Maths steps to success and vocabulary- year 6

Number and place value

Read and write numbers up to 10,000,000

M	HTh	TTh	Th	H	T	O
Millions	Ten Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
8	2	1	7	5	4	3

						3
					4	0
				5	0	0
			7	0	0	0
		1	0	0	0	0
	2	0	0	0	0	0
8	0	0	0	0	0	0

Eight million, two hundred and seventeen thousand, five hundred and forty-three.

Digit
Expanded form
Ones
Tens
Hundreds
Thousands
Ten thousand
Hundred thousands
Millions
Ten millions

Numeral
Place holder
Place value

Comparing and ordering whole numbers to 10,000,000

↑ ascending ↓ descending

70,177 7,170 70,717

70,177
7,170
70,717

1) Put all the numbers in a column, making sure the digits in each column are aligned.

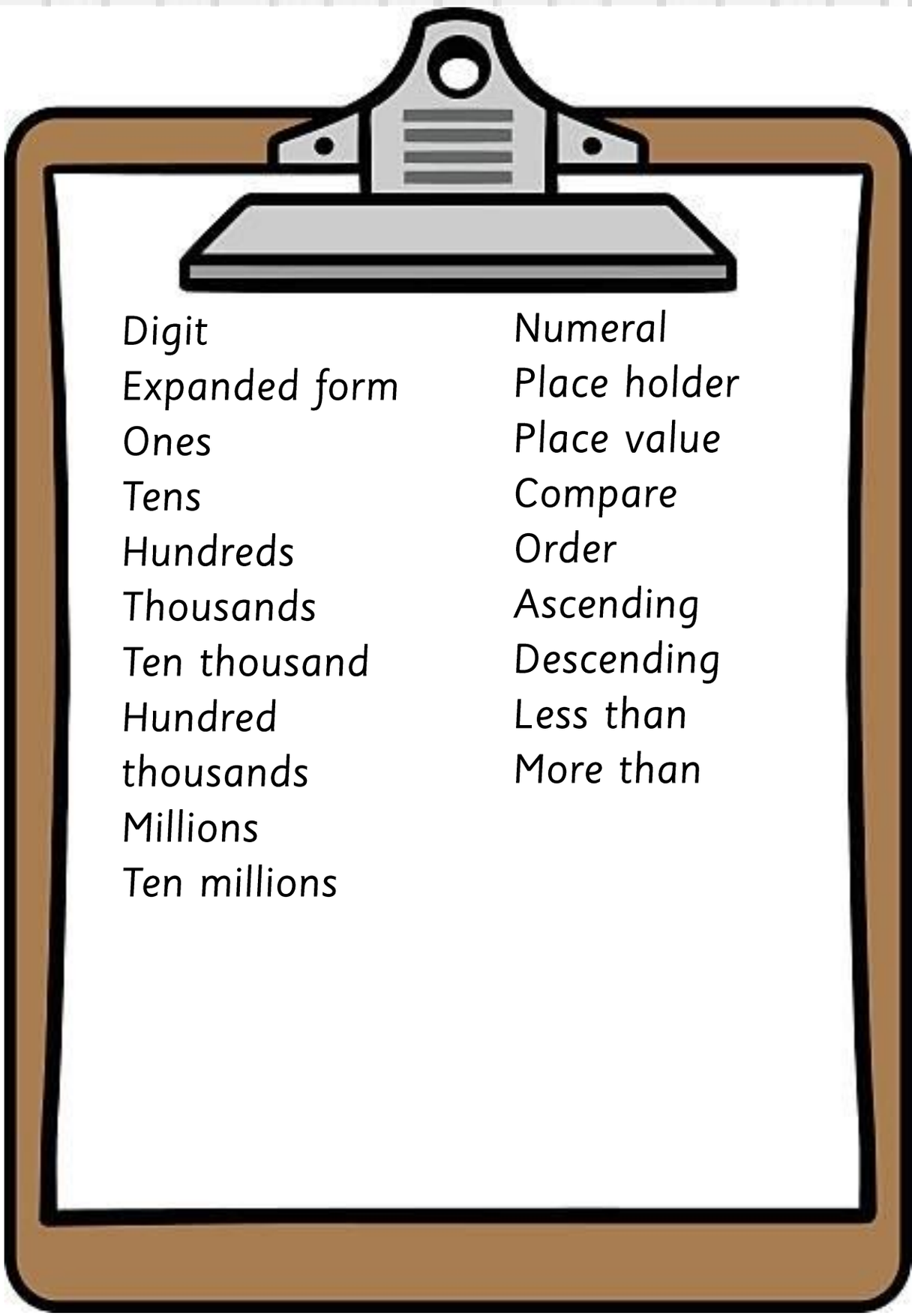
2) Check whether you are putting the numbers in ascending or descending order

3) Compare the digits in each column, starting from the left. If two digits are the same, move along to the next column.

Ascending

7,170 70,177 70,717

Read through each number to check the order.



Digit
Expanded form
Ones
Tens
Hundreds
Thousands
Ten thousand
Hundred thousands
Millions
Ten millions

Numeral
Place holder
Place value
Compare
Order
Ascending
Descending
Less than
More than

Round any whole number to a required degree of accuracy

1) Find your number and circle it
2) Look next door
3) Less than 4, just ignore
4) 5 or more, add one more to the circled number
5) Replace the rest with zeros

4 1 2 3

nearest 10: 4 1 2 3 → 4 1 2 0

nearest 100: 4 1 2 3 → 4 1 0 0

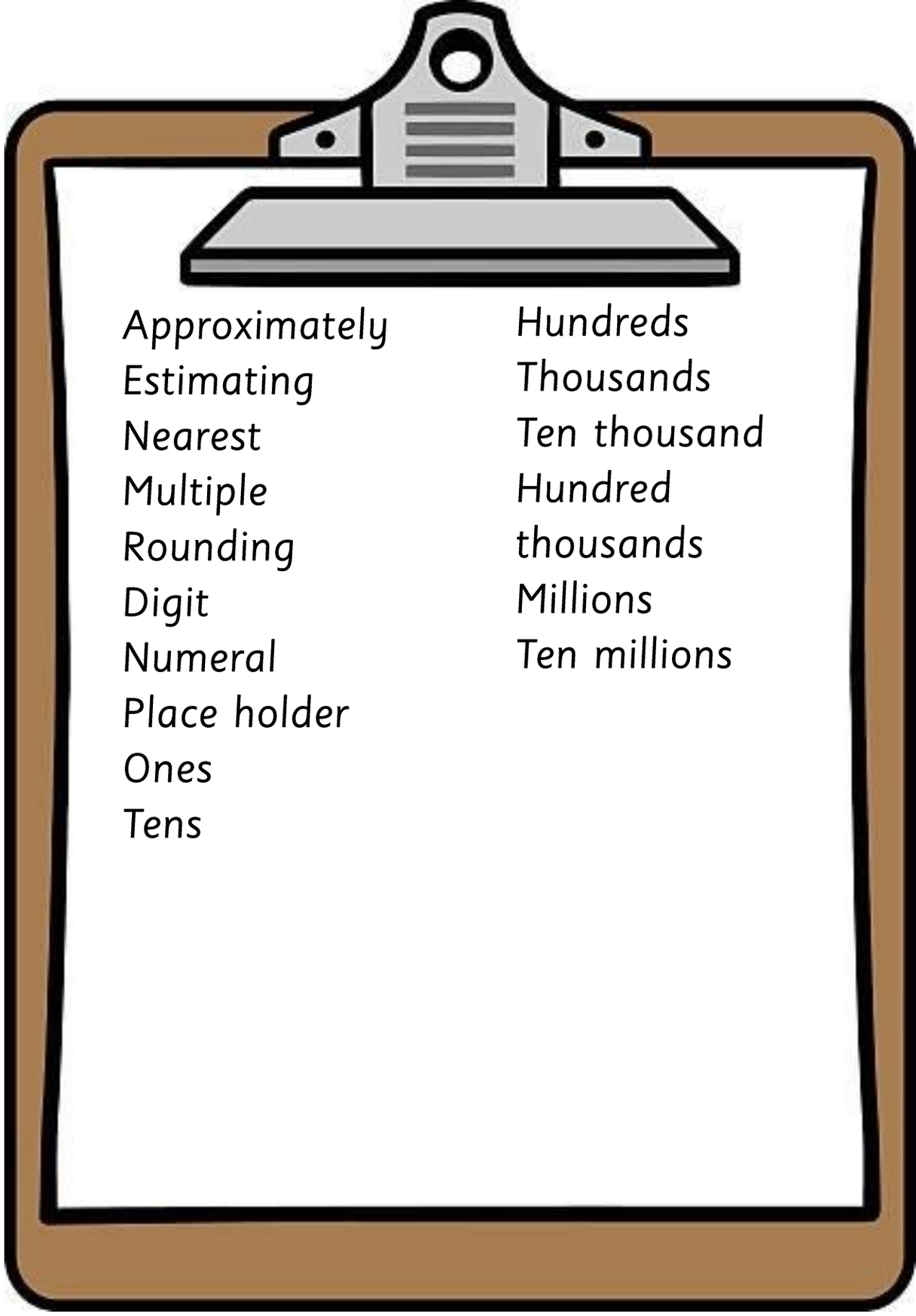
nearest 1000: 4 1 2 3 → 4 0 0 0

5 8 6 7

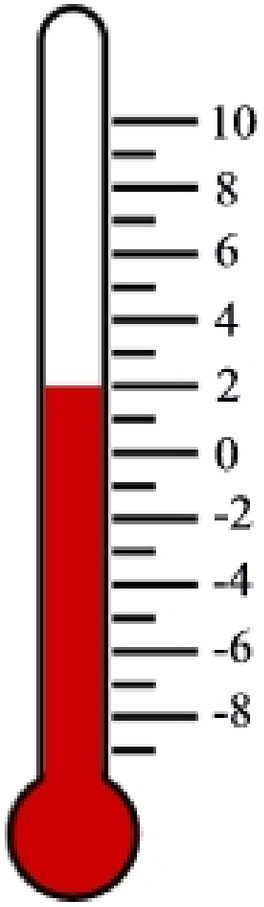
nearest 10: 5 8 6 7 → 5 8 7 0

nearest 100: 5 8 6 7 → 5 9 0 0

nearest 1000: 5 8 6 7 → 6 0 0 0

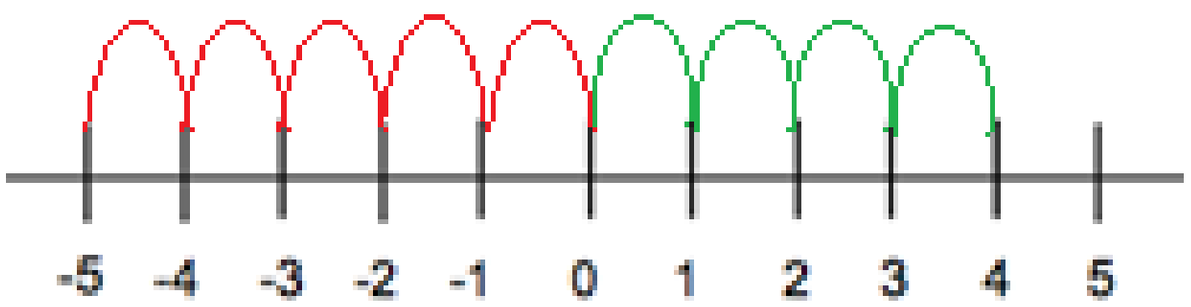


Use negative numbers in context and calculate intervals across zero



You'll most often use negative numbers when looking at temperature. Temperatures below zero will go into negative numbers.

What is the difference between 4 and -5?
The difference between -5 and 0 is 5, and the difference between 0 and 4 is 4. In total, the difference is 9.



Positive
Negative
Scale
Number line
Intervals
Calculate
Minus

Addition, subtraction, multiplication and division

Use column addition

4, 4 5 3 + 4, 5 2 7

TTH TH, H T O

4, 4 5 3 +
4, 5 2 7

1) Align digits in the correct place value columns.

3) Starting from the right, add each column in turn. Carry digits to the next column if the total adds to more than 9.

TTH TH, H T O
4, 4 5 3 +
4, 5 2 7
0
1

Carry the 1 to the next column

TTH TH, H T O
4, 4 5 3 +
4, 5 2 7
8 0
1

Include the 1 in your next addition

TTH TH, H T O
4, 4 5 3 +
4, 5 2 7
8 9 8 0
1

- Addition
- Calculate
- Decimal number
- Decimal point
- Digit
- Inverse
- Operation
- Sum
- Column
- Symbol
- Total
- Equal

Use column addition (decimals)

3 2 . 7 + 4 . 3 7

T O . t h

3 2 . 7 0

\+ 0 4 . 3 7

1) Align digits and decimal points.

2) Add zeros as placeholders if needed.

3) Starting from the right, add each column in turn. Carry digits to the next column if the total adds to more than 9.

3 2 . 7 0

\+ 0 4 . 3 7

. 7

3 2 . 7 0

\+ 0 4 . 3 7

. 0 7

1

Carry the 1 to the next column

3 2 . 7 0

\+ 0 4 . 3 7

7 . 0 7

1

Include the 1 in your next addition

3 2 . 7 0

\+ 0 4 . 3 7

3 7 . 0 7

1

- Addition
- Calculate
- Decimal number
- Decimal point
- Digit
- Inverse
- Operation
- Sum
- Column
- Symbol
- Total
- Equal

Use column subtraction (decimals)

1 8 . 9 - 2 . 8 2

T	O	.	t	h
	1	8	. 9	0
+	0	2	. 8	2

1) Align digits and decimal points.

2) Add zeros as placeholders if needed.

3) Starting from the right, subtract each column in turn. If the top digit is smaller than the bottom, borrow from the next column.

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

Borrow from the tenths digit

1 8 . 8 9 0
- 0 2 . 8 2
. 0 8

1 8 . 8 9 0
- 0 2 . 8 2
6 . 0 8

1 8 . 8 9 0
- 0 2 . 8 2
1 6 . 0 8

Subtraction	Symbol
Calculate	Total
Decimal	Equal
number	
Decimal point	
Digit	
Inverse	
Operation	
Sum	
Column	

Use column subtraction

3 4, 6 5 3 - 4, 5 2 7

TTH TH, H T O

3 4, 6 5 3 -

4, 5 2 7

1) Align digits in the correct place value columns.

3) Starting from the right, subtract each column in turn.

4 1

3 4, 6 5 3 -

4, 5 2 7

6

3 subtract 7 would give us a negative number, so we regroup

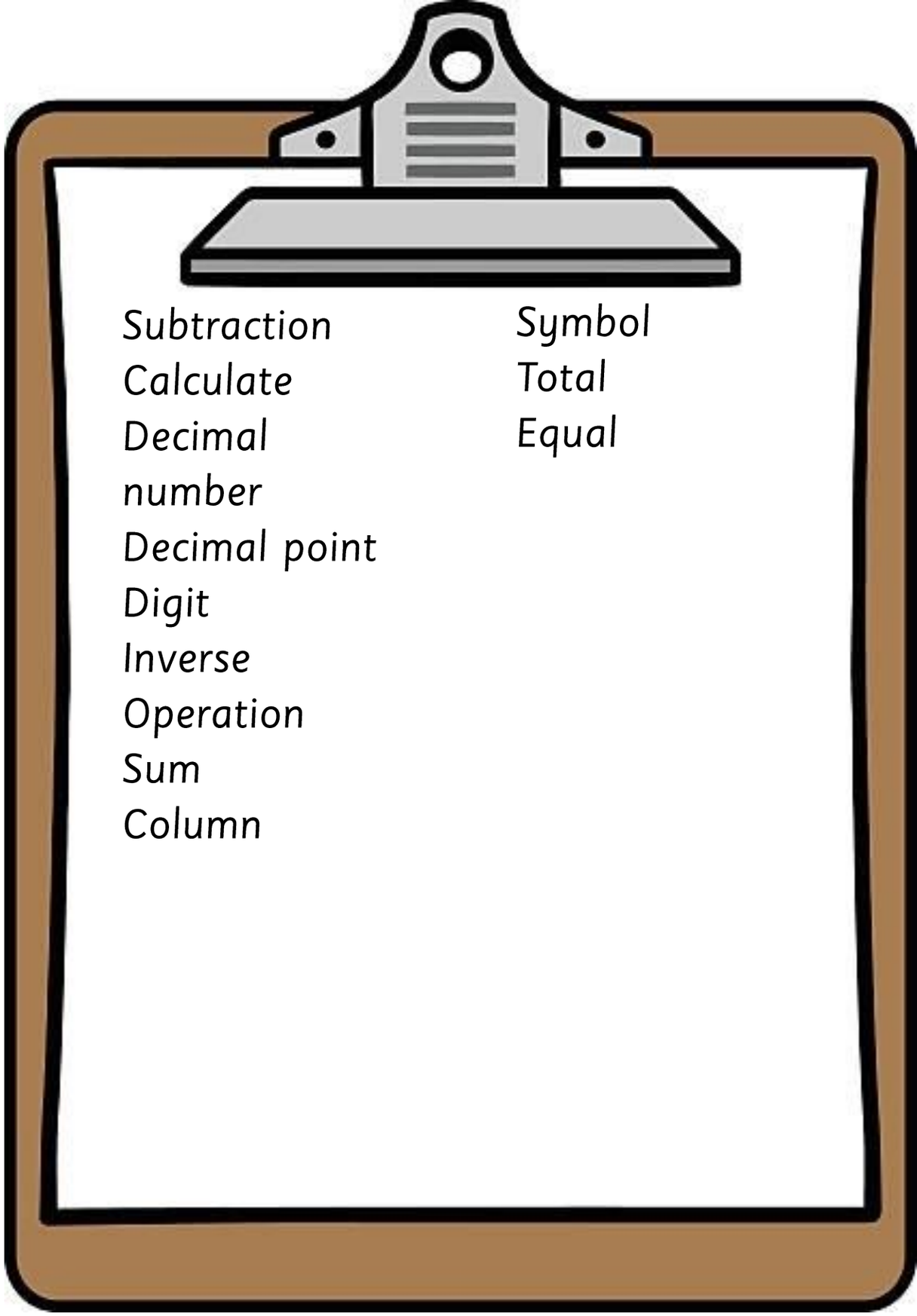
Exchange one lot of 10, so we now have 13—7.

4 1

3 4, 6 5 3 -

4, 5 2 7

3 0 1 2 6



Subtraction
Calculate
Decimal
number
Decimal point
Digit
Inverse
Operation
Sum
Column

Symbol
Total
Equal

Solve multi-step word problems

1) 2)

One drink costs £1.67 and I buy 4. If I pay with a £20 note, how much change will I get?

1) Read the question and break it down into parts.

2) Work out the calculation £20- (4 x £1.67)

3) Solve each part.

£1.67 x 4 = £6.68

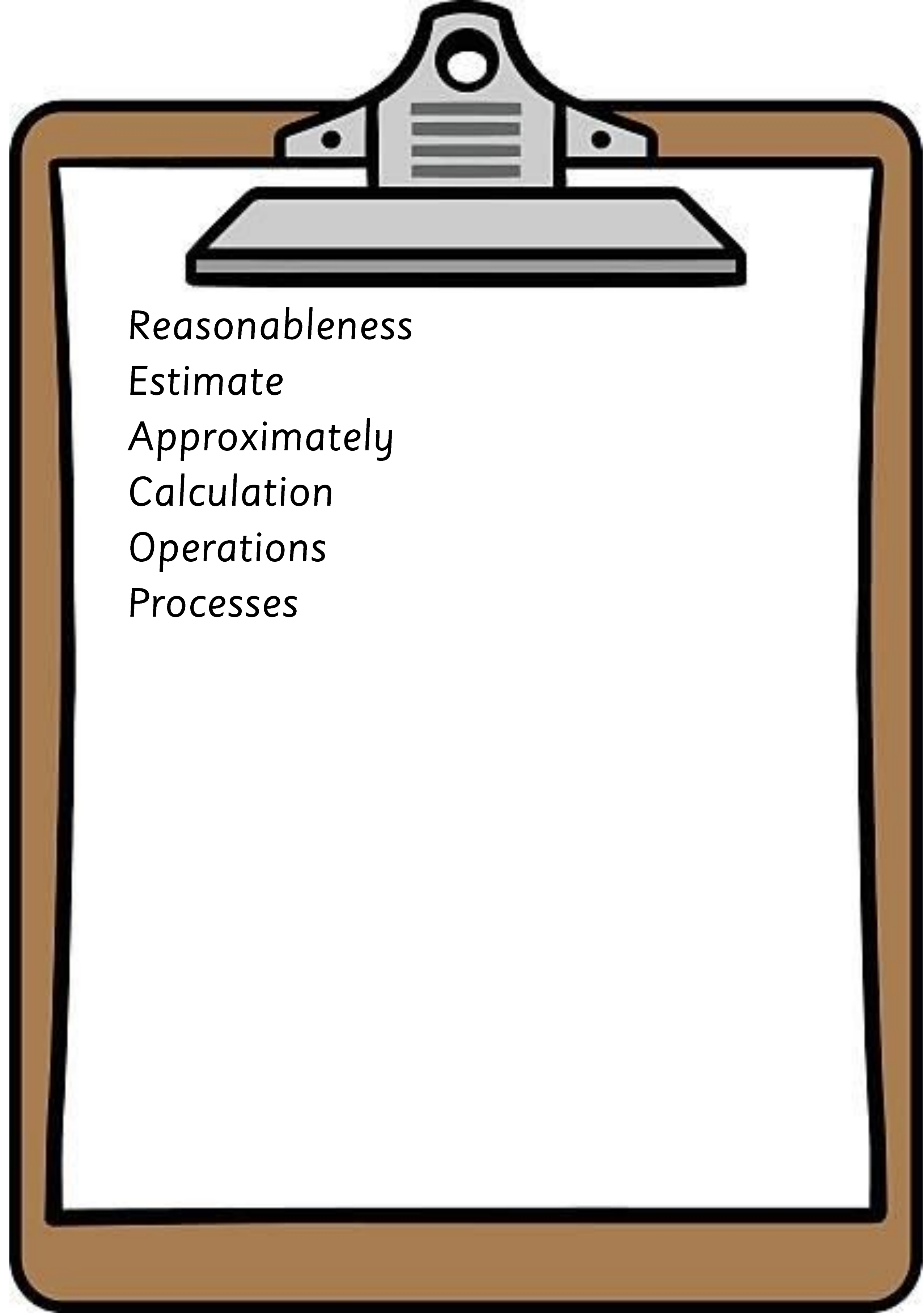
£20—£6.68 =£13.32

```
   1 . 6 7
x        4
----------
   6 . 6 8
 2    2
```

```
  1      9   9    1
  2̶  0   0̶   0  0
-    6   .   6  8
-----------------
  1  3   .   3  2
```

4) Check your answer fits the question.

£1.67 + £1.67 + £1.67 + £1.67 + **£13.32** = £20



Use rounding to estimate

1) Choose what to round each number to.

2) Complete the rounded calculation.

3) Complete the original calculation.

4) If your answers are very different, work it out again!

3 8 . 7 + 2 0 . 8

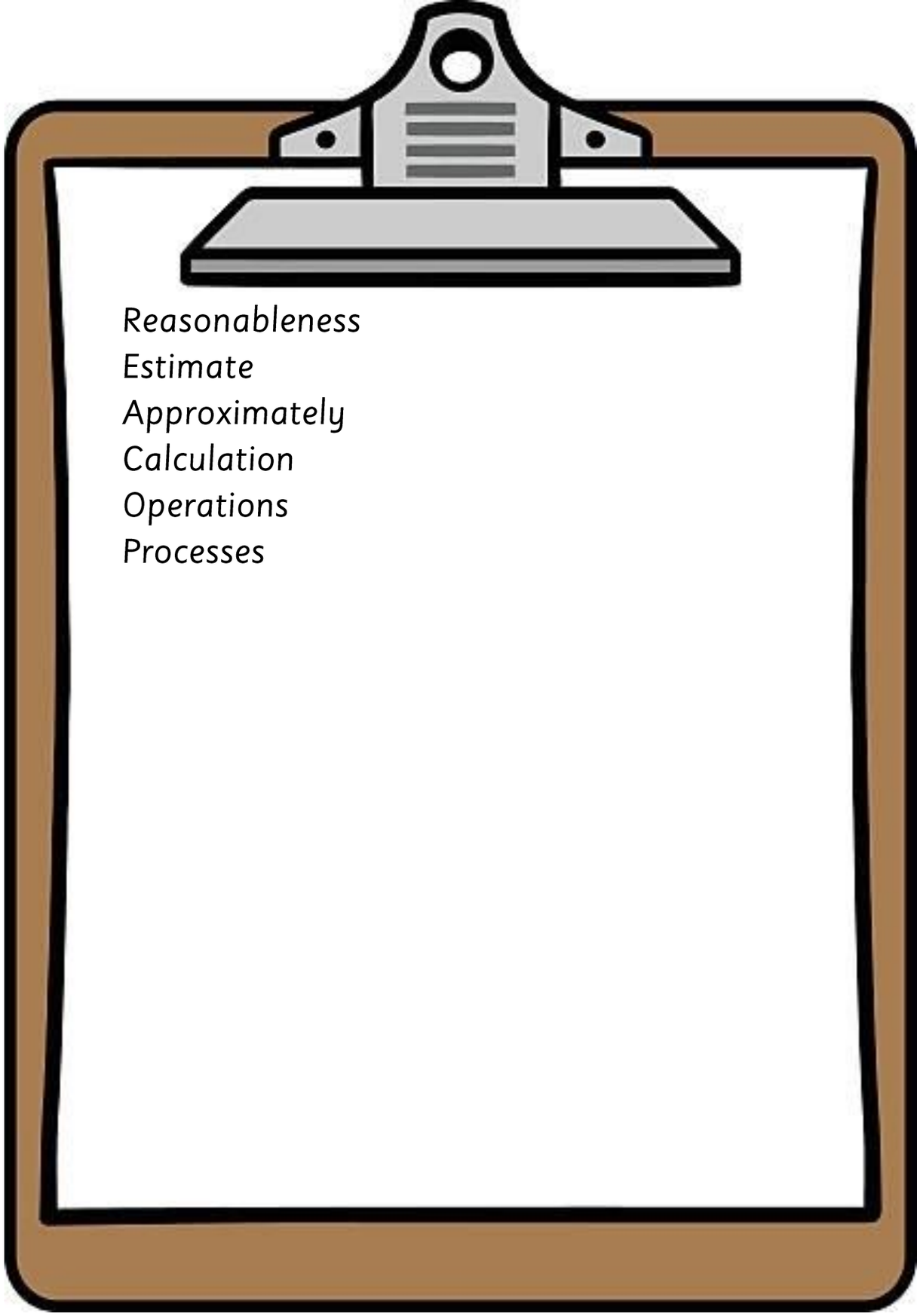
4 0 + 2 0 = 6 0

3 8 . 7 + 2 0 . 8 = 5 9. 5

3 0 , 1 2 7 + 2 , 9 5 3

3 0 , 0 0 0 + 3 , 0 0 0 = 3 3 , 0 0 0

3 0 , 1 2 7 + 2 , 9 5 3 = 3 3 , 0 8 0



Reasonableness
Estimate
Approximately
Calculation
Operations
Processes

Prime numbers

A prime number is a whole number greater than 1 with no divisors except 1 and itself.

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

Top tips:

2 is the only even prime number.
There are no prime numbers that end in 5, except for 5.
The digits can't add up to 3, except 3.

Factors
Prime
Composite

Use the order of operations

B rackets
O rder (square/ cubes)
D ivision **M**ultiplication
A ddition **S**ubtraction

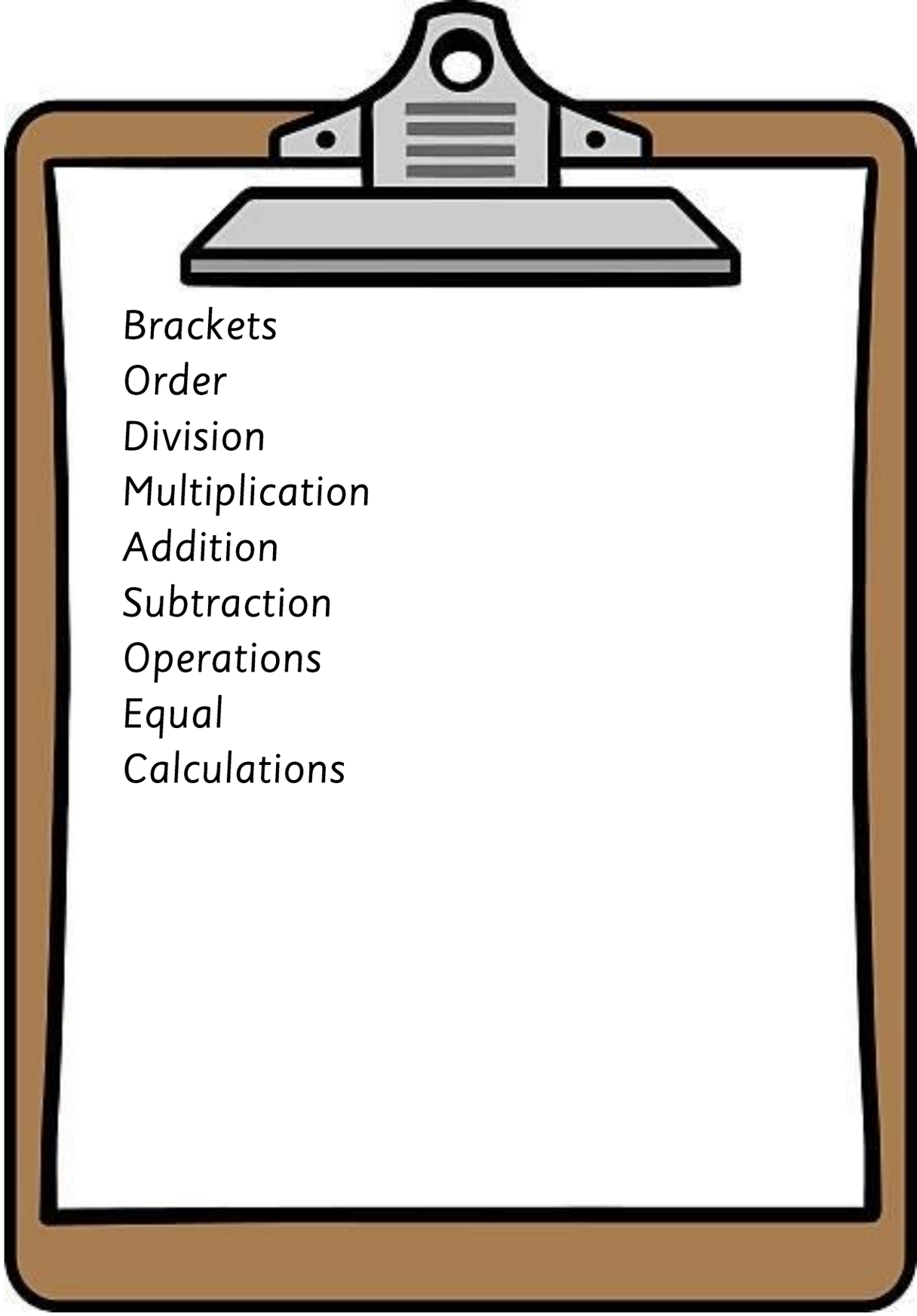
$3^3 - 3 \times (3 + 2)$

$3^3 - 3 \times 5$ — 1) Complete any calculations in brackets.

$2\ 7 - 3 \times 5$ — 2) Complete any square or cube number calculations

$2\ 7 - 1\ 5$ — 3) Complete any multiplication or division (going from left to right)

$2\ 7 - 1\ 5 = 1\ 2$ — 4) Complete any addition or subtraction (going from left to right)



Use short multiplication (decimals)

8 .5 3 x 6

x 8 5 3
6
8
1

1) Multiply the top ones digit by the multiplier. Carry the extra digit if needed.

x 8 5 3
6
1 8
3 1

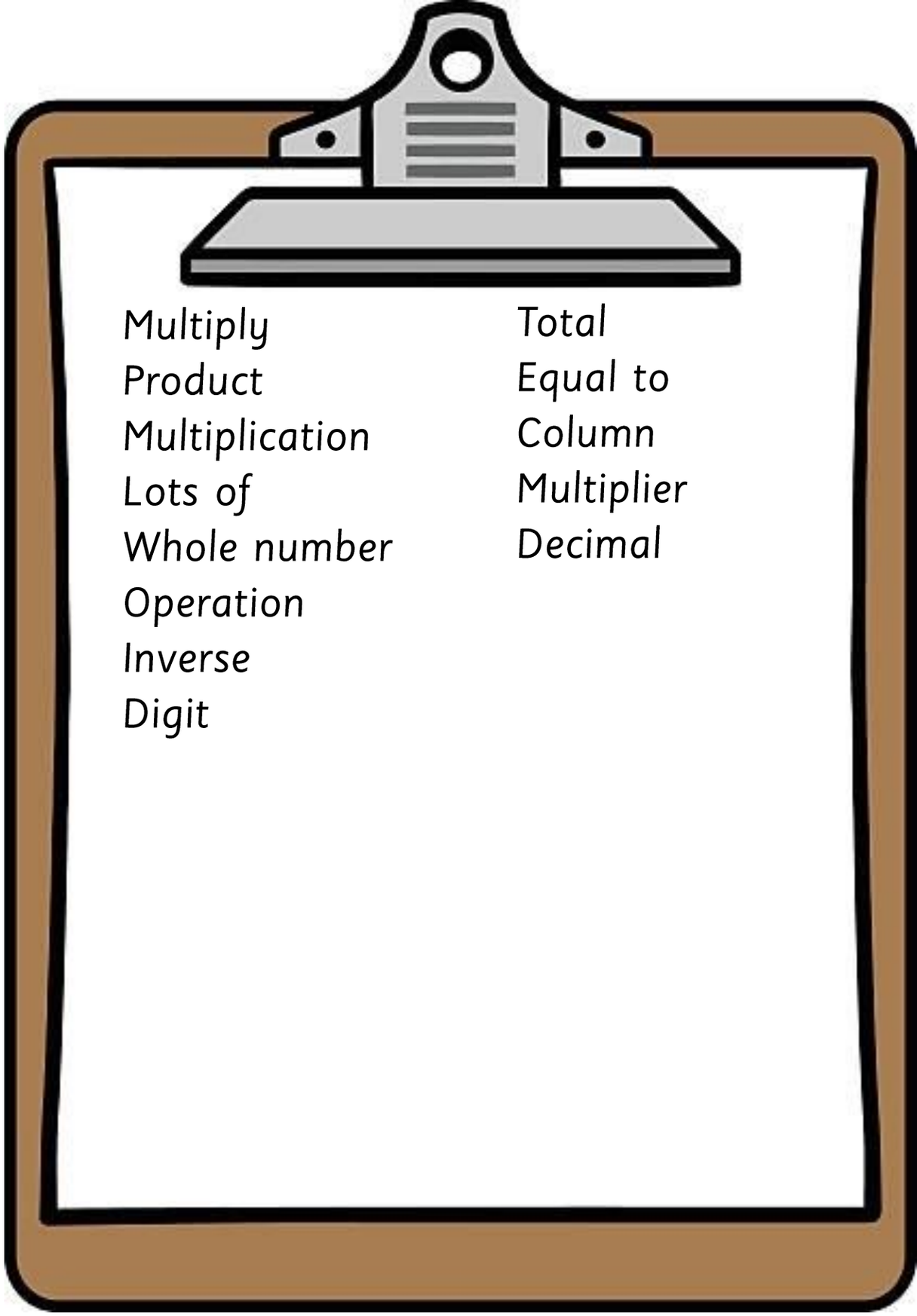
2) Multiply the top tens digit by the multiplier. Add any carried digits. Carry the extra digit if needed.

x 8 5 3
6
5 1 1 8
3 1

3) Multiply the top hundreds digit by the multiplier. Add any carried digits.

8 5 3 x 6 = 5 1 1 8

8 . 5 3 x 6 = 5 1 .1 8



Use long multiplication

3 2 x 4 5

1) Multiply the top ones digit by the bottom ones.

x 3 2
4 5

2 x 5 = 10
Carry the one.

1 0

2) Multiply the top tens digit by the bottom ones.

x 3 2
4 5

1 6 1 0

3) Add a zero below the ones digits.

x 3 2
4 5

1 6 1 0
0

This shows that you are multiplying by 40 rather than 4

4) Multiply the top ones digit by the bottom tens.

x 3 2
4 5

4 x 2 = 8

1 6 1 0
8 0

5) Multiply the top tens digit by the bottom tens.

x 3 2
4 5

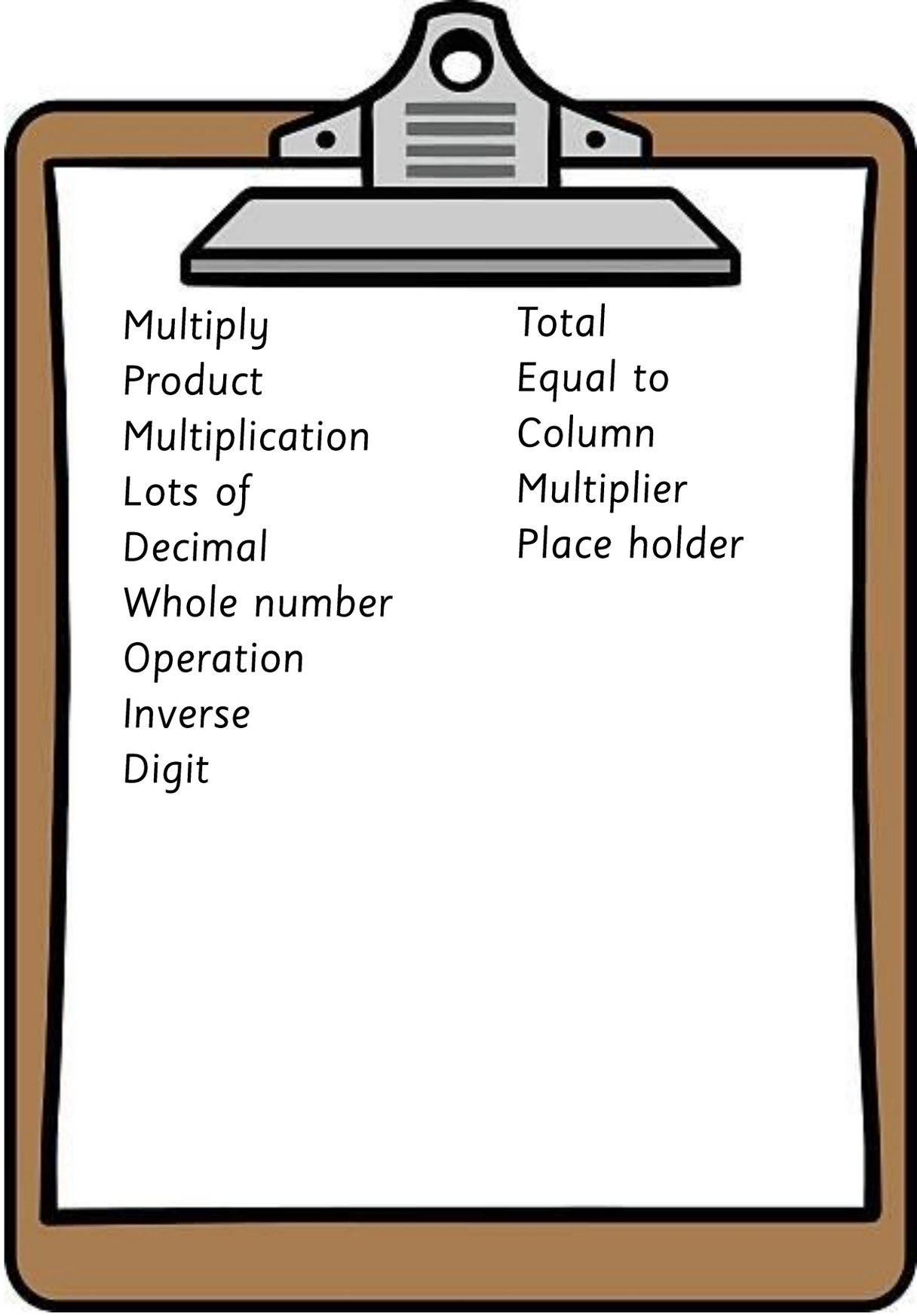
4 x 3 = 12

1 6 1 0
1 2 8 0

6) Add the two answers together.

x 3 2
4 5

1 6 1 0
1 2 8 0
1 4 4 0



Use short division with remainders

divisor

2 4 ÷ 4 = 6

quotient

dividend

$$\begin{array}{r|ll} & 6 \\ \hline 4 & 2 & 4 \end{array}$$

6 2 5 ÷ 4 =

$$\begin{array}{r|l} & 1\ 5\ 6 \\ \hline 4 & 6_{2}\ 2_{2}\ 5 \end{array}$$

1) Starting from the left, see how many times the divisor will go into each digit of the dividend

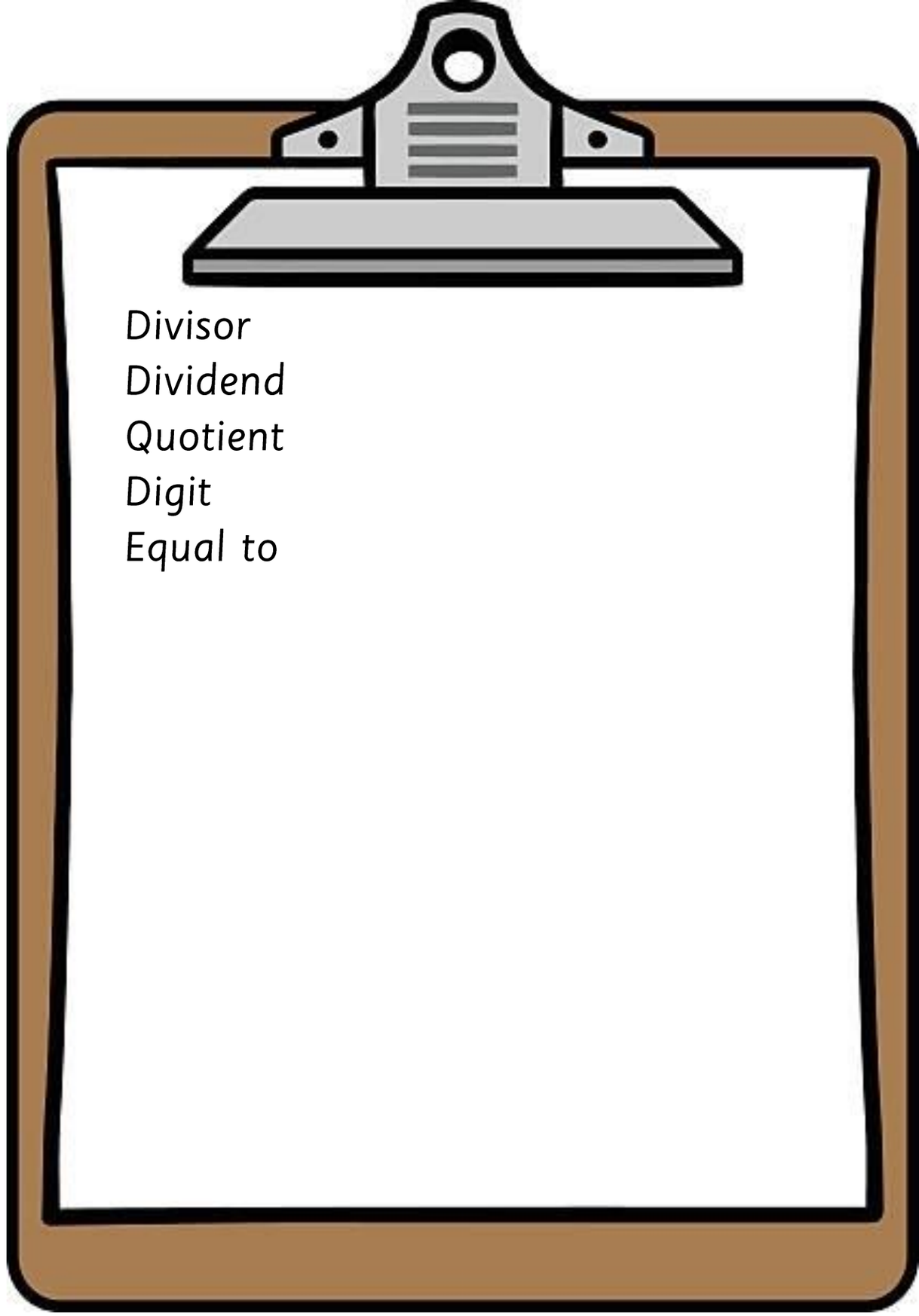
$$\begin{array}{r|l} & 1\ 5\ 6\ r\ 1 \\ \hline 4 & 6_{2}\ 2_{2}\ 5 \end{array}$$

2) When you reach the last digit, if there is a remainder, add a 'r' and the number that is left over.

You can check by doing short multiplication.

1 5 6 x 4 = 6 2 4 ✓

Add the remainder= 6 2 5



Use short division with decimal remainders

$24 \div 4 = 6$

divisor, quotient, dividend

$4\overline{)24}$ with quotient 6

$625 \div 4 =$

1) Starting from the left, see how many times the divisor will go into each digit of the dividend

$4\overline{)6_{2}2_{2}5}$ with quotient 1 5 6

2) When you reach the last digit, add a decimal point to the quotient and a decimal point and a zero to the dividend

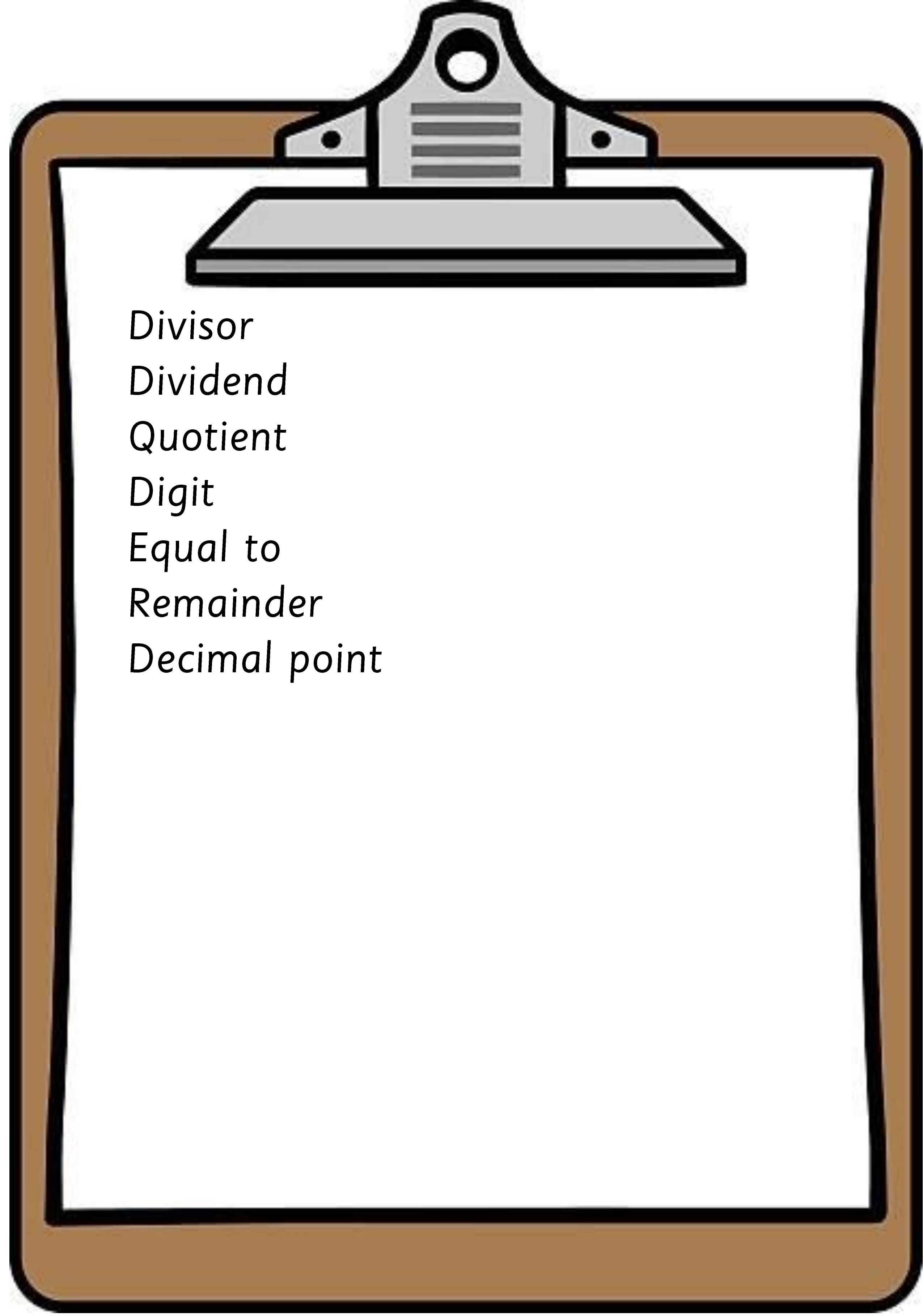
$4\overline{)6_{2}2_{2}5.0}$ with quotient 1 5 6 .

3) Continue the division, adding more zeros to the dividend if needed.

$4\overline{)6_{2}2_{2}5.{}_{1}0\,{}_{2}0}$ with quotient 1 5 6 . 2 5

You can check by doing short multiplication.

$156.25 \times 4 = 625$ ✓



Use long division

divisor

24 ÷ 4 = 6   quotient   4 | 24 (6 above)

dividend

1 4 7 2 ÷ 2 3 =

1) Lay out the calculation

```
        ___________
  2 3 | 1  4  7  2
        1  1  5  0     (x 50)
        ___________
        0  3  2  2
           2  3  0     (x 10)
        ___________
           0  9  2
              9  2     (x 4)
        ___________
              0  0
```

2) Subtract a "chunk" (a multiple of the dividend)

23 x 50 = 1150

3) Subtract a further "chunk"

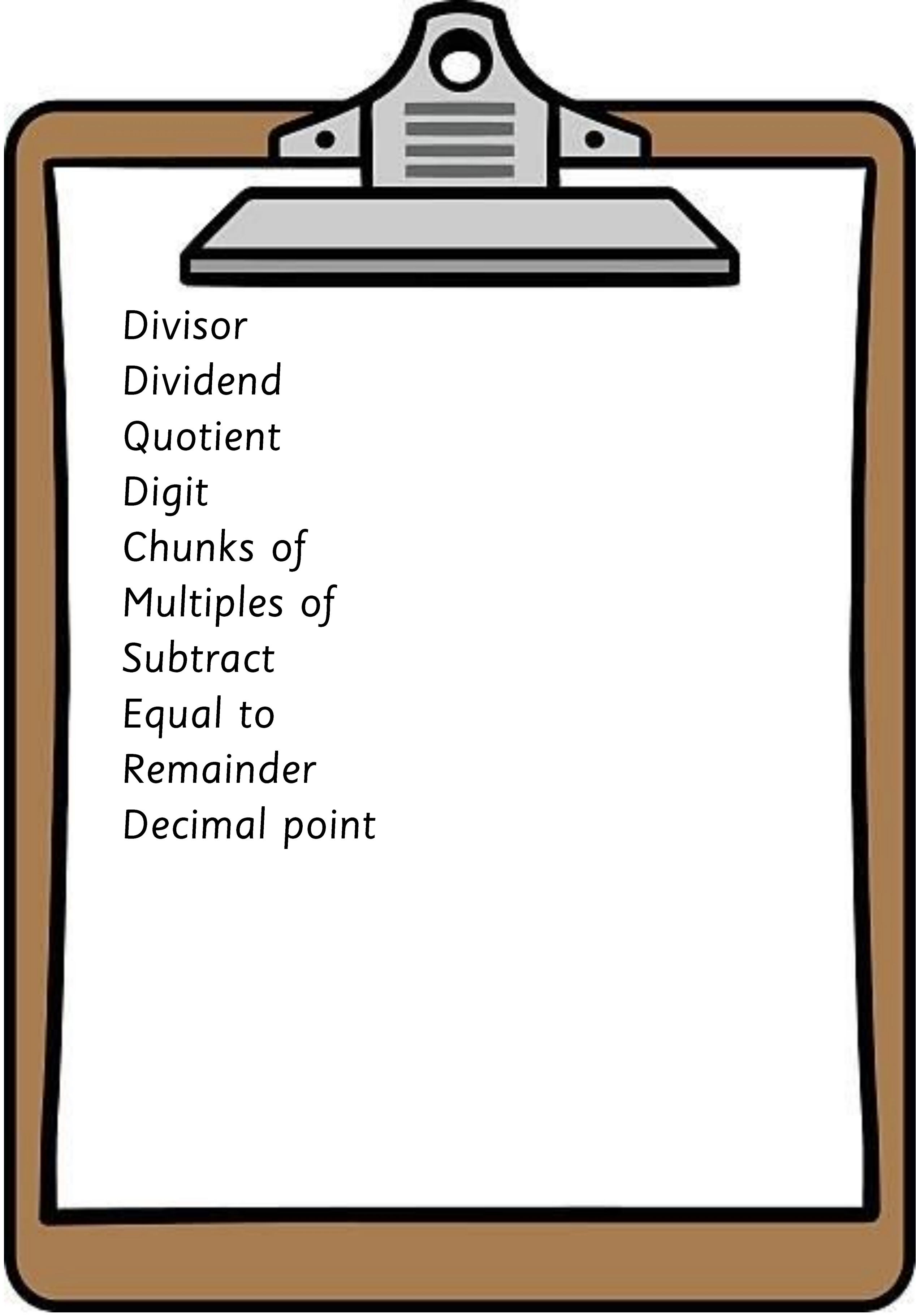
23 x 10 = 230

4) Subtract a further "chunk"

23 x 4 = 92

5) Add up how many "chunks" you have subtracted. 50 + 10 + 4

1 4 7 2 ÷ 2 3 = 6 4



Interpret remainders

When doing short division, we will sometimes need to interpret the remainders in different ways.

Remainders

$625 \div 4 =$

$$\begin{array}{r} 1\ 5\ 6 \\ 4\overline{)6_2 2_2 5} \end{array}$$

$$\begin{array}{r} 1\ 5\ 6\ r\ 1 \\ 4\overline{)6_2 2_2 5} \end{array}$$

Decimal Remainders

$625 \div 4 =$

$$\begin{array}{r} 1\ 5\ 6 \\ 4\overline{)6_2 2_2 5} \end{array}$$

$$\begin{array}{r} 1\ 5\ 6\ . \\ 4\overline{)6_2 2_2 5.0} \end{array}$$

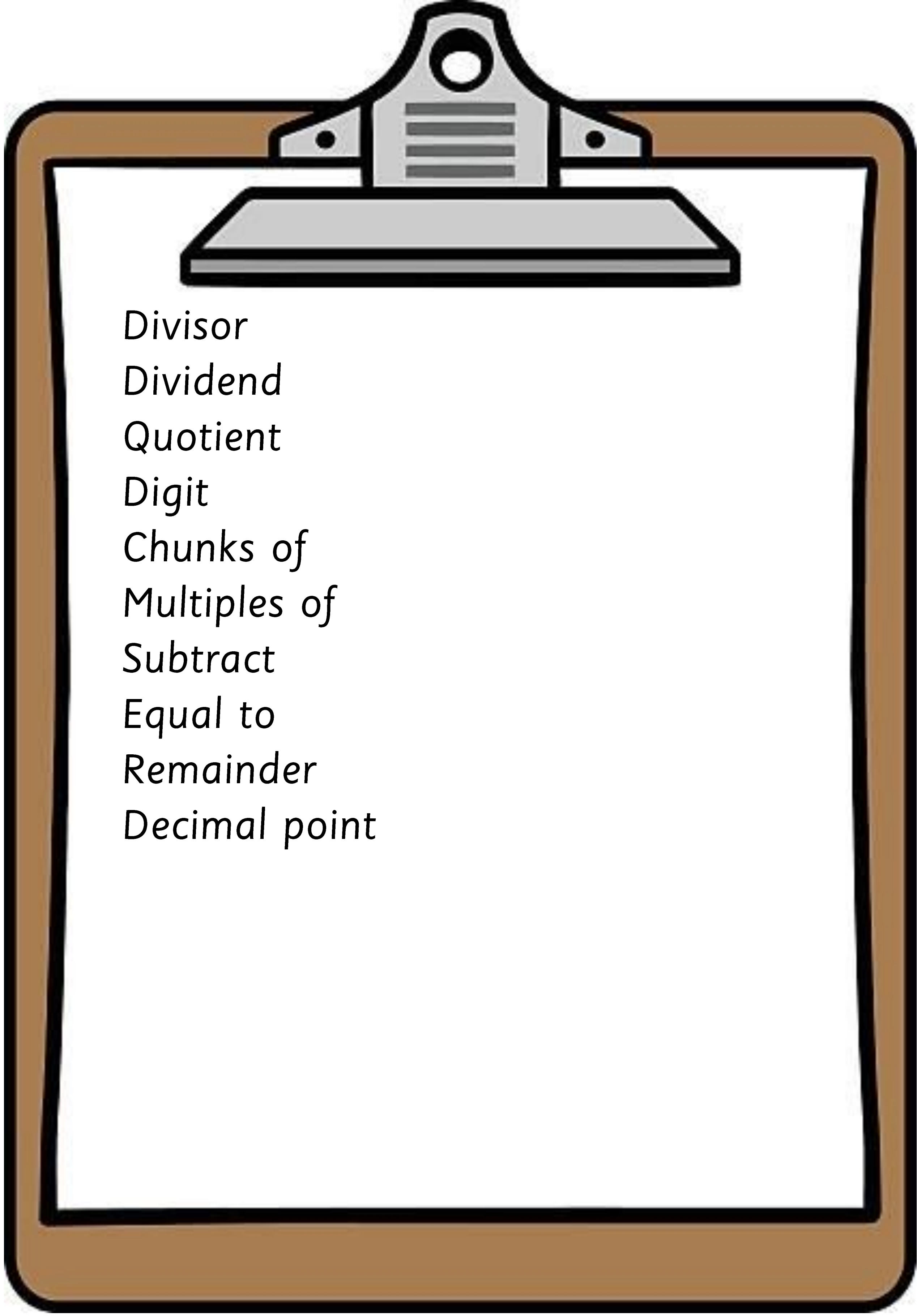
$$\begin{array}{r} 1\ 5\ 6\ .\ 2\ 5 \\ 4\overline{)6_2 2_2 5.0_1 0_2} \end{array}$$

This will usually be used for measure and money.

With remainders, sometimes you'll need to go one step further depending on the question.

Eggs go into boxes of 4. If we have 625 eggs, **how many boxes can we fill**? 156

Eggs go into boxes of 4. If we have 625 eggs, **how many boxes will we need to hold all the eggs?** 157



Finding multiples and common multiples

A multiple is a number which can be divided by another number without a remainder.

Multiples of 5= 5, 1 0, 1 5 , 2 0, 2 5, 3 0

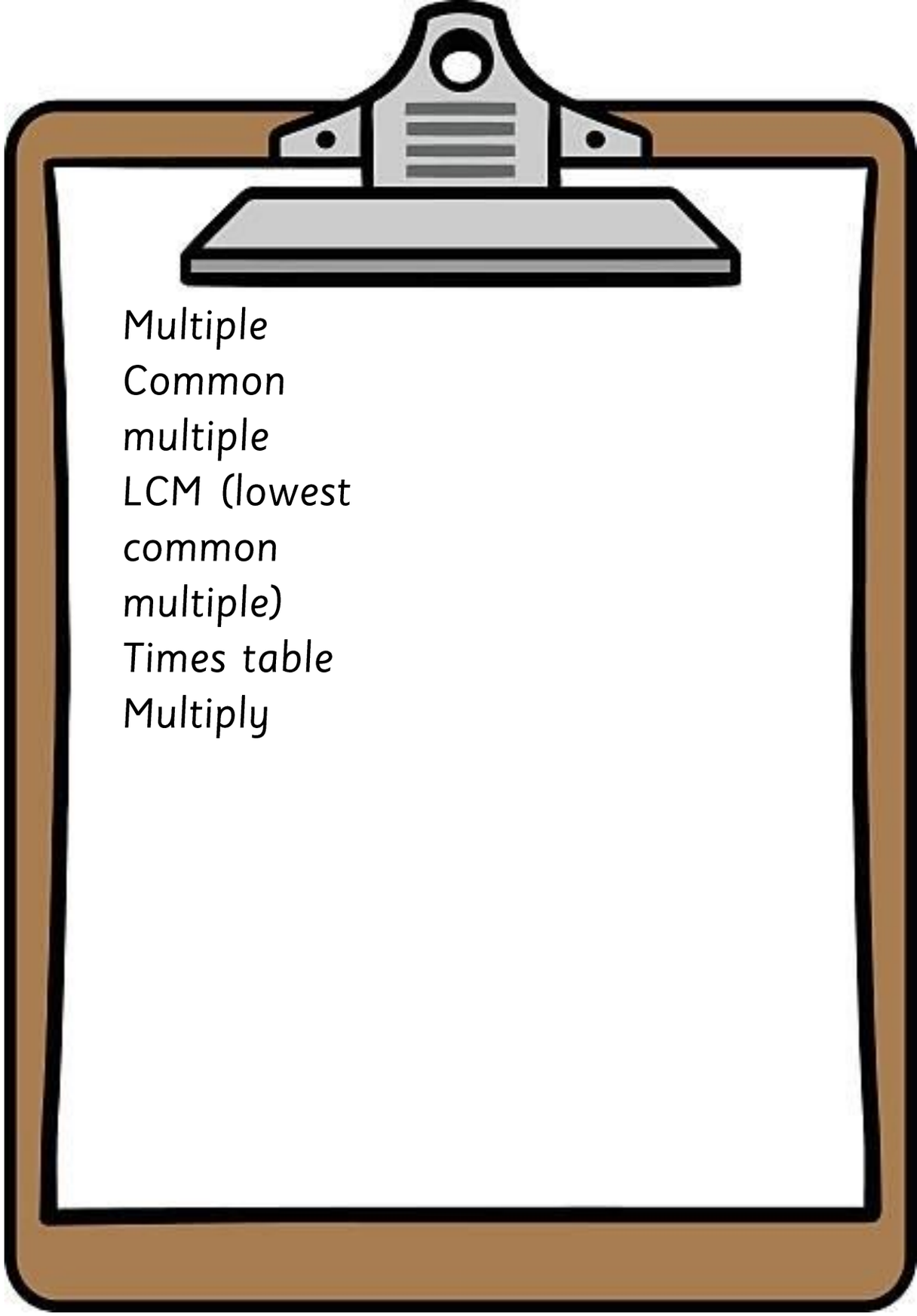
Common multiples

1) Write out multiples of the first number.
2) Write out multiples of the next number.
3) Look for the numbers that appear in both. These will be the common multiples.

Multiples of 3: 3, 6, 9, 12, 18, 21, 24

Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32

1 2 and 2 4 appear in both sets so are common multiples of 3 and 4.



Finding factors and common factors

Factors are whole numbers that can multiply by other whole numbers to make the product.

product

3 6

1 x 3 6
2 x 1 8
3 x 1 2
4 x 9
6 x 6

1) Starting with '1 x __', find pairs of numbers which multiply to make the product.

2) List your factors in ascending order, ignoring any duplicates.

1, 2, 3, 5, 6, 9, 12, 18, 36

Common factors

1) Find the factor pairs of both numbers.

4 8

1 x 4 8
2 x 2 4
3 x 1 6
4 x 1 2
6 x 8

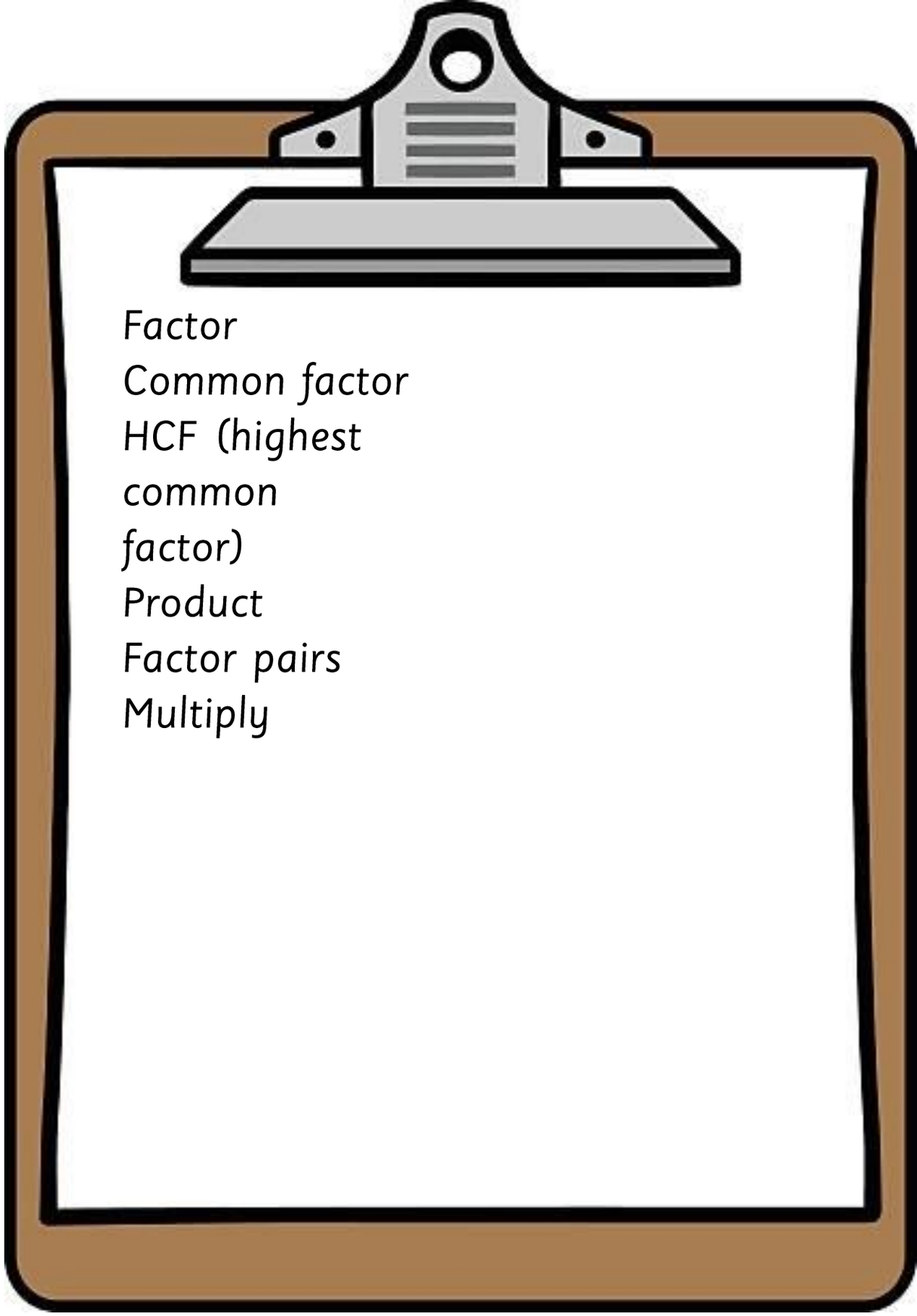
3 6

1 x 3 6
2 x 1 8
3 x 1 2
4 x 9
6 x 6

2) Circle the numbers that appear in both lists.

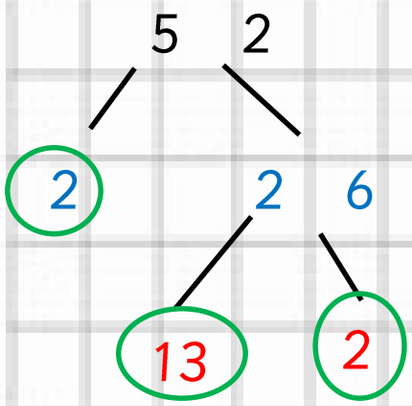
Common factors of 2 4 and 3 6

1, 2, 3, 4, 6, 12



Factor
Common factor
HCF (highest common factor)
Product
Factor pairs
Multiply

Prime factors



1) Place your number at the top.

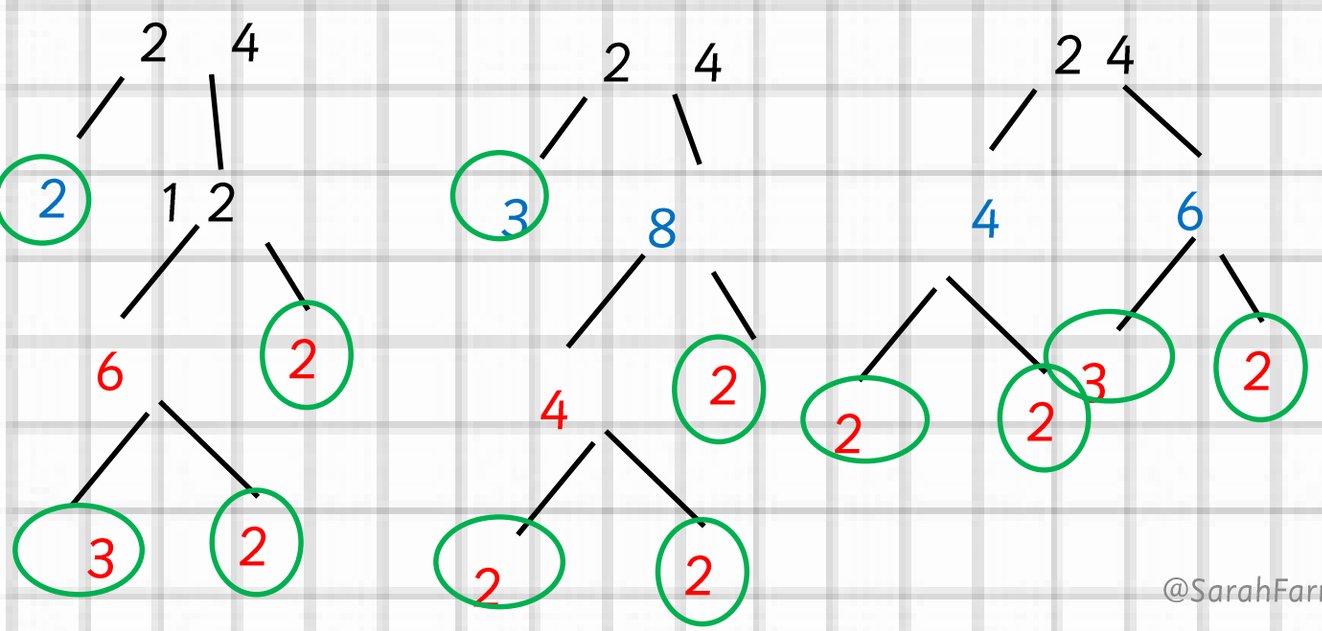
2) Choose a pair of numbers that multiply to make your target.

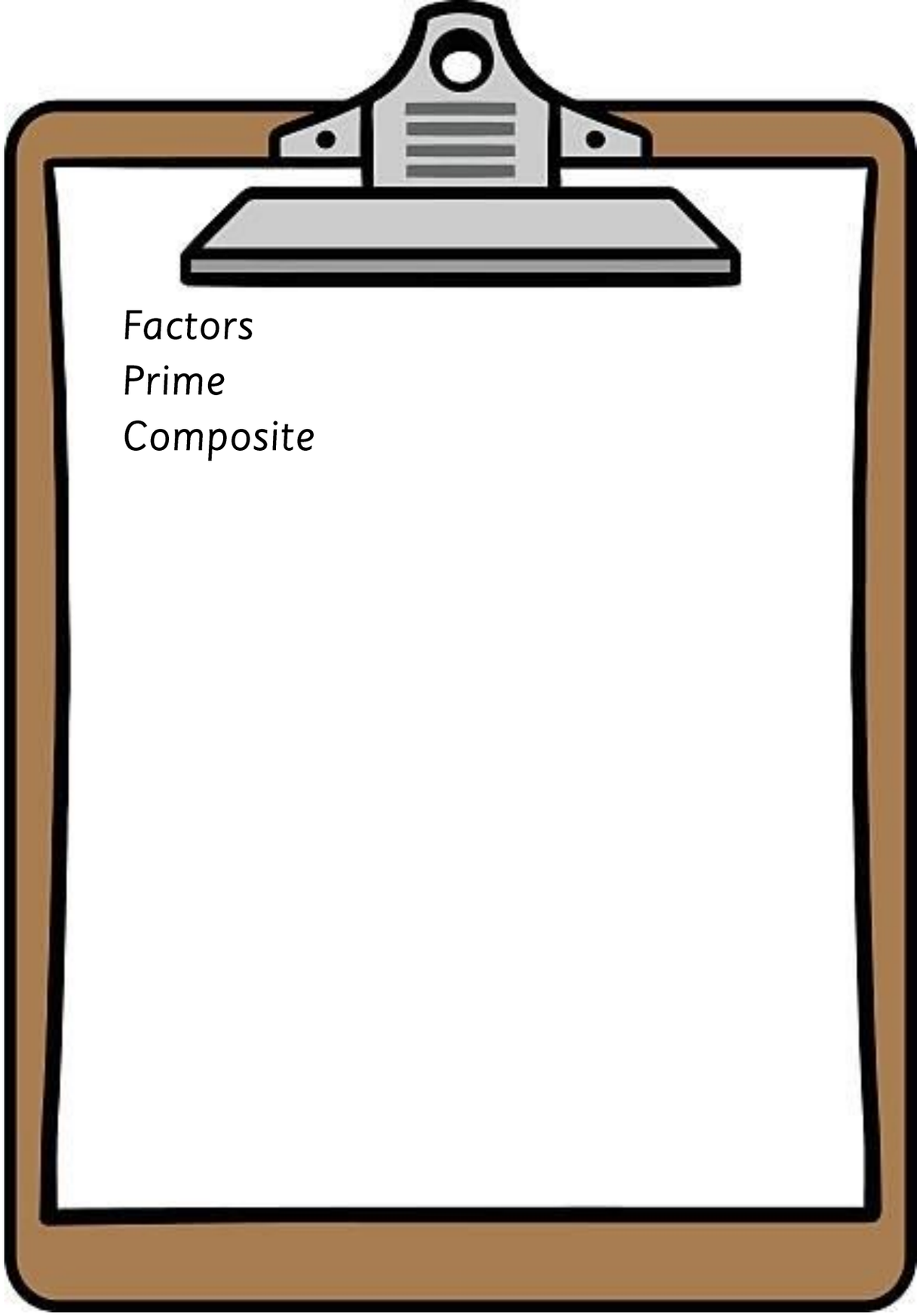
3) If there are any prime numbers, circle them.

Prime factors:
2 x 3 x 13 = 52

4) Continue by finding a pair of numbers that make your new target.

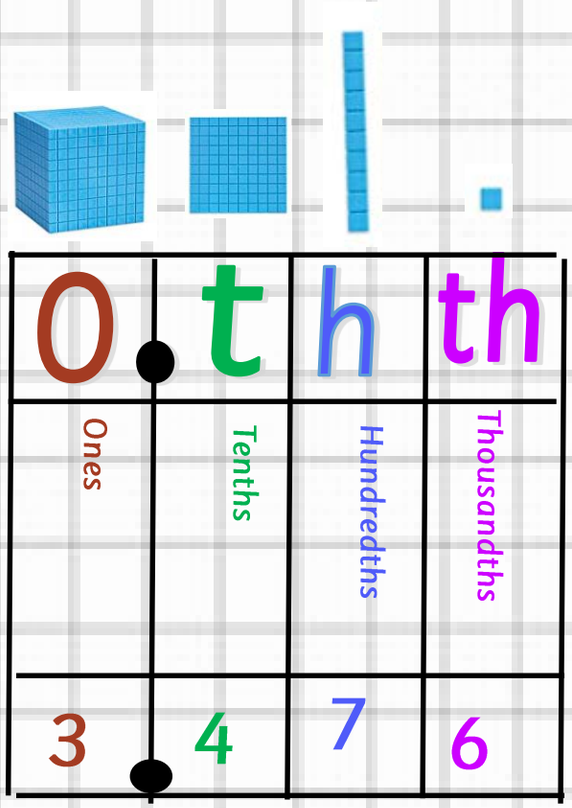
Sometimes there will be more than one way to get the answer, e.g.





Fractions (including decimals and percentages)

Read and write decimal numbers to 3dp and determine the value of each digit



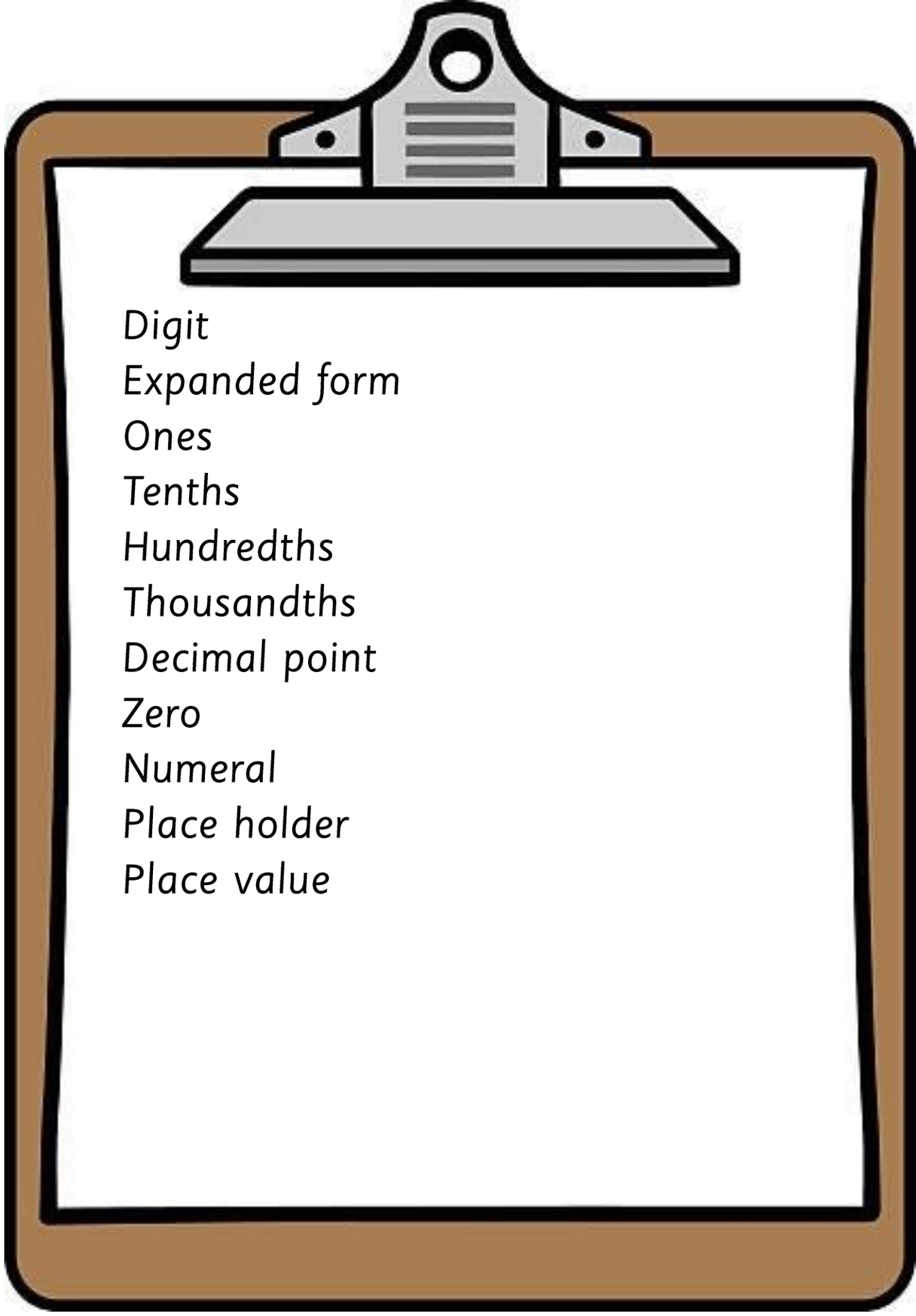
3

0 . 4

0 . 0 7

0 . 0 0 6

Three point four seven six



Compare and order decimal numbers to 3dp

ascending ⬆ descending ⬇

1.23 0.123 21.3 1.233

0 1.2 3 0
0 0.1 2 3
2 1.3 0 0
0 1.2 3 3

1) Put all the numbers in a column, making sure the decimal points are aligned

2) Check whether you are putting the numbers in ascending or descending order

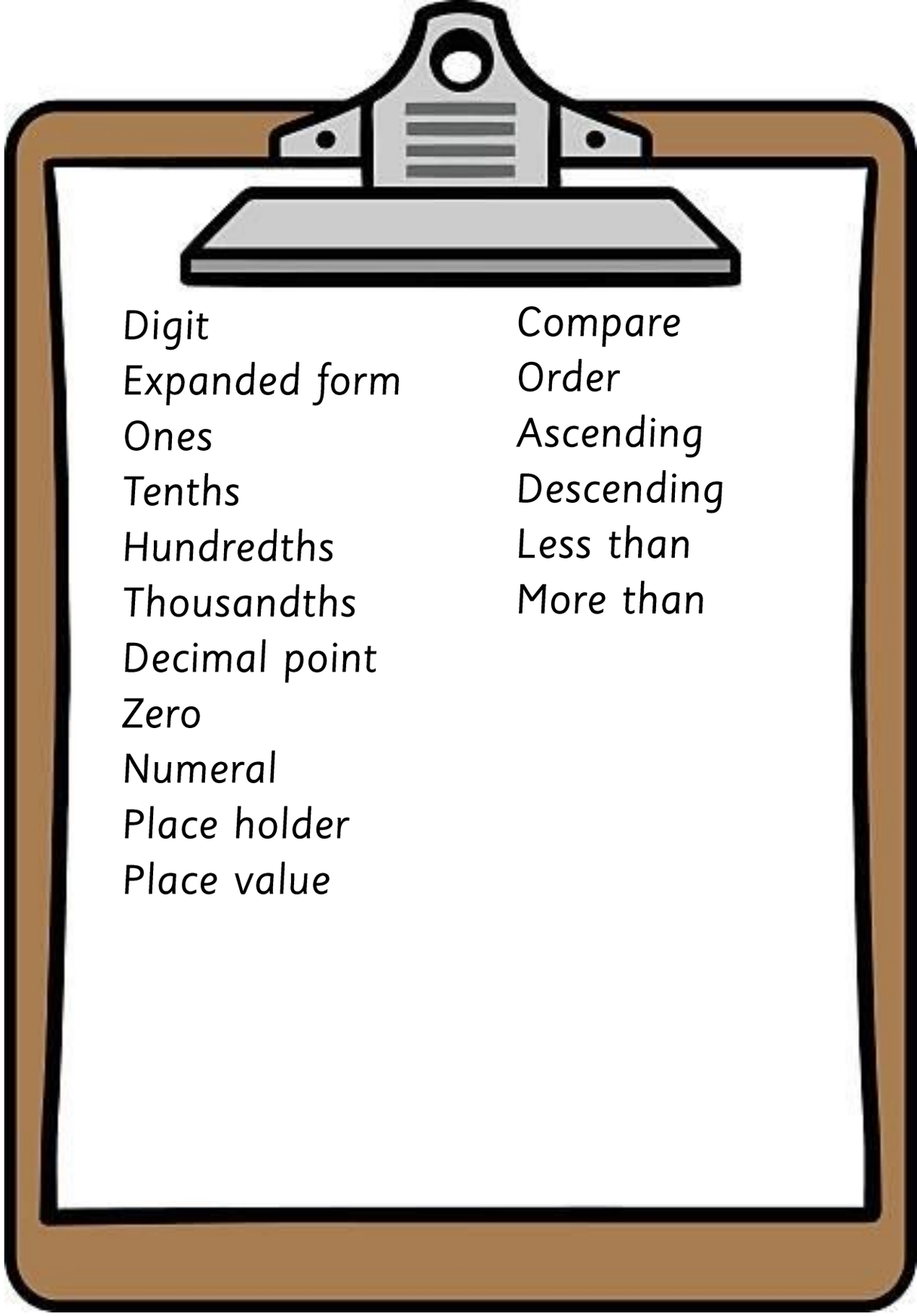
3) Add in zeros as placeholders

4) Compare the digits in each column, starting from the left. If two digits are the same, move along to the next column.

Ascending

0.123 1.23 1.233 21.3

Read through each number to check the order.



Digit
Expanded form
Ones
Tenths
Hundredths
Thousandths
Decimal point
Zero
Numeral
Place holder
Place value

Compare
Order
Ascending
Descending
Less than
More than

Multiply by 10, 100 and 1000

4 . 5 x 1 0

Th H T O . t h th

4 . 5

4 5

Makes the number 10 times bigger.
Move each digit one place to the left.

4 . 5 x 1 0 0

Th H T O . t h th

4 . 5

4 5 0

Makes the number 100 times bigger.
Move each digit two places to the left.

4 . 5 x 1 0 0 0

Th H T O . t h th

4 . 5

4 5 0 0

Makes the number 1000 times bigger.
Move each digit three places to the left.

1) Lay out the number

2) Work out the number of places the digits need to move.

3) Move each digit, adding in zeros as placeholders.

Digit	Tenths
Ones	Hundredths
Tens	Thousandths
Hundreds	Decimal point
Thousands	Zero
Ten thousand	Numeral
Hundred thousands	Place holder
Millions	Place value
Ten millions	Multiply
	Larger

Divide by 10, 100 and 1000

4 5 7 ÷ 1 0

Th	H	T	O	.	t	h	th
	4	5	7				
		4	5	.	7		

Makes the number 10 times smaller.
Move each digit one place to the right.

4 5 7 ÷ 1 0 0

Th	H	T	O	.	t	h	th
	4	5	7				
			4	.	5	7	

Makes the number 100 times smaller.
Move each digit two places to the right.

4 5 7 ÷ 1 0 0 0

Th	H	T	O	.	t	h	th
	4	5	7				
			0	.	4	5	7

Makes the number 1000 times smaller.
Move each digit three places to the right.

1) Lay out the number

2) Work out the number of places the digits need to move.

3) Move each digit, adding in zeros as placeholders.

Digit	Tenths
Ones	Hundredths
Tens	Thousandths
Hundreds	Decimal point
Thousands	Zero
Ten thousand	Numeral
Hundred thousands	Place holder
Millions	Place value
Ten millions	Divide
	Smaller

Round decimal numbers to a required degree of accuracy

1) Find your number and circle it
2) Look next door
3) Less than 4, just ignore
4) 5 or more, add one more to the circled number

nearest hundredth (2dp)

nearest whole

4 . 1 2 3 → 4 . 1 2 3 → 4 . 1 2

4 . 1 2 3 → 4

nearest tenth(1dp)

4 . 1 2 3 → 4 . 1

nearest hundredth (2dp)

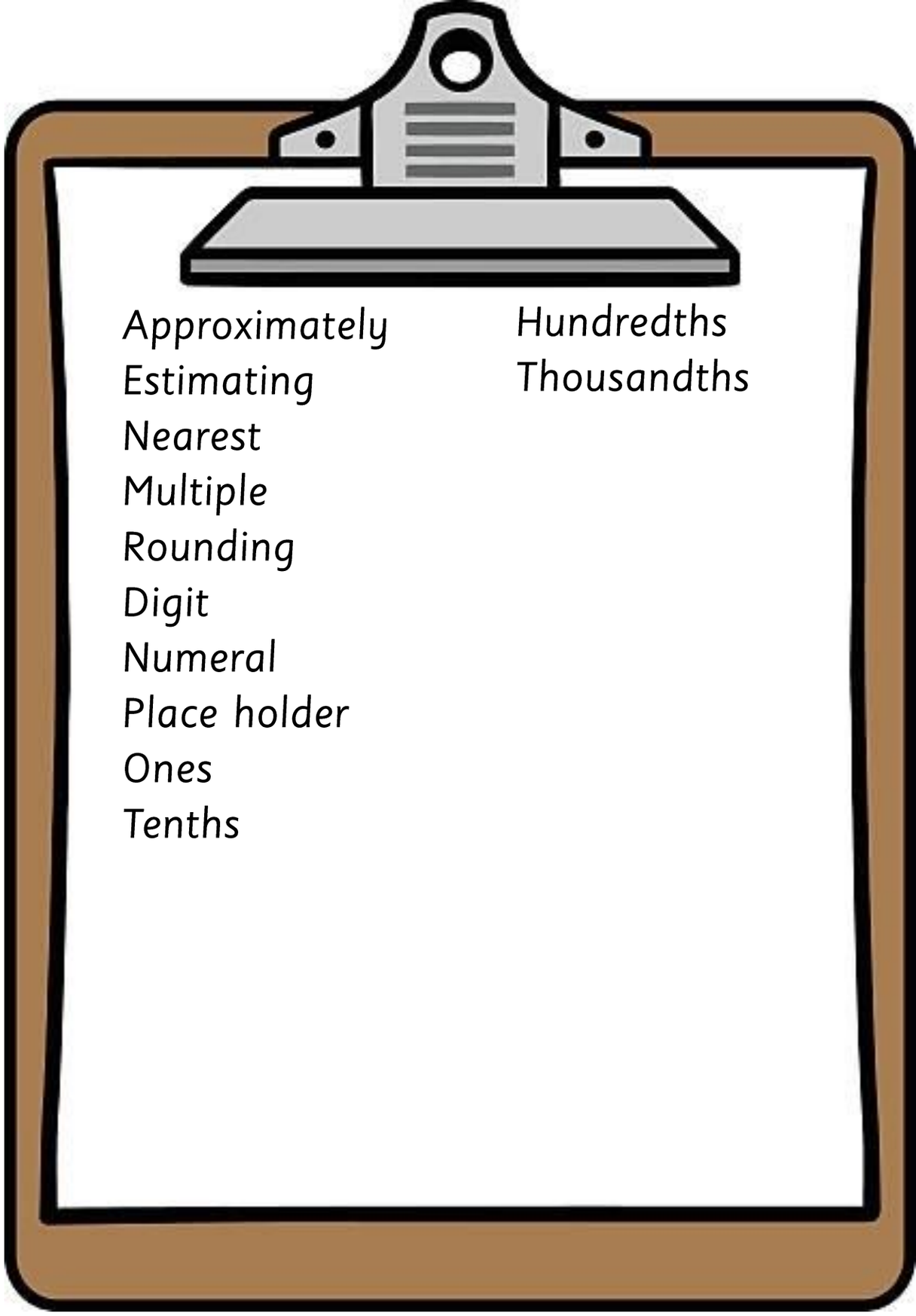
nearest whole

5. 8 6 7 → 5. 8 6 7 → 5 . 8 7

5. 8 6 7 → 6

nearest tenth(1dp)

5 . 8 6 7 → 5 .9

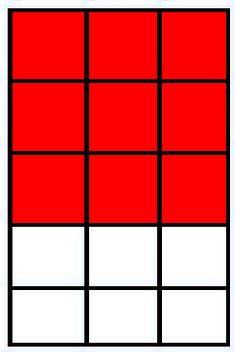


Approximately
Estimating
Nearest
Multiple
Rounding
Digit
Numeral
Place holder
Ones
Tenths
Hundredths
Thousandths

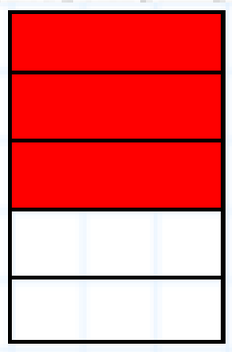
Use common factors to simplify fractions

1) Find a number that both the numerator and the denominator can be divided by.

2) Divide both the numerator and denominator by that number.



$$\frac{9}{15} \quad \div 3 \quad \div 3$$



$$\frac{3}{5}$$

- Factor
- Common factor
- HCF (highest common factor)
- Product
- Factor pairs
- Multiply
- Numerator
- Denominator
- Vinculum
- Simplify
- Simplified
- Equivalent
- Lowest term

Use multiples to express fractions in the same denominator

$\frac{2}{3}$ $\frac{3}{4}$

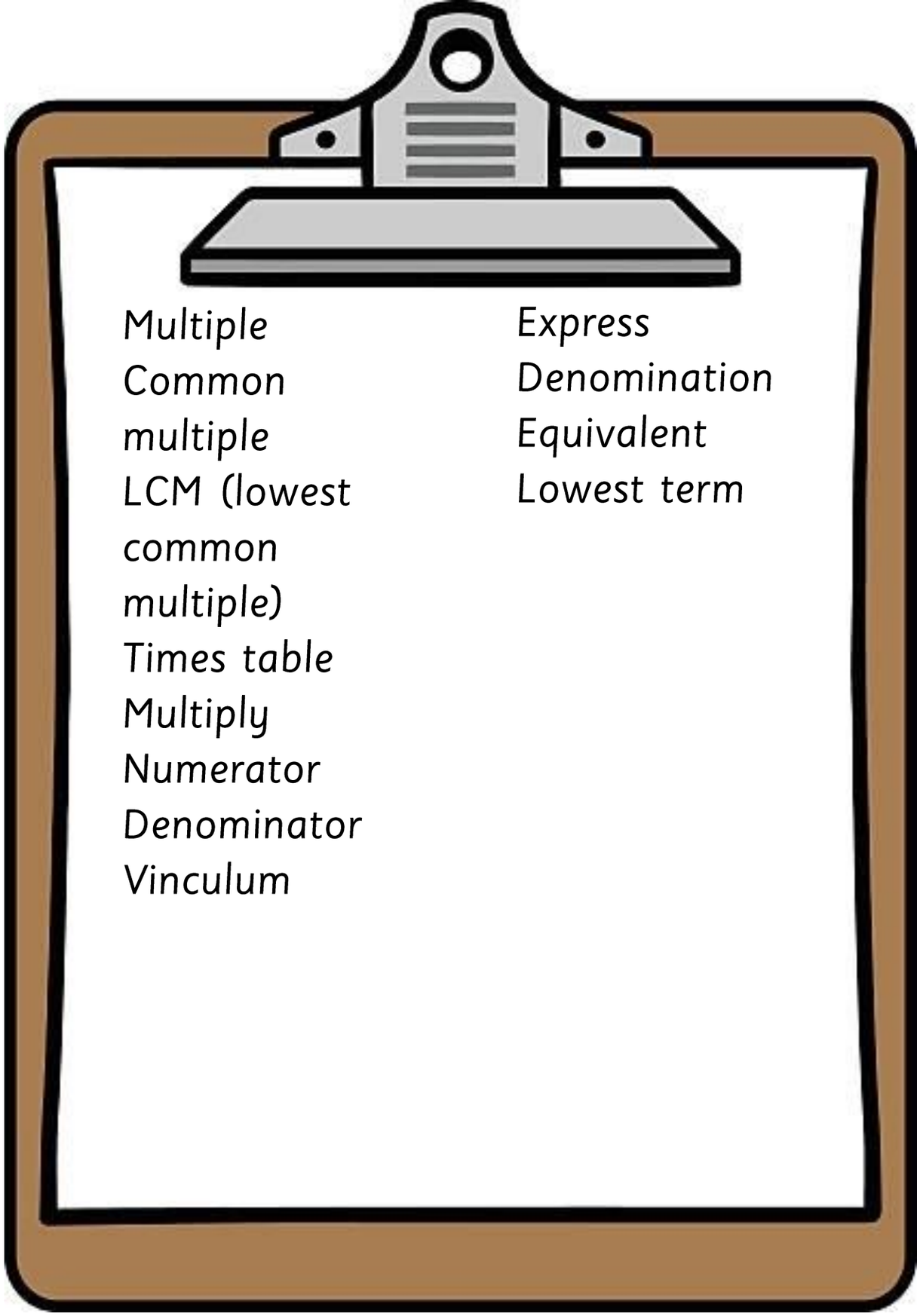
1) Find a number that is a common multiple of both denominators.

12 12

2) Multiply both fractions by the relevant multiple to reach the new denominator

$\frac{2}{3}$ x 4 x 4 $\frac{3}{4}$ x 3 x 3

$\frac{8}{12}$ $\frac{9}{12}$



Compare fractions

>	<	=
more than	less than	equal to

$\frac{2}{3}$ $\frac{3}{4}$

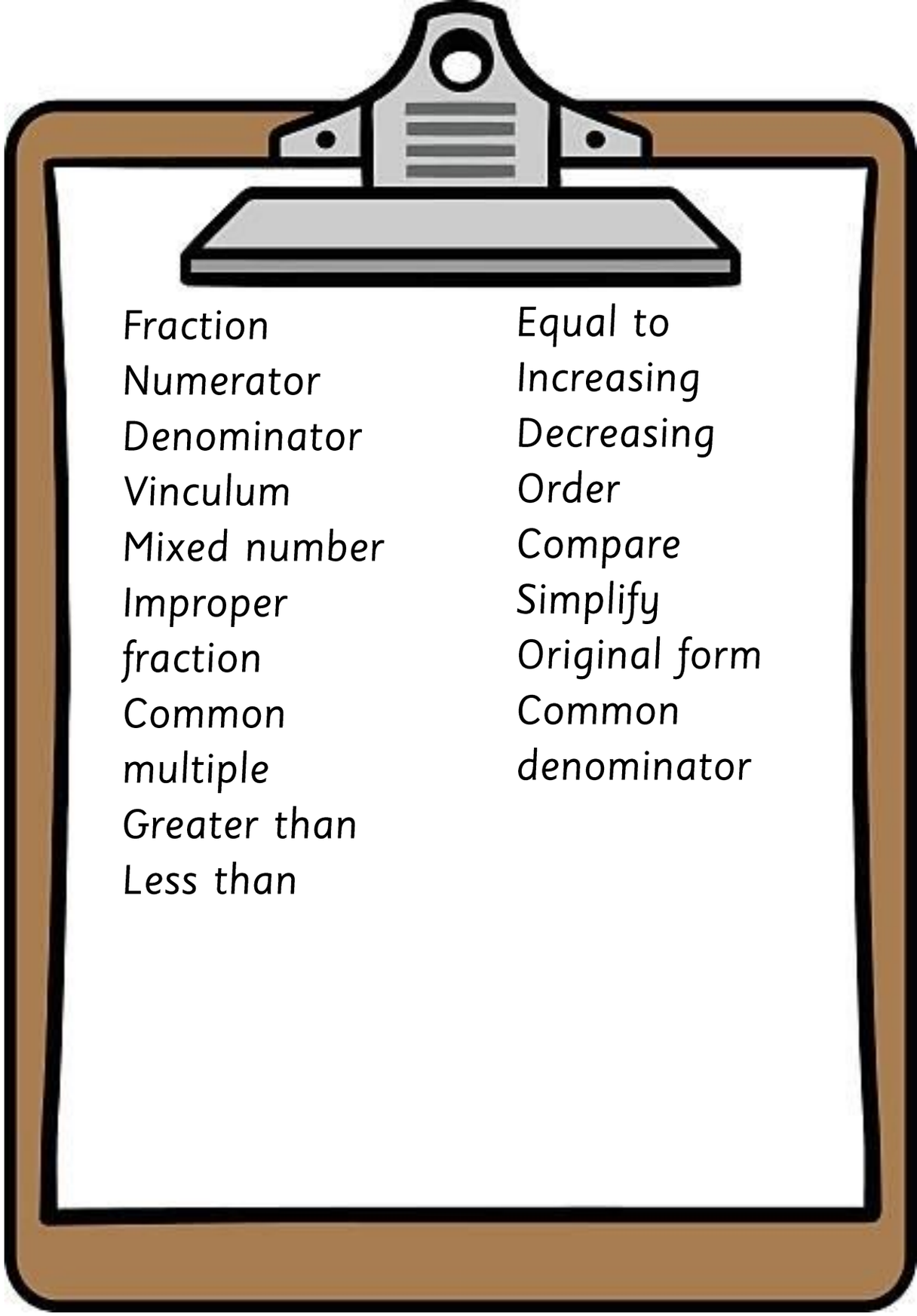
1) Decide on a common multiple of the two denominators to become the new denominator.

2) Convert both fractions to have the same denominator.

$\frac{2}{3}$ x 4 x 4 $\frac{3}{4}$ x 3 x 3

$\frac{8}{12}$ < $\frac{9}{12}$

3) Decide which symbol to use– which fraction is larger?



Order fractions

ascending ⬆ descending ⬇

Put these fractions in ascending order:

$\frac{3}{4}$ $\frac{4}{5}$ $\frac{9}{10}$ $\frac{14}{20}$

1) Decide on a common multiple of the denominators to become the new denominator.

2) Convert the fractions to have the same denominator.

$\frac{3}{4}$ x5 x5 $\frac{15}{20}$

$\frac{4}{5}$ x4 x4 $\frac{16}{20}$

$\frac{9}{10}$ x2 x2 $\frac{18}{20}$

$\frac{14}{20}$ x1 x1 $\frac{14}{20}$

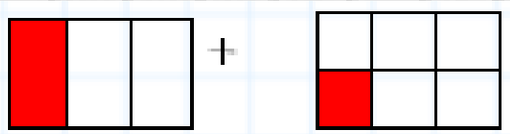
3) Re-order the fractions in their original form.

$\frac{14}{20}$ $\frac{3}{4}$ $\frac{4}{5}$ $\frac{9}{10}$

Fraction	Equal to
Numerator	Increasing
Denominator	Decreasing
Vinculum	Order
Mixed number	Compare
Improper fraction	Simplify
Common multiple	Original form
Greater than	Common denominator
Less than	

Add fractions

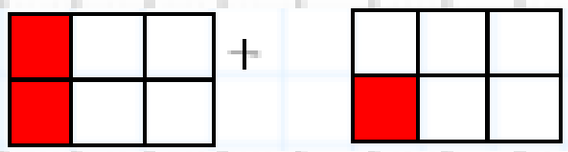
$\frac{1}{3} + \frac{1}{6}$



1) Convert both fractions to have the same denominator.

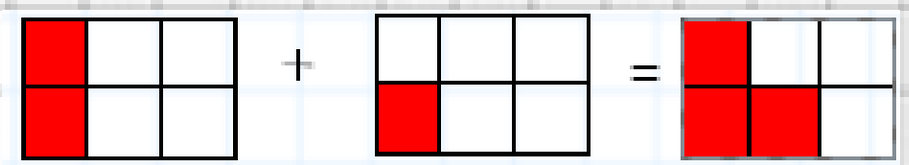
$\frac{1}{3} \overset{\times 2}{+} \frac{1}{6}$ $\times 2$

$\frac{2}{6} + \frac{1}{6}$



2) Add the numerators, but not the denominators.

$\frac{2}{6} + \frac{1}{6} = \frac{3}{6}$

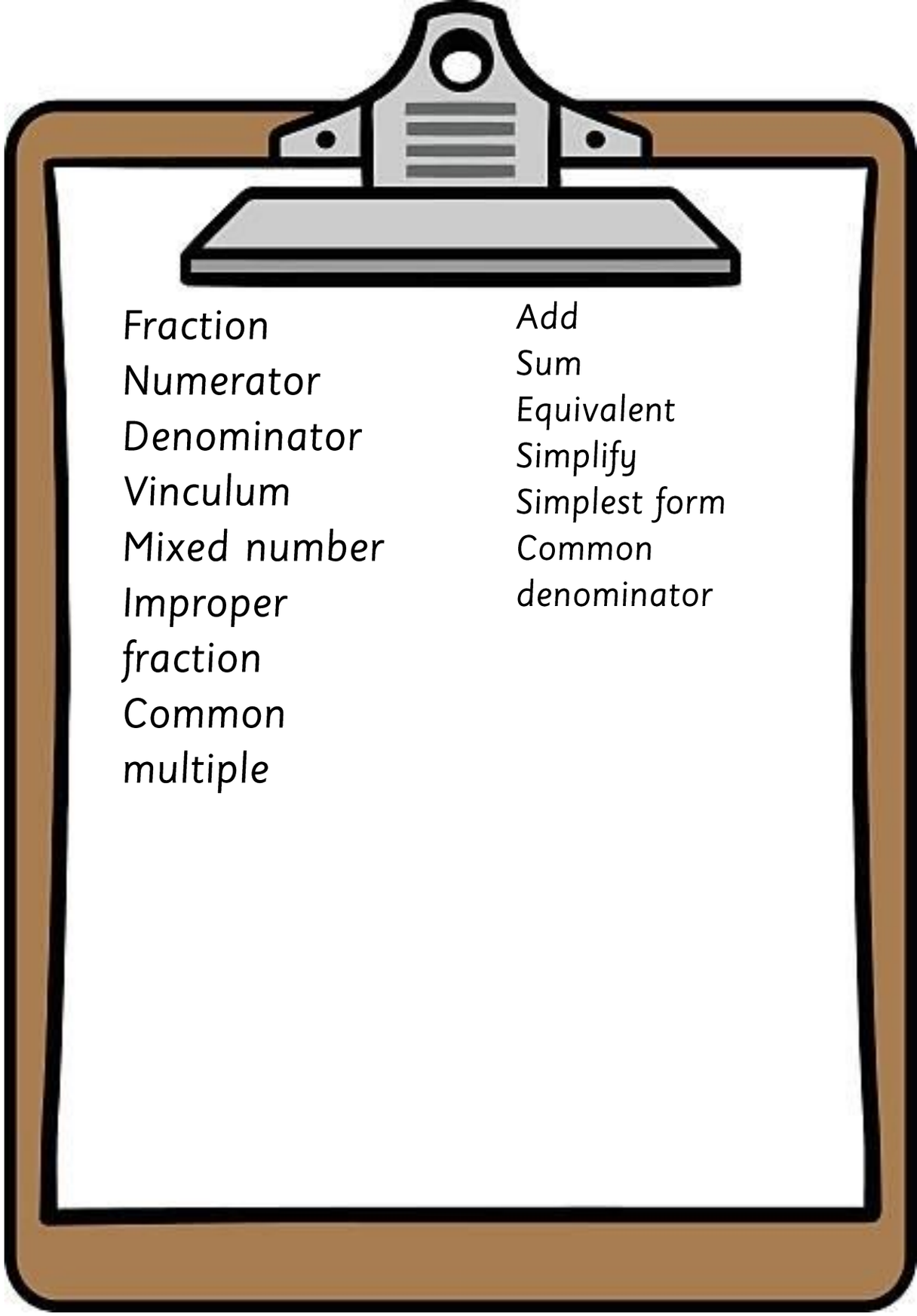


3) Simplify the answer if you can.

$\div 3$

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

$\div 3$



Fraction
Numerator
Denominator
Vinculum
Mixed number
Improper fraction
Common multiple

Add
Sum
Equivalent
Simplify
Simplest form
Common denominator

Add mixed numbers– method 1

$$1\frac{3}{4} + 1\frac{3}{8}$$

1) Change any mixed numbers to improper fractions.

$$\frac{7}{4} + \frac{1}{8}$$

2) Convert both fractions to have the same denominator.

$$\frac{7}{4} \xrightarrow{x2} + \frac{1}{8} \xrightarrow{x2}$$

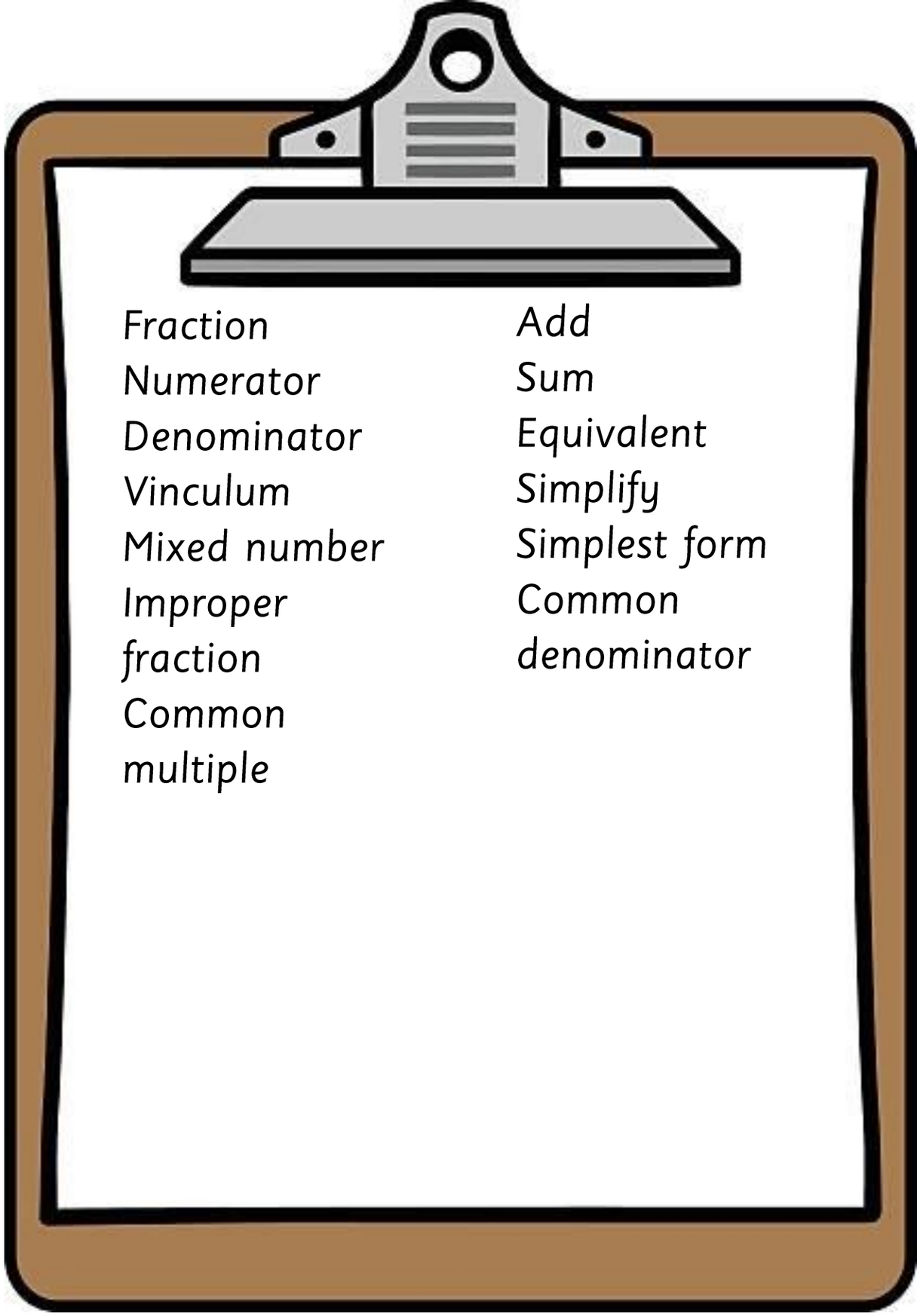
3) Add the numerators together.

$$\frac{14}{8} + \frac{11}{8} = \frac{25}{8}$$

4) Change any improper fractions back to mixed numbers.

$$\frac{25}{8} = 3\frac{1}{8}$$

5) Simplify the answer if you can.



Fraction
Numerator
Denominator
Vinculum
Mixed number
Improper fraction
Common multiple

Add
Sum
Equivalent
Simplify
Simplest form
Common denominator

Add mixed numbers– method 2

$$1\frac{3}{4} + 1\frac{3}{8}$$

1) Add the two whole numbers together.

$$1 + 1 = 2$$

2) Convert both fractions to have the same denominator.

$$\frac{3}{4} \overset{\times 2}{} + \frac{3}{8} \overset{\times 2}{}$$

3) Add the numerators together.

$$\frac{6}{8} + \frac{3}{8} = \frac{9}{8}$$

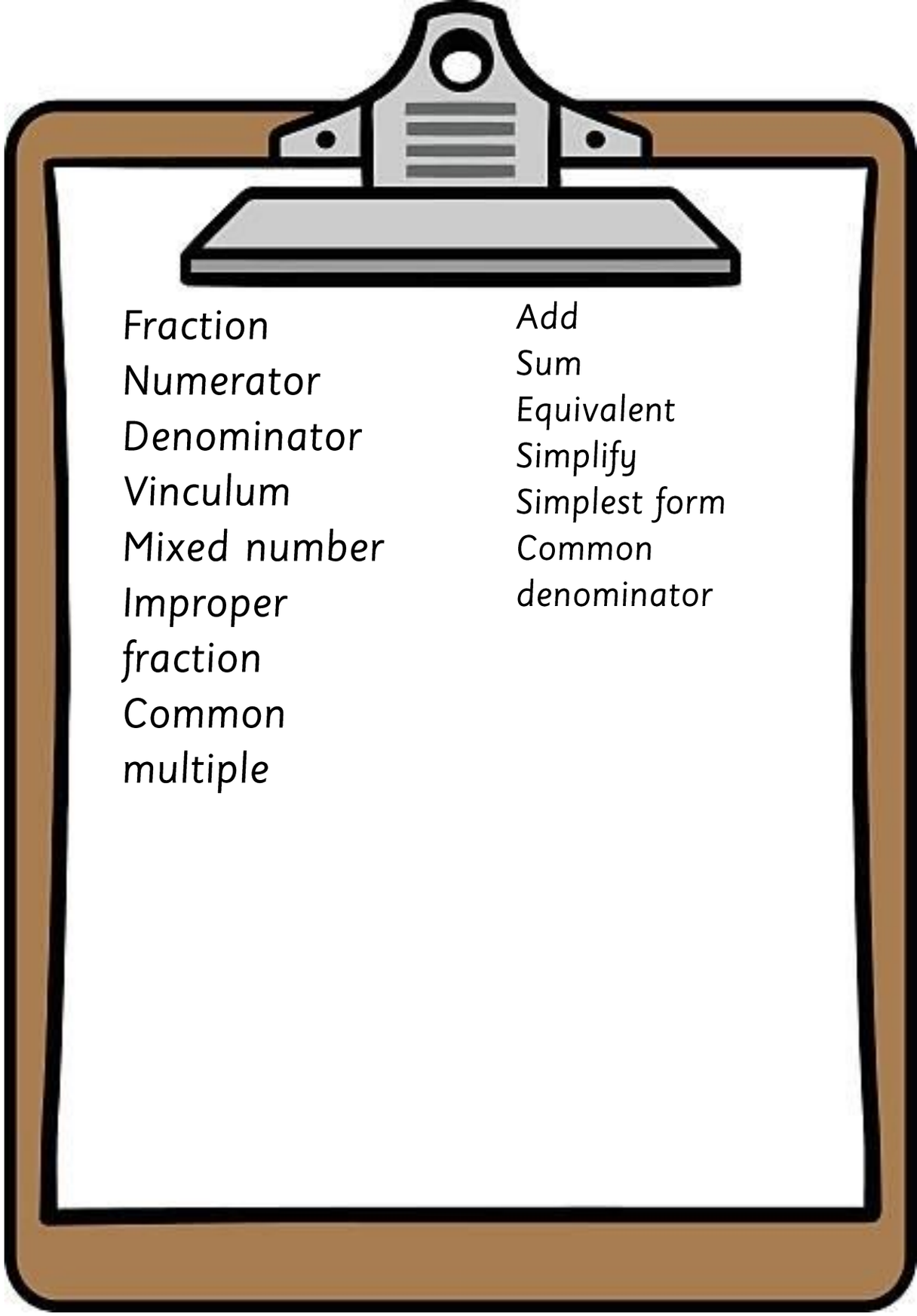
4) Change any improper fractions back to mixed numbers.

$$\frac{9}{8} = 1\frac{1}{8}$$

5) Add together your two answers.

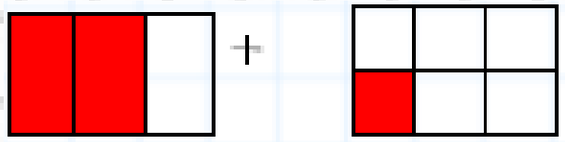
$$2 + 1\frac{1}{8} = 3\frac{1}{8}$$

6) Simplify the answer if you can.



Subtract fractions

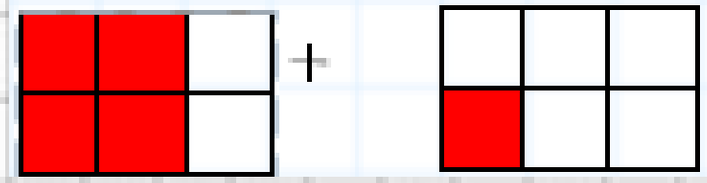
$\frac{2}{3} - \frac{1}{6}$



1) Convert both fractions to have the same denominator.

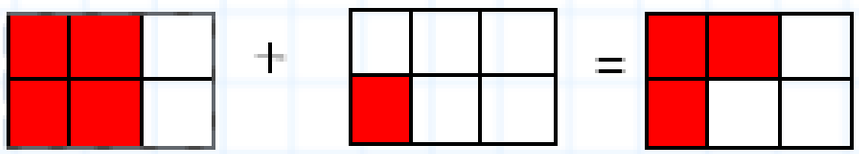
$\frac{2}{3} \overset{\times 2}{-} \frac{1}{6}$ $\times 2$

$\frac{4}{6} - \frac{1}{6}$



2) Add the numerators, but not the denominators.

$\frac{4}{6} - \frac{1}{6} = \frac{3}{6}$



3) Simplify the answer if you can.

$\div 3$

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

$\div 3$

- Fraction
- Numerator
- Denominator
- Vinculum
- Mixed number
- Improper fraction
- Common multiple
- Subtract
- Difference
- Equivalent
- Simplify
- Simplest form
- Common denominator

Subtracting mixed numbers

$$2\frac{3}{4} - 1\frac{1}{8}$$

1) Change any mixed numbers to improper fractions.

$$\frac{1}{4}\ \frac{1}{}\ -\ \frac{9}{8}$$

2) Convert both fractions to have the same denominator.

x2

$$\frac{1}{4}\ \frac{1}{}\ -\ \frac{9}{8}$$

x2

3) Subtract the second numerator from the first.

$$\frac{2}{8}\ \frac{2}{}\ -\ \frac{9}{8} = \frac{1}{8}\ \frac{3}{}$$

4) Change any improper fractions back to mixed numbers.

$$\frac{1}{8}\ \frac{3}{} = 1\frac{5}{8}$$

5) Simplify the answer if you can.

Fraction
Numerator
Denominator
Vinculum
Mixed number
Improper fraction
Common multiple
Subtract
Difference

Equivalent
Simplify
Simplest form
Common denominator

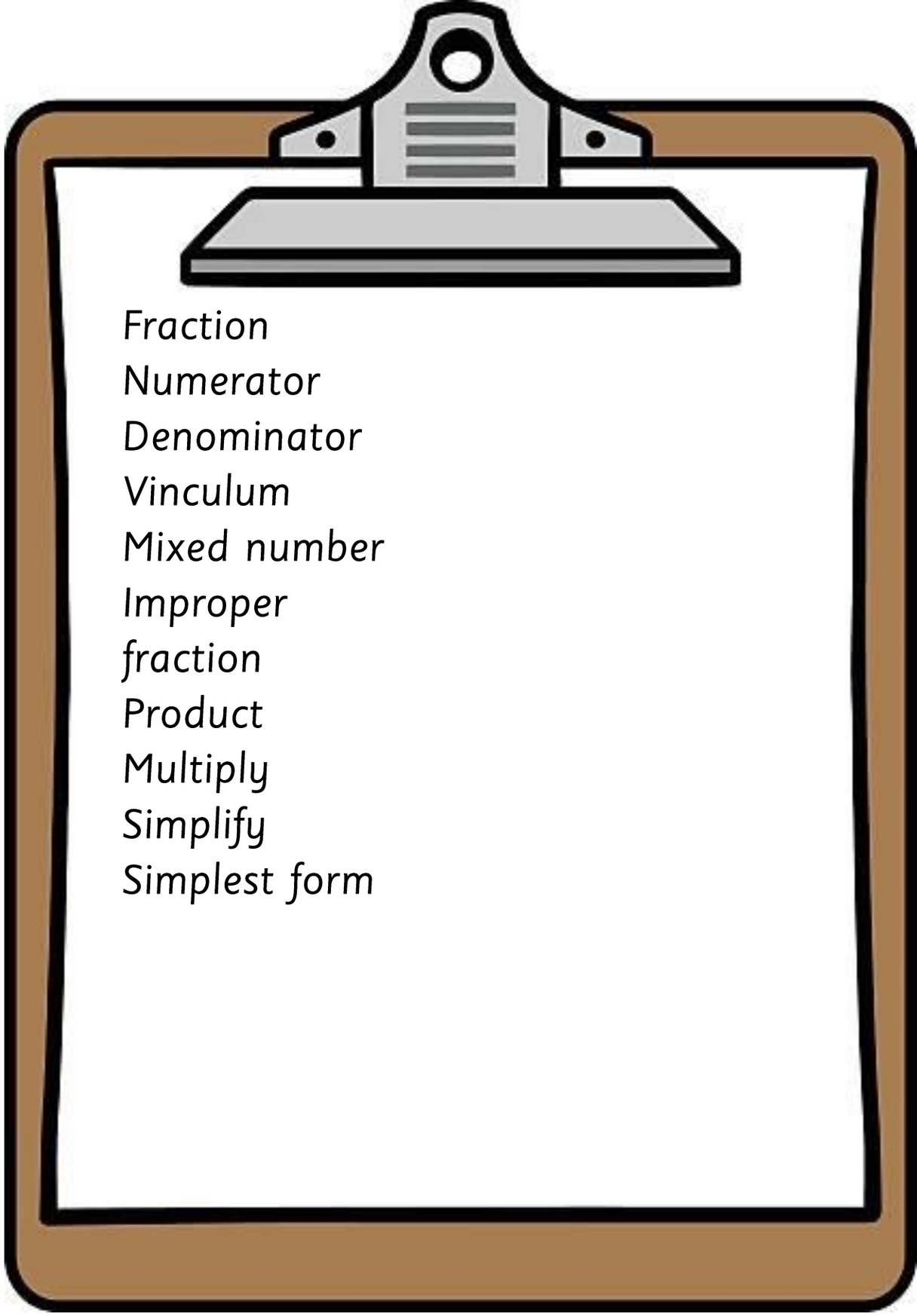
Multiplying pairs of fractions

$$\frac{3}{4} \times \frac{2}{3}$$

1) Multiply the numerators $\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$

2) Multiply the denominators

3) Simplify the answer if you can. $\frac{6}{12} = \frac{1}{2}$



Multiplying pairs of mixed numbers

$$2\frac{3}{4} \times 2\frac{\cancel{2}}{3}$$

1) Change any mixed numbers to improper fractions.

$$\frac{11}{4} \times \frac{8}{3}$$

2) Multiply the numerators

3) Multiply the denominators

$$\frac{11}{4} \times \frac{8}{3} = \frac{88}{12}$$

4) Change any improper fractions back to mixed numbers.

$$\frac{88}{12} = 7\frac{4}{12}$$

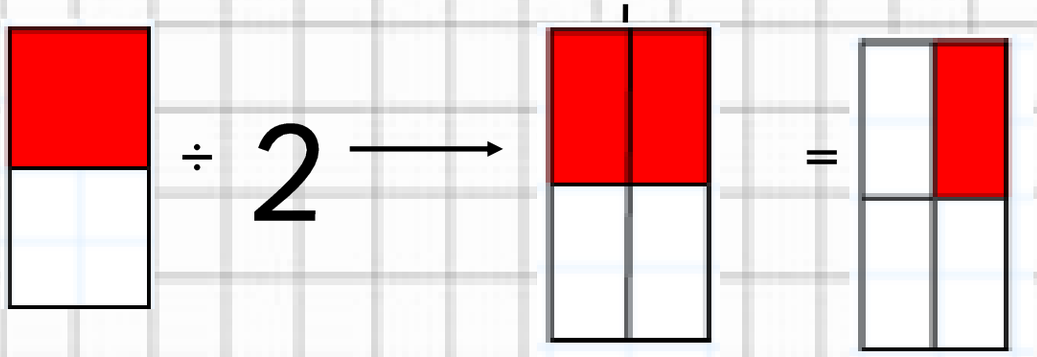
5) Simplify the answer if you can.

$$7\frac{4}{12} = 7\frac{1}{3}$$

- Fraction
- Numerator
- Denominator
- Vinculum
- Mixed number
- Improper fraction
- Product
- Multiply
- Simplify
- Simplest form

Divide fractions by whole numbers

$\frac{1}{2} \div 2$



1) Multiply the denominator by the whole number and write the answer as the new denominator.

$\frac{1}{2} \div 2$

$= \frac{1}{4}$

2) Simplify the answer if you can.

Fraction
Numerator
Denominator
Vinculum
Mixed number
Improper fraction
Divisor
Dividend
Quotient
Simplify
Simplest form
Whole number

Divide fractions by whole numbers

$$5\frac{3}{4} \div 3$$

1) Change any mixed numbers to improper fractions.

$$\frac{2}{4}\frac{3}{} \div 3$$

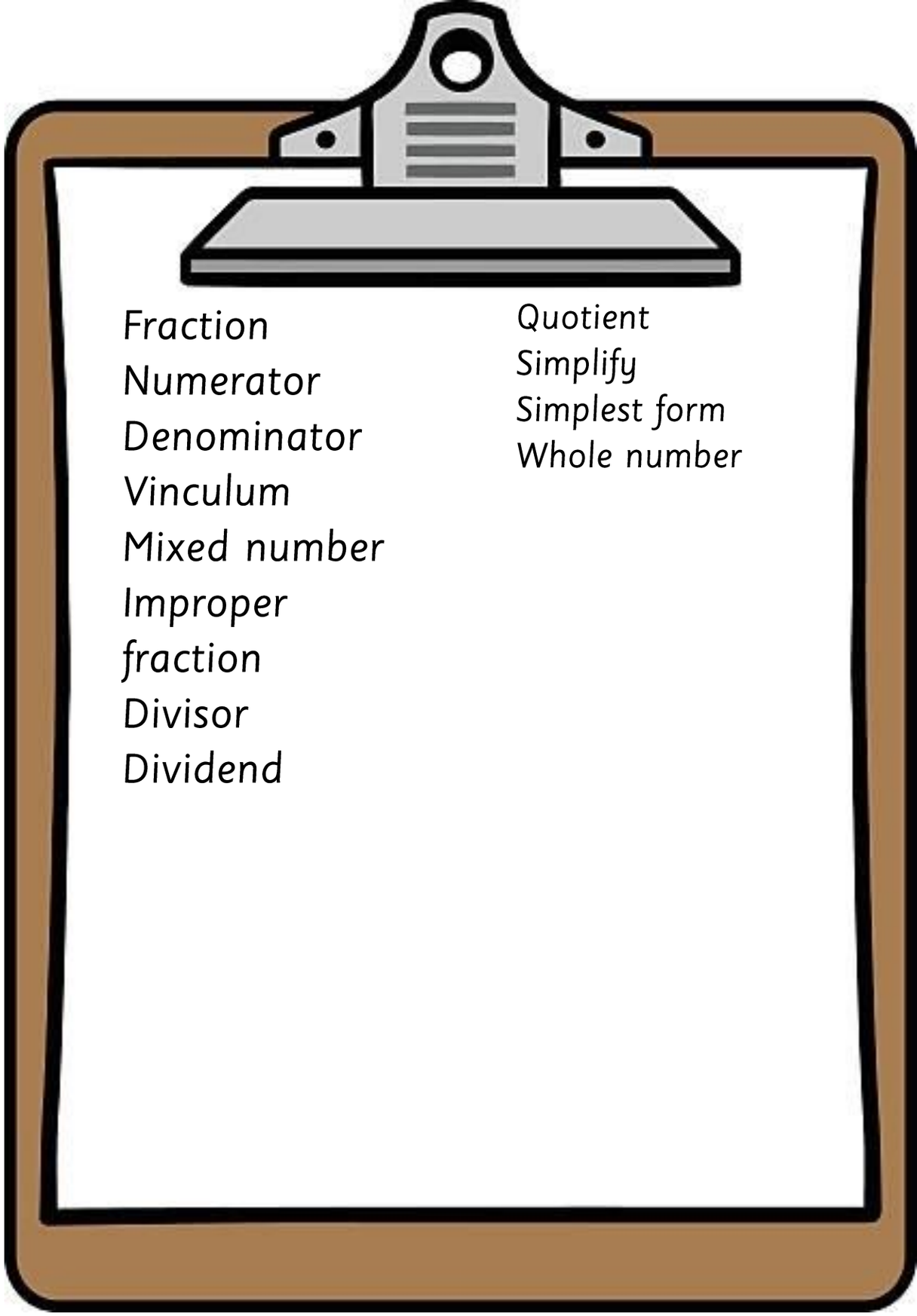
2) Multiply the denominator by the whole number and write the answer as the new denominator.

$$\frac{2}{4}\frac{3}{} \div 3$$

3) Change any improper fractions back to mixed numbers.

$$\frac{2}{1}\frac{3}{2} = 1\frac{1}{1}\frac{1}{2}$$

4) Simplify the answer if you can.



Fraction
Numerator
Denominator
Vinculum
Mixed number
Improper fraction
Divisor
Dividend

Quotient
Simplify
Simplest form
Whole number

Use equivalence between fractions, decimals and percentages

$\frac{5}{8}$

Decimal– divide the numerator by the denominator. 0.625

Percentage– multiply by 10 and add the percent symbol. 62.5%

Fraction	Decimal	Percentage
$\frac{1}{8}$	0.125	12.5%
$\frac{2}{8}$	0.25	25%
$\frac{3}{8}$	0.375	37.5%
$\frac{4}{8}$	0.5	50%
$\frac{5}{8}$	0.625	62.5%
$\frac{6}{8}$	0.75	75%
$\frac{7}{8}$	0.875	87.5%
$\frac{8}{8}$	1	100%

Fraction
Numerator
Denominator
Vinculum
Mixed number
Improper fraction
Simplest form
Decimal number

Decimal point
Divide
Percentage
Per cent %
Equivalent

Ratio and proportion

Calculate percentages

Remember: 'per cent' means 'out of 100'

Easy ones to remember:

50% = divide by 2

25% = divide by 4

75% = divide by 4, then multiply by 3

10% = divide by 10

5% = divide by 10, then divide by 2

1% = divide by 100

For all other multiples of 10%, divide by 10 to find 10%, then multiply by the first digit.

30% = divide by 10, then multiply by 3

40% = divide by 10, then multiply by 4

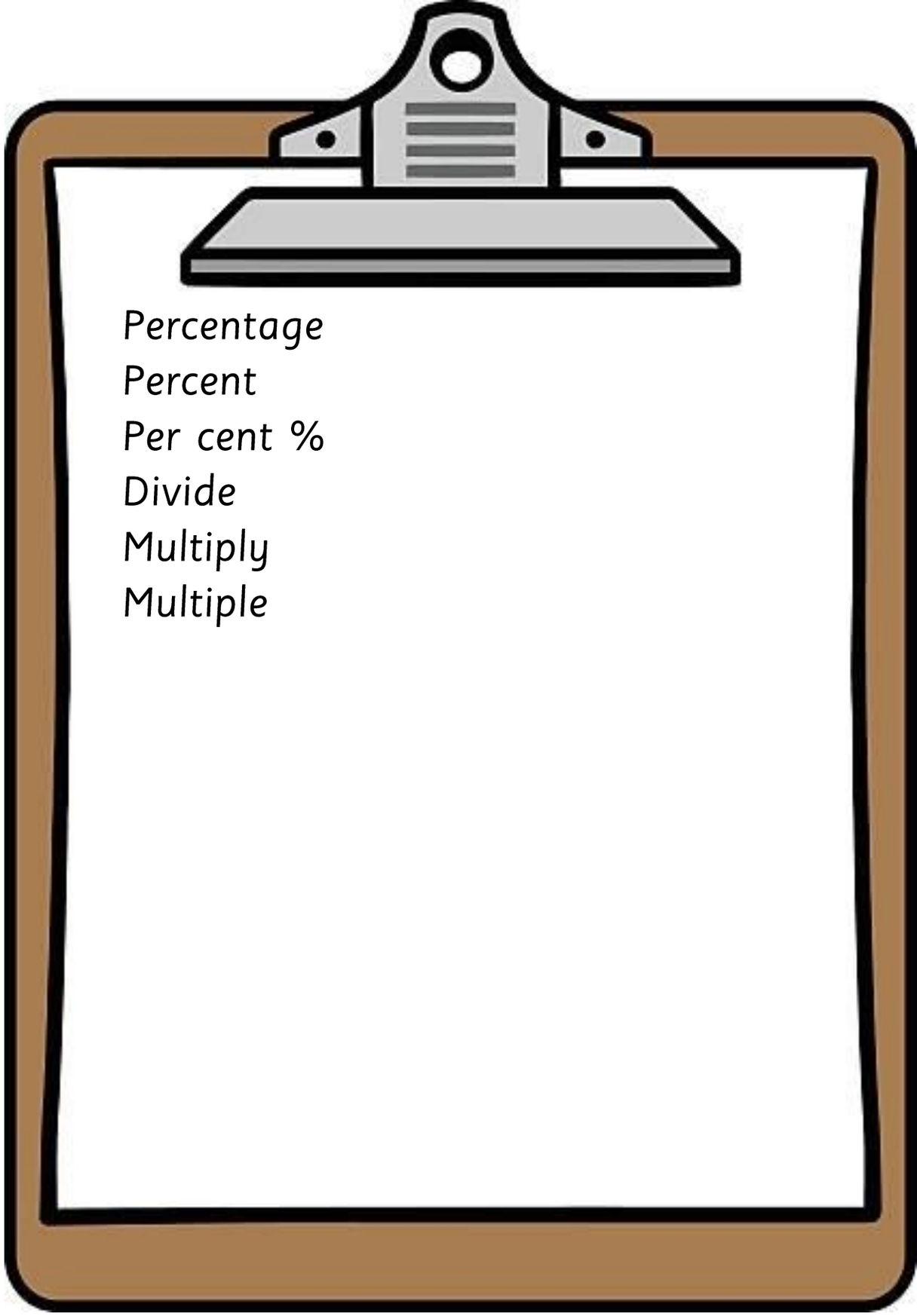
70%= divide by 10, then multiply by 7

For all other percentages, divide by 100 to find 1%, then multiply by the percentage.

35% = divide by 100, then multiply by 35

48% = divide by 100, then multiply by 48

79%= divide by 100, then multiply by 79



Use ratio

Simplifying ratios:

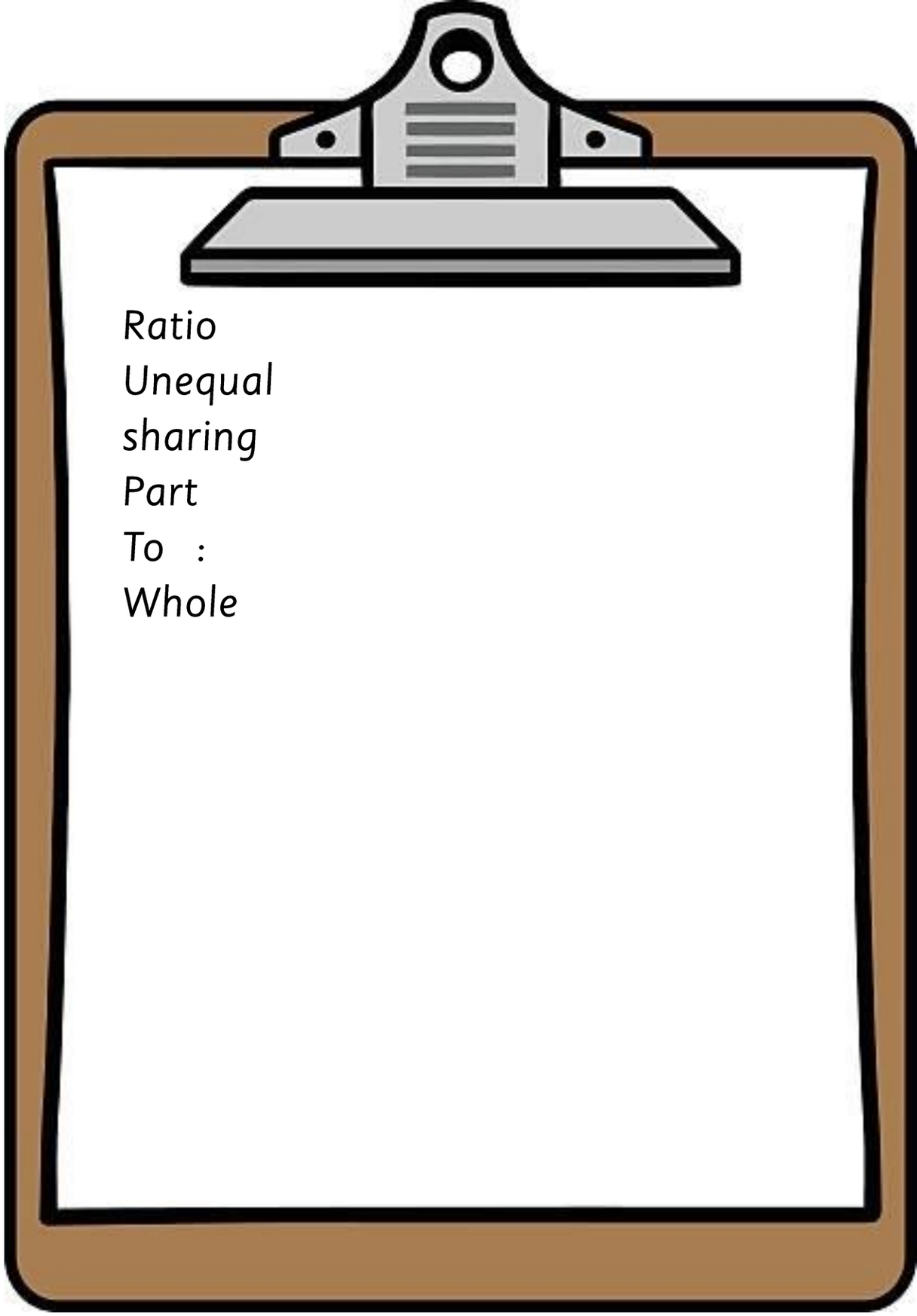
1) Work out how many of each item there are.

2) Write out as a ratio.

red	:	blue	:	green
2	:	4	:	6

3) Work out if there is a number that you can divide each of the shares by, and if so divide them.

red	:	blue	:	green	÷ 2
2	:	4	:	6	
1	:	2	:	3	



Ratio
Unequal sharing
Part
To :
Whole

Use ratio

Using knowledge of one share to find out how big the others are.

A prize is shared in a ratio of 3 : 4 between Jamie and Dan. If Jamie gets £ 2 1, how much will Dan get?

Jamie : Dan

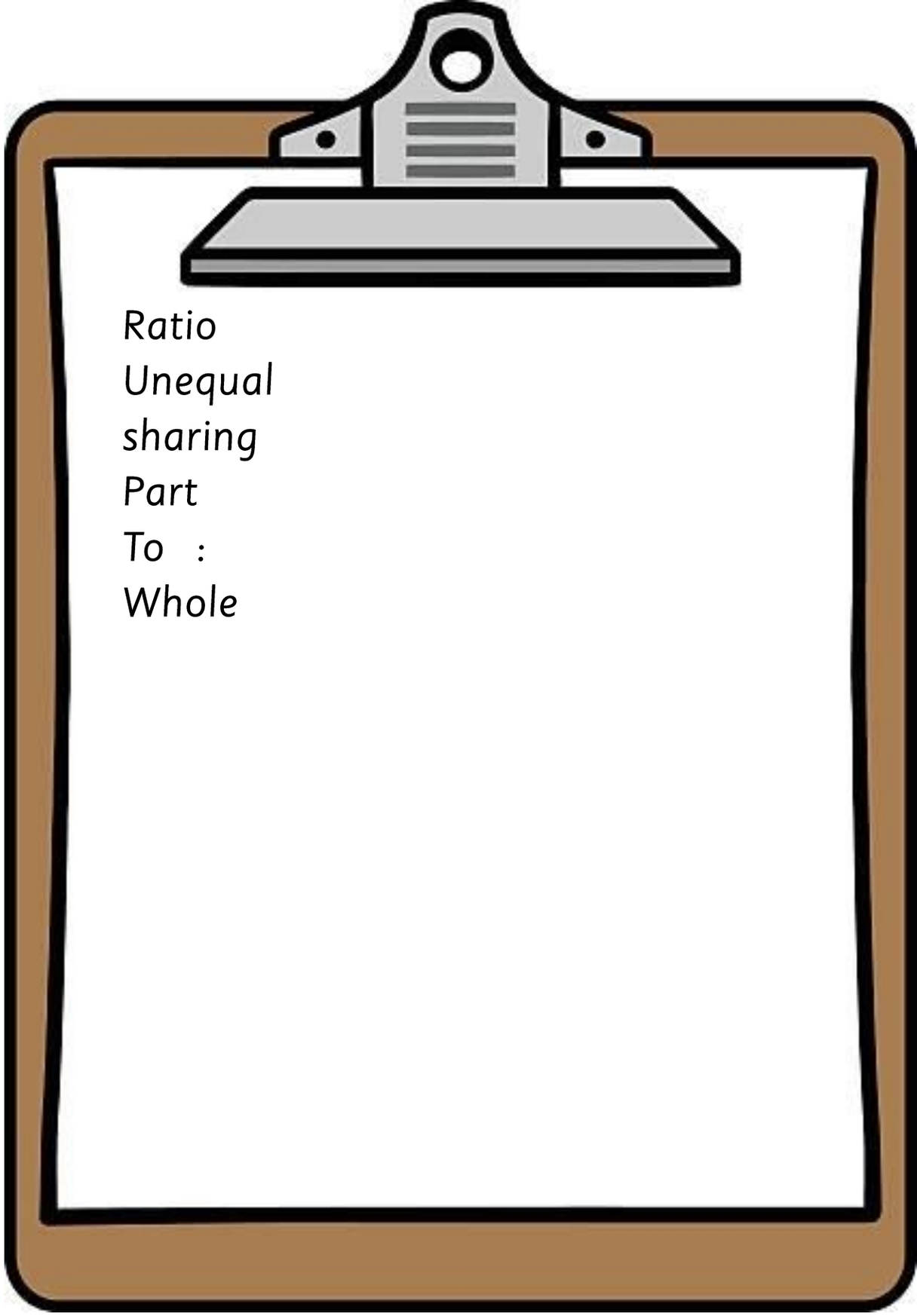
3 : 4

2 1 : 2 8

1) Work out how to get from the share you know to the value. In this case, multiply by 7.

2) Do the same with the other shares.

Jamie will get £21 and Dan will get £28.



Use ratio

Using knowledge of the total to find out how big the different parts are.

A prize of £200 is shared in a ratio of 3:2 between Diane and Dave. How much should they get each?

Diane : Dave

3 : 2 = 5

1) Add together the total shares (3+ 2 = 5)

2) Work out how to get from the total shares to the overall amount.

Diane : Dave

3 : 2 = 5 x40

= £200

3) Multiply each of the shares by that amount.

Diane : Dave

3 : 2 = 5 x40

Ratio
Unequal sharing
Part
To :
Whole

Use scale factor– recipes

Recipe for fairy cakes– 2 people.

Complete the recipe for 8 people.

1) Work out the relationship between 2 and 8 (x 4)

2) Using your scale factor, convert each value (x 4)

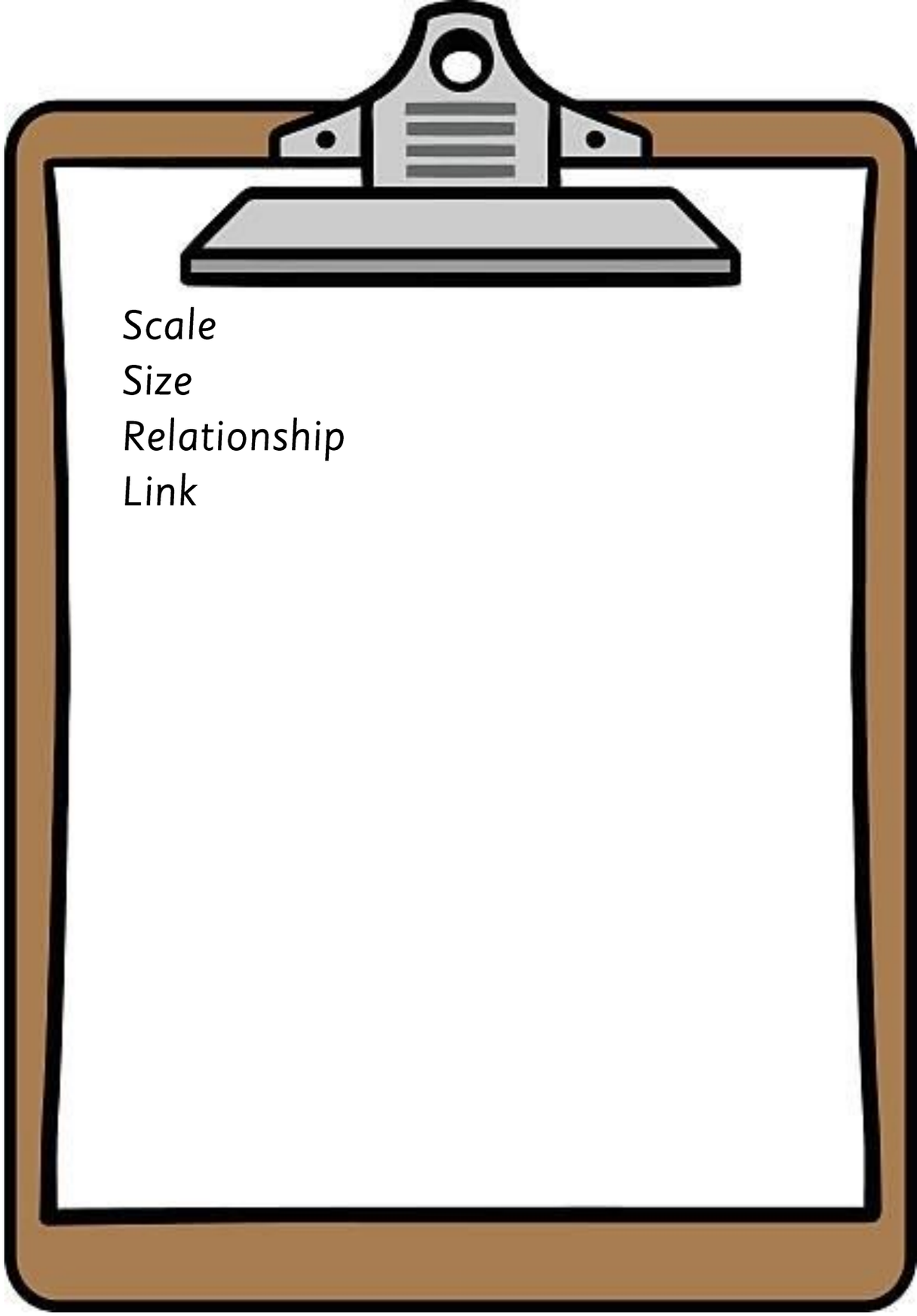
6 eggs	(x 4) →	24 eggs
100g flour		400g flour
50g butter		200g butter
80 ml milk		320 ml milk

For measurements where there is not a clear scale factor, first find the amount for one serving.

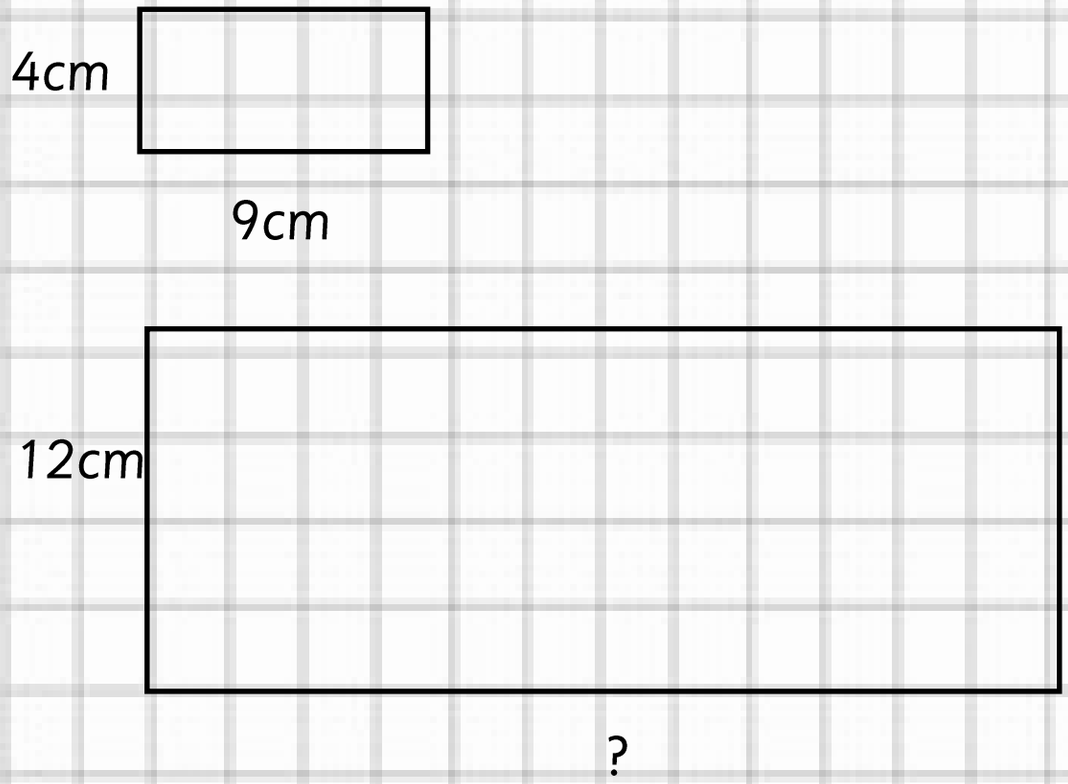
2 people	1 person	5 people
6 eggs	6 ÷ 2 = 3 eggs	3 x 5 = 15 eggs
100g flour	100 ÷ 2 = 50g	50 x 5 = 250g
50g butter	50 ÷ 2 = 25g	25 x 5 = 125g
80ml milk	80 ÷ 2 = 40ml	40 x 5 = 200ml

Find the amount for one serving (÷ 2)

Multiply by the amount of servings there are (x 5)



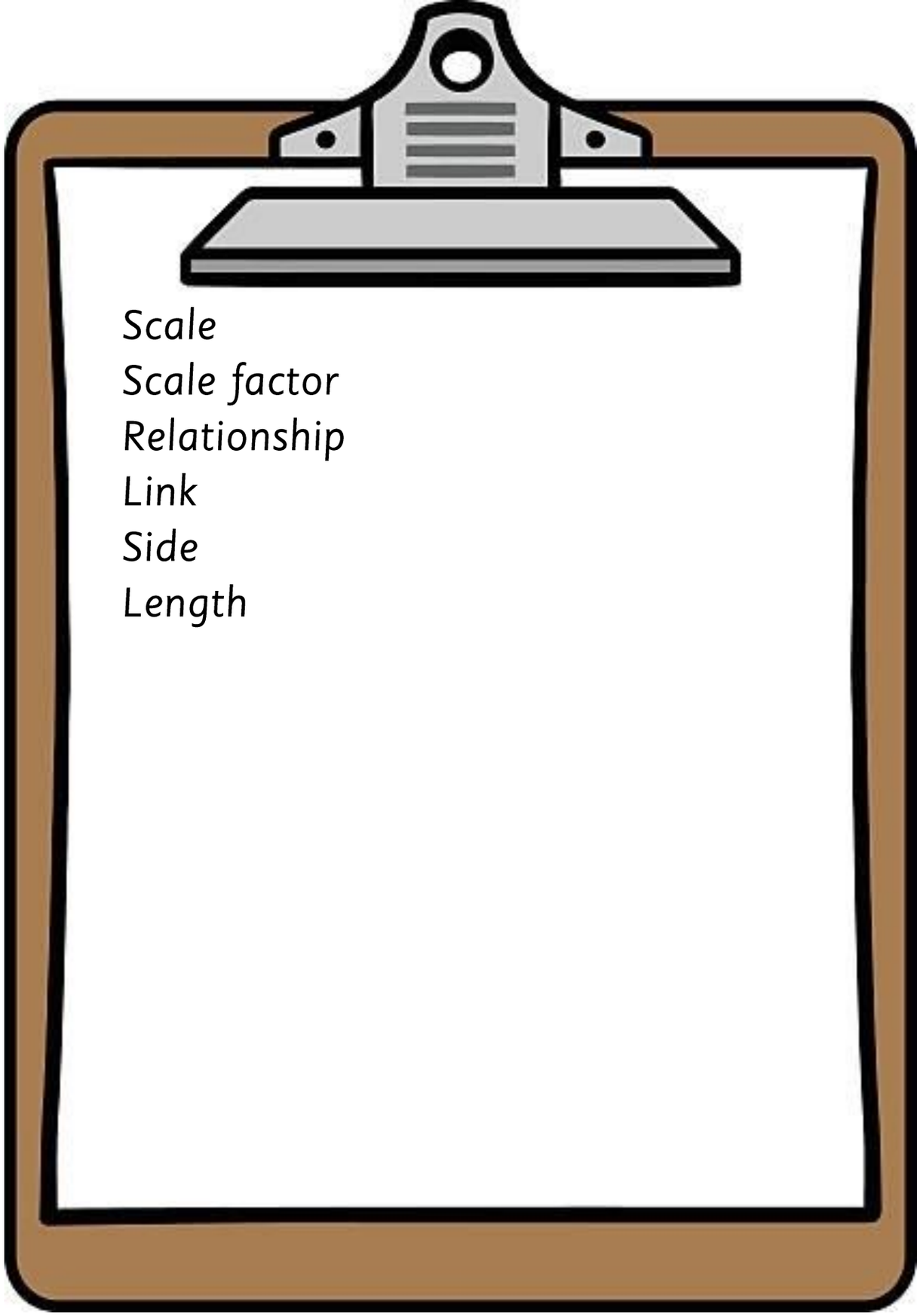
Use scale factor–shape



1) Find the corresponding known lengths on each shape (in this case, the vertical sides)

2) Find the scale factor by working out the relationships between the two lengths.
4cm -> 12cm= multiply by 3 scale factor is 3

3) Use this scale factor to work out the unknown line, using the corresponding known line.
9cm x 3 = 27cm.



Algebra

Generate and describe linear number sequences

Finding the rule:

3 7 11 15 19

+4 +4 +4 +4

1) Find the difference between each number in the sequence. This is your 'n'

4n

2) Work out how to get from your 'n' to the first number in the sequence. In this case, -1

4n - 1

3) Check your rule.

4 x 1 - 1 = 3

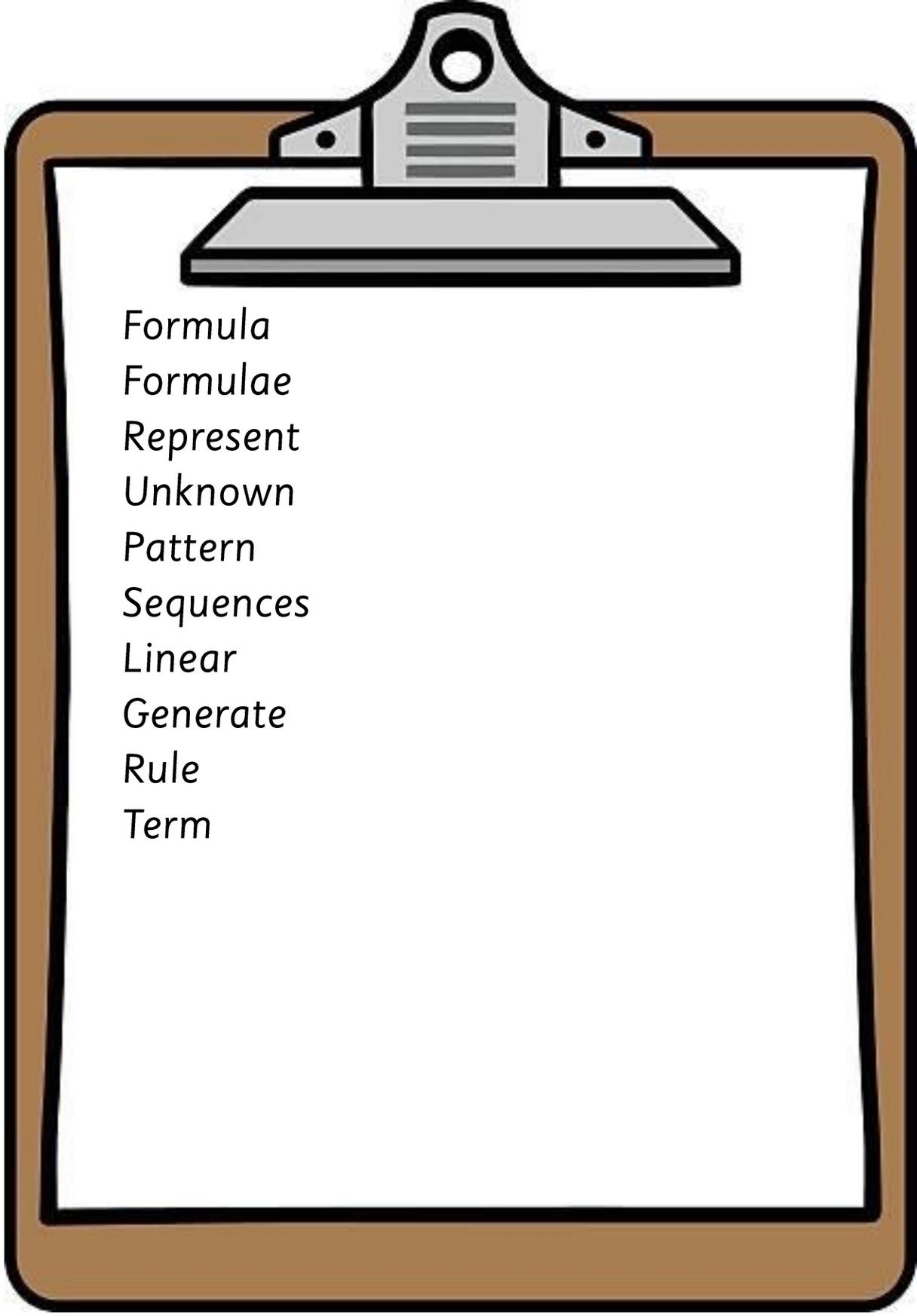
4 x 2 - 1 = 7

4 x 3 - 1 = 11

4 x 4 - 1 = 15

4 x 5 - 1 = 19

✓



Generate and describe linear number sequences

Calculating the sequence.

Rule: 5 n - 4

1) Multiply the 'n' number by the each term in the term in the sequence.

2) Add or subtract the number which comes after 'n'

1st term: 5 x 1 - 4 = 1

2nd term: 5 x 2 - 4 = 6

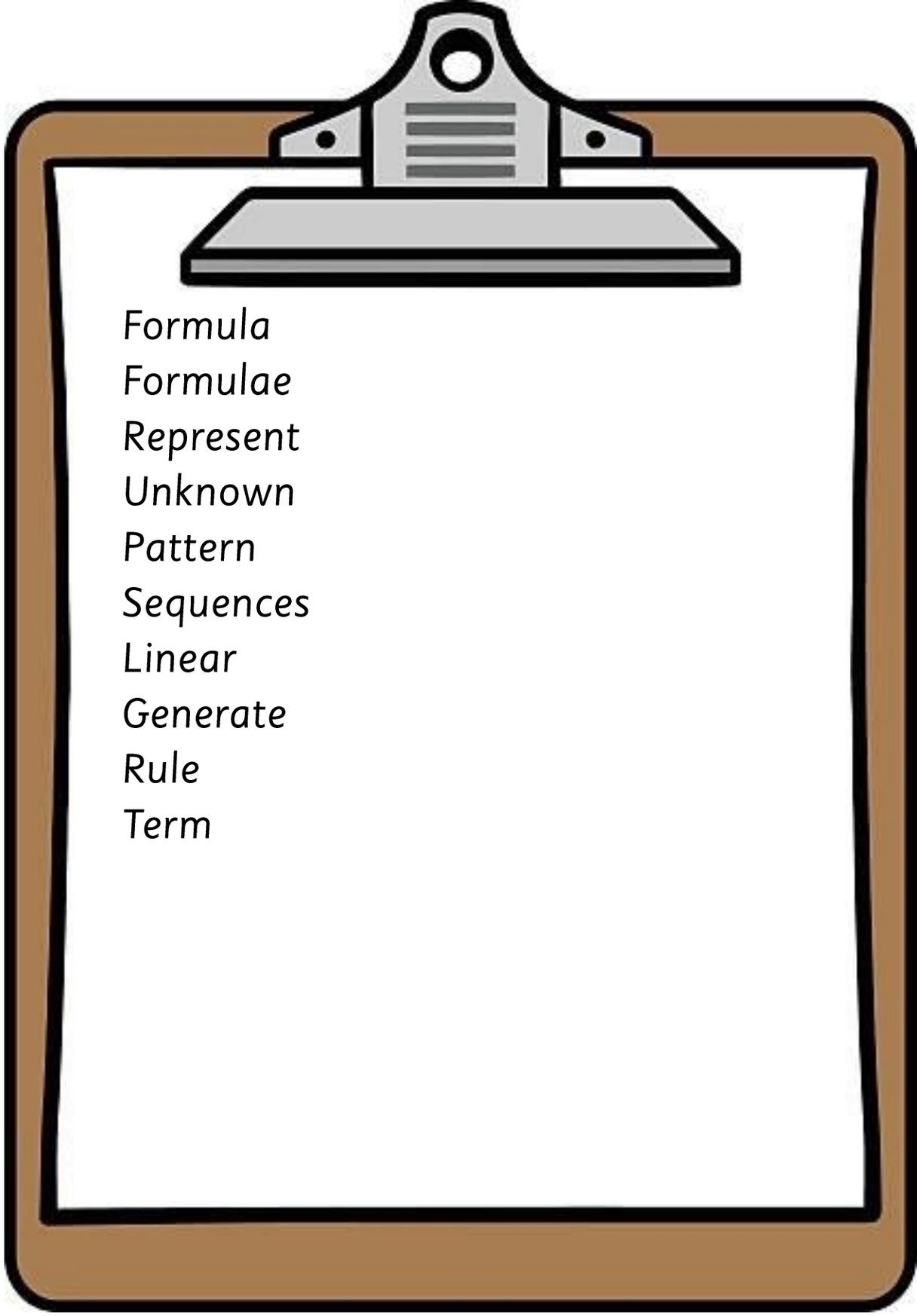
3rd term: 5 x 3 - 4 = 1 1

4th term: 5 x 4 - 4 = 1 6

5th term: 5 x 5 - 4 = 2 1

20th term: 5 x 2 0 - 4 = 9 6

1-0th term: 5 x 2 0 - 4 = 9 6



Use simple formulae

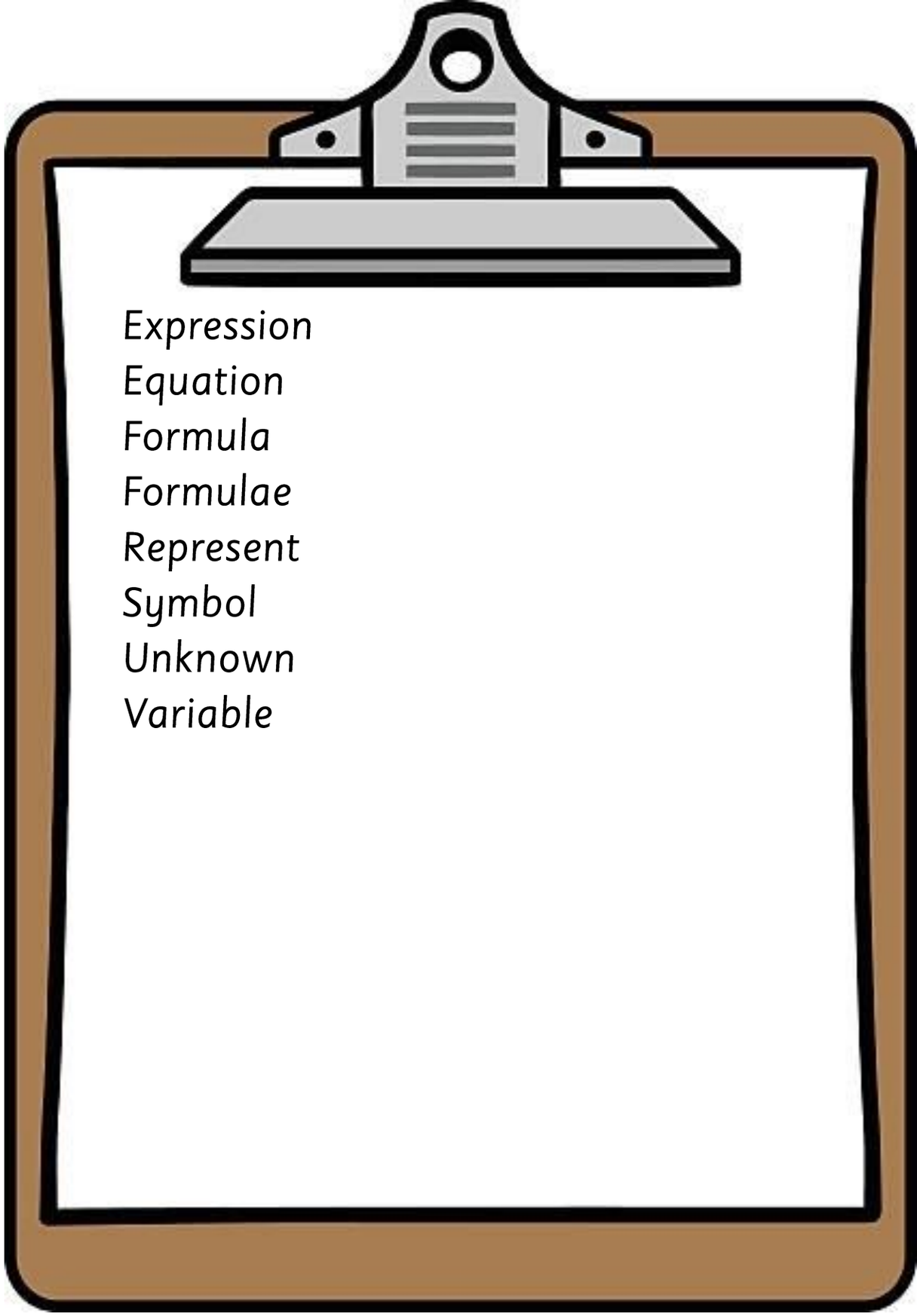
$5x + 4 = 39$

$5x = 35$

1) Subtract the whole number from both sides (- 4)

$x = 7$

2) Divide both sides by the 'x' number (divide by 5)

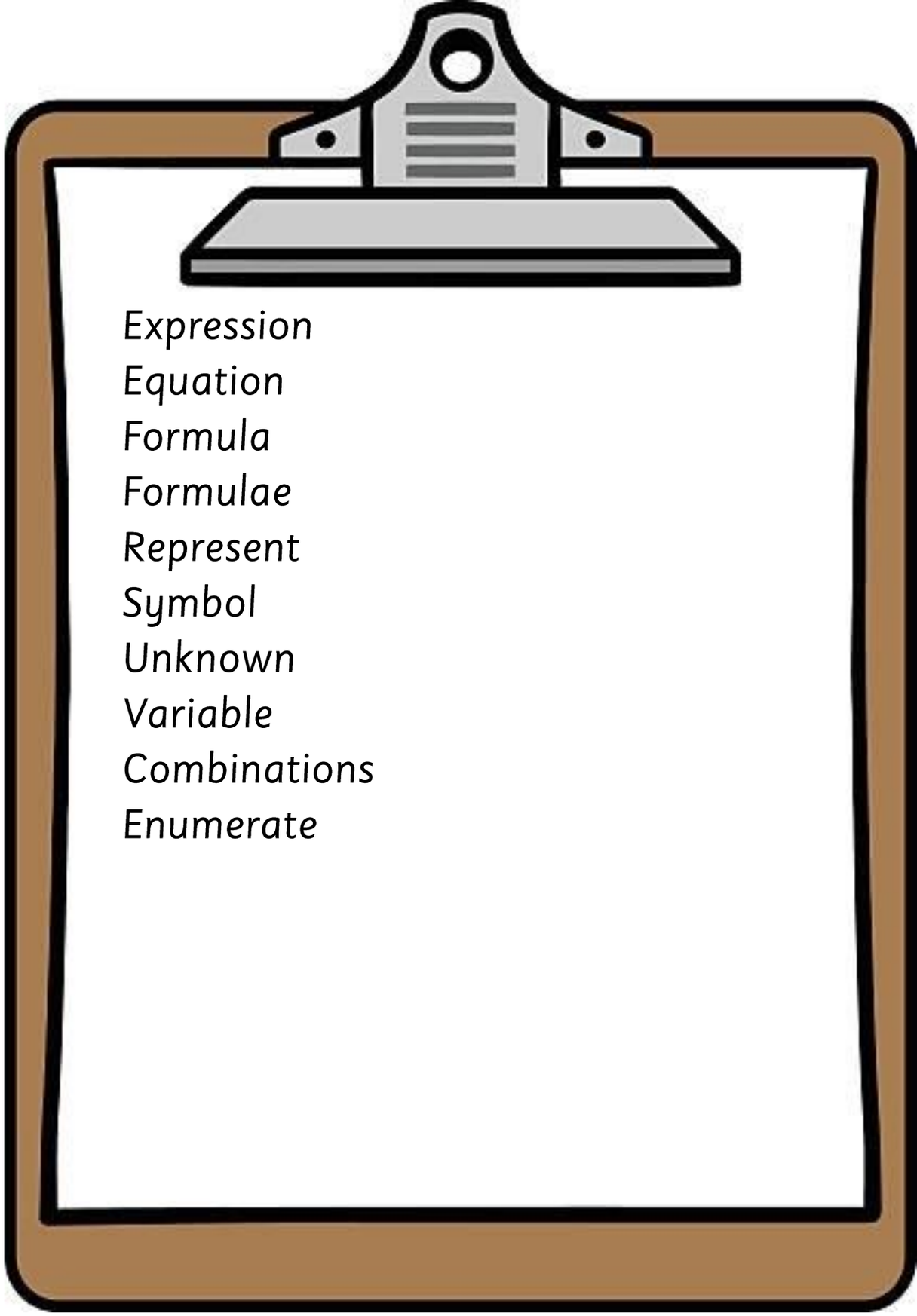


Find pairs of numbers that satisfy an equation

$2a + b = 10$

(2 x 1) + 8 = 1 0
(2 x 2) + 6 = 10
(2 x 3) + 4 = 10
(2 x 4) + 2 = 10

1) Work systematically to find sets of numbers that make the total

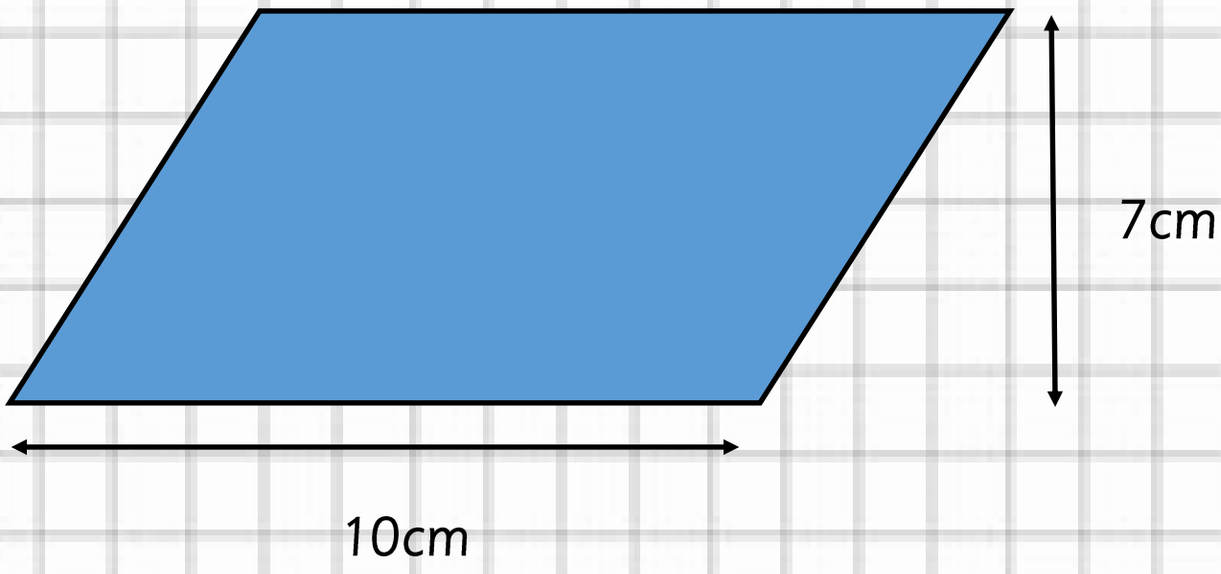


Measure

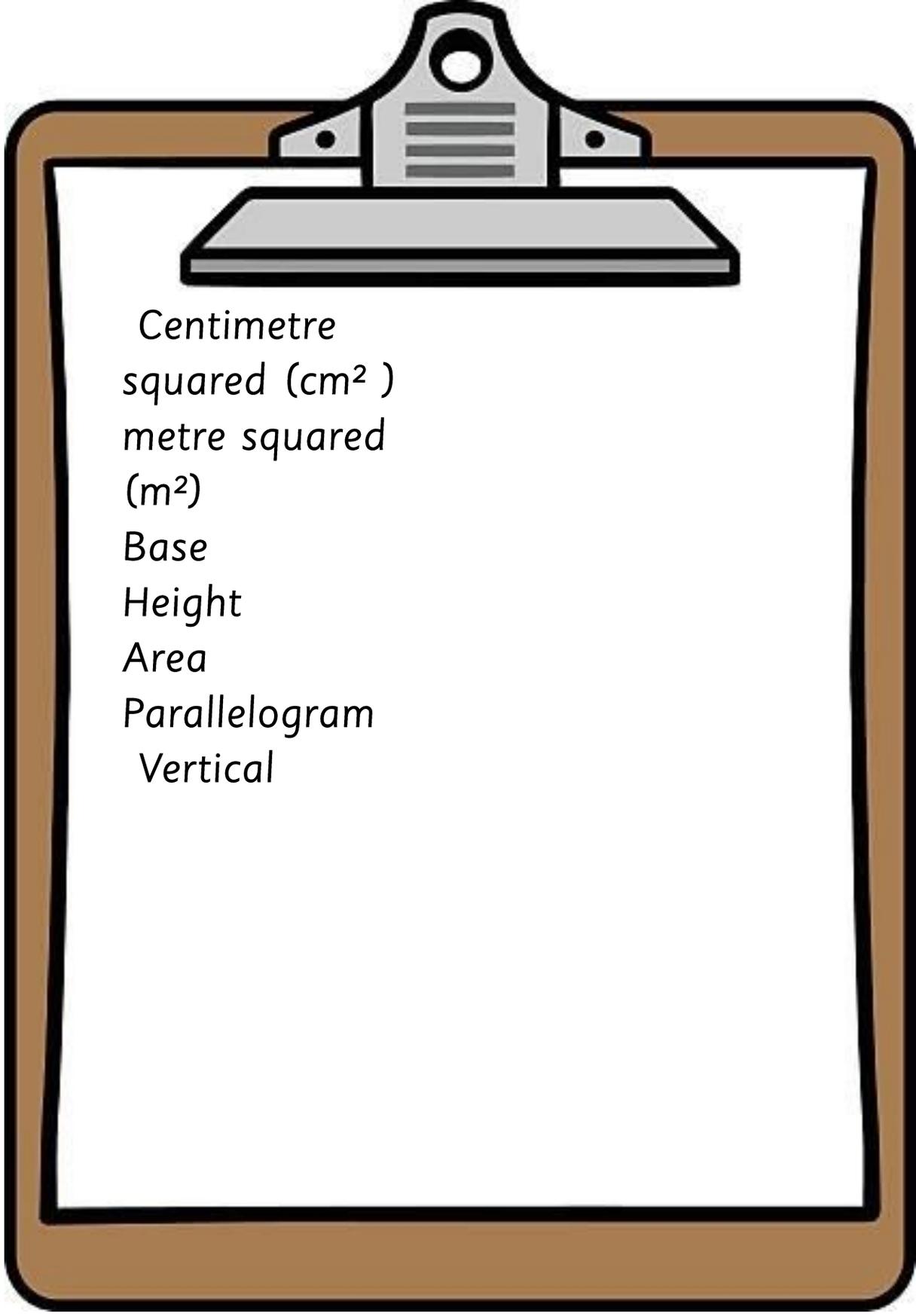
Area of parallelograms

Finding the area of a parallelogram is the same as finding the area of a rectangle.

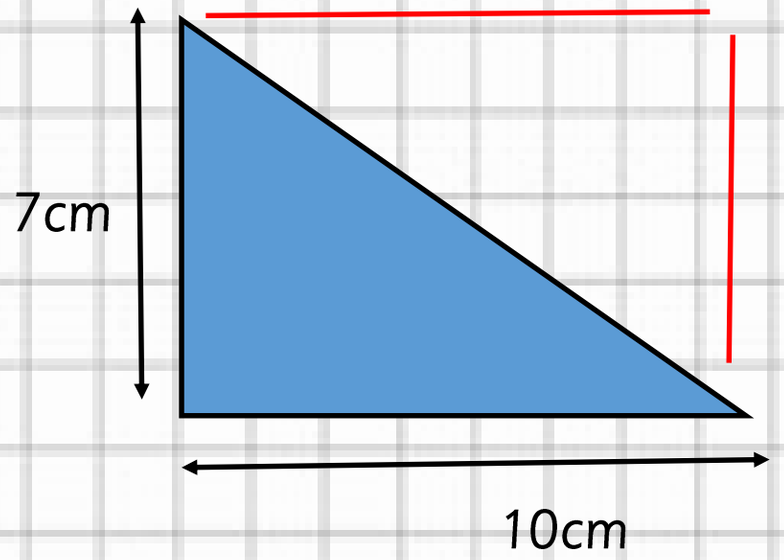
b x h



1) Multiply the base by the height. 10 x 7 = 70cm²



Area of triangles

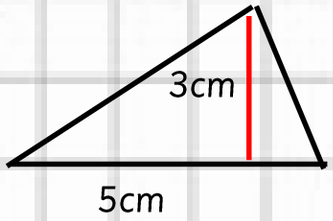


$(b \times h) \div 2$

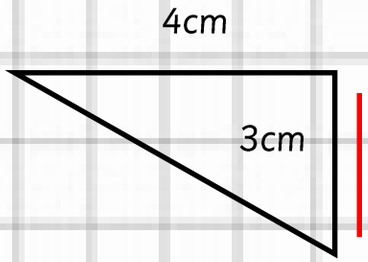
The area of a triangle will always be half the area of a rectangle.

1) First, multiply the base by the height.
   $10 \times 7 = 70\ cm^2$

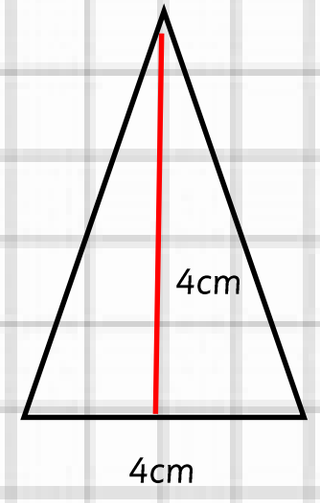
2) Next, divide the total by 2.
   $70 \div 2 = 35cm^2$



$5 \times 3 = 15$
$15 \div 2 = 7.5\ cm^2$



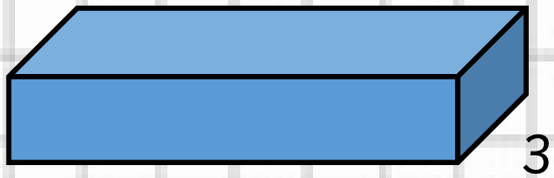
$4 \times 3 = 12$
$12 \div 2 = 6\ cm^2$



$4 \times 4 = 16$
$16 \div 2 = 8cm^2$

Centimetre squared (cm^2)
metre squared (m^2)
Base
Height
Area
Triangle
Vertical

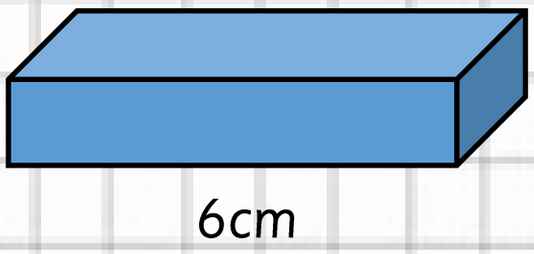
Calculating volume



1) Multiply the length by the width to find the area of one face. 5 x 3 = 15

2) Multiply the answer by the height.
15 x 2 = 30 cm³

Finding a missing value



Total: 36cm³

Divide the volume by one of the values.
36 ÷ 6 = 6

2) Divide the answer by the other value.
6 ÷ 3 =2

3) Check by multiplying
6 x 3 x 2 = 36cm³

- Multiply
- Measure
- Metric
- Scale
- Cubic centimetre (cm^3)
- Cubic metre (cm^3)
- Cuboid
- Cube
- Volume

Convert metric units of length

10 mm = 1cm

100 cm = 1m

1000m = 1km

What is 1.37 km in m?

1) Write out the fact that you need. 1000m = 1km

÷ 1000

2) Add in the arrows to show how to get from one value to the other.

1000m = 1km

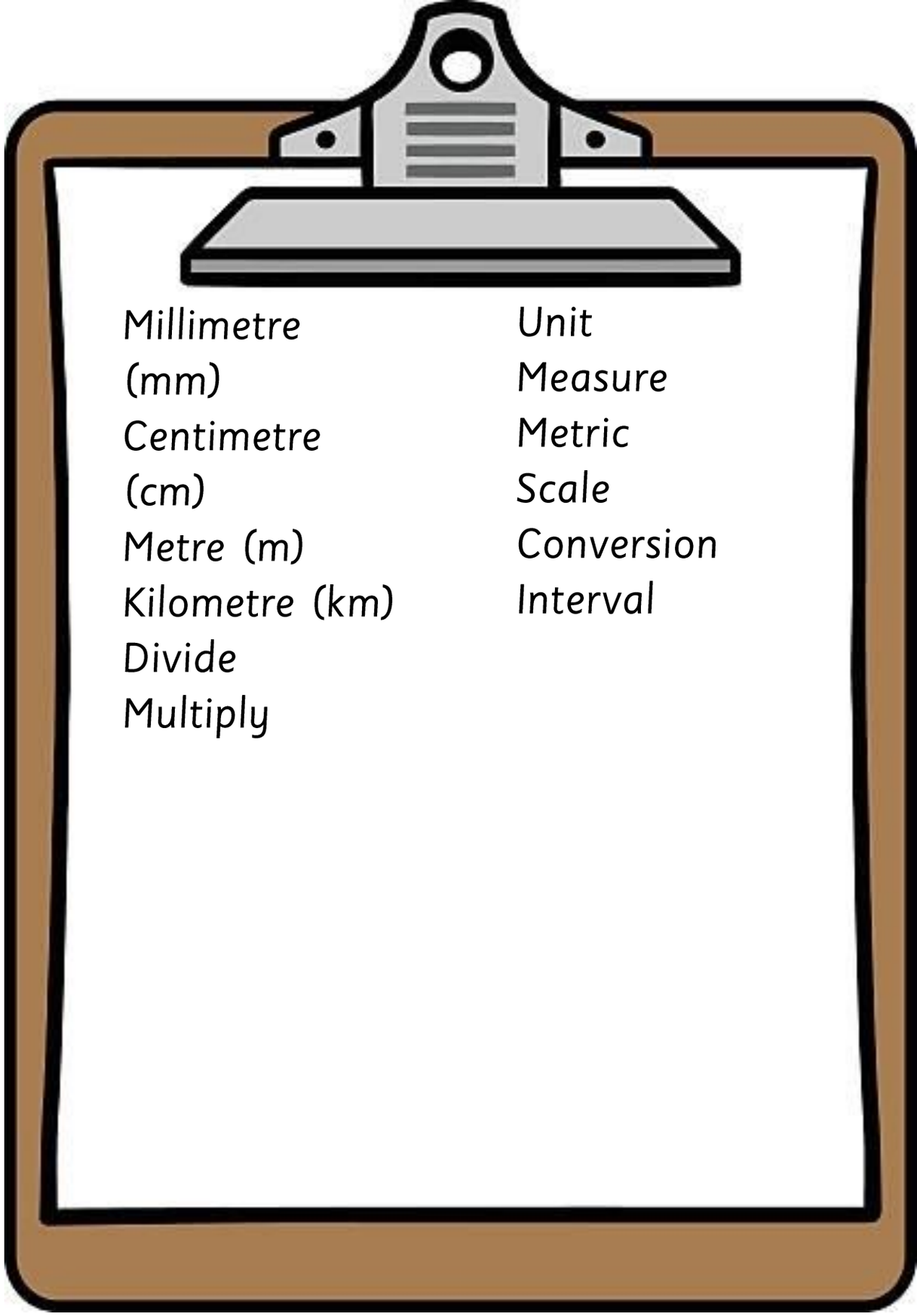
x 1000

What is 1.37 km in m? 1370m

÷ 10 ÷ 100 ÷ 1000

10mm = 1cm 100cm = 1m 1000m = 1km

x 10 x 100 x 1000



Convert metric units of mass

1000g = 1kg

What is 0.36 kg in g?

1) Write out the fact that you need.

1000g = 1kg

÷ 1000

2) Add in the arrows to show how to get from one value to the other.

1000g = 1kg

x 1000

What is 0.36kg in g? 360m

÷ 1000

1000g = 1kg

x 1000

Gram (g)
Kilogram (kg)
Mass
Divide
Multiply
Unit
Measure
Metric
Scale
Conversion
Interval

Convert metric units of capacity

1000ml = 1l

What is 3.26 l in ml?

1) Write out the fact that you need. 1000ml = 1l

÷ 1000

2) Add in the arrows to show how to get from one value to the other.

1000ml = 1l

x 1000

What is 3.26l in ml? 3260m

÷ 1000

1000ml = 1l

x 1000

- Centilitre (cl)
- Litre (l)
- Millilitre (ml)
- Capacity
- Divide
- Multiply
- Unit
- Measure
- Metric
- Scale
- Conversion
- Interval

Convert metric units

length

÷ 10 | ÷ 100 | ÷ 1000

10mm = 1cm | 100cm = 1m | 1000m = 1km

x 10 | x 100 | x 1000

mass

÷ 1000

1000g = 1kg

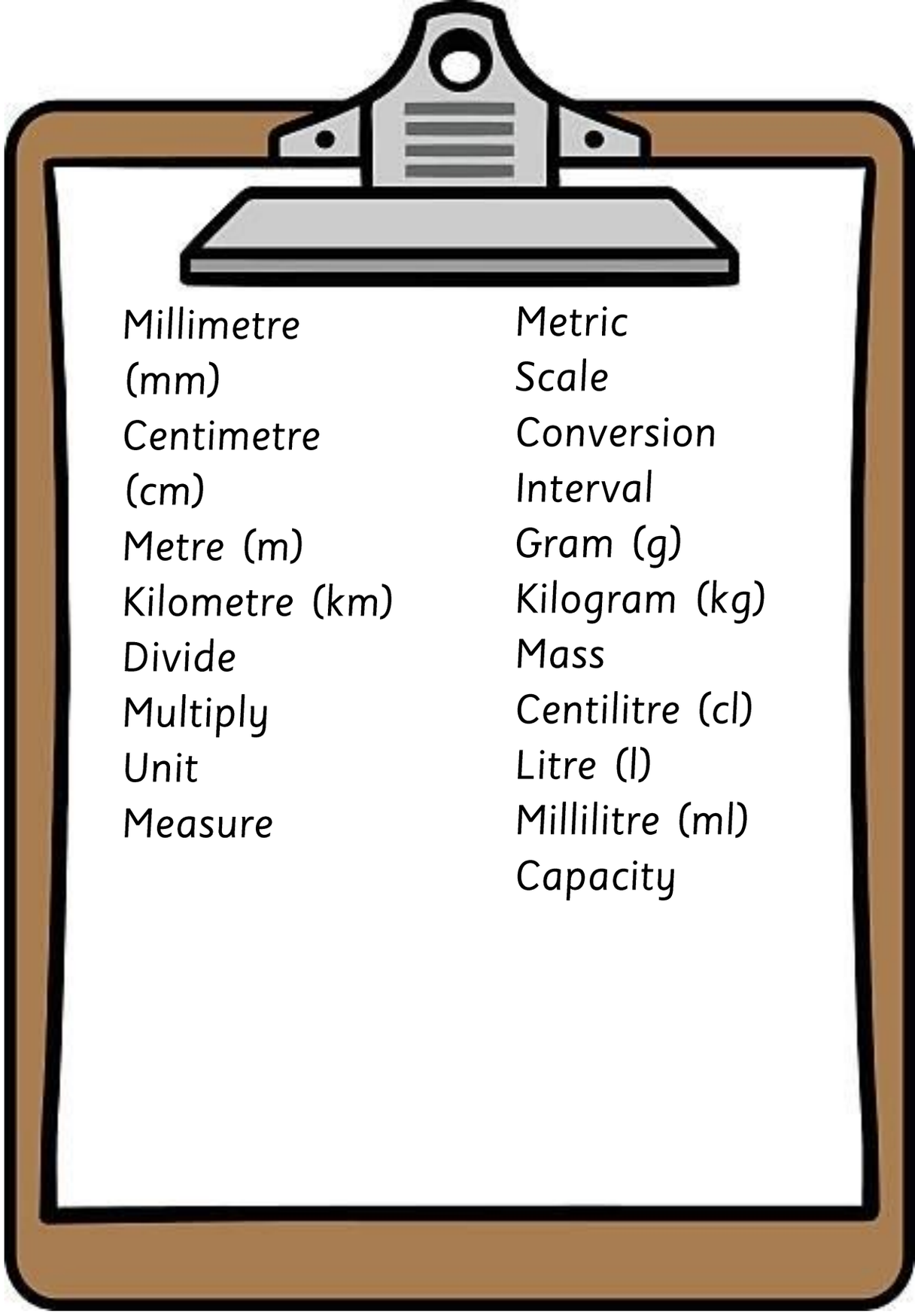
x 1000

capacity

÷ 1000

1000ml = 1l

x 1000



Millimetre (mm)
Centimetre (cm)
Metre (m)
Kilometre (km)
Divide
Multiply
Unit
Measure
Metric
Scale
Conversion
Interval
Gram (g)
Kilogram (kg)
Mass
Centilitre (cl)
Litre (l)
Millilitre (ml)
Capacity

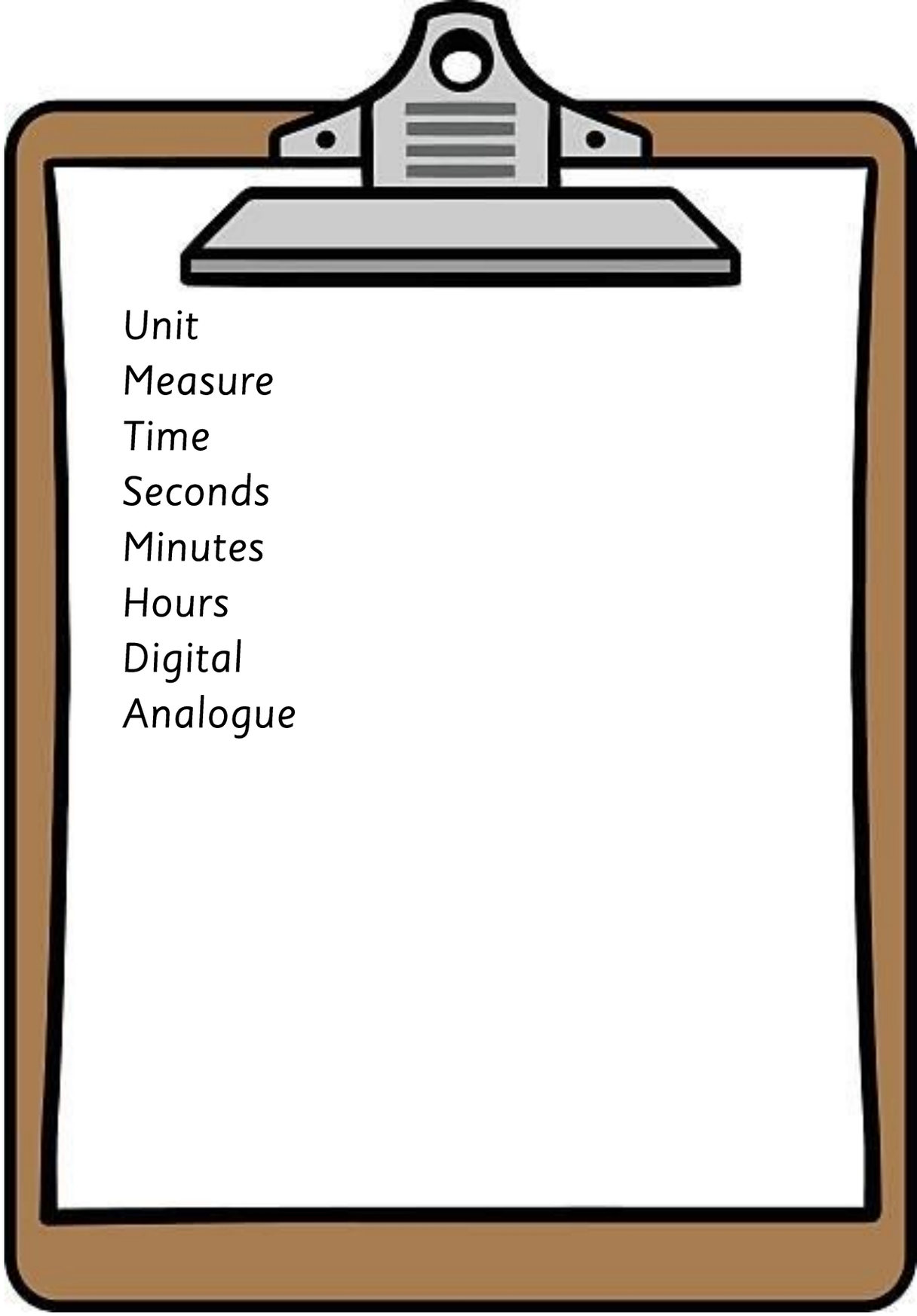
Convert units of time

60 seconds= 1 minute
60 minutes= 1 hour
24 hours= 1 day
7 days = 1 week
12 months = 1 year
365 days = 1 year

÷ 60 ÷ 60 ÷ 24

60 s = 1m 60m= 1h 24 h = 1d

x 60 x 60 x 24



Convert between miles and kilometres

Facts to remember:
1 mile = 1.6km
5 miles= 8km

To convert miles to km:

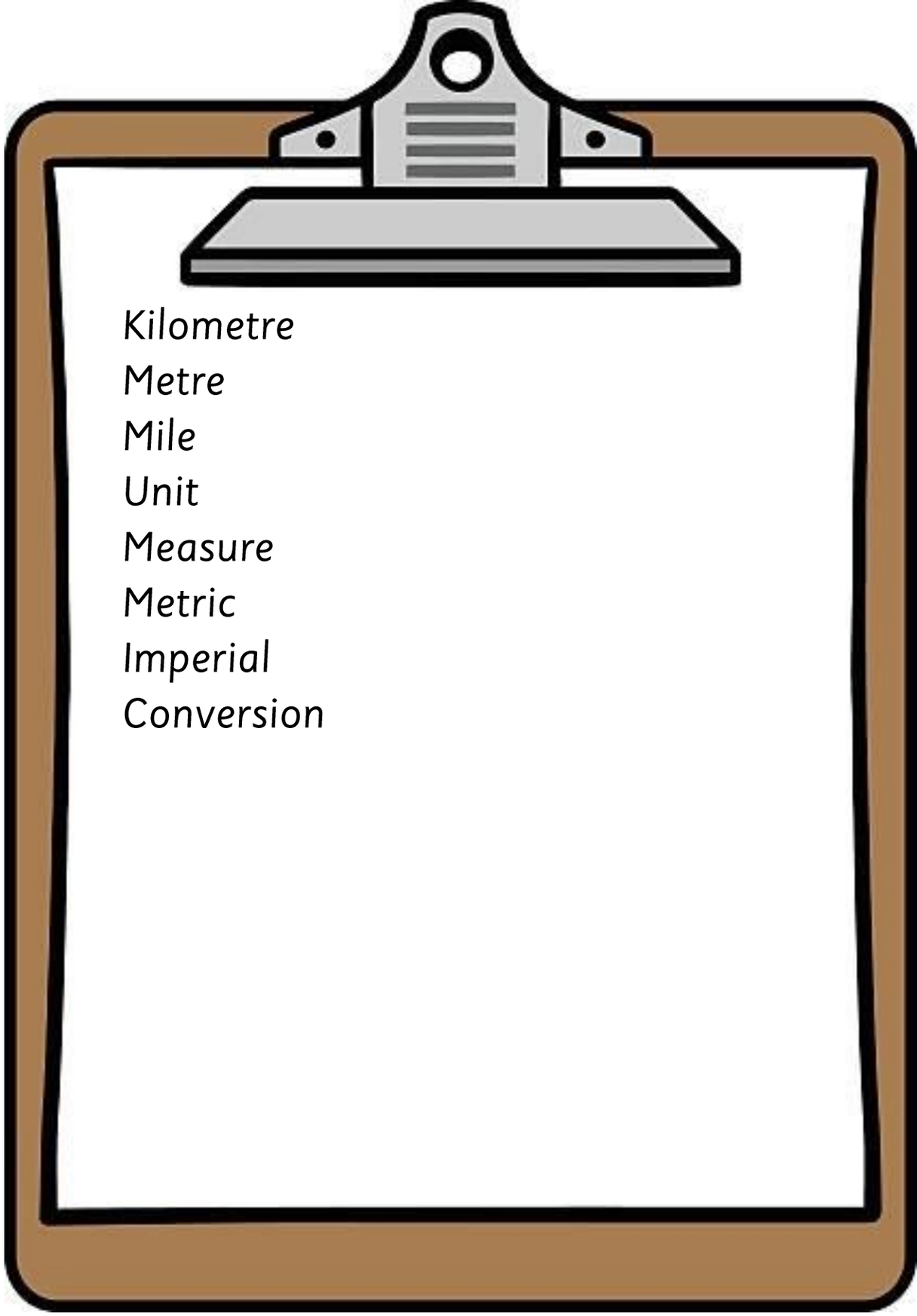
5 miles= 8km ↓ 1) Divide by 5 (45÷ 5 =9)

↑ 40 miles= 72km ↓ 2) Multiply by 8 (9 x 8= 72)

To convert km to miles: 1) Divide by 8 (48 ÷ 8=6)

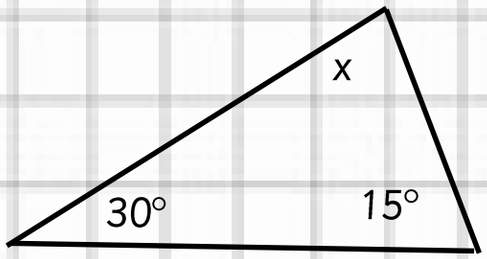
↓ 5 miles= 8km ↑ 2) Multiply by 5 (6 x 5 = 30)

30 miles= 48km



Geometry- properties of shapes

Missing angles in triangles



Angles in a triangle add to 180°

1) Add the two known values.

30° + 15° = 45°

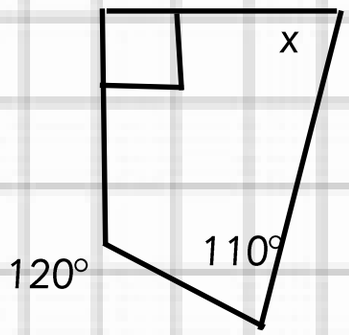
2) Subtract from 180°

180° - 45° = 135°

3) Check by adding the values together to make sure they reach 180°

Angles
Degrees
Regular
Polygons
Triangle
Acute angle
Obtuse angle
Right angle
Reflex angle
Total
Difference

Missing angles in quadrilaterals



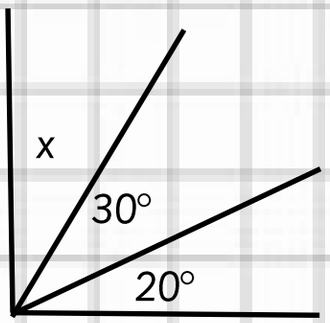
Angles in a quadrilateral add to 360°

1) Add the three known values.
120° + 110° + 90 = 320°

2) Subtract from 360°
360° - 320° = 40°

Angles
Degrees
Regular
Polygons
Quadrilateral
Acute angle
Obtuse angle
Right angle
Reflex angle
Total
Difference

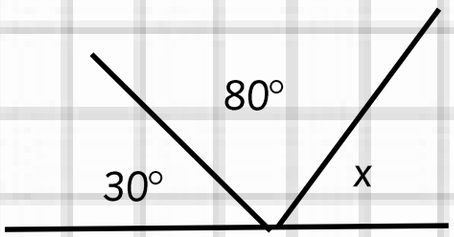
Missing angles



1) Add the known values.
$20° + 30° = 50°$

2) Subtract from 90°.
$90° - 50° = 40°$

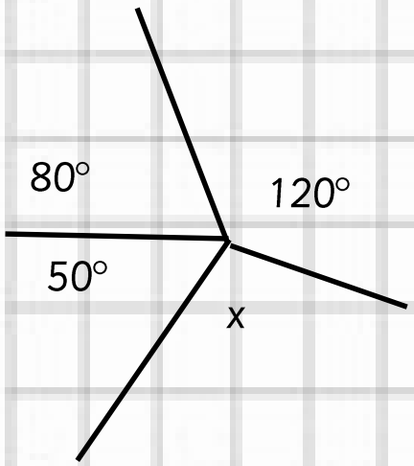
3) Check that the values add to 90°.



1) Add the known values.
$30° + 80° = 110°$

2) Subtract from 180°.
$180° - 110° = 70°$

3) Check that the values add to 180°.



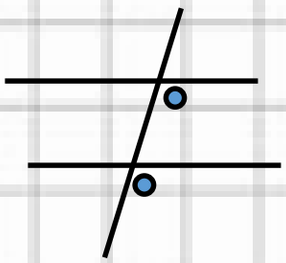
1) Add the known values.
$120° + 80° + 50° = 250°$

2) Subtract from 360°.
$360° - 250° = 110°$

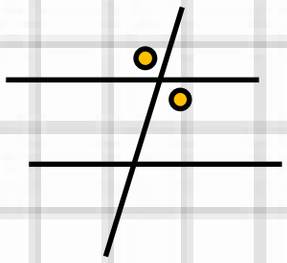
3) Check that the values add to 360°.

Angles	Numeral
Degrees	
Acute angle	
Obtuse angle	
Right angle	
Reflex angle	
Total	
Difference	
Point	
Straight line	

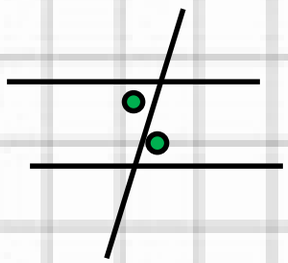
Corresponding, alternate and opposite angles



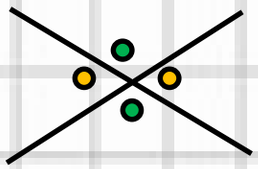
Corresponding angles are equal.



Opposite angles are equal.



Alternate angles are equal.

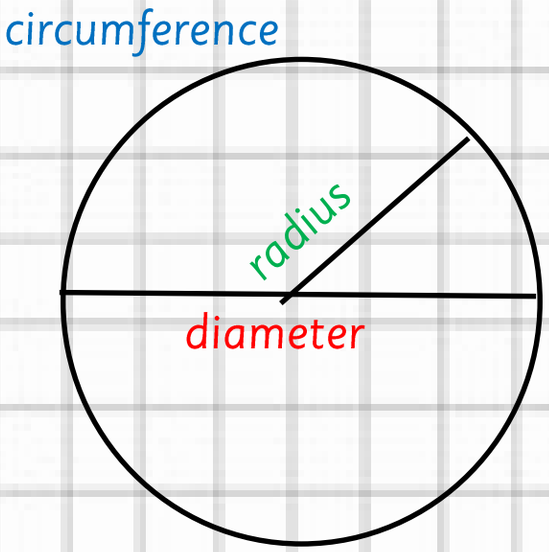


Opposite angles are equal.

- Angles
- Degrees
- Acute angle
- Obtuse angle
- Right angle
- Reflex angle
- Total
- Difference
- Point
- Straight line
- Vertically opposite
- Sum

Parts of a circle

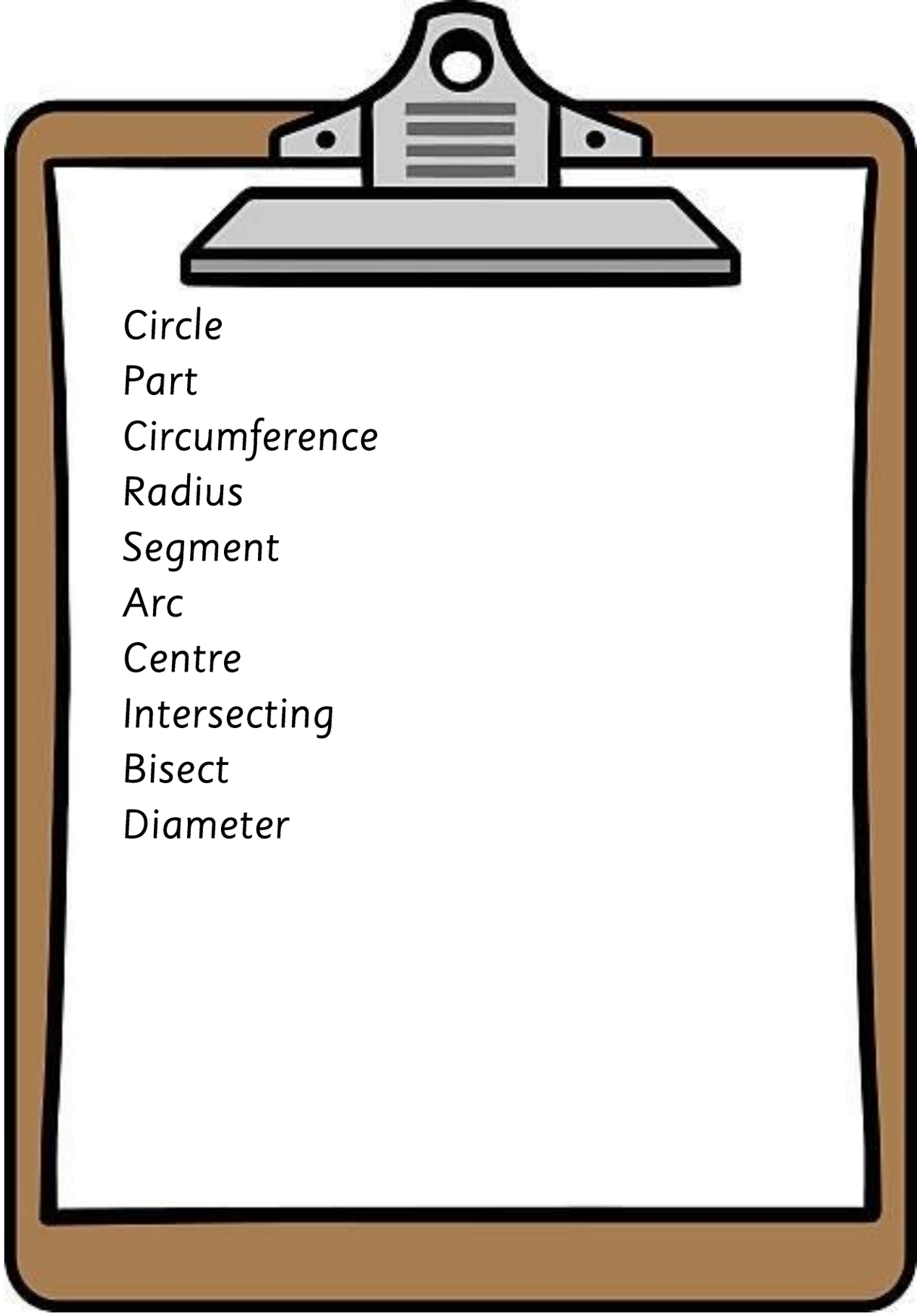
Hint: the diameter is twice the radius.



Circumference: Distance around the edge of the circle.

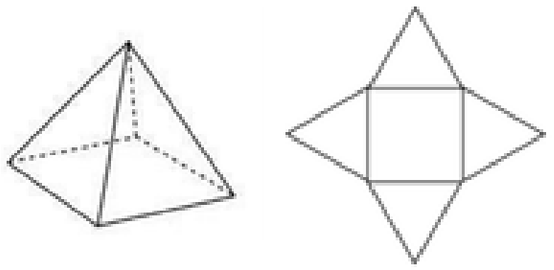
Diameter: Length of a line through the middle from one edge to the other.

Radius: Distance from the middle of the circle to the outer edge.

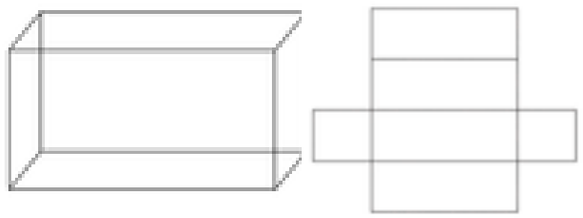


Recognise nets of shapes

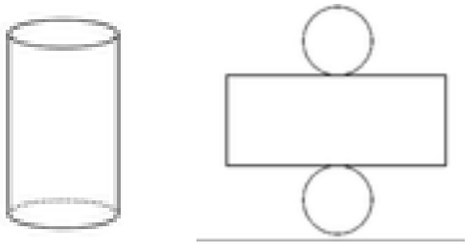
Square-based pyramid

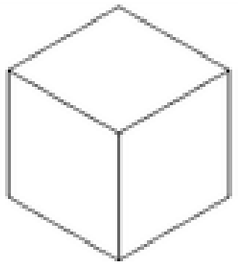


Cuboid

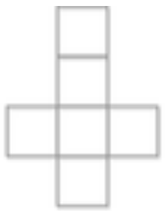


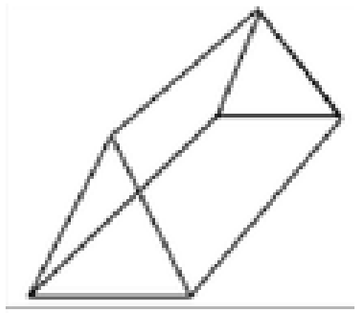
Cylinder



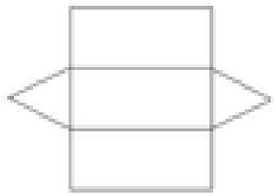


Cube



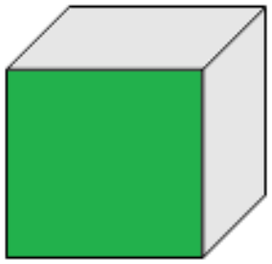


Triangular prism

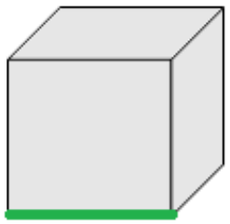


Net
Face
Three dimensional (3D)
Geometric
Vertex/ vertices
Apex
Face
Edge

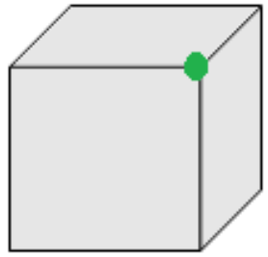
Compare and classify 3D shapes based on their characteristics



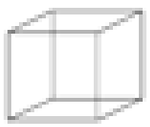
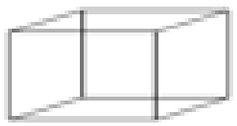
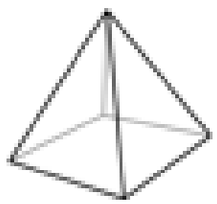
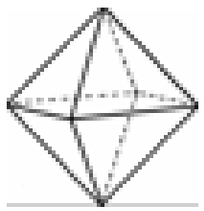
Faces are the surfaces of the shape

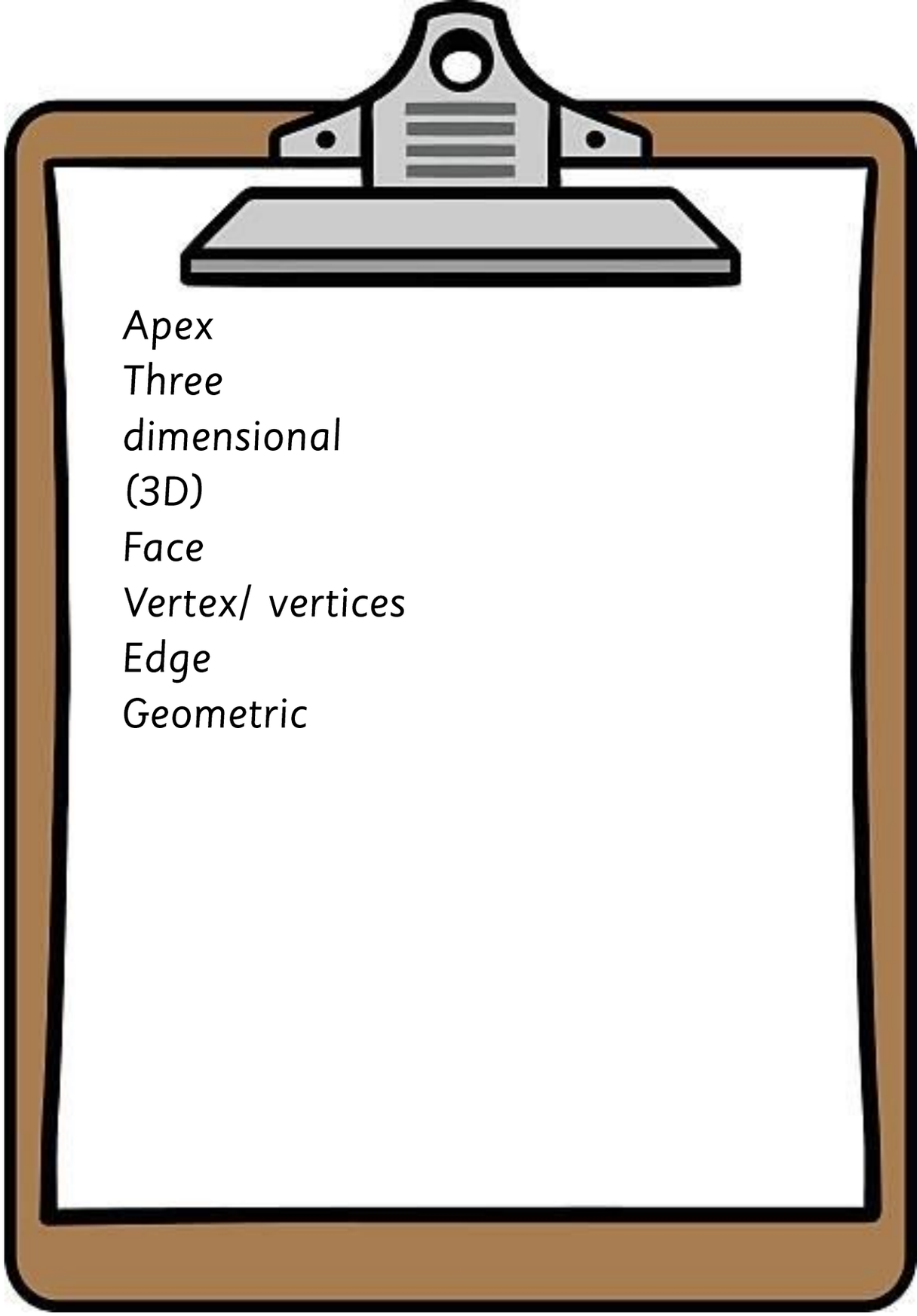


Edges are the line segments where two faces meet



Vertices are the places where 3 or more edges meet

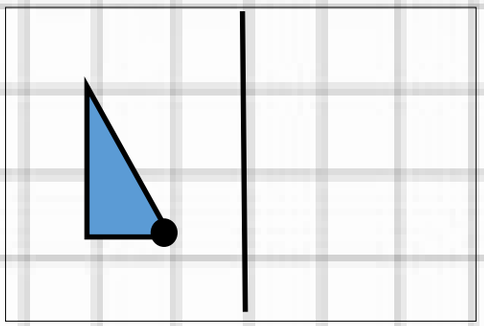
Cube 6 square faces 12 edges 8 vertices 	**Cuboid** 6 faces 12 edges 8 vertices 	**Sphere** 1 curved surface 0 edges 0 vertices 
Tetrahedron 4 triangular faces 6 edges 4 vertices 	**Triangular prism** 5 faces 9 edges 6 vertices 	**Cylinder** 2 circular faces 1 curved surface 2 curved edges 0 vertices 
Cone 1 circular face 1 curved surface 1 curved edge 1 apex 	**Square-based pyramid** 5 faces 8 edges 5 vertices 	**Octahedron** 8 faces 12 edges 6 vertices 



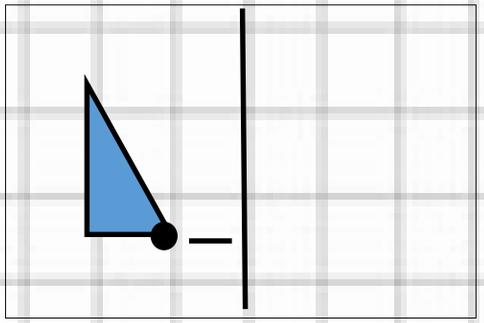
Apex
Three
dimensional
(3D)
Face
Vertex/ vertices
Edge
Geometric

Geometry- position and direction

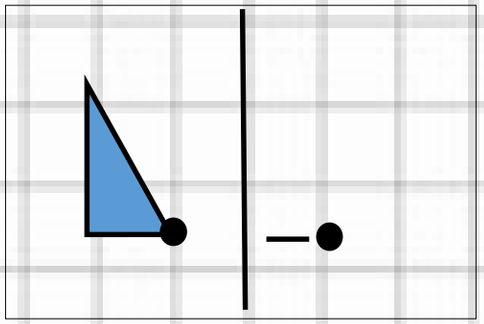
Reflect shapes



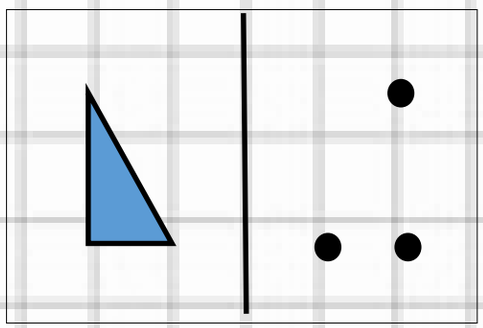
Choose a point



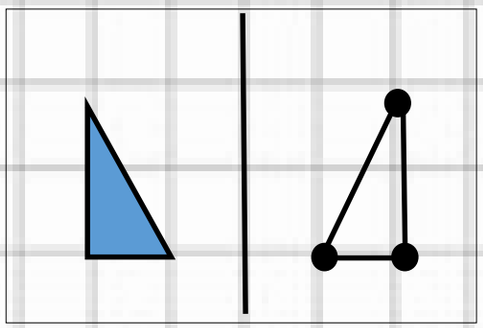
2) Count the units from the point to the mirror line



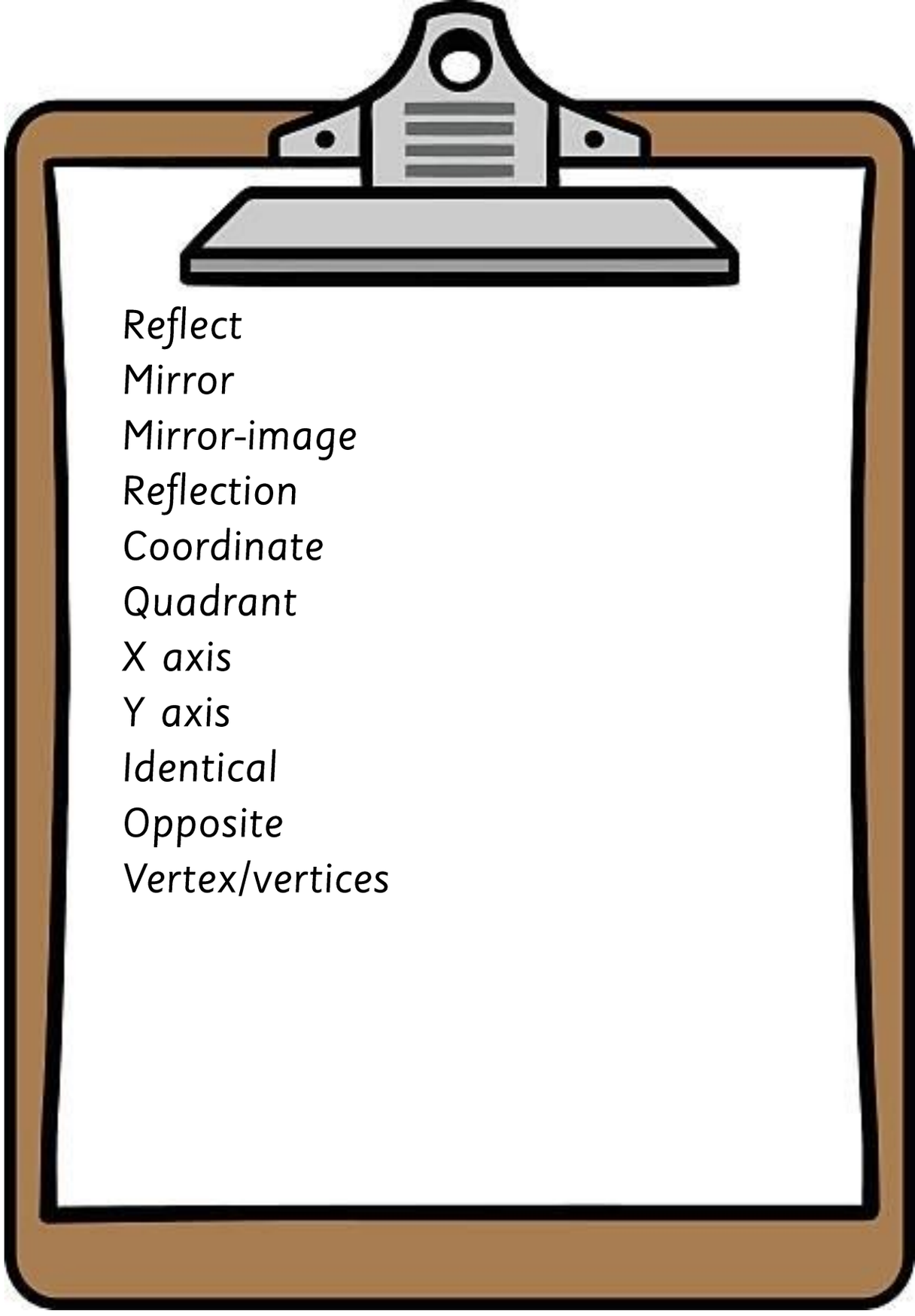
3) Count the same number out the other side and draw a dot.



4) Repeat with the other points.



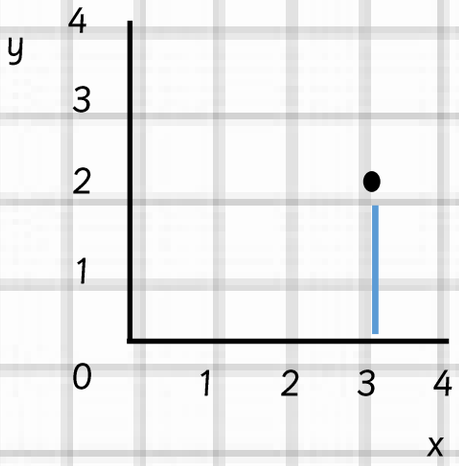
5) Join the points using a ruler



Reflect
Mirror
Mirror-image
Reflection
Coordinate
Quadrant
X axis
Y axis
Identical
Opposite
Vertex/vertices

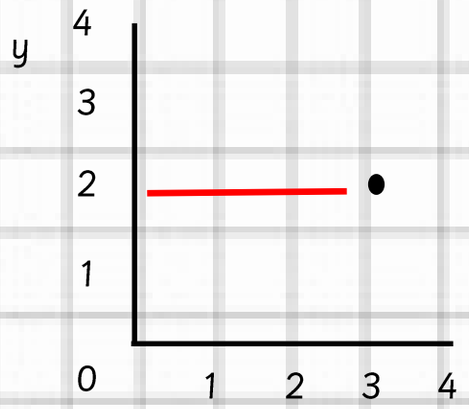
Read co-ordinates

Remember: Along the corridor and up the stairs

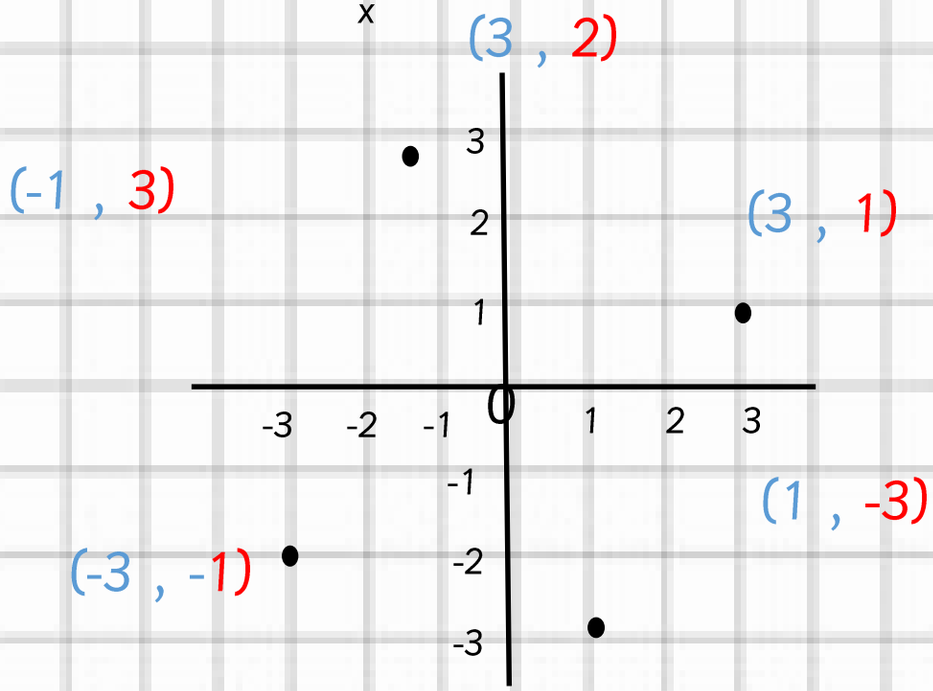


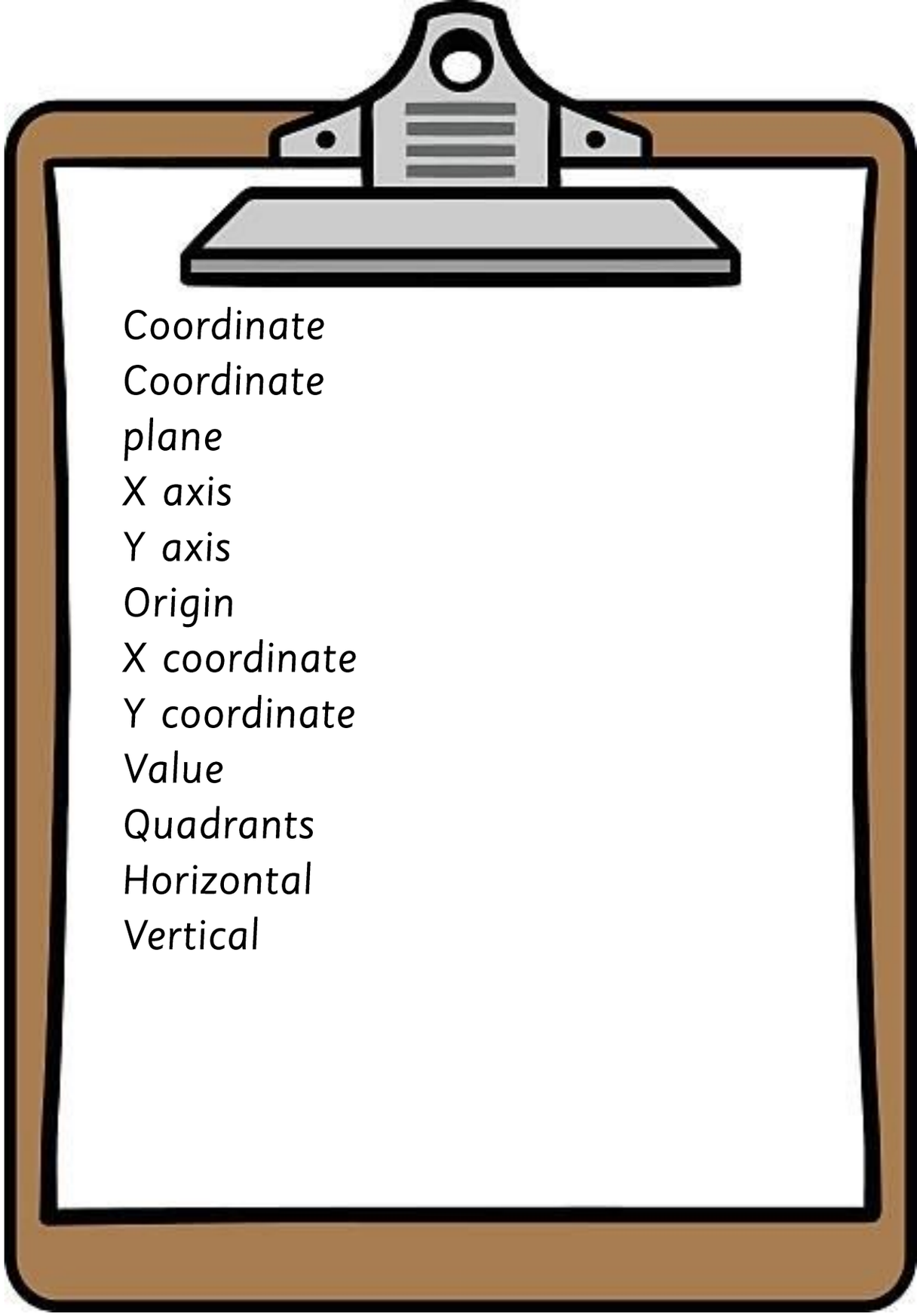
1) Imagine a line going down to the x-axis. This is the x coordinate and the first number inside the brackets.

(3 ,



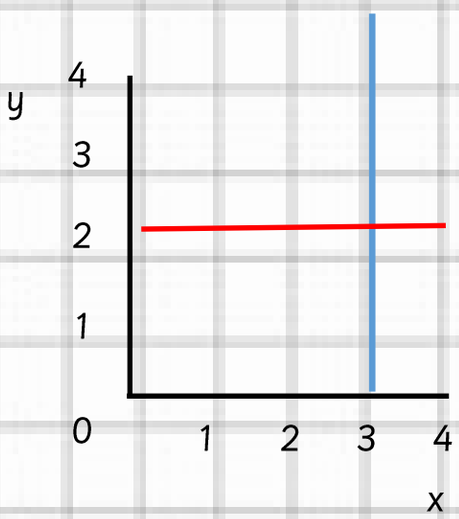
2) Imagine a line going across to the y-axis. This is the y coordinate and the second number inside the brackets.





Read and plot co-ordinates

Remember: Along the corridor and up the stairs



Plot the co-ordinate (3, 2)

1) Go along the x axis to get to the co-ordinate you .want.

2) Go up or down the y axis to get to the co-ordinate you .want.

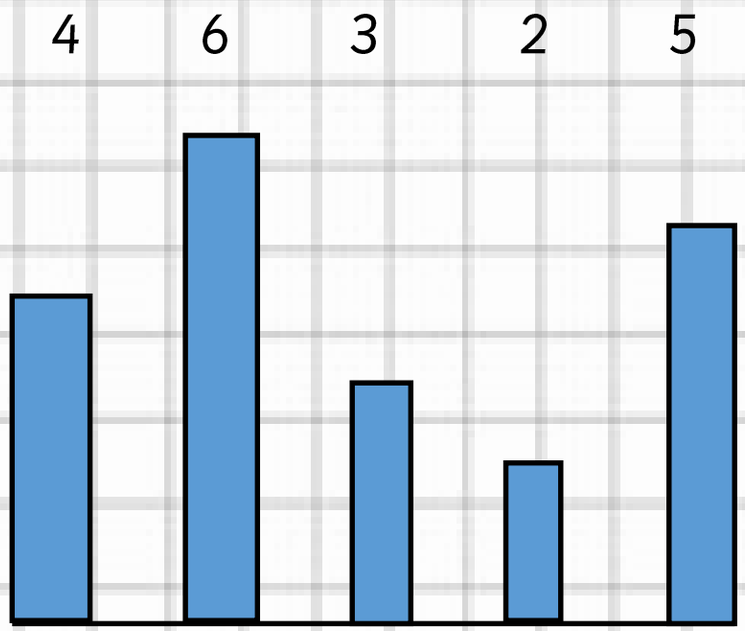
3) Put a cross where the two imaginary lines meet.

Coordinate
Coordinate
plane
X axis
Y axis
Origin
X coordinate
Y coordinate
Value
Quadrants
Horizontal
Vertical

Statistics

Calculate the mean

The mean is a way of finding the average of a set of data.



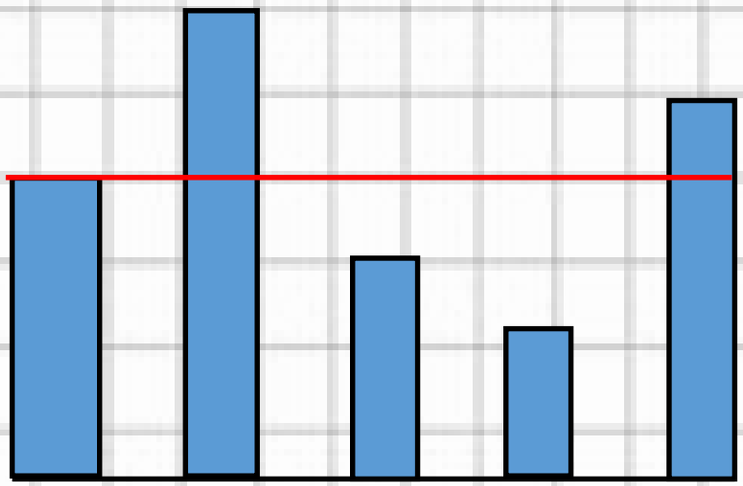
4 + 6 + 3 + 2 + 5
= 20

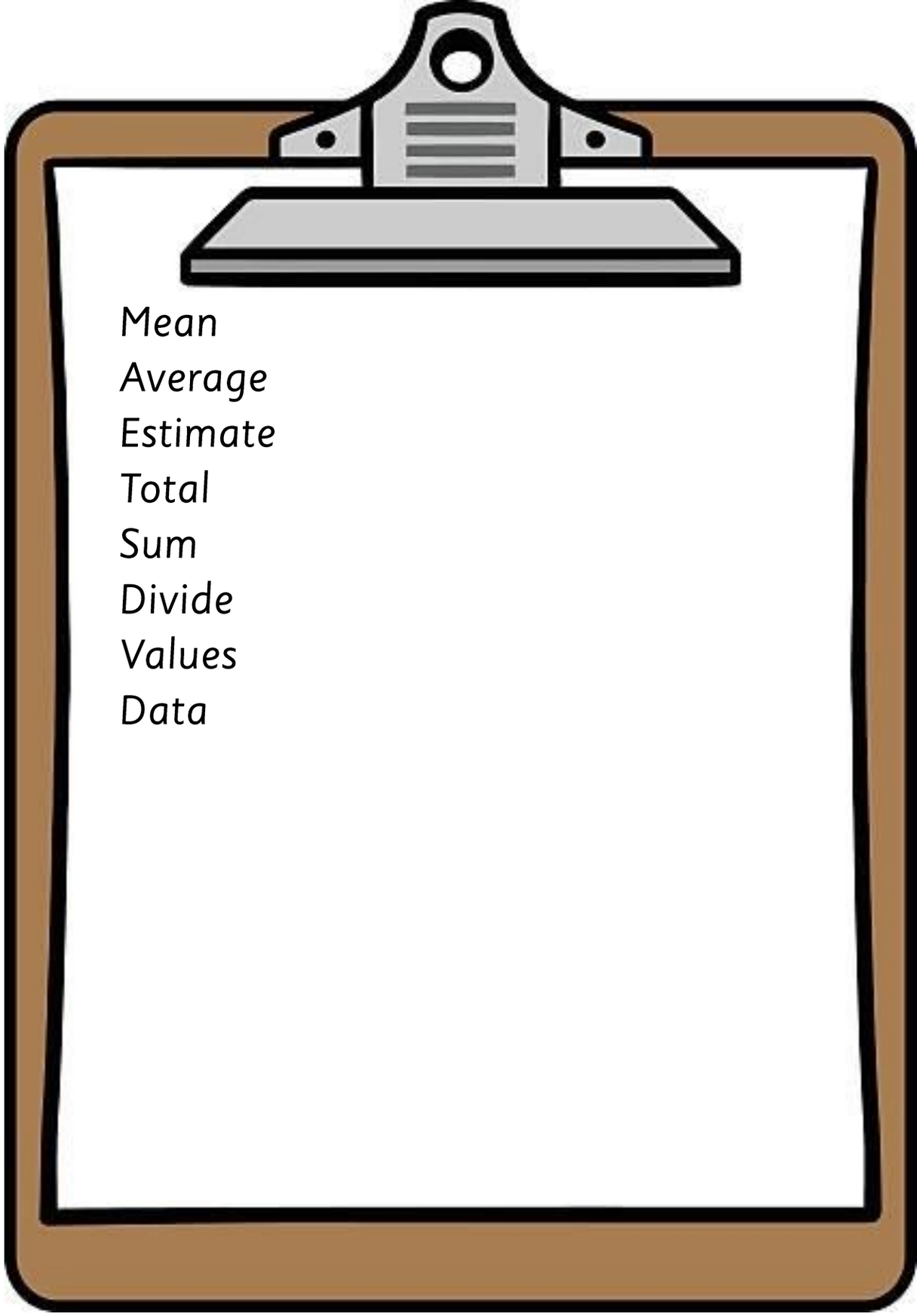
20 ÷ 5 = 4

1) Add the values together

2) Divide by the amount of values.

The mean of this set of data is 4.



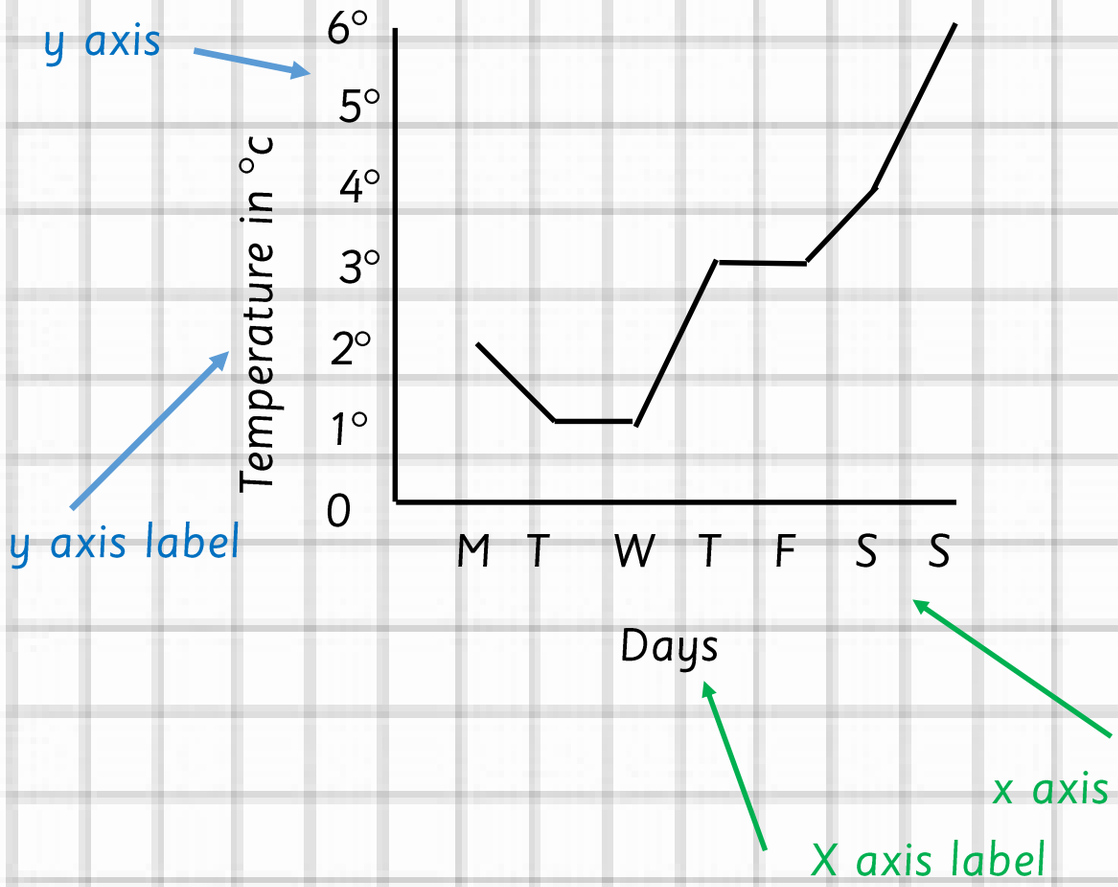


Read and interpret line graphs

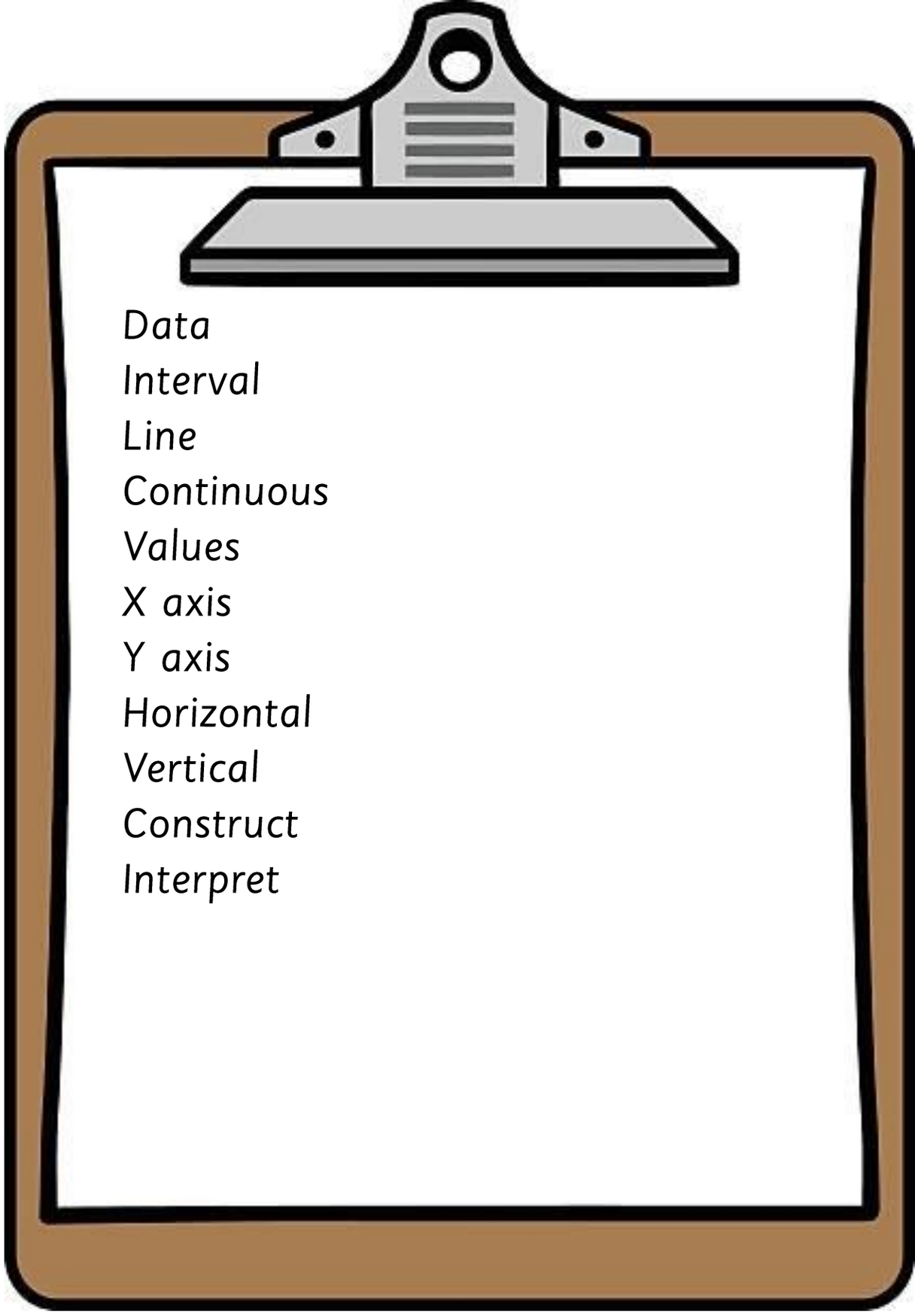
Graph title

Line graphs show a change over time.

Graph showing the temperature change over a week



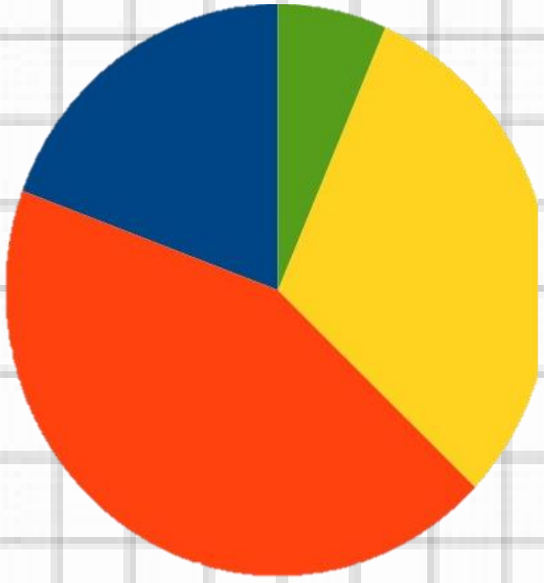
- Read the title and the axes
- Check what the graph is telling you
- Look at the general trends.



Read and interpret pie charts

Pie charts are a way of showing data

Pie chart showing the favourite fruits of year 5



	Strawberries	12
	Apples	3
	Blueberries	7
	Bananas	8

1)Read the title and the axes
2) Check what the graph is telling you
3)Look at the general trends.