the **hundreds** in the **100s** column.
The **1** represents the digit value of the **thousands** in the **1,000s** column.

First, write **0.06** in the **100ths** column, the value of the **hundredths**.
Then, write **0.5** in the **10ths** column, the value of the **tenths**.
Next, write **4** in the **1s** column, the value of the **ones**.
Then, write **30** in the **10s** column, the value of the **tens**.
Next, write **200** in the **100s** column, the value of the **hundreds**.
Then, write **1,000** in the **1,000s** column, the value of the **thousands**.
Finally, the **Place Value Grid shows** the digit value of each of the digits as
1,000 200, 30, 4, 0.5, 0.06,

Place Value Grid

1000s	100s	10s	1s	.	10ths	100ths
1,000	200	30	4	.	0.5	0.06

Test Questions

What is the digit value of the **1,000s** (thousands), **100s** (hundreds), **10s** (tens), **1s** (ones), **10ths** (tenths) and **100ths** (hundredths) in each number?

1) 1,234.56 = ___

2) 1,246.19 = ___

3) 2,179.83 = ___

4) 3,537.74 = ___

5) 4,068.61 = ___

6) 5,379.02 = ___

7) 6,513.93 = ___

8) 7,215.48 = ___

9) 8,346.57 = ___

10) 9,537.20 = ___

1,000 more

1) 1,750 + 1,000 = ?

Word Problem

Susan is thinking of a number. Her number is **one thousand** **more than** **one thousand, seven hundred and fifty**.
What is her number**?**

Partitioning

1,	0	0	0	+	1,	0	0	0	=	2,	0	0	0	
	7	0	0	+				0	=		7	0	0	
		5	0	+				0	=			5	0	
			0	+				0	=				0	+
										2,	7	5	0	

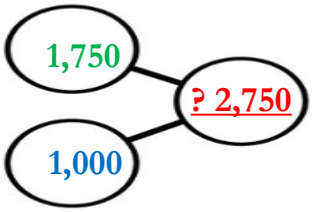
Column Addition

1,000s	100s	10s	1s
1	7	5	0
+ 1	0	0	0
2,	7	5	0

Strategy Applied

Partition both numbers into **1,000s**, **100s**, **10s**, **1s** and add together their relative **digit values**.
1,750 = 1,000 + 700 + 50 + 0 and 1,000 = 1,000 + 0 + 0 + 0.
First, add the **1,000s** digit values of **one thousand** and **one thousand**, equal to **two thousand**.
Then, add the **100s** digit values of **seven hundred** and **zero**, equal to **seven hundred**.
Next, add the **10s** digit values of **fifty** and **zero**, equal to **fifty**.
Then, add the **1s** digit values of **zero** and **zero**, equal to **zero**.
Next, use column addition to add the values of 2,000+700+50+0=2,750.
Finally, 1,750 plus 1,000 equals 2,750.

Part Whole Model



Bar Model

1,750	1,000
? 2,750	

Test Questions

1) 1,750 + 1,000 = ___

2) 2,559 + 1,000 = ___

3) 3,699 + 1,000 = ___

4) 4,455 + 1,000 = ___

5) 5,308 + 1,000 = ___

6) 6,700 + 1,000 = ___

7) 7,619 + 1,000 = ___

8) 8,591 + 1,000 = ___

9) 9,455 + 1,000 = ___

10) 9,309 + 1,000 = ___

11) 1,000 + 309 = ___

12) 1,000 + 455 = ___

13) 1,000 + 591 = ___

14) 1,000 + 710 = ___

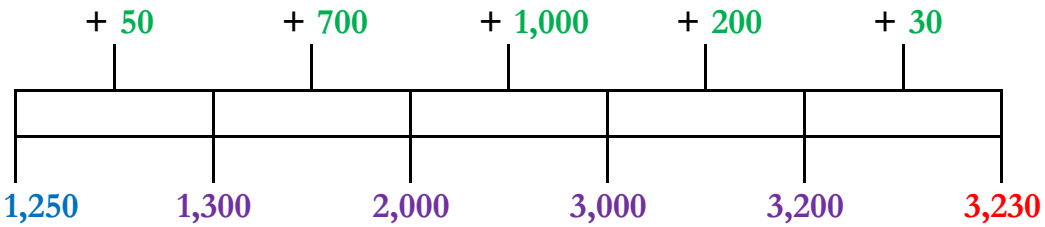
More Than 1,000

1) ? + 1,250 = 3,230

Word Problem

London to Warsaw is **three thousand, two hundred and thirty** miles.
Paris to Warsaw is **one thousand, two hundred and fifty** miles.
What is the **distance** from London to Paris**?**

Number Line



Strategy Applied

A number grid or a ruler can be used to **count on**.
First, draw a number line and write **one thousand, two hundred and fifty** at the start and **three thousand, two hundred and thirty** at the end.
Then, from **1,250** count on in **10s** to the next **multiple of 100s**, 1,260, 1,270, 1,280, 1,290, **1,300** equal to **fifty**.
Next, from **1,300** count on in **100s** to the next **multiple of 1,000s**, 1,400, 1,500, 1,600, 1,700, 1,800, 1,900, **2,000** equal to **seven hundred**.
Then, from **2,000** count on in **1,000s** to the next **multiple of 1,000s**, **3,000** equal to **one thousand**.
Next, from **3,000** count on in **100s** to the **multiple of 100s** before **3,230**, 3,100, **3,200** equal to **two hundred**.
Then, from **3,200** count on in **10s** on to **3,230**, 3,210, 3,220, **3230**, equal to **thirty**.
Next, add from **largest to smallest** the amounts that were counted on**,** **1,000** and **700** and **200** and **50** and **30**.
Finally, the missing number is **1,980**.

Column Addition

$$\begin{array}{rrrrr} & 1 & 0 & 0 & 0 \\ & & 7 & 0 & 0 \\ & & 2 & 0 & 0 \\ & & & 5 & 0 \\ + & & & 3 & 0 \\ \hline & 1, & 9 & 8 & 0 \end{array}$$

Test Questions

1) ___ + 1,250 = 3,230

2) ___ + 2,230 = 4,700

3) ___ + 3,500 = 5,650

4) ___ + 4,190 = 6,280

5) ___ + 5,250 = 7,800

6) 420 + ___ = 2,600

7) 350 + ___ = 3,680

8) 220 + ___ = 4,550

9) 200 + ___ = 5,580

10) 640 + ___ = 6,850

11) 2,200 + 3,520 = ___

12) 3,050 + 1,000 = ___

13) 2,800 + 1,190 = ___

14) 4,040 + 5,700 = ___

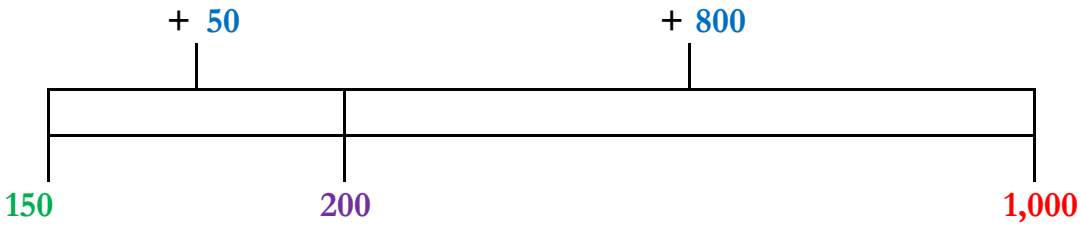
Bonds to 1,000

1) 150 + ? = 1,000

Word Problem

A Charity Shop has raised **one hundred and fifty** pounds in donations.
The **total amount** to be raised is **one thousand** pounds.
How much more money is needed to be raised**?**

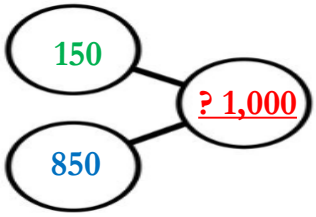
Number Line



Strategy Applied

Number bonds to 1,000, means two or more numbers added together that make the number **1,000**.
First, draw a number line and write **one hundred and fifty** at the start and **one thousand** at the end.
Then, from **150** count on in **10s** to the next **multiple of 100s**, 160, 170, 180, 190, **200** equal to **fifty**.
Next, from **200** count on in **100s** up to **one thousand**, 300, 400, 500, 600, 700, 800, 900, **1,000** equal to **800**.
Then, add from **largest to smallest** the amounts counted on **800** and **50**, equal to **850**.
Finally, the **value** of the missing number is **eight hundred and fifty**.

Part Whole Model



Bar Model

150	? 850
1,000	

Test Questions

1) 150 + ___ = 1,000

2) 240 + ___ = 1,000

3) 360 + ___ = 1,000

4) 480 + ___ = 1,000

5) ___ + 190p = 1000p

6) ___ + 270p = 1000p

7) ___ + £300 = £1,000

8) ___ + £500 = £1,000

9) ___ + 100 = 1,000

10) ___ + 720 = 1,000

11) ___ + 250 = 1,000

12) ___ + 570 = 1,000

13) ___ + 480 = 1,000

14) ___ + 650 = 1,000

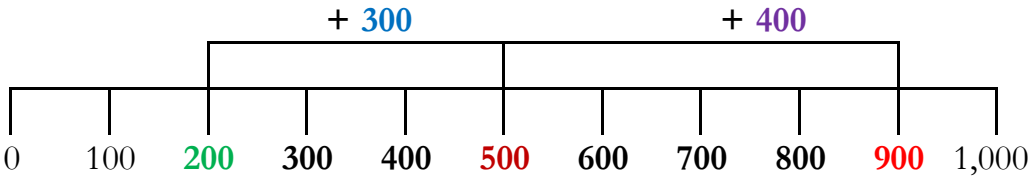
Multiple Numbers

1) 200 + 300 + 400 = ?

Word Problem

Three children raise money for a Homeless Charity. **Child A** raised £200, **Child B** raised £300 and **Child C** raised £400.
What is the **total amount** of money raised by all three children?

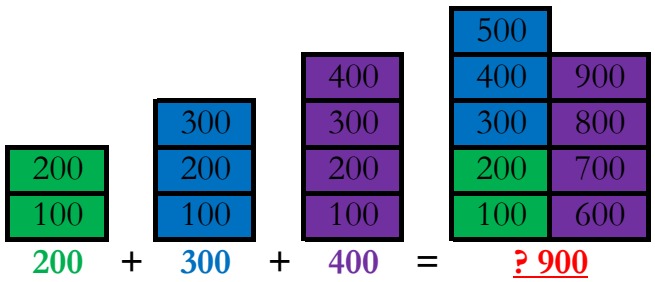
Number Line



Strategy Applied

First, find and touch the number **two hundred** on the number line.
Then, **count forwards** 300 more in **multiples of 100s**, 300, 400, **500** aloud in number order, whilst touching the numbers on the number line.
Next, the number counted on to should be **five hundred**.
Then, **count forwards** 400 more in multiples of **100s**, 600, 700, 800, **900** aloud in number order, whilst touching the numbers on the number line.
Next, the number counted on to should be **nine hundred**.
Finally, 200 plus 300 plus 400 equals 900.

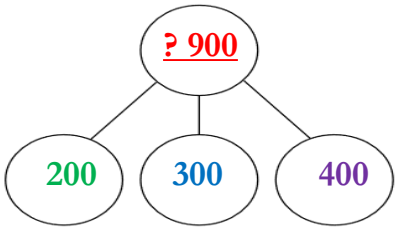
Concrete Object



Column Addition

100s	10s	1s
2	0	0
3	0	0
+ 4	0	0
9	0	0

Part Whole Model



Bar Model

200	300	400
? 900		

Test Questions

1) 200 + 300 + 400 = ___

2) 900 + 800 + 700 = ___

3) 600 + 300 + 300 = ___

4) 300 + 3,000 + 300 = ___

5) 1,000 + 4,000 + 2,000 = ___

6) 2,000 + 3,000 + 5,000 = ___

7) 100p + 500p + 200p = ___

8) £400 + £500 + £900 = ___

9) 200cm + 400cm + 300cm = ___

10) 400m + 500m + 600m = ___

11) ___ = 700 + 900 + 600

12) ___ = 1,500 + 1,500 + 1,500

13) ___ = 900 + 900 + 700

14) ___ = 6,000 + 2,000 + 1,000

Multiples of 6, 7, 9, 25, 100

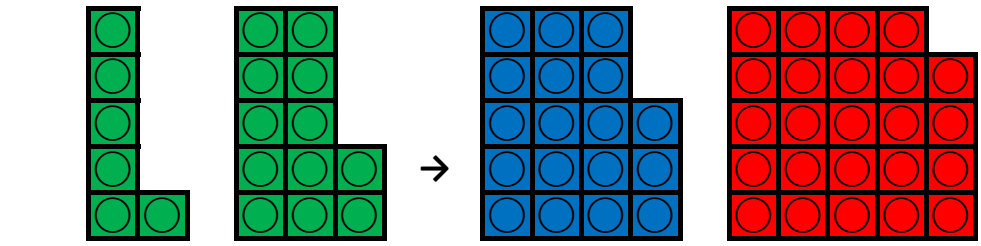
In the **number pattern** below, find the next two missing **terms**.

1) **0, 6, 12, ?, ?**

Word Problem

Lee uses objects to make the **number pattern** of **zero**, **six** and **twelve**.
What will be the next two **terms** in the number pattern**?**

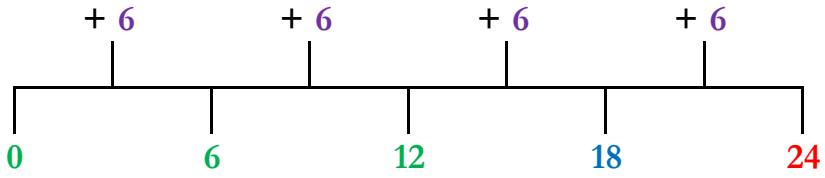
Concrete Object



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 **zero** to **six** equalling **six**, the rule is **+6**.
Then, count forwards from **six** to **twelve** equalling **six**, the rule is **+6**.
The rule is **+6** (**count on six**) to each of the numbers in the number pattern.
Continue this number pattern to find the next two missing numbers.
Next, find **twelve** on the number line and count on **six** more, equal to **eighteen**.
Then, find **eighteen** on the number line and count on **six** more, equal to **twenty four**.
Finally, the next two missing terms in the number pattern are **eighteen** and **twenty four**.

Metric Ruler



Test Questions

1) 0, 6, 12, ___, ___

2) 24, 30, 36, ___, ___

3) 40, 46, 52, ___, ___

4) 0, 7, 14, ___, ___

5) 28, 35, 42, ___, ___

6) 50, 57, 64, ___, ___

7) 0, 9, 18, ___, ___

8) 36, 45, 54, ___, ___

9) 10, 19, 28, ___, ___

10) 0, 25, 50, ___, ___

11) 20, 45, 70, ___, ___

12) 100, 125, 150, ___, ___

13) 15, 115, 215, ___, ___

14) 383, 483, 583, ___, ___

Decimals

1) 2.1 + 1.8 = ?

Word Problem

Mr. Ben and Dr. Barrie are playing guess my **number**.
The **number** is **one point eight** **more than** **two point one**.

Partitioning

$$2.0 + 1.0 = 3.0$$
$$0.1 + 0.8 = 0.9 +$$
$$3.9$$

Column Addition

	1s	10ths
	2	. 1
+	1	. 8
	3	. 9

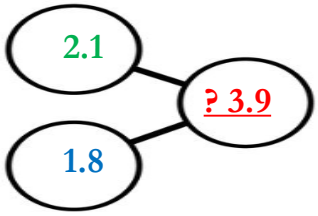
Strategy Applied

Partition both numbers into **1s**, **10ths** and add together their relative **digit values**.
2.1 = 2.0 + 0.1 and 1.8 = 1.0 + 0.8.
First, add the **1s** place values of **two** and **one**, which is equal to **three**.
Then, add the **10ths** place values of **zero point one** and **zero point eight**, which is equal to **zero point nine**.
Next, use column addition to add the values of **3.0** + **0.9** = **3.9**.
Finally, **2.1** plus **1.8** is equal to **3.9**.

Decimal Number Grid

2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9
3.0	3.1 →	3.2	3.3	3.4	3.5	3.6	3.7	3.8 →	3.9

Part Whole Model



Bar Model

2.1	1.8
? 3.9	

Test Questions

1) 2.1 + 1.8 = ___

2) 1.3 + 2.5 = ___

3) 2.6 + 6.3 = ___

4) 7.5 + 1.4 = ___

5) 6.2 + 1.7 = ___

6) 4.7 + 2.1 = ___

7) 3.7 + 4.4 = ___

8) 6.1 + 3.9 = ___

9) 1.9 + 8.1 = ___

10) 3.6 + 3.2 = ___

11) ___ = 5.4 + 2.2

12) ___ = 6.7 + 3.3

13) ___ = 5.5 + 1.7

14) ___ = 7.2 + 1.9

Column Addition

1) **3,835 + 2,246 = ?**

Step 1

	3	8	3	5
+	2	2	4	6
			8	1
			1	

Step 2

	3	8	3	5
+	2	2	4	6
		0	8	1
	1		1	

Step 3

	3	8	3	5
+	2	2	4	6
	6,	0	8	1
	1		1	

Strategy Applied

Step 1

First, in the **1s** column add **altogether**, 5 + 6, equals 11 **ones** (**10** + **1**).
Write **1** in the **total value** of the **1s** column.
Exchange/Regroup the **10 ones** into **1 ten** the from the **1s** column to the **10s** column and write **1 ten** below the **total value line** of the **10s** column.
Then, in the **10s** column add **altogether**, 3 + 4 + **1**, equals 8 **tens** (**80**).
Write **8** in the **total value** of the **10s** column.

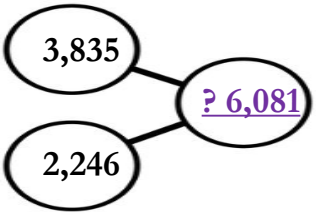
Step 2

Next, in the **100s** column add **altogether**, 8 + 2, equals 10 **hundreds** (**1,000** + **0**).
Write **0** in the **total value** of the **100s** columns.
Exchange/Regroup the **10 hundreds** into **1 thousand** from the **100s** column to the **1,000s** column and write **1 thousand** below the **total value line** of the **1,000s** column.

Step 3

Finally, in the **1,000s** column add **altogether**, 3 + 2 + **1**, equals 6 **thousands** (**6,000**).
Write **6** in the **total value** of the **1,000s** column.
Total value is **6,081**.

Part Whole Model



Bar Model

3,835	2,246
? 6,081	

Test Questions

1) 3 8 3 5
+ 2 2 4 6

2) 4 1 3 7
+ 1 2 4 8

3) 4 1 3 5
2 1 3 7
+ 1 2 4 8

4) 8 2 5 7
+ 1 4 6 5

5) 5 2 7 9
+ 4 4 8 3

6) 7 3 4 0
1 5 6 9
+ 4 6 5

7) 7 3 4 0
+ 5 6 9

8) 3 2 6 0
+ 4 4 8

9) 5 2 7 9
5 4 8 3
4 3 0 4
+ 2 5 6 8

10) 5 3 0 4
+ 2 5 6 8

11) 6 2 0 6
+ 1 4 8 7

12) 3 9 3 8
+ 2 4 4 8

13) 4 5 2 7
+ 2 9 3 8

14) 6 2 8 9
5 6 8 4
5 3 0 4
+ 1 5 6 9

Column Addition with Decimals

1) 48.53 + 25.71 = ?

Step 1

	4	8	.	5	3
+	2	5	.	7	1
			.		4

Step 2

	4	8	.	5	3
+	2	5	.	7	1
			.	2	4
		1			

Step 3

	4	8	.	5	3
+	2	5	.	7	1
		4	.	2	4
	1	1			

Step 4

	4	8	.	5	3
+	2	5	.	7	1
	7	4	.	2	4
	1	1			

Strategy Applied

Step 1

First, in the **100ths** column add **altogether**, 3 + 1, equals 4 **hundredths** (**0.04**).

Step 2

Then, in the **10ths** column add **altogether**, 5 + 7, equals 12 **tenths** (**1** + **0.2**).
Write **2** in the **total value** of the **10ths** column.
Exchange/Regroup the **10 tenths** into **1 one** from the 10ths column to the **1s** column and write **1 one** below the **total value line** of the **1s column**.

Step 3

Next, in the **1s** column add **altogether**, 8 + 5 + **1**, equals 14 **ones** (**10** + **4**).
Write **4** in the **total value** of the **1s** column.
Exchange/Regroup the **10 ones** into **1 ten** from the 1s column to the **10s** column write **1 ten** below the **total value line** of the **10s** column.

Step 4

Finally, in the **10s** column add **altogether**, 4 + 2 + **1**, equals 7 **tens** (**70**).
Write **7** in the **total value** of the **1s** column.
Total Value is **74.24**.

Part Whole Model

Bar Model

48.53	25.71
? 74.24	

Test Questions

1) 48.53 + 25.71 = .

2) 38.37 + 24.48 = .

3) 45.31 + 27.31 + 18.42 = .

4) 47.57 + 38.65 = .

5) 45.79 + 28.83 = .

6) 70.43 + 19.65 + 5.64 = .

7) 89.40 + 63.69 = .

8) 54.60 + 36.48 = .

9) 59.72 + 53.84 + 44.03 + 28.65 = .

10) 60.04 + 48.68 = .

11) 50.06 + 36.87 = .

12) 96.38 + 87.48 = .

13) 13.27 + 9.38 = .

14) 69.82 + 54.86 + 54.03 + 19.65 = .

Find the Missing Number

1) **7942cm + 379cm = ? cm + 7,021cm**

Strategy Applied

Step 1

First, add up the **known number sentence**, which is **7942cm** + **379cm**.

Then, in the **1s** column add **altogether**, 2 + 9, equals 11 **ones** (**10** + **1**).
Write **1** in the **total value** of the **1s** column.
Exchange/Regroup the **10 ones** into **1 ten** from the **1s** column to the **10s** column and write **1 ten** below the **total value line** of the **10s** column.

Next, in the **10s** column add **altogether**, 4 + 7 + **1**, equals 12 **tens** (**100** + **20**).
Write **2** in the **total value** of the **10s** column.
Exchange/Regroup the **10 tens** into **1 hundred** from the **10s** column to the **100s** column and write **1 hundred** below the **total value line** of the **100s** column.

Then, in the **100s** column add **altogether**, 9 + 3 + **1**, equals 13 **hundreds** (**1000** + **300**).
Write **3** in the **total value** of the **100s** column.
Exchange/Regroup the **10 hundreds** into **1 thousand** from the **100s** column to the **1,000s** column and write **1 thousand** below the **total value line** of the **1,000s** column.
In the **1,000s** column add **altogether**, 7 + **1**, equals 8 **thousands** (**800**).

Finally write **8** in the **total value** of the **1,000s** column.
Total value is **8,321**.

	7	9	4	2
+		3	7	9
	8,	3	2	1
	1	1	1	

Step 2

New known fact **8321cm = ? cm + 7,021cm** .

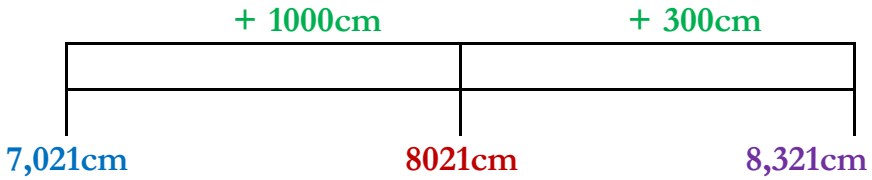
The value of the **10s** and **1s** in **8,321** and **7,021** are the same, **21**.

First, **count on** in **1,000s**, **7,021cm** on to **8,021cm**, equal to **1,000cm**.

Then, **count on** in **100s**, **8,021cm** up to **8,321cm**, equal to **300cm**.

Finally, add the amounts counted on **1,000cm** and **300cm**, equals **1,300cm**.

Number Line



Test Questions

1) 7,942cm + 379cm = ___ cm + 7,021cm

2) 379 + 2742 = 479 + ___

3) £2.45 + £1.75 = ___

4) £8.56 + 208 pence + 75 pence = ___

5) 1 hour 23 mins + ___ = 3 hours

6) 1 metre + 350 centimetres = ___

7) 3 litres = ___ ml + 1257 ml

8) 4,500 + 776 + 95 = ___

9) 0.36 + ___ = 1

10) 18 + 6 + 6 = ___

11) 28 + 7 + 7 = ___

12) 63 + 9 + 9 = ___

13) 250 + 25 + 25 = ___

14) 375 + 25 + 25 = ___

1,000 Less

1) 1,280 - 1,000 = ?

Word Problem

A road is **one thousand, two hundred and eighty** metres long.
Diane cycles **one thousand** metres along the road.
How much **further** to the end of the road**?**

Partitioning

1,	0	0	0	-	1,	0	0	0	=			0		
	2	0	0	-				0	=	2	0	0		
		8	0	-				0	=		8	0		
			0	-				0	=			0	+	
										2	8	0		

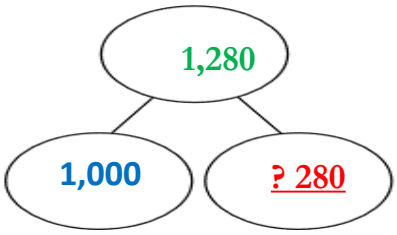
Column Subtraction

	1	2	8	0
-	1	0	0	0
	0	2	8	0

Strategy Applied

Partition both numbers into **1,000s**, **100s**, **10s**, **1s** and subtract their relative **digit values**.
1,280 = 1,000 + 200 + 80 + 0 and 1,000 = 1,000 + 0 + 0 + 0.
First, subtract the **1,000s** digit values of **one thousand** and **one thousand**, which is equal to **zero**.
Then, subtract the **100s** digit values of **two hundred** and **zero**, which is equal to **two hundred**.
Next, subtract the **10s** digit values of **eighty** and **zero**, which is equal to **eighty**.
Then, subtract the **1s** digit values of **zero** and **zero**, which is equal to **zero**.
Then, use column addition to add the values of **200** + **80** + **0** + **0** = **280**.
Finally, **1,280** minus **1,000** is equal to **280**.

Part Whole Model



Bar Model

1,280	
1,000	? 280

Test Questions

1) 1,280 - 1,000 = ___

2) 2,520 - 1,000 = ___

3) 3,489 - 1,000 = ___

4) 4,345 - 1,000 = ___

5) 5,250 - 1,000 = ___

6) 6,222 - 1,000 = ___

7) 7,340 - 1,000 = ___

8) 8,400 - 1,000 = ___

9) 9,690 - 1,000 = ___

10) 9,710 - 1,000 = ___

11) ___ = 1,210 - 1,000

12) ___ = 4,784 - 1,000

13) ___ = 7,969 - 1,000

14) ___ = 9,907 - 1,000

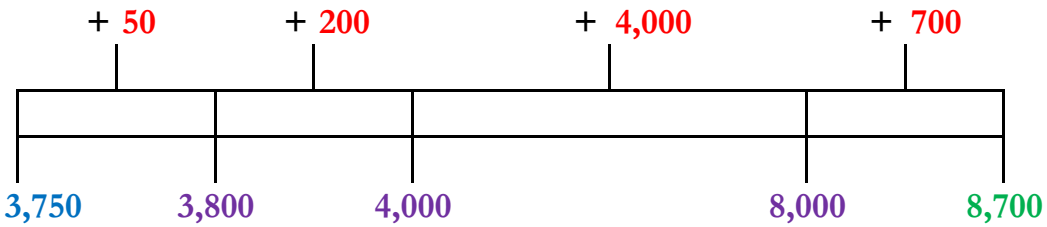
More Than 1,000

1) 8,700 - 3,750 = ?

Word Problem

My parents are thinking of buying a new car costing **eight thousand, seven hundred** pounds. They decide to buy a car that is **three thousand, seven hundred and fifty** pounds **cheaper**. What is the cost of the car?

Number Line



Strategy Applied

Use the **inverse** of subtraction, which is addition and **count on** from the **smallest** number to the **largest** number.

Use a ruler or number grid to help when counting on.

First, draw a number line and write **three thousand, seven hundred and fifty** at the start and **eight thousand, seven hundred** at the end.

Then, from **3,750** count on in **10s** to the next **multiple of 100s**, 3,760, 3,770, 3,780, 3,790, **3,800** equal to **fifty**.

Next, from **3,800** count on in **100s** to the next **multiple of 1,000s**, 3,900, **4,000** equal to **two hundred**.

Then, from **4,000** count on in **1,000s** to the **multiple of 1,000s** before **8,700**, 5,000, 6,000, 7,000, **8,000** equal to **four thousand**.

Next, from **8,000** count on in **100s** to **8,700**, 8,100, 8,200, 8,300, 8,400, 8,500, 8,600, **8,700** equal to **seven hundred**.

Next, add the amounts counted on from **largest** to **smallest**, **4,000** and **700** and **200** and **50**.

Finally, the missing number is **4,950**.

Column Addition

	1,000s	100s	10s	1s
	4	0	0	0
		7	0	0
		2	0	0
+			5	0
	4,	9	5	0

Test Questions

1) 8,700 - 3,750 = ___

2) 5,050 - 1,250 = ___

3) 7,220 - 2,100 = ___

4) 4,440 - 3,100 = ___

5) 2,700 - ___ = 280

6) 3,550 - ___ = 130

7) 6,400 - ___ = 270

8) 5,850 - ___ = 250

9) 9,740 - ___ = 320

10) 5,200 - ___ = 240

11) 2,050 - ___ = 500

12) 6,850 - ___ = 990

13) 2,040 - ___ = 500

14) 4,090 - ___ = 790

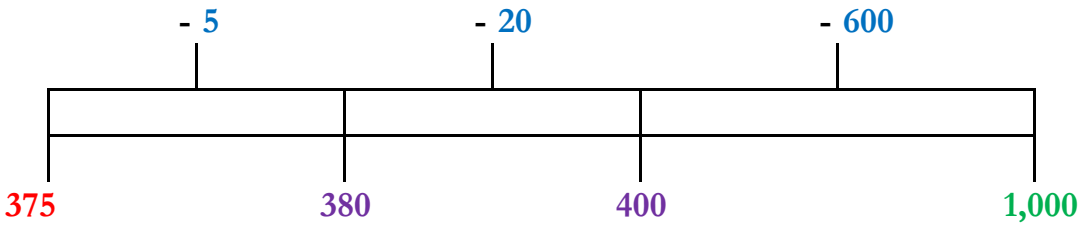
Bonds to 1,000

1) 1,000 - ? = 375

Word Problem

Rafique's missing number is the **difference** between **one thousand** and **three hundred and seventy five**.
What is his missing number**?**

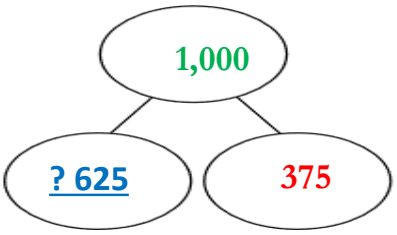
Number Line



Strategy Applied

Number bonds to 1,000, means two or more numbers added together that make the number **1,000**.
Use a ruler or number grid to help when counting on.
First, draw a number line and write **three hundred and seventy five**. at the start and **one thousand** at the end.
Then, from **1,000** count back in **100s** to the **multiple of 100s** before **375**, 900, 800, 700, 600, 500, **400** equal to **six hundred**.
Next, from **400** count back in **10s** to the **multiple of 10s** before **375**, 390, **380** equal to **twenty**.
Then, from **380** count back in **1s** back to **375**, 379, 378, 377, 376, **375** equal to **five**.
Next, add the amounts counted on from **largest** to **smallest**, **600** and **20** and **5** equal to **625**.
Finally, the missing number is **625**.

Part Whole Model



Bar Model

1,000	
? 625	375

Test Questions

1) 1,000 - ___ = 375

2) 1,000 - ___ = 135

3) 1,000 - ___ = 453

4) 1,000 - ___ = 500

5) 1,000 - ___ = 520

6) 1,000 - ___ = 135

7) 1,000 - ___ = 458

8) 1,000 - ___ = 600

9) 1,000 - ___ = 720

10) 1,000 - ___ = 457

11) 1,000 - ___ = 235

12) 1,000 - ___ = 184

13) 1,000 - ___ = 506

14) 1,000 - ___ = 368

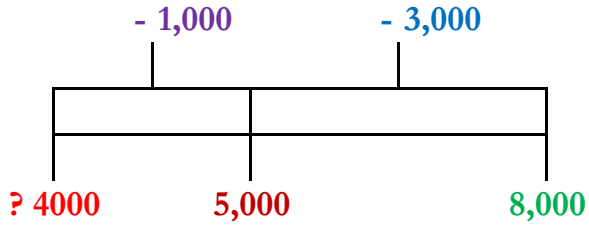
Multiple Numbers

1) 8,000 - 3,000 - 1,000 = ?

Word Problem

Eight thousand fans are seated at the Olympic Stadium. At **6pm three thousand** fans leave the stadium. It's **7.30pm** and **one thousand** more fans leave. How many fans are **left** in the stadium**?**

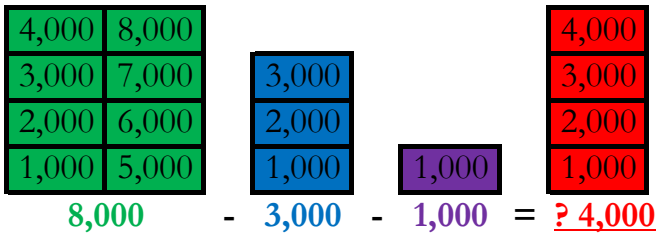
Number Line



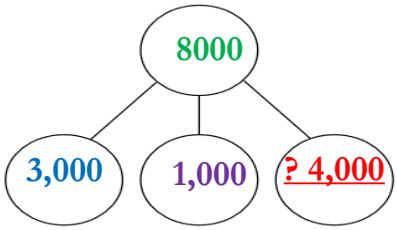
Strategy Applied

First, draw a number line and write a **?** at the start and eight thousand at the end.
First, find and touch the number **eight thousand** on the number line.
Then, **count backwards 3,000** less in **multiples of 1,000s**, 7,000, 6,000, **5,000** equal to **5,000**.
Next, the number counted back to should be **five thousand**.
Then, **count backwards 1,000** less in **multiples of 1,000s**, 4,000 equal to **4,000**.
Next, the number counted back to should be **four thousand**.
Finally, **8,000** subtract **3,000** subtract **1,000** equals **4,000**.

Concrete Object



Part Whole Model



Bar Model

8,000		
3,000	1,000	? 4,000

Test Questions

1) 8,000 - 3,000 - 1,000 = ___

2) 6,000 - 1,000 - 4,000 = ___

3) 4,000 - 3,000 - 300 = ___

4) 3,000 - 2,000 - 300 = ___

5) 7,000 - 5,000 - 100 = ___

6) 5,000 - 3,000 - 200 = ___

7) 5,000 - 1,000 - 200 = ___

8) 9,000 - 500 - 4,000 = ___

9) 4,000 - 2,100 - 300 = ___

10) 5,000 - 2,400 - 600 = ___

11) ___ = 1,700 - 900 - 60

12) ___ = 4,500 - 1,500 - 150

13) ___ = 3,900 - 900 - 70

14) ___ = 6,000 - 200 - 100

Multiples of 6, 7, 9, 25, 100

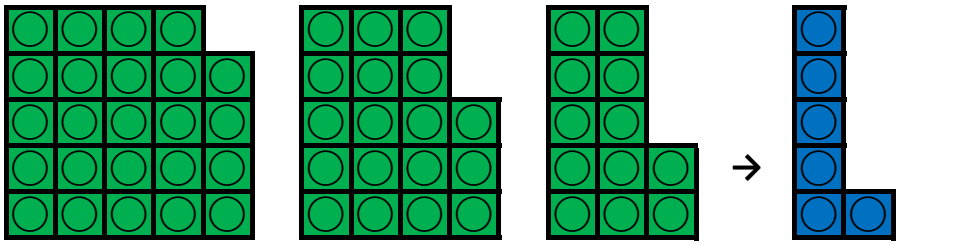
In the **number pattern** below, find the next two missing **terms**.

1) **24, 18, 12, ? ?**

Word Problem

David uses cubes to make the **number pattern** of **twenty four**, **eighteen** and **twelve**.
What are the next two missing **terms?**

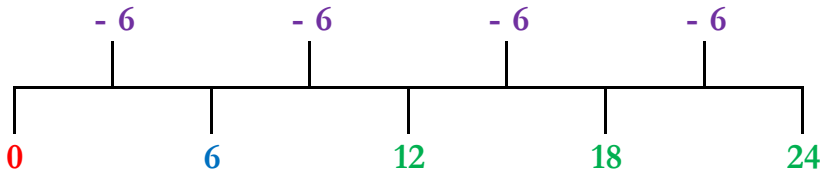
Concrete Object



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 **twenty four** to **eighteen** equalling **six**, the rule is **-6**.
Then, count backwards from **eighteen** to **twelve** equalling **six**, the rule is **-6**.
The rule is **-6** (**count back six)** each number in the number pattern.
Continue this number pattern to find the next two missing numbers.
Next, find **twelve** on the number line and count back **six less**, equal to **six**.
Then, find **six** on the number line and count back **six less**, equal to **zero**.
Finally, the next two missing terms in the number pattern are **six** and **zero**.

Metric Ruler



Test Questions

1) 24, 18, 12, __ , ____

2) 39, 33, 27, __ , ____

3) 51, 45, 39, __ , ____

4) 52, 45, 38, __ , ____

5) 64, 57, 50, __ , ____

6) 76, 69, 62, __ , ____

7) 101, 92, 83, __ , ____

8) 210, 201, 192, __ , ____

9) 305, 296, 287, __ , ____

10) 420, 411, 402, __ , ____

11) 725, 700, 675, __ , ____

12) 950, 925, 900, __ , ____

13) 1,200, 1,100 1,000 __ , ____

14) 2,700, 2,600 2,500 __ , ____

Decimals

1) **2.1** - **1.8** = **?**

Word Problem

In the Arctic, the temperature was **two point one** degrees above freezing on Saturday and **one point eight** degrees above freezing on Sunday. What was the **difference** in temperatures**?**

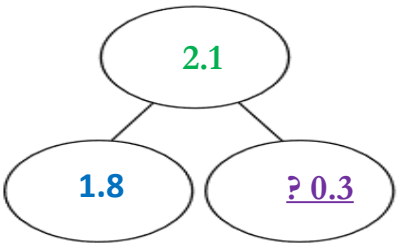
Number Grid

0.0	0.1	0.2	**0.3** ←	**0.4**	**0.5**	**0.6**	**0.7**	**0.8** ←	**0.9**
1.0 ←	**1.1**	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
2.0	**2.1**	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9

Strategy Applied

Partition **1.8** into **1.0** + **0.8** and subtract each partitioned value from **2.1**.
First, find and touch the number **two point one** on a decimal number grid.
Then, **count upwards one square** which is **1.0** less aloud in number order, whilst touching the numbers on the number grid, equal to **one point one**.
Next, **count backwards** **0.8** less aloud in number order, whilst touching the numbers on the number grid, 1.0, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, **0.3** equal to **zero point three**.
Finally, the **value** of the missing number is **zero point three**.

Part Whole Model



Bar Model

2.1	
1.8	? 0.3

Test Questions

1) 2.1 - 1.8 = ___

2) 2.5 - 1.3 = ___

3) 6.3 - 2.6 = ___

4) 7.5 - 1.4 = ___

5) 6.2 - 1.7 = ___

6) 4.7 - 2.1 = ___

7) 4.4 - 3.7 = ___

8) 6.1 - 3.9 = ___

9) 8.1 - 1.9 = ___

10) 3.6 - 3.2 = ___

11) ___ = 5.4 - 2.2

12) ___ = 6.7 - 3.3

13) ___ = 5.5 - 1.7

14) ___ = 7.2 - 1.9

Column Subtraction

1) **3,657 - 2,465** = **?**

Step 1

3	6	5	7
-2	4	6	5
			2

Step 2

		5	
3	~~6~~	15	7
- 2	4	6	5
		9	2

Step 3

		5	
3	~~6~~	15	7
- 2	4	6	5
	1	9	2

Step 4

		5		
3	~~6~~	15	7	
- 2	4	6	5	
1,	1	9	2	

Strategy Applied

Step 1

In the **1s** column, **7** subtract 6, equals 2 **ones** (2).
Write 2 in the **total value** of the **1s** column.

Step 2

In the **10s** column, 5 subtract 6, you cannot do as 5 is a **lower value** than 6.
Exchange/Regroup 1 **hundred** into 10 **tens** from the **100s** column to the **10s** column.
Cross out the 6 **tens** and write 5 **tens** above, then write the **exchanged/regrouped** 1 **ten** next to the 5 **ones** to make 15 **ones**.
In the **10s** column, 15 subtract 6, equals 9 **tens** (90).
Write 9 in the **total value** of the **10s** column.

Step 3

In the **100s** column, 5 subtract 4, equals 1 **hundred** (100).
Write 1 in the **total value** of the **100s** column.

Step 4

In the **1,000s** column, 3 subtract 2, equals 1 **thousand** (1,000).
Write 1 in the **total value** of the **1,000s** column.
Total value is 1,192.

Column Subtraction

1) **3,635 - 2,446** = **?**

Step 1

			2	
3	6	~~3~~	15	
-2	4	4	6	
			9	

Step 2

		5	2	
3	~~6~~	13	15	
- 2	4	4	6	
		8	9	

Step 3

		5	2	
3	~~6~~	13	15	
- 2	4	4	6	
	1	8	9	

Step 3

		5	2	
3	~~6~~	13	15	
- 2	4	4	6	
1,	1	8	9	

Strategy Applied

Step 1

In the **1s** column, 5 subtract 6, you cannot do as 5 is a **lower value** than 6.
Exchange/Regroup 1 **ten** into 10 **ones** from the **10s** column to the **1s** column.
Cross out the 3 **tens** and write 2 **tens** above, then write the **exchanged/ regrouped** 1 **ten** next to the 5 **ones** to make 15 **ones**.
In the **1s** column, 15 subtract 6, equals 9 **ones** (9).
Write 9 in the **total value** of the **1s** column.

Step 2

In the **10s** column, 2 subtract 4, you cannot do as 2 is a **lower value** than 4.
Exchange/Regroup 1 **hundred** into 10 **tens** from the **100s** column to the **10s** column.
Cross out the 6 **hundreds** and write 5 **tens** above, then write the **exchanged/regrouped** 1 **hundred** next to the 2 **tens** to make 12 **tens**.
In the **10s** column, 12 subtract 4, equals 8 **tens** (80).
Write 8 in the **total value** of the **10s** column.

Step 3

In the **100s** column, 5 subtract 4, equals 1 **hundred** (100).
Write 1 in the **total value** of the **100s** column.

Step 4

In the **1,000s** column, 3 subtract 2, equals 1 **thousand** (1,000).
Write 1 in the **total value** of the **1,000s** column.
Total value is 1,549.

Column Subtraction

1) **3,000 - 2,448** = **?**

Step 1

```
  2
  3 10  0  0
 -2  4  4  8
 ----------
```

Step 2

```
  2  9
  3 10 10  0
 -2  4  4  8
 ----------
```

Step 3

```
  2  9  9
  3 10 10 10
 -2  4  4  8
 ----------
```

Step 4

```
  2  9  9
  3 10 10 10
 -2  4  4  8
 ----------
  0  5  5  2
```

Strategy Applied

Step 1

In the **1s** column, 0 subtract 8, you cannot do as 0 is a **lower value** than 8. From the **10s** column, **regroup** 1 **ten** from the 0 **tens,** you cannot do this as the value of the **tens** is zero.
From the **100s** column, **regroup** 1 **hundred** from the 0 **tens,** you cannot do this as the value of the **hundreds** is zero.
Instead, **exchange/regroup** 1 **thousand** into 10 **hundreds** from the **1,000s** column to the **10s** column.
Cross out the 3 **thousands** and write 2 **thousands** above, then write the **exchanged/regrouped** 1 **thousand** next to the 0 **hundreds** to make 10 **hundreds**.

Step 2

Exchange/Regroup 1 **hundred** into 10 **tens** from the **100s** column to the **10s** column.
Cross out the 10 **hundreds** and write 9 **hundreds** above, then write the **exchanged/regrouped** 1 **hundred** next to the 0 **tens** to make 10 tens.

Step 3

Exchange/Regroup 1 **ten** into 10 **ones** from the **10s** column to the **1s** column.
Cross out the 10 **tens** and write 9 **tens** above, then write the **exchanged/regrouped** 1 **ten** next to the 0 **ones** to make 10 ones.

Step 4

In the **1s** column, **1**0 subtract 8, equals 2 **ones** (**2**).
Write **2** in the **total value** of the **1s** column.
In the **10s** column, **9** subtract 4, equals 5 **tens** (**50**).
Write **5** in the **total value** of the **10s** column.
In the **100s** column, **9** subtract 4, equals 5 **hundreds** (**500**).
Write **5** in the **total value** of the **100s** column.
In the **1,000s** column, **2** subtract 2, equals 0 **thousands** (**0**).
Write **0** in the **total value** of the **1,000s** column.
Total value is **552**.

Test Questions

1) 8 2 5 7 - 1 4 6 5	2) 8 9 7 5 - 5 4 8 3	3) 6 2 6 8 - 3 3 9 4
4) 3 4 3 5 - 2 2 4 6	5) 4 8 3 7 - 1 2 4 8	6) 5 7 1 3 - 2 2 4 4
7) 7 3 4 0 - 5 6 9	8) 3 2 5 0 - 4 4 8	9) 8 4 5 0 - 6 5 3
10) 3 0 0 0 - 2 4 4 8	11) 4 0 0 0 - 2 9 3 8	12) 7 0 0 0 - 4 8 3 7

Column Subtraction with Decimals

1) 7 9 . 5 + 2 4 . 6 = ?

Word Problem

The **perimeter** of a farm is **twenty four point six** kilometres **fewer** than **seventy nine point five** kilometres.
What is the perimeter of the farm?

Step 1

```
    8
  7 9 .15
- 2 4 . 6
  -----
      .
  -----
```

Step 2

```
    8
  7 9 .15
- 2 4 . 6
  -----
      . 9
  -----
```

Step 3

```
    8
  7 9 .15
- 2 4 . 6
  -----
  5 4 . 9
  -----
```

Strategy Applied

Step 1

In the **10ths** column, 5 subtract 6, you cannot do as 5 is a **lower value** than 6.
Exchange/Regroup 1 **one** into 10 **tenths** from the **1s** column to the **10ths** column.
Cross out the 9 **ones** and write 8 **ones** above, then write the **exchanged/ regrouped** 1 **one** next to the 5 **tenths** to make 15 **tenths**.

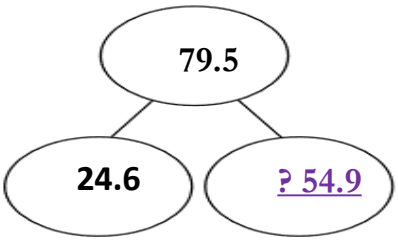
Step 2

In the **10ths** column, 15 subtract 6, equals 9 **tenths** (0.9).
Write 9 in the **total value** of the **10ths** column.

Step 3

In the **1s** column, 8 subtract 4, equals 4 **ones** (4).
Write 4 in the **total value** of the **1s** column.
In the **10s** column, 7 subtract 2, equals 5 **tens** (50).
Write 5 in the **total value** of the **10s** column.
Total value is 54.9.

Part Whole Model



Bar Model

79.5	
24.6	? 54.9

Test Questions

1) 79.5 − 24.6 =

2) 45.7 − 24.8 =

3) 69.3 − 24.4 =

4) 95.7 − 46.5 =

5) 67.9 − 48.3 =

6) 56.8 − 39.4 =

7) 84.0 − 56.9 =

8) 73.0 − 44.8 =

9) 75.0 − 65.3 =

10) 80.4 − 56.8 =

11) 60.6 − 48.7 =

12) 90.5 − 63.5 =

13) 30.0 − 9.4 =

14) 40.0 − 9.3 =

15) 20.0 − 8.3 =

Find the Missing Number

1) 8,700 - 1,000 = ? - 2,000

Word Problem

Two thousand fewer than the **missing** number is **equal to** the **total value** of the **first** number sentence.

Step 1

$$\begin{array}{r} 8,\ 7\ 0\ 0 \\ -\ 1,\ 0\ 0\ 0 \\ \hline 7,\ 7\ 0\ 0 \end{array}$$

Step 2

$$\begin{array}{r} 7,\ 7\ 0\ 0 \\ +\ 2,\ 0\ 0\ 0 \\ \hline 9,\ 7\ 0\ 0 \end{array}$$

Strategy Applied

Step 1

First, subtract the **known number sentence**, which is 8,700 - 1,000.
Then, **partition** eight thousand, seven hundred into its **digit values**.
8,000 + 700 + 0 + 0.
From the digit value of the **1,000s place value**, eight thousand, subtract the **one thousand.** 8,000 - 1,000 = 7,000
The digit value of the **100s**, **10s** and **1s** in 8,700 will remain the same as 700 + 0 + 0.
Next, the new partitioned values are 7,000 + 700 + 0 + 0 equal to 7,700.
Finally, 8,700 subtract 1,000 is equal to 7,700.

Step 2

Now we know 7,700 = ? - 2,000
Use the **inverse** to calculate the missing number 7,700 + 2,000 = ?
Then, **partition** seven thousand, seven hundred into its **digit values**.
7,000 + 700 + 0 + 0.

From the digit value of the **1,000s place value**, **seven thousand** add the **two thousand**. **7,000 + 2,000 = 9,000**
The digit value of the **100s**, **10s** and **1s** in **7,700** will remain the same as **700 + 0 + 0**.
Next, the new partitioned values are **9,000 + 700 + 0 + 0**, equal to **9,700**.
Finally, the **value** of the missing number is equal to **9,700**.

Test Questions

1) 8,700 - 1,000 = ___ - 2,000

2) 1,457 + 1,732 - 357 = ___

3) 5,950 - ___ - 450 = 2,500

4) £3.42 - £1.72 = ___

5) 450 + ___ - 226 = 1,000

6) 10 less than 729 = ___

7) 5,623 + 1,000 - 100 = ___

8) £54.84 - £27.63 = ___

9) 235 - 142 = ___ + 50

10) 36 - 6 - 6 = ___

11) 63 - 9 - 9 = ___

12) 70 - 7 - 7 = ___

13) 90 - 9 - 9 = ___

14) 84 - 7 - 7 = ___

Step Counting

1) ? = 4 x 12

Word Problem

There are **four** fish in one jar.
How many fish are there in **twelve** jars**?**

Number Line

0	1	2	3	4	5	6	7	8	9	10	11	**12**	13	14	15	16	17	18	19	20
21	22	23	**24**	25	26	27	28	29	30	31	32	33	34	35	**36**	37	38	39	40	41
42	43	44	45	46	47	**48**	49	50	51	52	53	54	55	56	57	58	59	60	61	62

Strategy Applied

The **twelve represents** the **value** in each **group**, the **multiplicand**.
The **four represents** how many **groups** there are, the **multiplier**.
The **? represents** the **total value** of **four groups of twelve**, the **product**.
For **step counting** each **lot of twelve** is **added on four** times up to **?**, expressing the **number value** as it is **counted on**.

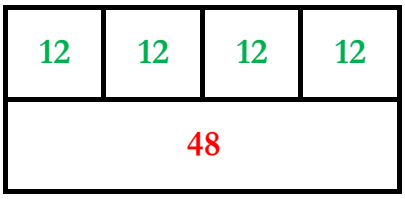
First, find and touch the number **zero** on a number line.
Then, **count forwards twelve** more aloud in number order, whilst touching the numbers on the number line, on to the number **twelve**.
Next, **count forwards twelve** more aloud in number order, whilst touching the numbers on the number line, on to the number **twenty four**.
Then, **count forwards twelve** more aloud in number order, whilst touching the numbers on the number line, on to the number **thirty six**.
Next, **count forwards twelve** more aloud in number order, whilst touching the numbers on the number line, on to the number **forty eight**.
Finally, **twelve** lots of **four** equals **forty eight**.

Step Counting

12 → 24 → 36 → 48

● ● ● ●

Bar Model



Test Questions

1) ___ = 4 x 12

2) ___ = 12 x 3

3) ___ = 4 x 9

4) ___ = 5 x 5

5) ___ = 7 x 11

6) ___ = 4 x 4

7) ___ = 12 x 8

8) ___ = 6 x 6

9) ___ = 9 x 3

10) ___ = 8 x 6

11) ___ = 9 x 9

12) ___ = 4 x 11

13) ___ = 8 x 3

14) ___ = 7 x 6

Multiple Numbers

1) 2 x 5 x 4 = ?

Word Problem

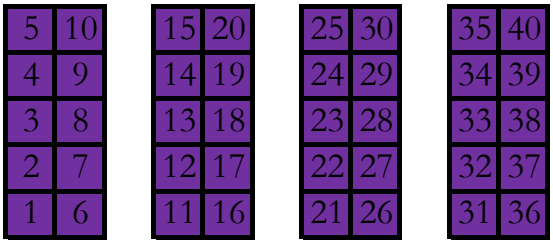
Two pencils are placed in each pot.
There are five pots in one row.
What is the **total** number of pencils in four rows?

Step 1

2 → 4 → 6 → 8 → 10

Step 2

10 → 20 → 30 → 40



Strategy Applied

The **three** numbers can be **multiplied** in any order.
Out of the **three** numbers, multiply two of them together first and the **product** (answer) will then be multiplied by the remaining number.

Step 1

Use step counting to multiply **two** by **five**, equal to **ten**.

Step 2

Use step counting to multiply **ten** by **four**, equal to **forty**.
The **total value** of the **product** is **forty**.

Test Questions

1) 2 x 5 x 4 = ___

2) 5 x 3 x 5 = ___

3) 2 x 3 x 5 = ___

4) 5 x 6 x 4 = ___

5) 2 x 3 x 8 = ___

6) 7 x 7 x 3 = ___

7) 2 x 3 x 7 = ___

8) 8 x 3 x 4 = ___

9) 3 x 4 x 6 = ___

10) 3 x 4 x 7 = ___

11) ___ = 20 x 3 x 7

12) ___ = 80 x 3 x 4

13) ___ = 30 x 4 x 60

14) ___ = 30 x 40 x 70

x10 and x100

1) 26 x 100 = ?

Word Problem

A race from London to Brighton is **one hundred** miles long.
Only **twenty six** of the participants complete the race.
The collective number of miles ridden by them all is **how much?**

Place Value Grid

Thousands 1,000s	Hundreds 100s	Tens 10s	Ones 1s
		2	6
2	6	0	0

Strategy Applied

Multiplying any number by **one hundred**, means that number will become **one hundred times as big**.
Each **digit** in the number will move **two column place values** to the **left**.
First, write the number **twenty six** on a **place value grid**, in the **1s** and **10s** column.
Then, in the **10s** column multiply the digit **two** by **one hundred** by moving it **two column place values** to the **left** and write **two** in the **1,000s** column.
Next, in the **1s** column multiply the digit **six** by **one hundred** by moving it **two column place values** to the **left** and write **six** in the **100s** column.
Then, the **10s** and **1s** column cannot be left blank as they still have a **value**, write **zero**, a **place holder** in both columns**.**
Finally, **26** multiplied by **100** is equal to **2,600**.

Test Questions

1) 26 x 100 = ___

2) 39 x 10 = ___

3) 41 x 100 = ___

4) 58 x 10 = ___

5) 63 x 100 = ___

6) 72 x 10 = ___

7) 80 x 100 = ___

8) 94 x 10 = ___

9) 75 x 100 = ___

10) 53 x 10 = ___

11) 91 x 100 = ___

12) 82 x 10 = ___

13) 64 x 100 = ___

14) 55 x 10 = ___

Short Multiplication

1) 2, 1 3 5 x 4 = ?

Word Problem

Over **four** years, **two thousand, one hundred and thirty five** pounds is saved each year.
How much is saved in **total?**

Step 1

```
  2 1 3 5
x       4
---------
      2 0
```

Step 2

```
  2 1 3 5
x       4
---------
    4 0
  1 2
```

Step 3

```
  2 1 3 5
x       4
---------
  5 4 0
  1 2
```

Step 4

```
  2 1 3 5
x       4
---------
8, 5 4 0
  1 2
```

Strategy Applied

Step 1

In the **1s** column, multiply **5** by **4** , equals 20 **ones** (**20** + **0**).
Write **0** in the **total value** of the **1s** column.
Exchange/Regroup the **20 ones** into **2 tens** from the **1s** column to the **10s** column and write **2 tens** below the **total value line** of the **10s** column.

Step 2

In the **10s** column, multiply (30) **3** by **4**, equals 12 **tens** (**100** + **20**).
Add the **exchanged/regrouped 2 tens** (20) below, equals 14 **tens** (**100** + **40**).
Write **4** in the **total value** of the **10s** column**.**
Exchange/Regroup the **10 tens** into **1 hundred** from the **10s** column to the **100s** column and write **1** below the **total value line** of the **100s** column.

Step 3

In the **100s** column, multiply (100) **1** by **4**, equals 4 **hundreds** (**400**).
Add the **exchanged/regrouped 1 hundred** (100) below, equals 5 **hundreds** (**500**).
Write **5** in the **total value** of the **100s** column.

Step 4

In the **1,000s** column, multiply (2,000) **2** by **4**, equals **8 hundreds** (**800**).
Write **8** in the **total value** of the **1,000s** column.
Total value is **8,540**.

Bar Model

2,135	**2,135**	**2,135**	**2,135**
8,540			

Test Questions

1) 2 8 x 4

2) 6 4 x 8

3) 2 1 4 x 5

4) 2 1 3 5 x 4

5) 4 7 x 9

6) 5 2 x 6

7) 3 7 5 x 3

8) 8 2 5 7 x 5

9) 4 3 x 9

10) 6 3 x 3

11) 1 7 6 x 4

12) 7 3 4 0 x 9

Short Multiplication with Decimals

1) 2 1 . 3 5 x 3 = ?

Word Problem

One bag of cement weighs **twenty one point three five** kilograms.
What is the weight of **three** bags**?**

Step 1

$$\begin{array}{r} 2\ 1\ .\ 3\ 5 \\ \times \qquad\quad 3 \\ \hline .\quad 5 \\ \hline \quad 1 \end{array}$$

Step 2

$$\begin{array}{r} 2\ 1\ .\ 3\ 5 \\ \times \qquad\quad 3 \\ \hline .\ 0\ 5 \\ \hline 1\quad 1 \end{array}$$

Step 3

$$\begin{array}{r} 2\ 1\ .\ 3\ 5 \\ \times \qquad\quad 3 \\ \hline 6\ 4\ .\ 0\ 5 \\ \hline 1\quad 1 \end{array}$$

Strategy Applied

Step 1

In the **100ths** column, multiply **5** by **3** , **equals** 15 **hundredths** (**0.10** + **0.05**).
Write **5** in the **total value** of the **100ths** column.
Exchange/Regroup the **10** **hundredths** into **1** **tenth** from the **10ths** column to the **10ths** column and write **1** **tenth** below the **total value line** of the **10ths** column.

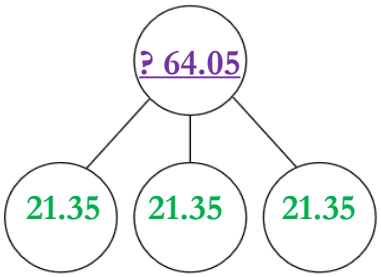
Step 2

In the **10ths** column, multiply **3** by **3**, equals **9 ones** (**0.09**).
Add the **exchanged/regrouped** **1** **tenth** below, equals 10 **tenths** (**1.0** + **0.0**).
Write **0** in the **total value** of the **10ths** column.
Exchange/Regroup the **10** **tenths** into **1** **one** from the **10ths** column to the **1s** column and write **1** **one** below the **total value line** of the **1s** column.

Step 3

In the **1s** column, multiply **1** by **3**, equals 3 **ones** (**3**).
Add the **exchanged/regrouped 1** one below, equals 4 **ones** (**4**).
Write **4** in the **total value** of the **1s** column.
In the **10s** column, multiply **2** by **3**, equals 6 **tens** (**6**).
Write **6** in the **total value** of the **10s** column.
Total value is **64.05**.

Part Whole Model



Bar Model

21.35	21.35	21.35
? 64.05		

Test Questions

1) 21.35 x 3 = ____.

2) 41.37 x 8 = ____.

3) 41.37 x 9 = ____.

4) 82.57 x 5 = ____.

5) 42.79 x 3 = ____.

6) 73.40 x 5 = ____.

7) 73.40 x 9 = ____.

8) 32.60 x 8 = ____.

9) 62.06 x 6 = ____.

10) 53.04 x 8 = ____.

11) 62.06 x 7 = ____.

12) 50.27 x 8 = ____.

Find the Missing Number

1) 34 x 5 = ___ - 30

Word Problem

Five packets of **thirty four** sunflower seeds are planted in **Garden A**.
Garden B plants the same amount of seeds.

Step 1

$$\begin{array}{rrrrrrr} 3 & 0 & \times & 5 & = & 1 & 5 & 0 \\ 4 & 0 & \times & 5 & = & & 2 & 0 & + \\ \hline & & & & & 1 & 7 & 0 \end{array}$$

Strategy Applied

Step 1

Calculate the **known number sentence** 34 x 5, using **partitioning**.
There are **five lots of thirty fours**,
Partition the number **thirty four** into its digit values 30 + 4, multiplicand.
Multiply each digit value by **five**, the multiplier.
First, multiply **thirty** by **five**, equal to **one hundred and fifty**.
Then, multiply **four** by **five**, equal to **twenty**.
Finally, add **together one hundred and fifty** and **twenty**, equal to **one hundred and seventy**.

Step 2

$$\begin{array}{rrrrrrrrrr} 1 & 0 & 0 & + & & 0 & = & 1 & 0 & 0 \\ & 7 & 0 & + & 3 & 0 & = & 1 & 0 & 0 & + \\ \hline & & 0 & + & & 0 & = & 2 & 0 & 0 \end{array}$$

Step 2

New **known fact** 170 = ? - 30 or ? - 30 = 170

Use the **inverse** of subtraction, which is addition and add together,

170 + 30 = ?

Partition **one hundred and seventy** into its digit values **100** + **70** + **0**.

As only **thirty** is to be added, the digit value of the **10s** column will change in the number **170**, which is **70**.

70 add **30** is equal to **100**.

The digit value of the **100s** and **10s** in **170** will remain the same as **100** + **0**.

Next, the new partitioned values are **100** + **100** + **0**.

Finally, **100** + **70** + **0** add **30** is equal to **200**.

Test Questions

1) 34 x 5 = ___ - 30

2) 3 x 8 = ___ x 4

3) 7 x 3 x 0 = ___

4) 4 x 6 x 10 = ___

5) 4 x 3 x 6 = ___

6) 3 x 7 x 7 = ___

7) 24 x 5 = ___ x 10

8) 9 x 4 x 2 = ___

9) 3 x 8 = ___ x 4

10) 4 x 8 x 8 = ___

11) 25 x 3 = ___ x 5

12) 8 x 3 x 0 = ___

13) 6 x 8 = ___ x 4

14) 345 x 8 = 3450 - ___

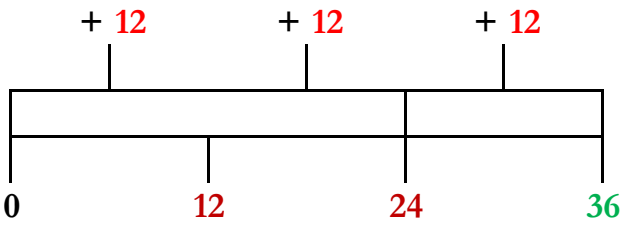
Inverse of Division

1) 36 ÷ ? = 12

Word Problem

A number of children share **thirty six** pounds equally between them, they each receive **twelve** pounds.
How many children are there**?**

Metric Ruler



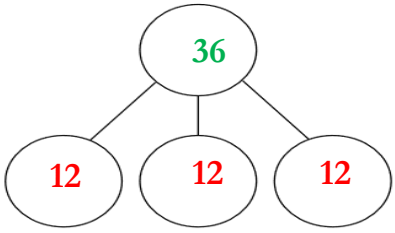
Step Counting

Strategy Applied

The **thirty six** **represents** the **total value,** the **dividend.**
The **missing number** **represents** how many **groups of** **thirty six**, the **divisor**.
The **twelve** **represents** the **value** in each **equal group**, the **quotient**.
Use the **inverse** of **division** is **multiplication**, 12 x ? = 36
Apply **step counting** to calculate the **missing number**, the **divisor**, by counting on **lots of** **twelves** on to **thirty six**.

First, find and touch the number **zero** on a number line.
Then, **count forwards** **twelve** more aloud in number order, whilst touching the numbers on the number line, on to the number **twelve**.
Then, **count forwards** **twelve** more aloud in number order, whilst touching the numbers on the number line, on to the number **twenty four**.
Then, **count forwards** **twelve** more aloud in number order, whilst touching the numbers on the number line, on to the number **thirty six**.
Finally, **three** groups of **twelve** equals **thirty six**.

Part Whole Model



Bar Model

36		
12	12	12

Test Questions

1) 36 ÷ ___ = 12

2) 27 ÷ ___ = 3

3) 54 ÷ ___ = 6

4) 46 ÷ ___ = 1

5) 28 ÷ ___ = 7

6) ___ ÷ 98 = 1

7) ___ ÷ 6 = 5

8) ___ ÷ 12 = 8

9) ___ ÷ 11 = 10

10) ___ ÷ 56 = 1

11) 24 ÷ 12 = ___

12) 63 ÷ 9 = ___

13) 72 ÷ 6 = ___

14) 44 ÷ 4 = ___

÷10 and ÷100

1) 361 ÷ 100 = ?

Word Problem

A landmark building is **three hundred and sixty one** metres tall.
Miniature replicas sold in the shops are **one hundred times as small**.
How tall is a replica?

Place Value Grid

1000s	100s	10s	1s	.	10ths	100ths
	3	6	1	.		
			3	.	6	1

Strategy Applied

Dividing any number by **one hundred**, means that number will become **one hundred times as small**.
Each **digit** in the number moves **two column place values** to the **right**.
First, write the number **three hundred and sixty one** on a **Place Value Grid**, in the **100s**, **10s** and **1s** columns.
Then, in the **100s** column divide the digit **three** by **one hundred**, moving it **two column place values** to the **right** and write **three** in the **1s** column.
Next, in the **10s** column divide the digit **six** by **one hundred**, moving it **two column place values** to the **right** and write **six** in the **10ths** column.
Then, in the **1s** column divide the digit **one** by **one hundred**, moving it **two column place values** to the **right** and write **one** in the **100ths** column.
Finally, **three hundred and sixty one** divided by **one hundred** is equal to **three point six one**.

Test Questions

1) 361 ÷ 100 = ___

2) 329 ÷ 10 = ___

3) 338 ÷ 100 = ___

4) 482 ÷ 10 = ___

5) 123 ÷ 100 = ___

6) 724 ÷ 10 = ___

7) 135 ÷ 100 = ___

8) 166 ÷ 10 = ___

9) 247 ÷ 100 = ___

10) 9,208 ÷ 10 = ___

11) 4,159 ÷ 100 = ___

12) 6,107 ÷ 10 = ___

13) 5,203 ÷ 100 = ___

14) 3,109 ÷ 10 = ___

Short Division

1) 7,135 ÷ 2 = ?

Word Problem

Two cargo ships should have an **identical** number of crates of apple juice. Altogether they both hold **seven thousand, one hundred and thirty five** crates. How many crates does each ship hold**?**

Step 1

$$2\overline{)\,7\;11\;3\;5}\qquad 3$$

Step 2

$$2\overline{)\,7\;11\;13\;5}\qquad 3\;5$$

Step 3

$$2\overline{)\,7\;11\;13\;15}\qquad 3\;5\;6$$

Step 4

$$2\overline{)\,7\;11\;13\;15}\qquad 3\;5\;6\;7$$

Step 5

$$2\overline{)\,7\;11\;13\;15}\qquad 3\;5\;6\;7\;r1$$

Strategy Applied

Step 1

How many **lots of** 2 divide **exactly** in to 7? The answer is 3 (2 x 3 = 6), with a **remainder** of 1 .

Write 3 on the line above the 7.

Cross out the 7 and **regroup** the **remainder** 1 to the next **digit place value**.

Step 2

How many **lots of** 2 divide **exactly** in to 11? The answer is 5 (2 x 5 = 10), with a **remainder** of 1 .

Write 5 on the line above the 11.

Regroup the **remainder** 1 to the next **digit place value,** 3, to become 13.

Step 3

How many **lots of 2** divide **exactly** in to **13**? The answer is **6** (2 x **6** = 12), with a **remainder** of **1**.

Write **6** on the line above the **13**.

Regroup the **remainder 1** to the next **digit place value, 5**, to become **15**.

Step 4

How many **lots of 2** divide **exactly** in to **15**? The answer is **7** (2 x **7** = 14), with a **remainder** of **1**.

Write **7** on the line above the **15**.

Step 5

There are no more **digits** in the number to be divided by **2**.

The **remainder** of **1**, is written as **r1** on the line above.

Total value is **3,567 r1**.

Test Questions

1) $4\overline{)9\ 1\ 3}$

2) $2\overline{)7\ 1\ 3\ 5}$

3) $3\overline{)8\ 1\ 3\ 7}$

4) $5\overline{)6\ 2\ 6}$

5) $4\overline{)4\ 2\ 7\ 9}$

6) $3\overline{)8\ 2\ 5\ 7}$

7) $6\overline{)8\ 4\ 5}$

8) $5\overline{)9\ 2\ 6\ 0}$

9) $4\overline{)7\ 3\ 4\ 0}$

10) $7\overline{)6\ 4\ 0}$

11) $6\overline{)4\ 2\ 0\ 6}$

12) $5\overline{)2\ 3\ 0\ 4}$

13) $8\overline{)2\ 6\ 8}$

14) $7\overline{)4\ 5\ 2\ 7}$

15) $6\overline{)3\ 9\ 3\ 8}$

Short Division with Decimals

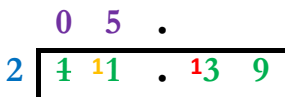
1) 11.39 ÷ 2 = ?

Word Problem

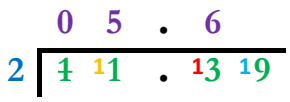
Eleven point three nine pounds is to be shared equally between two kids. Can the amount of money be shared equally?

Step 1

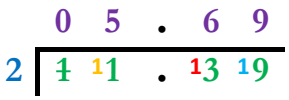
Step 2



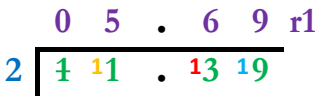
Step 3



Step 4



Step 5



Strategy Applied

Step 1

How many **lots of** 2 divide **exactly** in to 1? The answer is 0 (2 x 0 = 0), with **remainder** 1.

Write 0 on the line above the 1.

Cross out the 1 and **regroup** the **remainder** 1 to the next **digit place value**, 1, to become 11.

Step 2

How many **lots of** 2 divide **exactly** in to 11? The answer is 5 (2 x 5 = 10), with **remainder** 1 .

Write 5 on the line above the 11 and write a **decimal point** next to it.

Regroup the **remainder** 1 to the next **digit place value,** 3, to become 13.

Step 3

How many **lots of 2** divide **exactly** in to **13**? The answer is **6** (2 x **6** = 12), with **remainder 1**.

Write **6** on the line above the **13**.

Regroup the **remainder 1** to the next **digit place value, 9**, to become **19**.

Step 4

How many **lots of 2** divide **exactly** in to **19**? The answer is **9** (2 x **9** = 18), with **remainder 1**.

Write **9** on the line above the **19**.

Step 5

There are no more **digits** in the number to be divided by **2**.

The **remainder 1**, is written as **r1** on the line above.

Total value is **5.68 r1**.

Test Questions

1) $2\overline{)11.38}$

2) $3\overline{)12.37}$

3) $3\overline{)26.57}$

4) $4\overline{)28.79}$

5) $4\overline{)35.40}$

6) $5\overline{)20.60}$

7) $5\overline{)30.04}$

8) $6\overline{)25.06}$

9) $7\overline{)41.56}$

10) $8\overline{)16.97}$

Find the Missing Number

1) 40 ÷ 5 = ? x 2

Word Problem

A basket contains **forty** strawberries. Noel has **five** **times as less**.
Kavalli has the **same** amount as him, split into **two** tubs.
How many strawberries in one tub**?**

Step 1

5 → 10 → 15 → 20 → 25 → 30 → 35 → 40

● ● ● ● ● ● ● ●

Strategy Applied

Step 1

Out of the two number sentences, calculate the number sentence with all the **known** numbers first, 40 ÷ 5 .
Apply **step counting**, the **inverse** of division, to calculate how many **lots of five** is equal to **forty**.
Count forwards saying the number names that are after the number.
First, find and touch the number **five** on a number line.
Then, count forwards aloud in number order, whilst touching the numbers on the number line, **five** more equal to **six**.
Next, keep repeating the action of counting on in **lots of fives** up to the number **forty** on a number line.
Finally, **eight** **lots of five** is equal to **forty**.

Step 2

2 → 4 → 6 → 8

● ● ● ●

Step 2

If 40 ÷ 5 = 8 , then 8 = ? x 2 , as they are the **same value**.

Use step counting to calculate the missing number, 2 x ? = 8 ,

by counting on in **lots of twos** up to **eight**.

Count forwards saying the number names that are after the number.

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

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

Next, keep repeating the action of counting on in **lots of twos** up to the number **eight** on a number line.

Finally, **four lots of twos** is equal to **eight**, the missing number is **four**.

Test Questions

1) 40 ÷ 5 = ___ x 2

2) 60 ÷ 5 = ___ x 6

3) 7 ÷ 100 = ___

4) 26 ÷ 100 = ___

5) 20 ÷ 5 ÷ 1 = ___

6) 33 ÷ 3 ÷ 1 = ___

7) 3 ÷ 10 = ___

8) 6 ÷ 10 = ___

9) 56 ÷ ___ = 8

10) 72 ÷ ___ = 9

11) 78 ÷ 3 = ___

12) 84 ÷ 6 = ___

13) 96 ÷ 12 = ___

14) 99 ÷ 11 = ___

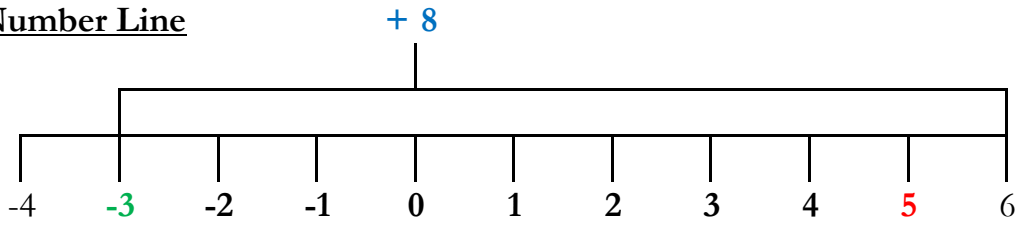
Add and Subtract Integers

1) - 3 + 8 = ?

Word Problem

The temperature on the last day of September in Scotland was **minus three** degrees. Yet England was **eight** degrees **warmer** on the same day. What was the temperature in England**?**

Number Line



Strategy Applied

Positive numbers are counted on **forwards** on a **horizontal** number line and **upwards** on a **vertical** number line.

Negative numbers are counted on **backwards** on a **horizontal** number line and **downwards** on a **vertical** number line.

To **represent** positive and negative numbers on a number line, then mark **zero** half way (**mid-point**) on the line.

On a **horizontal** number line, all the numbers (**integers**) to the **right** of the **zero** will be **positive**.

On a **horizontal** number line, all the numbers (**integers**) to the **left** of the **zero** will be **negative**.

Step 1

Draw a **horizontal** number line and **half way** mark it with a **zero**.

From the **zero**, count backwards in **multiples of 1s** to **minus three**.

Mark the **minus three** on the number line.

Step 2

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

Then, count forwards **eight** more in **multiples of 1s** aloud in number order whilst touching the numbers on the number line, -2, -1, 0, 1, 2, 3, 4, **5** equal to **five**.

Test Questions

1) - 3 + 8 = ___

2) - 5 + 6 = ___

3) - 7 + 10 = ___

4) - 2 + 14 = ___

5) - 15 + 7 = ___

6) - 23 + 9 = ___

7) - 11 + 4 = ___

8) + 1 - 13 = ___

9) + 5 - 18 = ___

10) + 10 - 25 = ___

11) + 15 - 8 = ___

12) + 20 - 12 = ___

13) + 25 - 16 = ___

14) + 30 - 19 = ___

To Nearest 10

1) **3, 2 5 7 = ?**

Place Value Grid

1000s	100s	10s	1s	.	10ths	100ths
3	2	5	7	.		
3	2	6	0	.		

Strategy Applied

When rounding to the nearest **10s** place value, the following will occur.
1. The **10s digit value** will remain the **same** (round down), if the digit in the **1s** column is a 0, 1, 2, 3, 4 (**4 or less**).
2. The **10s digit value** will increase by **ten** (round up), if the digit in the **1s** column is a 5, 6, 7, 8, 9 (**5 or more**).
3. The **value** of any digits in the **column place values** to the **right** of the **10s** column change to a **place holder**, **0**.
4. The **value** of any digits in the **column place values** to the **left** of the **10s** column usually remain the **same**. (If the **10s** digit value increases to 100 then the **10s** digit becomes a **place holder**, **0** and the **100s** digit increases by 100 more)

Step 1

First, write the number **3,257** on a **Place Value Grid** in the correct column place values of the **1s**, **10s**, **100s** and **1,000s**.

Step 2

Then, say the digit in the **1s** column which is **7** and as it is **5 or more** the **10s** digit value will increase by **ten** (round up).

Step 3

Next, the digit value of the **5** **tens** (50), add **10** to make **6** **tens** (60).
In the **10s** column write the digit **6** underneath the digit **5**.

Step 4

Then, the **1s** column digit value changes to a **place holder**, **0**.
In the **1s** column write the digit **0** underneath the digit **7**.

Step 5

Next, the **1,000s** and **100s** column digit values remain the **same** as **3** and **2**.
In the **1,000s** and **100s** columns write the same digits **3** and **2** underneath.

Step 6

Finally, **3,257** rounded to the **nearest 10** is **3,260**.

Test Questions

1) 3,257 = ___

2) 2,138 = ___

3) 7,656 = ___

4) 7,222 = ___

5) 4,395 = ___

6) 3,203 = ___

7) 43.68 = ___

8) 10.27 = ___

9) 87.67 = ___

10) 61.11 = ___

11) 32.84 = ___

12) 21.92 = ___

13) 874.51 = ___

14) 1,254.56 = ___

To Nearest 100

1) 5, 4 7 9 = ?

Place Value Grid

1000s	100s	10s	1s	.	10ths	100ths
5	4	7	9	.		
5	5	0	0	.		

Strategy Applied

When rounding to the nearest **100s** place value, the following will occur.
1. The **100s digit value** will remain the **same** (round down), if the digit in the **10s** column is a 0, 1, 2, 3, 4 (**4 or less**).
2. The **100s digit value** will increase by **one hundred** (round up), if the digit in the **10s** column is a 5, 6, 7, 8, 9 (**5 or more**).
3. The **value** of any digits in the **column place values** to the **right** of the **100s** column change to a **place holder**, **0**.
4. The **value** of any digits in the **column place values** to the **left** of the **100s** column usually remain the **same**. (If the **100s** digit value increases to 1,000 then the **100s** digit becomes a **place holder**, **0** and the **1,000s** digit increases by 1,000 more)

Step 1

First, write the number **5,479** on a **Place Value Grid** in the correct column place values of the **1s**, **10s**, **100s** and **1,000s**.

Step 2

Then, say the digit in the **10s** column which is **7** and as it is **5 or more** the **100s** digit value will increase by **one hundred** (round up).

Step 3

Next, the digit value of the **4** **hundreds** (400), add **100** to make **5** **hundreds** (500).

In the **100s** column write the digit **5** underneath the digit **4**.

Step 4

Then, the **10s** and **1s** column digit values change to a **place holder**, **0**.

In the **10s** and **1s** columns write the digit **0** underneath the digit **7** and **9**.

Step 5

Next, the **1,000s** column digit value remains the **same** as **5**.

In the **1,000s** column write the same digit **3** underneath.

Step 6

Finally, **5,479** rounded to the **nearest 100** is **5,500**.

Test Questions

1) 5,479 = ___

2) 927 = ___

3) 9,878 = ___

4) 5,888 = ___

5) 2,173 = ___

6) 1,081 = ___

7) 143.68 = ___

8) 210.27 = ___

9) 387.67 = ___

10) 561.11 = ___

11) 632.84 = ___

12) 721.92 = ___

13) 9,874.51 = ___

14) 9,362.04 = ___

To Nearest 1,000

1) 4, 3 6 8 . 7 9 = ?

Place Value Grid

1000s	100s	10s	1s	.	10ths	100ths
4	3	6	8	.	7	9
4	0	0	0	.	0	0

Strategy Applied

When rounding to the nearest **1,000s** place value, the following will occur.
1. The **1,000s digit value** will remain the **same** (round down), if the digit in the **100s** column is a 0, 1, 2, 3, 4 (**4 or less**).
2. The **1,000s digit value** will increase by **one thousand** (round up), if the digit in the **100s** column is a 5, 6, 7, 8, 9 (**5 or more**).
3. The **value** of any digits in the **column place values** to the **right** of the **1,000s** column change to a **place holder**, **0**.
4. The **value** of any digits in the **column place values** to the **left** of the **1,000s** column usually remain the **same**. (If the **1,000s** digit value increases to 10,000 then the **1,000s** digit becomes a **place holder**, **0** and the **10,000s** digit increases by 10,000 more)

Step 1

First, write the number **4368.79** on a **Place Value Grid** in the correct column place values of the **100ths**, **10ths**, **1s**, **10s**, **100s** and **1,000s**.

Step 2

Then, say the digit in the **100s** column which is **4** and as it is **4 or less** the **1,000s** digit value will remain the **same** (round down).

Step 3

Next, the digit value of the **4** **thousands** (4,000) remains the same.
In the **1,000s** column write the digit **4** underneath the digit **4**.

Step 4

Then, the **100s**, **10s**, **1s**, **10ths** and **100ths** column digit values change to a **place holder**, **0**.
In the **100s**, **10s**, **1s**, **10ths** and **100ths** columns write the digit **0** underneath the digits **3**, **6**, **8**, **7** and **9**.

Step 5

Next, the **1,000s** column digit value remains the **same** as **4**.
In the **1,000s** column write the same digits **4** underneath.

Step 6

Finally, **4368.79** rounded to the **nearest 1,000** is **4,000**.

Test Questions

1) 4,368.79 = ___

2) 1,029.27 = ___

3) 8,798.78 = ___

4) 6,158.88 = ___

5) 3,221.73 = ___

6) 2,110.81 = ___

7) 8,143.68 = ___

8) 7,210.27 = ___

9) 4,387.67 = ___

10) 9,561.11 = ___

11) 1,632.84 = ___

12) 5,721.92 = ___

13) 1,254.56 = ___

14) 9,999.99 = ___

Fraction of a Quantity

1) $\frac{7}{8}$ of 16 = ?

Word Problem

A **sixteen** slice extra large pizza was shared between the **eight** Scouts.
Only **seven** Scouts ate, eating some slices.
How many slices have been eaten**?**

Concrete Object

Quantity

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

Group 1	Group 2	Group 3	Group 4
1 2	1 2	1 2	1 2

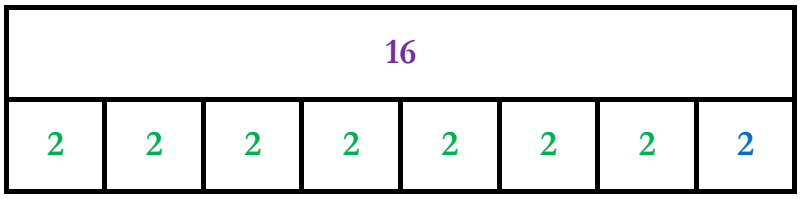
Group 5	Group 6	Group 7	Group 8
1 2	1 2	1 2	1 2

Strategy Applied

A fraction is part of a **whole** or part of **1** and an **eighth** is 1 of 8 **equal groups**.
16 is the **quantity** shared **equally** between the **total** number of **equal groups**.
8 is the **denominator**, represents the **total** number of **equal groups**.
7 is the **numerator**, represents **seven** of the **equal groups**.

First, pick up **sixteen** objects and place them together. Now count aloud from 1 to 16 ,to check there are only **sixteen** objects.
Then, **share** the **sixteen** objects one at a time **equally between** the **eight** groups, until exactly the **same quantity** of objects are in **each** of the groups.
Next, count how many objects there are **altogether** in **seven groups**, there should be fourteen objects; **one, two, three, four, five**, **six**, **seven**, **eight**, **nine**, **ten**, **eleven**, **twelve**, **thirteen**, **fourteen**.
Finally, the missing number is **fourteen** objects, which is the **total** amount in **seven** of the groups.

Bar Model



Test Questions

1) $\frac{7}{8}$ of 16 = ___

2) $\frac{2}{3}$ of 15 = ___

3) $\frac{3}{8}$ of 40 = ___

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

5) $\frac{4}{5}$ of 10 = ___

6) $\frac{2}{5}$ of 25 = ___

7) $\frac{1}{3}$ of 27 = ___

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

9) $\frac{1}{3}$ of 24 = ___

10) $\frac{1}{2}$ of 52 = ___

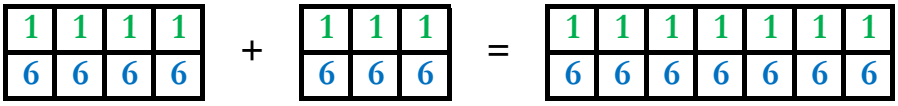
Add Fractions

1) $\frac{4}{6} + \frac{3}{6} = \frac{?}{?}$

Word Problem

Popsy ate **four sixths** of a tin of cat food, whilst Jiggy ate **three sixths**.
How many tins of cat food have they eaten**?**

Fraction Tiles



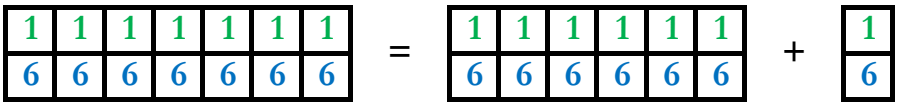
Step 1

$\frac{4}{6} + \frac{3}{6} =$

Step 2

$\frac{4 + 3}{6} = \frac{7}{6}$

Step 3



$= \frac{6}{6}$ or $1 + \frac{1}{6}$

Strategy Applied

Step 1

Add two fractions with the same denominators, **four-sixths** and **three-sixths**.

The **4** represents the **numerator**.
The **6** represents the **denominator**.

$\frac{4}{6}$

The **3** represents the **numerator**.
The 6 represents the **denominator**.

$\frac{3}{6}$

Step 2

Add the **numerators** **4** + **3** equalling **7**.
The **denominator** remains the **same** as **6**.
The resulting fraction is **seven-sixths**. (an **improper fraction**)

Step 3

Convert the **improper fraction** of **seven-sixths** into a **mixed fraction**.
A **mixed fraction** consists of a **whole number** and a **proper fraction**.
Out of **seven-sixths** a fraction wall shows **six-sixths** is equivalent to **one whole** and with a remainder of **one-sixth** . **1** $\frac{1}{6}$

Test Questions

1) $\frac{4}{6} + \frac{3}{6} = \_\_$

2) $\frac{4}{5} + \frac{2}{5} = \_\_$

3) $\frac{4}{9} + \frac{7}{9} = \_\_$

4) $\frac{4}{7} + \frac{5}{7} = \_\_$

5) $\frac{6}{4} + \frac{2}{4} = \_\_$

6) $\frac{7}{8} + \frac{3}{8} = \_\_$

7) $\frac{8}{9} + \frac{8}{9} = \_\_$

8) $\frac{6}{7} + \frac{6}{7} = \_\_$

9) $\frac{4}{5} + \frac{3}{5} = \_\_$

10) $\frac{2}{3} + \frac{2}{3} = \_\_$

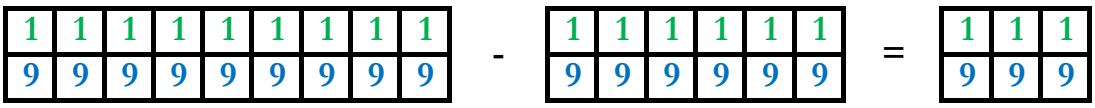
Subtract Fractions

1) $\frac{9}{9} - \frac{6}{9} = \frac{?}{?}$

Word Problem

Mum and dad enter a pie eating competition at the summer fete.
Mum ate **nine-ninths** of a pie and dad ate **six-ninths** less.
How much pie was **eaten** by dad**?**

Fraction Tiles



Step 1

$\frac{9}{9} - \frac{6}{9} =$

Step 2

$\frac{9 - 6}{9} = \frac{3}{9}$

Step 3

Common Factors of $3 = 1, 3$
$9 = 1, 3, 9$

$\frac{3}{9} \div \frac{3}{3} = \frac{1}{3}$

Strategy Applied

Step 1

Subtract two fractions with the **same denominators** and **different numerators** of **nine-ninths** and **six-ninths**.

The 9 represents the **numerator**.
The 9 represents the **denominator**.
$\frac{9}{9}$

The 6 represents the **numerator**.
The 9 represents the **denominator**.
$\frac{6}{9}$

Step 2

Subtract the **numerators** **9** - **6** equalling **3**.

The **denominator** remains the **same** as **9**.

The resulting fraction is **three-ninths**. (**Simplify** if possible)

Step 3

Simplify a fraction by reducing the **numerator** and **denominator** to their **lowest terms** by **dividing** them **both** by their **Highest Common Factor**.

The **Highest Common Factor** (**HCF**) of **3** and **9** is **3**.

The value of the simplified fraction of $\frac{1}{3}$.

Test Questions

1) $\frac{9}{9} - \frac{6}{9} = \_\_\_$

2) $\frac{3}{8} - \frac{1}{8} = \_\_\_$

3) $\frac{5}{6} - \frac{3}{6} = \_\_\_$

4) $\frac{5}{6} - \frac{1}{6} = \_\_\_$

5) $\frac{3}{4} - \frac{1}{4} = \_\_\_$

6) $\frac{2}{3} - \frac{1}{3} = \_\_\_$

7) $\frac{1}{2} - \frac{1}{2} = \_\_\_$

8) $\frac{8}{8} - \frac{4}{8} = \_\_\_$

9) $\frac{3}{3} - \frac{1}{3} = \_\_\_$

10) $\frac{7}{9} - \frac{1}{9} = \_\_\_$

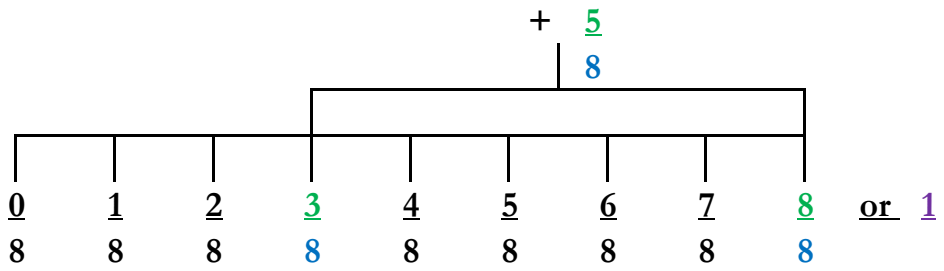
Find the Missing Number

1) $\frac{3}{8} + \frac{?}{?} = 1$

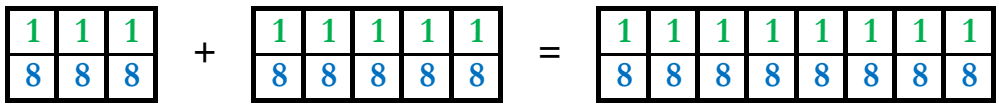
Word Problem

A litre bottle is **three eighths** full of water.
How much water is required to fill the **bottle?**

Number Line



Fraction Tiles



Strategy Applied

Step 1

The **3** represents the **numerator**.
The **8** represents the **denominator**.

The **1 whole** is equivalent to $\frac{8}{8}$

Step 2

First, draw a number line that represents **eighths**, writing **zero-eighths** at the start and **eight-eighths** or **one** whole at the end.
Then, number the number line by counting on **one-eighth** at a time.
Next, find and touch the number **three-eighths** on a number line.
Then, count forwards **one-eighth** at a time on a number line from the **three-eighths** on to **eight-eighths** or **one whole**.
Finally the number of **eighths** counted on is **five-eighths**, the missing number.

Test Questions

1) $\frac{3}{8} + \frac{\quad}{\quad} = 1$

2) $\frac{5}{9} + \frac{\quad}{\quad} = 1$

3) $1 \div \frac{\quad}{\quad} = \frac{1}{100}$

4) $7 \div \frac{\quad}{\quad} = \frac{7}{100}$

5) $2\ \frac{1}{2}\ \text{m} + 4\ \text{m} = \frac{\quad}{\quad}$

6) $\frac{5}{12} + \frac{11}{12} = \frac{\quad}{\quad} + \frac{1}{12}$

7) $\frac{12}{5} - \frac{4}{5} = \frac{\quad}{\quad} + 1$

8) $\frac{2}{9} + \frac{8}{9} - \frac{4}{9} = \frac{\quad}{\quad}$

Answers

P. 2

1) 1 thousand, 2 hundreds, 3 tens, 4 ones, 5 tenths, 6 hundredths
2) 1 thousand, 2 hundreds, 4 tens, 6 ones, 1 tenths, 9 hundredths
3) 2 thousand, 1 hundreds, 7 tens, 0 ones, 8 tenths, 3 hundredths
4) 3 thousand, 5 hundreds, 3 tens, 7 ones, 7 tenths, 4 hundredths
5) 4 thousand, 0 hundreds, 6 tens, 8 ones, 6 tenths, 1 hundredths
6) 5 thousand, 3 hundreds, 7 tens, 9 ones, 0 tenths, 2 hundredths
7) 6 thousand, 5 hundreds, 1 tens, 3 ones, 9 tenths, 3 hundredths
8) 7 thousand, 2 hundreds, 1 tens, 5 ones, 4 tenths, 8 hundredths
9) 8 thousand, 3 hundreds, 4 tens, 6 ones, 5 tenths, 7 hundredths
10) 9 thousand, 5 hundreds, 3 tens, 7 ones, 2 tenths, 0 hundredths

P. 4

1) 1,000, 200, 30, 4, 0.5, 0.06
2) 1,000, 200, 40, 6, 0.1, 0.09
3) 2,000, 100, 70, 9, 0.8, 0.03
4) 3,000, 500, 30, 7, 0.7, 0.04
5) 4,000, 0, 60, 8, 0.6, 0.01
6) 5,000, 300, 70, 9, 0.0, 0.02
7) 6,000, 500, 10, 3, 0.9, 0.03
8) 7,000, 200, 10, 5, 0.4, 0.08
9) 8,000, 300, 40, 6, 0.5, 0.07
10) 9,000, 500, 30, 7, 0.8, 0.00

P. 6

1) 2,750
2) 3,559
3) 4,699
4) 5,455
5) 6,308
6) 7,700
7) 8,619
8) 9,591
9) 10,455
10) 10,309
11) 1,309
12) 1,455
13) 1,591
14) 1,710

P. 8

1) 1,980
2) 2,470
3) 2,150
4) 2,090
5) 2,550
6) 2,180
7) 3,330
8) 4,330
9) 5,380
10) 6,210
11) 5,720
12) 4,050
13) 3,990
14) 9,740

Answers

P. 10

1) 850
2) 760
3) 640
4) 520
5) 810p
6) 730p
7) £700
8) £500
9) 900
10) 380
11) 750
12) 430
13) 520
14) 350

P. 12

1) 900
2) 2,400
3) 1,200
4) 3,600
5) 7,000
6) 10,000
7) 8,000
8) £1,800
9) 900cm
10) 1,500m
11) 2,200
12) 4,500
13) 2,500
14) 9,000

P. 14

1) 18, 24
2) 42, 48
3) 58, 64
4) 21, 28
5) 49, 56
6) 71, 78
7) 27, 36
8) 63, 72
9) 37, 46
10) 75, 100
11) 95, 120
12) 175, 200
13) 315, 415
14) 683, 783

P. 16

1) 3.9
2) 3.8
3) 8.9
4) 8.9
5) 7.9
6) 6.8
7) 8.1
8) 10.0
9) 10.0
10) 6.8
11) 7.6
12) 10.00
13) 7.2
14) 9.1

P. 18

1) 6,081
2) 5,385
3) 7,520
4) 9,722
5) 9,762
6) 9,374
7) 7,909
8) 3,748
9) 17,634
10) 7,872
11) 7,693
12) 6,386
13) 7,465
14) 18,846

P. 20

1) 74.24
2) 62.85
3) 91.04
4) 86.22
5) 74.62
6) 95.72
7) 153.09
8) 91.08
9) 186.24
10) 108.72
11) 86.93
12) 183.86
13) 22.65
14) 198.36

P. 22

1) 1,300
2) 2,642
3) £4.20
4) £11.39
5) 1hr 37min
6) 1m 350cm
7) 1,743ml
8) 5,371
9) 0.64
10) 30
11) 42
12) 81
13) 300
14) 425

P. 24

1) 280
2) 1,520
3) 2,489
4) 3,345
5) 4,250
6) 5,222
7) 6,340
8) 7,400
9) 8,690
10) 8,710
11) 210
12) 3,784
13) 6,969
14) 8,907

Answers

P. 26

1) 4,950
2) 3,800
3) 5,120
4) 1,340
5) 2,420
6) 3,420
7) 6,130
8) 5,600
9) 9,420
10) 4,960
11) 1,550
12) 5,860
13) 1,540
14) 3,300

P. 28

1) 625
2) 865
3) 547
4) 500
5) 480
6) 865
7) 542
8) 400
9) 280
10) 543
11) 765
12) 816
13) 494
14) 632

P. 30

1) 4,000
2) 1,000
3) 700
4) 700
5) 1,900
6) 1,800
7) 3,800
8) 4,500
9) 1,600
10) 2,000
11) 740
12) 2,850
13) 2,930
14) 5,700

P. 32

1) 6, 0
2) 21, 15
3) 33, 27
4) 31, 24
5) 43, 36
6) 55, 48
7) 74, 65
8) 183, 174
9) 278, 269
10) 393, 384
11) 650, 625
12) 875, 850
13) 900, 800
14) 2,400, 2,3(

P. 34

1) 0.3
2) 1.2
3) 3.7
4) 6.1
5) 4.5
6) 2.6
7) 0.7
8) 2.2
9) 6.2
10) 0.4
11) 3.2
12) 3.4
13) 3.8
14) 5.3

P. 38

1) 6,792
2) 3,492
3) 2,874
4) 1,189
5) 3,589
6) 3,469
7) 6,771
8) 2,802
9) 7.797
10) 552
11) 1,062
12) 2,163

P. 40

1) 54.9
2) 20.9
3) 44.9
4) 49.2
5) 19.6
6) 17.4
7) 27.1
8) 28.2
9) 9.7
10) 23.6
11) 11.9
12) 27.0
13) 20.6
14) 30.7
15) 11.7

P. 42

1) 9,700
2) 2,832
3) 3,000
4) £1.70
5) 776
6) 719
7) 6,523
8) £27.21
9) 57
10) 24
11) 45
12) 56
13) 72
14) 70

Answers

P. 44

1) 48
2) 36
3) 36
4) 25
5) 77
6) 16
7) 96
8) 36
9) 27
10) 48
11) 81
12) 44
13) 24
14) 42

P. 46

1) 40
2) 75
3) 30
4) 120
5) 48
6) 147
7) 42
8) 96
9) 72
10) 84
11) 420
12) 960
13) 7,200
14) 84,000

P. 48

1) 2,600
2) 390
3) 4,100
4) 580
5) 6,300
6) 720
7) 8,000
8) 940
9) 7,500
10) 530
11) 9,100
12) 820
13) 6,400
14) 550

P. 50

1) 112
2) 272
3) 1,070
4) 8,540
5) 423
6) 312
7) 1,125
8) 41,285
9) 387
10) 189
11) 704
12) 66,060

P. 52

1) 64.05
2) 330.96
3) 372.33
4) 412.85
5) 128.37
6) 367.00
7) 660.60
8) 260.80
9) 372.36
10) 424.32
11) 434.42
12) 402.16

P. 54

1) 200
2) 6
3) 0
4) 240
5) 72
6) 147
7) 12
8) 72
9) 6
10) 256
11) 15
12) 0
13) 12
14) 690

P. 56

1) 3
2) 9
3) 9
4) 46
5) 4
6) 98
7) 30
8) 96
9) 110
10) 56
11) 2
12) 7
13) 12
14) 11

P. 58

1) 3.61
2) 32.9
3) 3.38
4) 48.2
5) 1.23
6) 72.4
7) 1,35
8) 16.6
9) 2.47
10) 920.8
11) 41.59
12) 610.7
13) 52.03
14) 310.9

Answers

P. 60

1) 228 r1
2) 2,712 r1
3) 3,567 r1
4) 125 r1
5) 1,069 r3
6) 2,752 r1
7) 14 r5
8) 1,852
9) 1,835
10) 91 r3
11) 701
12) 460 r4
13) 33 r4
14) 646 r5
15) 656 r2

P. 62

1) 5.69
2) 4.12 r1
3) 8.85 r2
4) 7.19 r3
5) 8.85
6) 4.12
7) 6.00 r4
8) 4.17 r4
9) 5.93 r5
10) 2.12 r1

P. 64

1) 4
2) 2
3) 0.07
4) 0.26
5) 4
6) 11
7) 0.3
8) 0.6
9) 7
10) 8
11) 26
12) 14
13) 8
14) 9

P. 66

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

P. 68

1) 3,260
2) 2,140
3) 7,660
4) 7,220
5) 4,400
6) 3,200
7) 40.00
8) 10.00
9) 90.00
10) 60.00
11) 30.00
12) 20.00
13) 870.00
14) 1,250.00

P. 70

1) 5,500
2) 900
3) 9,900
4) 5,900
5) 2,200
6) 1,100
7) 100.00
8) 200.00
9) 400.00
10) 600.00
11) 600.00
12) 700.00
13) 9,900.00
14) 9,400.00

P. 72

1) 4,000
2) 1,000
3) 9,000
4) 6,000
5) 3,000
6) 2,000
7) 8,000
8) 7,000
9) 4,000
10) 10,000
11) 2,000
12) 6,000
13) 1,000
14) 10,000

P. 74

1) 14
2) 10
3) 15
4) 20
5) 8
6) 10
7) 9
8) 12
9) 8
10) 26

Answers

P. 76

1) $\frac{7}{8}$ or $1\ \frac{1}{6}$

2) $\frac{6}{5}$ or $1\ \frac{1}{5}$

3) $\frac{11}{9}$ or $1\ \frac{2}{9}$

4) $\frac{9}{7}$ or $1\ \frac{2}{7}$

5) $\frac{8}{4}$ or 2

6) $\frac{10}{8}$ or $1\ \frac{2}{8}$

7) $\frac{16}{9}$ or $1\ \frac{7}{9}$

8) $\frac{12}{7}$ or $1\ \frac{5}{7}$

9) $\frac{7}{5}$ or $1\ \frac{2}{5}$

10) $\frac{4}{3}$ or $1\ \frac{1}{3}$

P. 78

$9\ \frac{3}{9}$ or $\frac{1}{3}$

2) $\frac{2}{8}$ or $\frac{1}{4}$

3) $\frac{2}{6}$ or $\frac{1}{3}$

4) $\frac{4}{6}$ or $\frac{2}{3}$

5) $\frac{2}{4}$ or $\frac{1}{2}$

6) $\frac{1}{3}$

7) 0

8) $\frac{4}{8}$ or $\frac{1}{2}$

9) $\frac{2}{3}$

10) $\frac{6}{9}$ or $\frac{2}{3}$

P. 80

1) $\frac{5}{8}$

2) $\frac{4}{9}$

3) 100

4) 100

5) $6\ \frac{1}{2}$ m

6) $\frac{15}{12}$

7) $\frac{3}{5}$

8) $\frac{6}{9}$ or $\frac{1}{3}$

Glossary

Common Factor is a number which is a factor of two or more other numbers, e.g. 3 is a common factor of the numbers 9 and 30.

Common Multiple is an integer which is a multiple of a given set of integers, e.g. 24 is a common multiple of 2, 3, 4, 6, 8 and 12.

Decimal Fraction is tenths, hundredths, thousandths etc. represented by digits following a decimal point. E.g. 0.125 is equivalent to 1/10 + 2/100 + 5/1000 or 1/8. The decimal fraction representing 1/8 is a terminating decimal fraction since it has a finite number of decimal places.
Other fractions such as 1/3 produce recurring decimal fractions, these have a digit or group of digits that is repeated indefinitely.

Denominator is the number written below the line i.e. the divisor.
e.g. in the fraction ⅔ the denominator is 3.

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.

Equivalent Fraction are fractions with the same value as another.
e.g. 4/8, 5/10, 8/16 are all equivalent fractions and all are equal to 1/2.

Exchanging 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.

Factor is when a number, can be expressed as the product of two numbers, these are factors of the first. E.g. 1, 2, 3, 4, 6 and 12 are all factors of 12 because $12 = 1 \times 12 = 2 \times 6 = 3 \times 4$.

Glossary

Highest Common Factor (H.C.F.) is the common factor of two or more numbers which has the highest value.
e.g. 16 has factors 1, 2, 4, 8, 16. 24 has factors 1, 2, 3, 4, 6, 8, 12, 24.
56 has factors 1, 2, 4, 7, 8, 14, 28, 56. The common factors of 16, 24 and 56 are 1, 2, 4 and 8. Their highest common factor is 8.

Improper Fraction is an improper fraction has a numerator that is greater than its denominator. Example: 9/4 is improper and could be expressed as the mixed number 2 1/4.

Integer is any of the positive or negative whole numbers and zero.
e.g. …2, -1, 0, +1, +2 …

Lowest Common Multiple (L.C.M.) is the common multiple of two or more numbers, which has the least value. E.g. 3 has multiples 3, 6, 9, 12….
4 has multiples 4, 8, 12, 16, 20, 24 … and 6 has multiples 6, 12, 18, 24, 30 ….
The common multiples of 3, 4 and 6 include 12, 24 and 36.
The lowest common multiple of 3, 4 and 6 is 12.

Mixed Fraction is a whole number and a fractional part expressed as a common fraction. e.g. 1 1/3 is a mixed fraction or mixed number.

Mixed Number is a whole number and a fractional part expressed as a common fraction. Example: 2 ¼ is a mixed number. Also known as a mixed fraction.

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

Non-Unit Fraction is a fraction that has a value of 2 or more as the numerator and whose denominator is a non-zero integer. e.g. 1/2, 1/3.

Glossary

Numerator is the number written on the top– the dividend (the part that is divided). In the fraction 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. $6 \times 10 \div 10 = 6$.

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?'

Percentage 1) A fraction expressed as the number of parts per hundred and recorded using the notation %. E.g. One half can be expressed as 50%; the whole can be expressed as 100% 2) Percentage can also be interpreted as the operator 'a number of hundredths of'.

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.

Proper Fraction has a numerator that is less than its denominator, so 3/4 is a proper fraction, whereas 4/3 is an improper fraction (i.e. not proper).

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.

Simplify Fraction is to simplify a fraction down to its lowest terms. The numerator and denominator are divided by the same number e.g. 4/8 = 2/4, also to 'reduce' a fraction.
When the numerator and denominator are both divided by their highest common factor the fraction is said to have been cancelled down to give the equivalent fraction in its lowest terms. e.g.18/30 = 3/5 (dividing numerator and denominator by 6).

Unit Fraction is a fraction that has 1 as the numerator and whose denominator is a non-zero integer. e.g.1/2, 1/3.