

|   |                  |                                                                                             |                                                                                                      |
|---|------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 1 | $3,212 \div 4 =$ | <div style="border: 1px solid black; width: 150px; height: 40px; margin: 10px auto;"></div> | <div style="border: 1px solid black; width: 40px; height: 30px; margin: 10px auto;"></div><br>1 mark |
|   |                  |                                                                                             |                                                                                                      |

|   |                     |                                                                                             |                                                                                                      |
|---|---------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 2 | $(19 + 7) \div 2 =$ | <div style="border: 1px solid black; width: 150px; height: 40px; margin: 10px auto;"></div> | <div style="border: 1px solid black; width: 40px; height: 30px; margin: 10px auto;"></div><br>1 mark |
|   |                     |                                                                                             |                                                                                                      |

|   |                   |                                                                                             |                                                                                                      |
|---|-------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| 3 | $7,536 - 3,001 =$ | <div style="border: 1px solid black; width: 150px; height: 40px; margin: 10px auto;"></div> | <div style="border: 1px solid black; width: 40px; height: 30px; margin: 10px auto;"></div><br>1 mark |
|   |                   |                                                                                             |                                                                                                      |

4

$$156,400 - 86,148 =$$

1 mark

5

$$360 \div 60 =$$

1 mark

6

$$536 \times 9 =$$

1 mark

Challenge yourself!

7

$$2\frac{1}{8} + 5\frac{2}{4} =$$

☐  
1 mark

## Answer Sheet

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1.  $3,212 \div 4 = \mathbf{803}$  (W)
2.  $(19 + 7) \div 2 = \mathbf{13}$  (M)
3.  $7,536 - 3,001 = \mathbf{4,535}$  (M)
4.  $156,400 - 86,148 = \mathbf{70,252}$  (W)
5.  $360 \div 60 = \mathbf{6}$  (M)
6.  $536 \times 9 = \mathbf{4,824}$  (W)
7.  $2\frac{1}{8} + 5\frac{2}{4} = \mathbf{7\frac{5}{8}}$  (M)

# Fluent in Five

Daily Arithmetic Practice  
Week 18

Year 6

## Year 6 - Week 18

Please note, we always recommend reading 'Your Guide to Using Fluent in Five' before using these resources with your class.

### This week in a nutshell

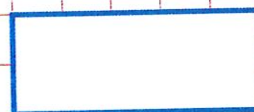
- Mental multiplication this week focuses on using the 1-12x table to solve multiplication and division questions.
- Mental addition and subtraction questions this week continue to focus on adding and subtracting multiples of 10, 100 and 1,000.
- Written methods for multiplication focuses on the multiplication of decimals by a single-digit number. Written methods for addition and subtraction are taken from the full range of possible questions.
- Fraction questions focus on children multiplying pairs of fractions together, and dividing fractions by a single digit number.

Fluent in Five - Year 6  
Week 18 - Day 1

Name.....  
Date.....School.....  
Class.....Score.....

1

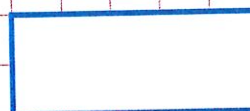
$$258,630 + 179,885 =$$



1 mark

2

$$\frac{2}{5} \times \frac{1}{2} =$$



1 mark

3

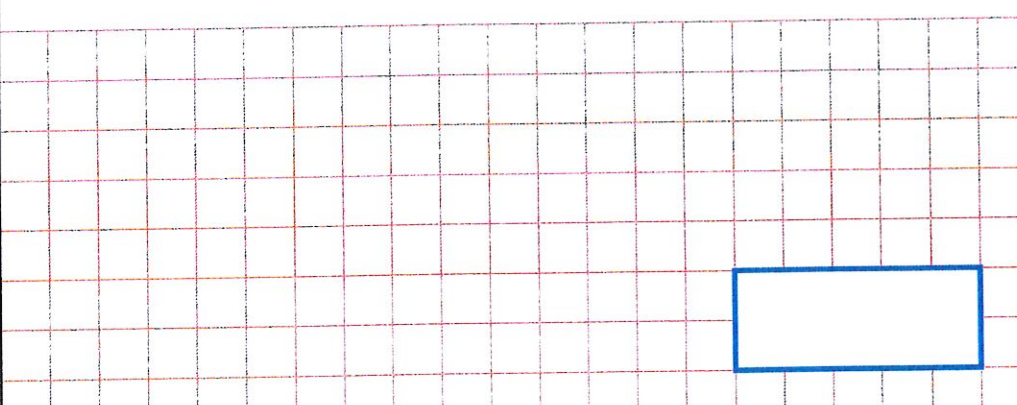
$$320 + 90 =$$



1 mark

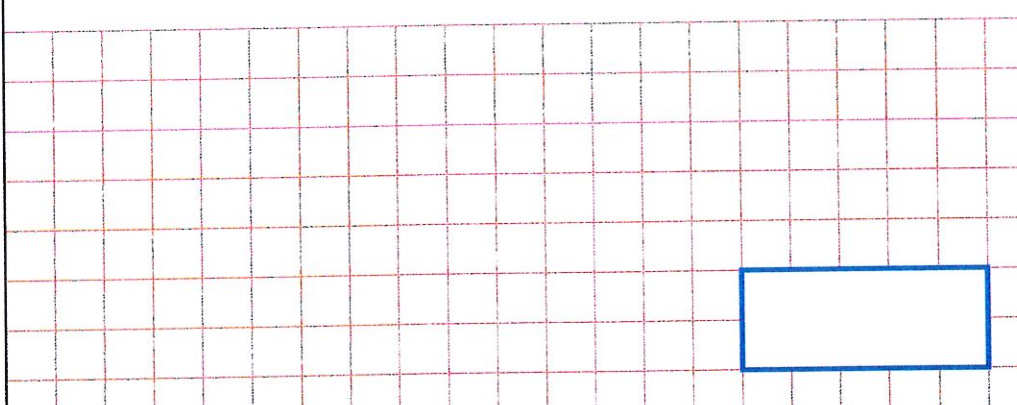
Fluent in Five - Year 6  
Week 18 - Day 1

4       $5 + 7 + 3 =$



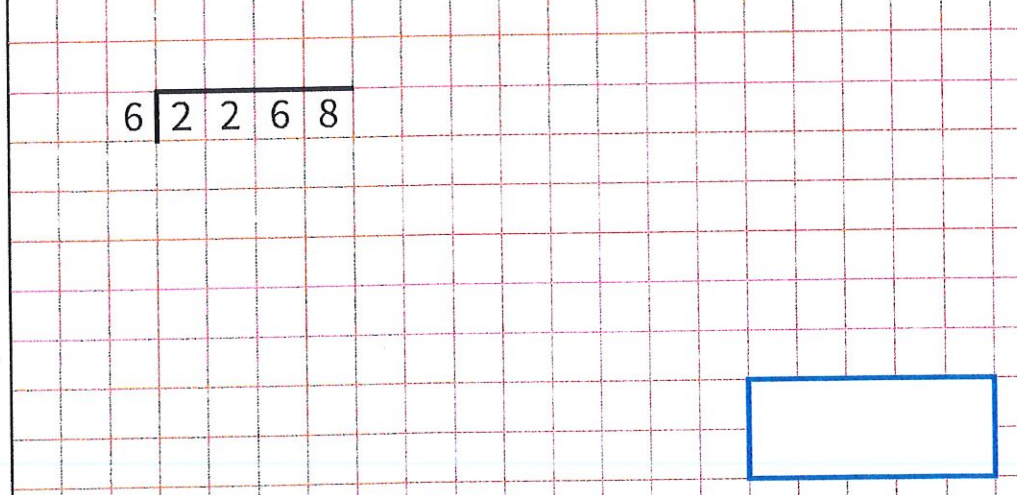
1 mark

5       $1.25 \times 6 =$



1 mark

6       $6 \overline{) 2268}$



1 mark

Challenge yourself!

7

$$120 \div \boxed{\phantom{000}} = 10$$



1 mark

## Answer Sheet

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1.  $258,630 + 179,885 = \mathbf{438,515}$  (W)

2.  $\frac{2}{5} \times \frac{1}{2} = \frac{\mathbf{2}}{\mathbf{10}}$  (M)

3.  $320 + 90 = \mathbf{410}$  (M)

4.  $5 + 7 + 3 = \mathbf{15}$  (M)

5.  $1.25 \times 6 = \mathbf{7.5}$  (W)

6.  $2,268 \div 6 = \mathbf{378}$  (W)

7.  $120 \div \mathbf{12} = 10$  (M)

Fluent in Five - Year 6  
Week 18 - Day 2

Name.....  
Date..... School.....  
Class..... Score.....

1

$626 \times 0 =$

1 mark

2

$3 \times$

$= 33$

1 mark

3

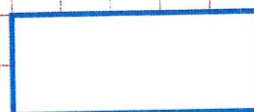
$4.39 \times 5 =$

1 mark

Fluent in Five - Year 6  
Week 18 - Day 2

4

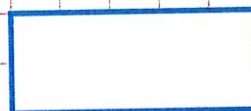
$$\frac{3}{4} \times \frac{2}{5} =$$



1 mark

5

$$486,132 - 399,889 =$$



1 mark

6

$$51,000 + 23,000 =$$



1 mark

Challenge yourself!

7

$$42.145 + 15.588 =$$

1 mark

## Answer Sheet

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1.  $626 \times 0 = \mathbf{0}$  (M)
2.  $3 \times \mathbf{11} = 33$  (M)
3.  $4.39 \times 5 = \mathbf{21.95}$  (W)
4.  $\frac{3}{4} \times \frac{2}{5} = \frac{\mathbf{6}}{\mathbf{20}}$  or  $\frac{\mathbf{3}}{\mathbf{10}}$  (M)
5.  $486,132 - 399,889 = \mathbf{86,243}$  (W)
6.  $51,000 + 23,000 = \mathbf{74,000}$  (M)
7.  $42.145 + 15.588 = \mathbf{57.733}$  (W)

Name.....  
Date.....School.....  
Class.....Score.....

1

$$4,000 + \boxed{\phantom{000}} = 6,500$$

☐  
1 mark

2

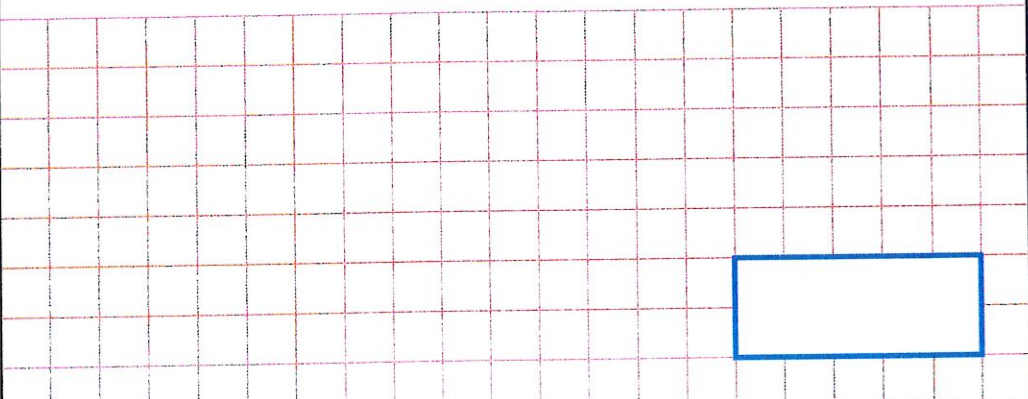
$$901,002 - 463,552 =$$

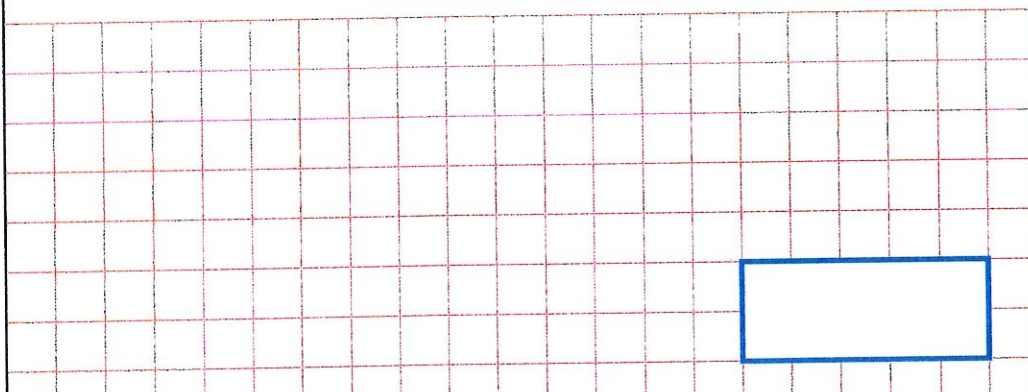
☐  
1 mark

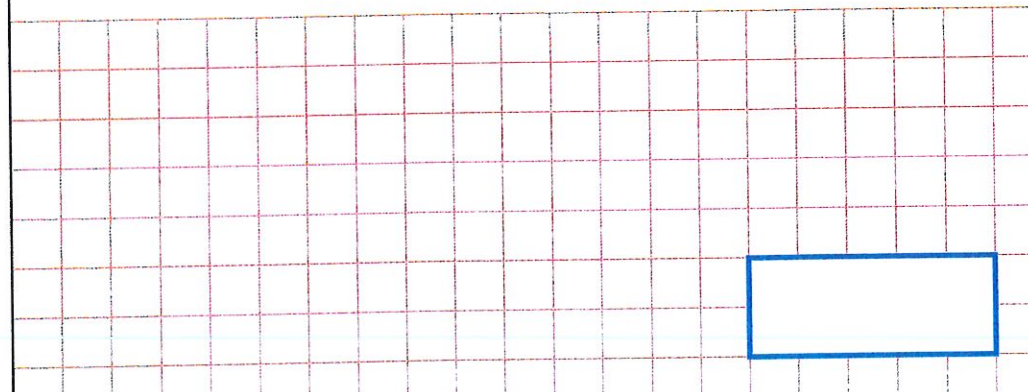
3

$$7 \times 4 =$$

☐  
1 mark

|   |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                             |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | $7,238 \div 100 =$<br> <div data-bbox="970 712 1220 817" style="border: 1px solid blue; width: 157px; height: 47px; position: absolute; bottom: 10px; right: 10px;"></div> | <div data-bbox="1295 705 1372 772" style="border: 1px solid black; width: 48px; height: 30px; position: absolute; bottom: 10px; right: 10px;"></div> <div data-bbox="1292 777 1380 808" style="position: absolute; bottom: 10px; right: 10px;">1 mark</div> |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|   |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                 |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | $\frac{2}{10} \div 4 =$<br> <div data-bbox="975 1294 1228 1400" style="border: 1px solid blue; width: 159px; height: 47px; position: absolute; bottom: 10px; right: 10px;"></div> | <div data-bbox="1303 1288 1380 1355" style="border: 1px solid black; width: 48px; height: 30px; position: absolute; bottom: 10px; right: 10px;"></div> <div data-bbox="1300 1359 1388 1391" style="position: absolute; bottom: 10px; right: 10px;">1 mark</div> |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|   |                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                 |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6 | $6.12 \times 4 =$<br> <div data-bbox="983 1877 1236 1982" style="border: 1px solid blue; width: 159px; height: 47px; position: absolute; bottom: 10px; right: 10px;"></div> | <div data-bbox="1311 1870 1388 1937" style="border: 1px solid black; width: 48px; height: 30px; position: absolute; bottom: 10px; right: 10px;"></div> <div data-bbox="1307 1942 1394 1973" style="position: absolute; bottom: 10px; right: 10px;">1 mark</div> |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Challenge yourself!

7

|   |  |   |   |   |   |   |   |
|---|--|---|---|---|---|---|---|
|   |  | 5 | 4 | . | 2 | 9 | 4 |
| - |  | 1 | 1 | . | 5 | 8 |   |

1

1 mark

## Answer Sheet

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1.  $4,000 + \mathbf{2,500} = 6,500$  (M)
2.  $901,002 - 463,552 = \mathbf{437,450}$  (W)
3.  $7 \times 4 = \mathbf{28}$  (M)
4.  $7,238 \div 100 = \mathbf{72.38}$  (M)
5.  $\frac{2}{10} \div 4 = \frac{\mathbf{2}}{\mathbf{40}}$  or  $\frac{\mathbf{1}}{\mathbf{20}}$  (M)
6.  $6.12 \times 4 = \mathbf{24.48}$  (W)
7.  $54.294 - 11.58 = \mathbf{42.714}$  (W)

Fluent in Five - Year 6  
Week 18 - Day 4

Name.....  
Date..... School.....  
Class..... Score.....

1

$$12 \times 3 =$$



1 mark

2

$$582.12 + 14.66 =$$



1 mark

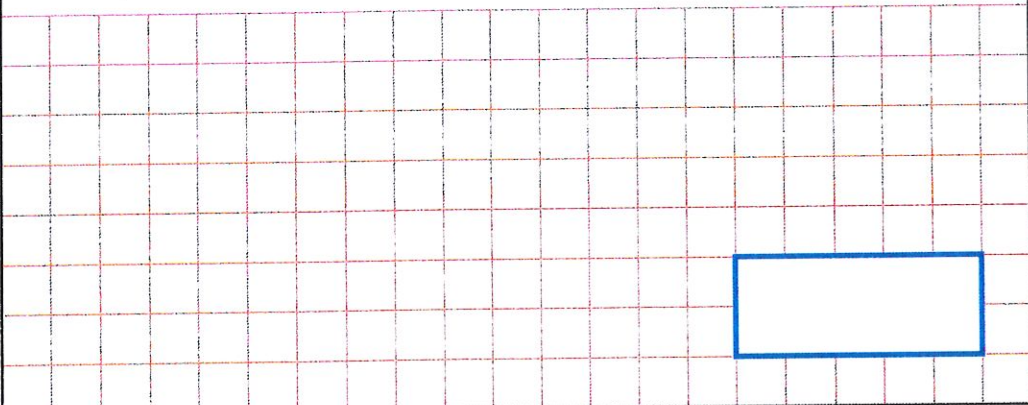
3

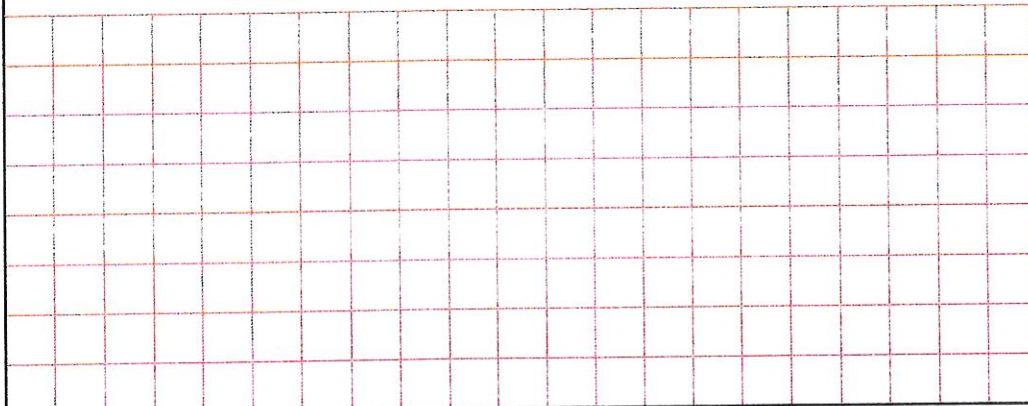
$$2.02 \times 9 =$$

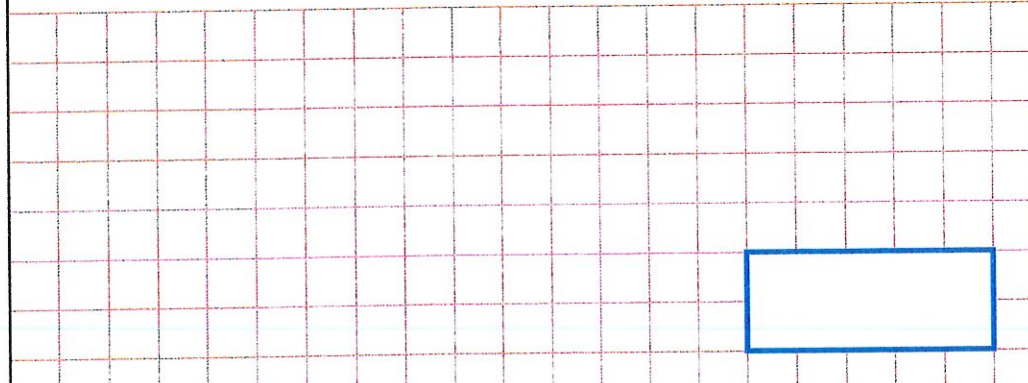


1 mark

Fluent in Five - Year 6  
Week 18 - Day 4

|   |                                                                                    |                                                                                            |                                                                                                          |
|---|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 4 | $\frac{3}{5} \div 2 =$                                                             | <div style="border: 1px solid blue; width: 150px; height: 40px; margin: 10px auto;"></div> | <div style="border: 1px solid black; width: 40px; height: 30px; display: inline-block;"></div><br>1 mark |
|   |  |                                                                                            |                                                                                                          |

|   |                                                                                                                        |                                                                                      |                                                                                                          |
|---|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 5 | $477,898 +$ <div style="border: 1px solid blue; width: 150px; height: 40px; display: inline-block;"></div> $= 955,796$ |  | <div style="border: 1px solid black; width: 40px; height: 30px; display: inline-block;"></div><br>1 mark |
|   |                                                                                                                        |                                                                                      |                                                                                                          |

|   |                                                                                      |                                                                                            |                                                                                                          |
|---|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 6 | $32 - 18 =$                                                                          | <div style="border: 1px solid blue; width: 150px; height: 40px; margin: 10px auto;"></div> | <div style="border: 1px solid black; width: 40px; height: 30px; display: inline-block;"></div><br>1 mark |
|   |  |                                                                                            |                                                                                                          |

## Challenge yourself!

7

$$\boxed{\phantom{000}} - 430 = 260$$

## Answer Sheet

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1.  $12 \times 3 = \mathbf{36}$  (M)
2.  $582.12 + 14.66 = \mathbf{596.78}$  (W)
3.  $2.02 \times 9 = \mathbf{18.18}$  (W)
4.  $\frac{3}{5} \div 2 = \frac{\mathbf{3}}{\mathbf{10}}$  (M)
5.  $477,898 + \mathbf{477,898} = 955,796$  (W)
6.  $32 - 18 = \mathbf{14}$  (M)
7.  $\mathbf{690} - 430 = 260$  (M)

Fluent in Five - Year 6  
Week 18 - Day 5

Name.....  
Date..... School.....  
Class..... Score.....

1

$$\begin{array}{r} 581000 \\ - 193412 \\ \hline \end{array}$$

☐  
1 mark

2

$$(40 + 8) \div 4 =$$

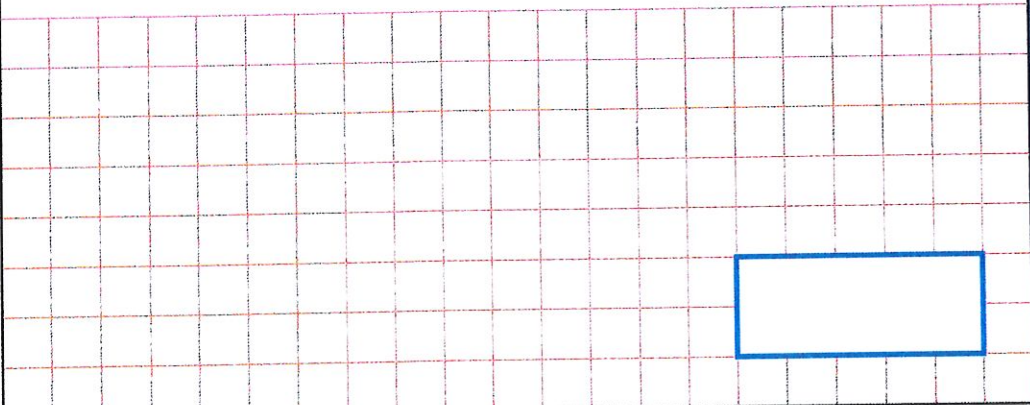
☐  
1 mark

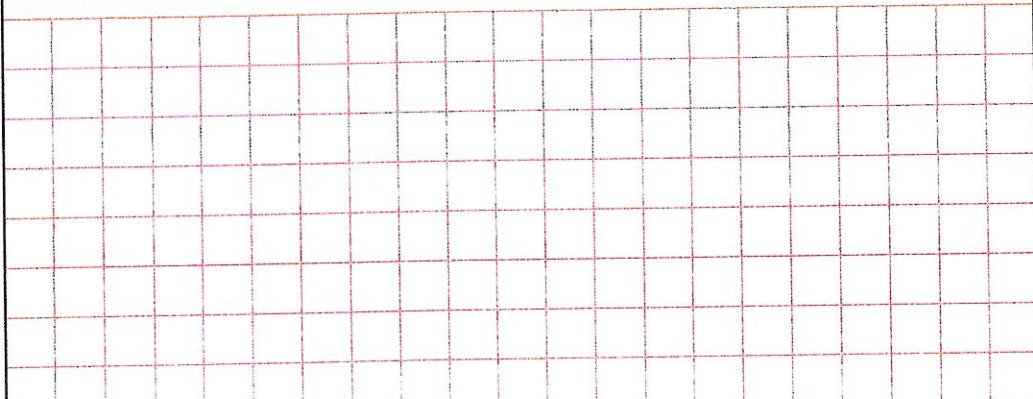
3

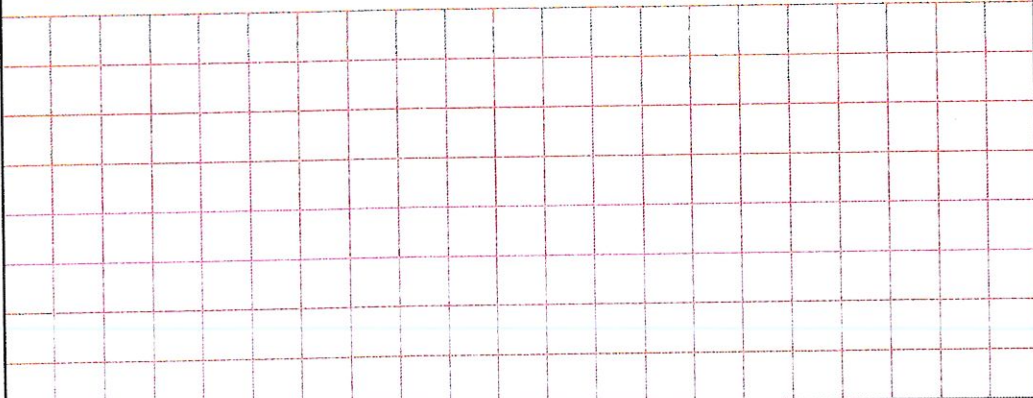
$$14,000 + 59,000 =$$

☐  
1 mark

Fluent in Five - Year 6  
Week 18 - Day 5

|   |                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                             |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | $5.85 \times 9 =$<br> <div data-bbox="973 716 1228 828" style="border: 1px solid blue; width: 160px; height: 50px; position: absolute; right: 100px; bottom: 100px;"></div> | <div data-bbox="1300 705 1380 795" style="border: 1px solid black; width: 50px; height: 40px; position: absolute; bottom: 10px; right: 10px;"></div> <div data-bbox="1300 784 1380 817" style="position: absolute; bottom: 10px; right: 10px;">1 mark</div> |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|   |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                 |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | <div data-bbox="287 940 542 1041" style="border: 1px solid blue; width: 160px; height: 45px; position: absolute; left: 10px; top: 10px;"></div> $= 7 \times 9$<br> | <div data-bbox="1308 1288 1388 1377" style="border: 1px solid black; width: 50px; height: 40px; position: absolute; bottom: 10px; right: 10px;"></div> <div data-bbox="1308 1366 1388 1400" style="position: absolute; bottom: 10px; right: 10px;">1 mark</div> |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|   |                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                 |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6 | <div data-bbox="295 1523 550 1624" style="border: 1px solid blue; width: 160px; height: 45px; position: absolute; left: 10px; top: 10px;"></div> $+ 1.505 = 8.504$<br> | <div data-bbox="1316 1870 1396 1960" style="border: 1px solid black; width: 50px; height: 40px; position: absolute; bottom: 10px; right: 10px;"></div> <div data-bbox="1316 1948 1396 1982" style="position: absolute; bottom: 10px; right: 10px;">1 mark</div> |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Challenge yourself!

7

$$\frac{6}{10} \div 2 =$$



1 mark

## Answer Sheet

Remember, (M) is written next to those questions you should have tried to solve mentally first. (W) means a written method is usually more efficient for this question.

1.  $581,000 - 193,412 = \mathbf{387,588}$  (W)

2.  $(40 + 8) \div 4 = \mathbf{12}$  (M)

3.  $14,000 + 59,000 = \mathbf{73,000}$  (M)

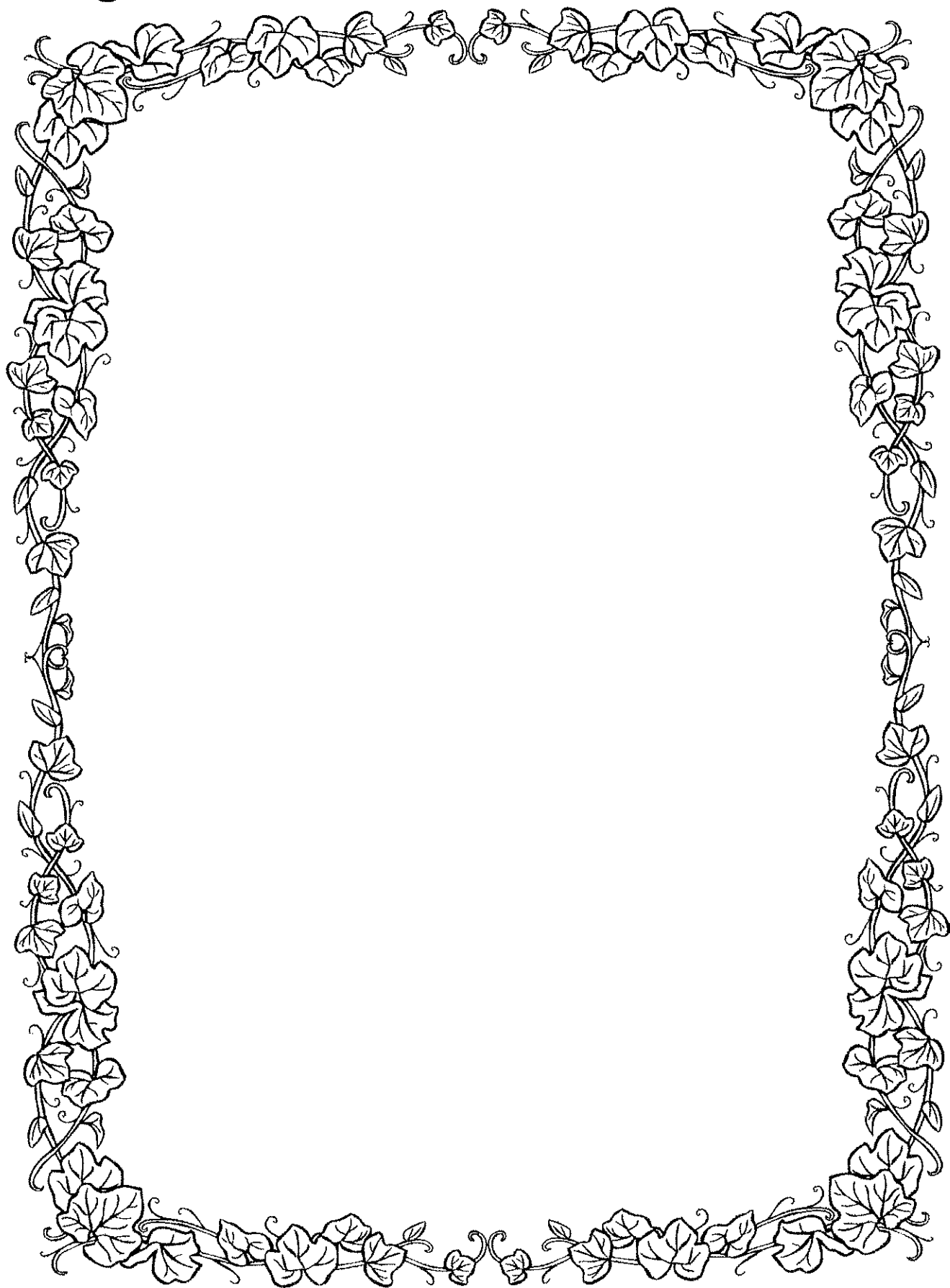
4.  $5.85 \times 9 = \mathbf{52.65}$  (W)

5.  $\mathbf{63} = 7 \times 9$  (M)

6.  $\mathbf{6.999} + 1.505 = 8.504$  (W)

7.  $\frac{6}{10} \div 2 = \frac{\mathbf{6}}{\mathbf{20}}$  (M)

# Design Your Own Illuminated Letter





# Illuminated Letters

- In Medieval times, all books were hand written and decorated by hand, usually by priests and monks. They were seen as very precious works of art, and you had to be very skilled to produce them.
- These manuscripts were called 'illuminated' because the letters and pictures were often decorated with gold and silver leaf. The word 'illuminated' comes from the Latin word illuminare, meaning "light up."
- An illuminated letter was usually the first letter of a page or paragraph. It was enlarged and in colour, with gold or silver added in areas, while the rest of the text was in black. Images of people, animals, plants or mythological creatures were sometimes added to enhance the letter.
- The Anglo-Saxons borrowed from the art styles of several different countries (Irish, Italian and Germanic) to create their own distinctive style of illuminated letters.
- Because not many people could read at this time, illuminated letters were a way of communicating a story or message without using words.

# Illuminated Letters

Here are some examples of medieval illuminated letters.  
Can you see what the letter is? Can you guess what the text was about from clues in the illuminated letter?



Photo courtesy of <http://www.britishlibrary.org> - granted under Creative Commons license - CC BY-NC-SA



Photo courtesy of <http://www.britishlibrary.org> - granted under Creative Commons license - CC BY-NC-SA



Photo courtesy of <http://www.britishlibrary.org> - granted under Creative Commons license - CC BY-NC-SA

## Warm up for functions

1. Work out:

a)  $2 \times 4 =$

b)  $12 \div 4 =$

c)  $-1 + 9 =$

d)  $-6 \div 3 =$

e)  $-3 - 5 =$

f)  $-2 \times 3 =$

2. Write the missing operation and number:

a)  $5 \quad +3 \quad = 8$

d)  $9 \quad \quad = 3$

b)  $6 \quad \quad = 10$

e)  $5 \quad \quad = 15$

c)  $11 \quad \quad = 6$



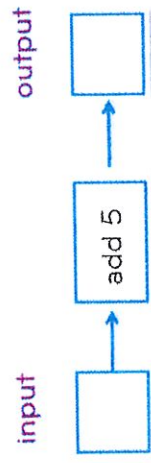
## Introducing functions

**In this session we are going to learn:**

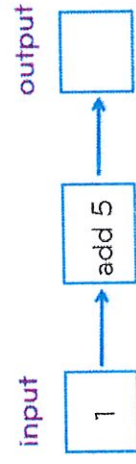
-  To read a function machine
-  To find the input and output from a function machine
-  To find the function in a function machine

## Using a function machine

Here is a function machine:

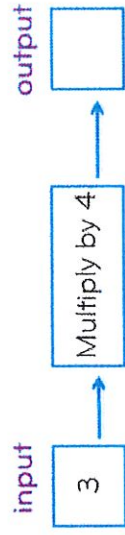
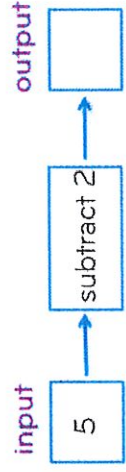


The input is 1. Work out the output.



## Using a function machine

A **function** is a rule. Functions can use add, subtract, multiply and divide.  
Work out the outputs.



## Using function machines

You can write functions using:

words

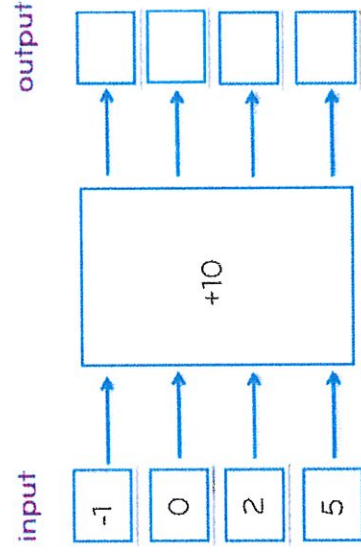
or

symbols



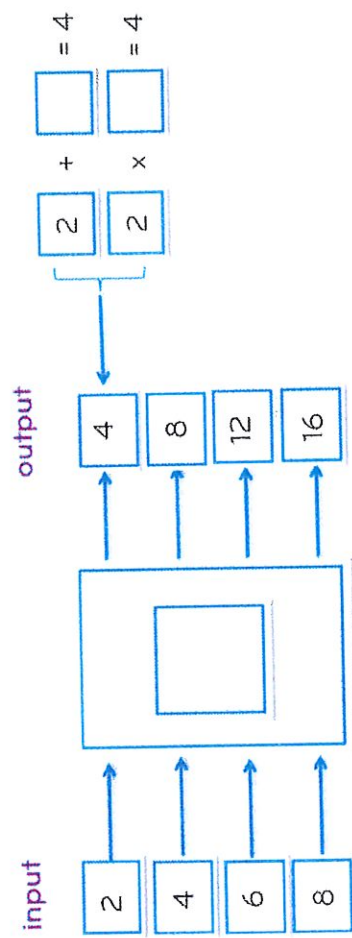
## More than one input

You can input more than one number into a function machine.



## Finding a missing function

You can work out the function from the inputs and outputs.



## Practice time

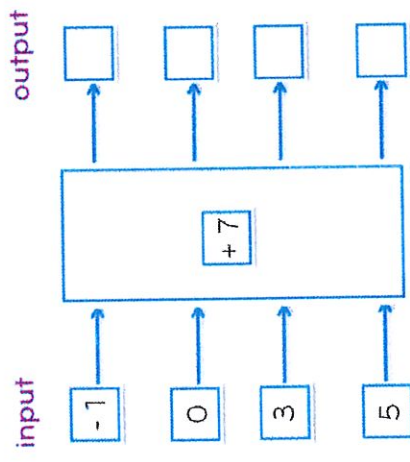
1. Work out the outputs.



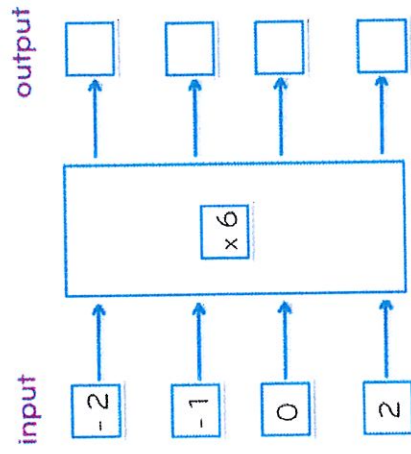
## Practice time

2. Work out the outputs.

a)



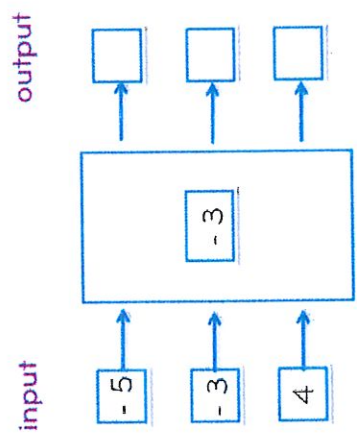
b)



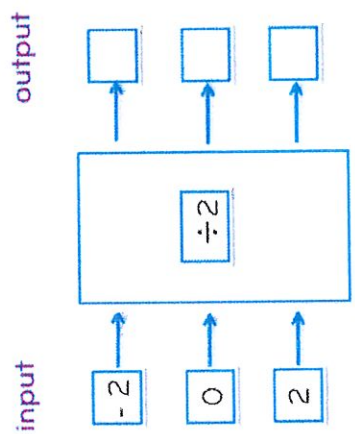
## Practice time

3. Work out the outputs.

a)

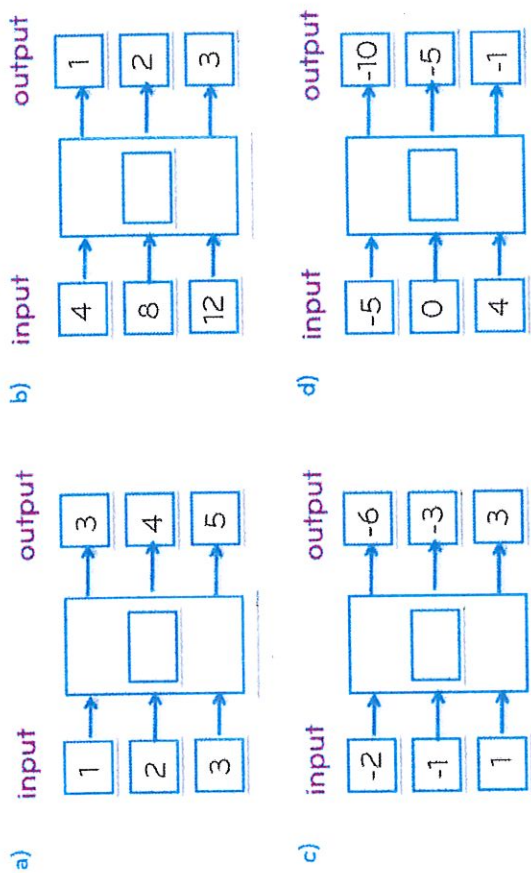


b)



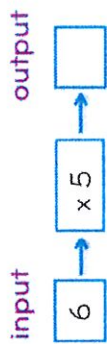
## Practice time

4. Find the missing numbers:



## Practice time

5. Bella gets £5 pocket money each week. She uses this function machine to work out how much pocket money she gets in 6 weeks.



Complete this function machine to work out how much pocket money she gets in

- a) 12 weeks

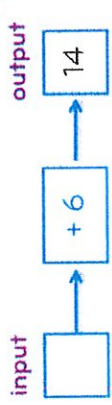
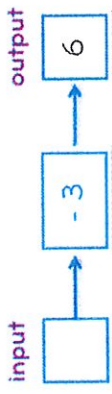


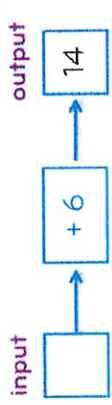
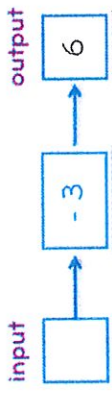
- b) 1 year

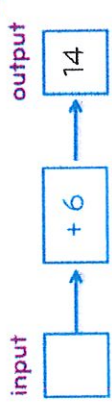
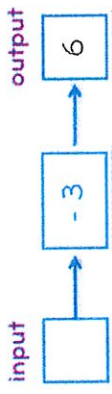


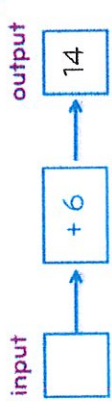
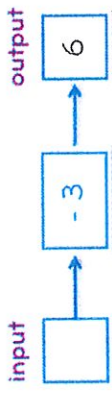
## Warm up for letters in missing number problems

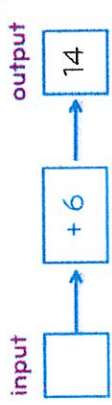
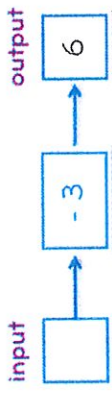
1. Write the missing inputs to these function machines:

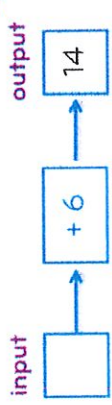
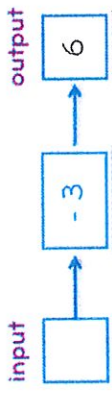
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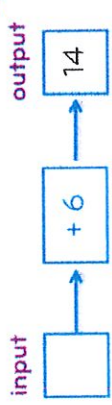
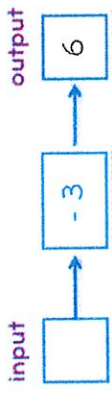
b)  

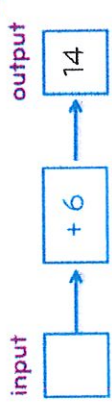
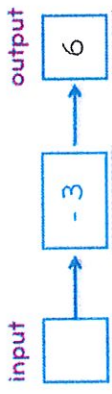
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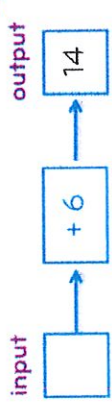
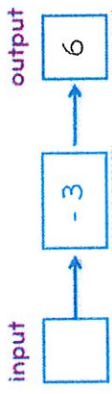
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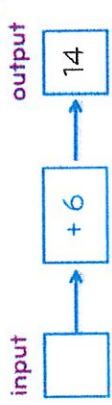
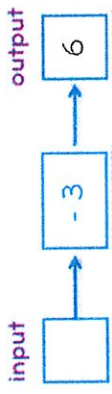
e)  

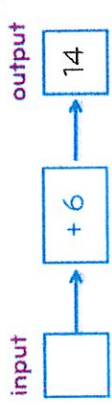
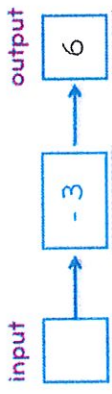
f)  

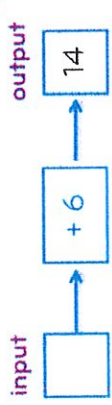
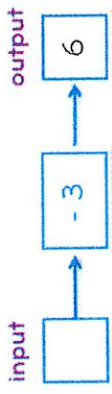
g)  

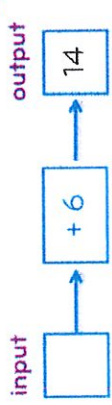
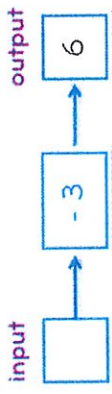
h)  

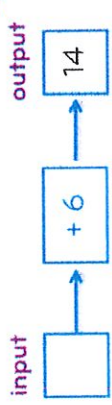
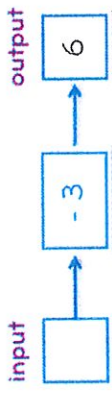
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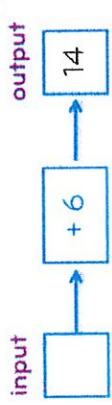
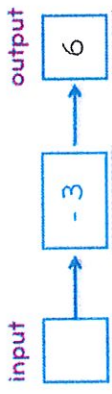
j)  

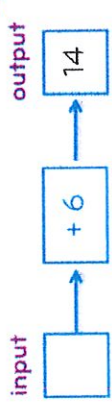
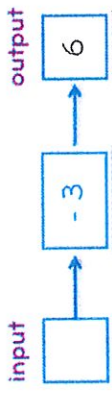
k)  

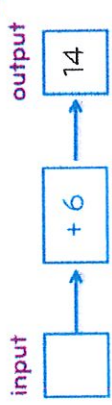
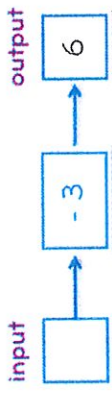
l)  

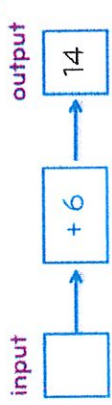
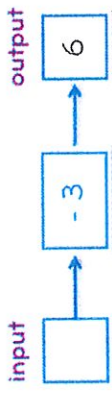
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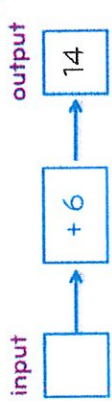
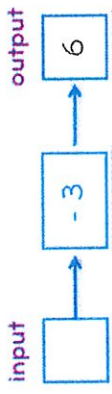
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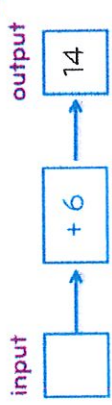
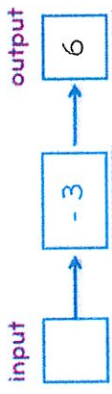
o)  

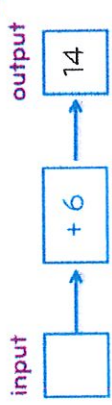
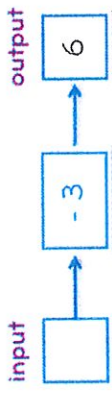
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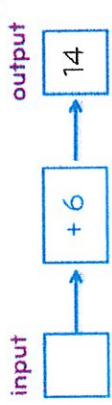
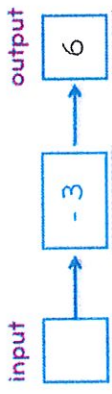
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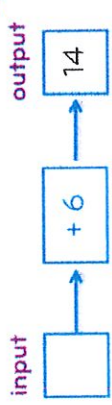
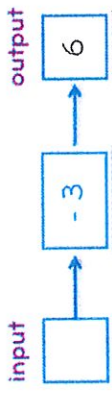
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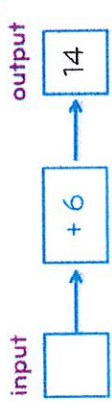
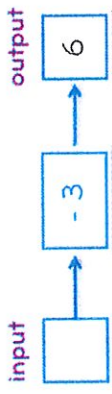
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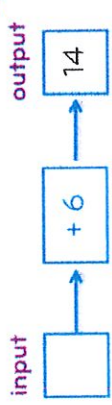
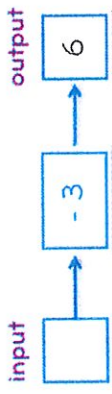
t)  

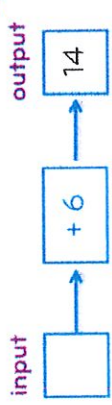
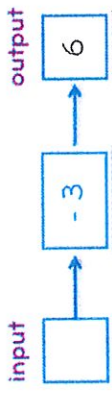
u)  

v)  

w)  

x)  

y)  

z)  

2. Write four pairs of numbers that add to make 10.



## Letters in missing number problems

In this session we are going to learn:

-  To write a missing number problem using a letter to stand for the missing number
-  To find missing numbers represented by letters



## Using letters to represent missing numbers

Here the letters **a** and **b** stand for missing numbers.  
Find possible values of **a** and **b**.

$$a + b = 6$$

$$0 + \boxed{\phantom{00}} = 6 \quad a = 0, \quad b = \boxed{\phantom{00}}$$

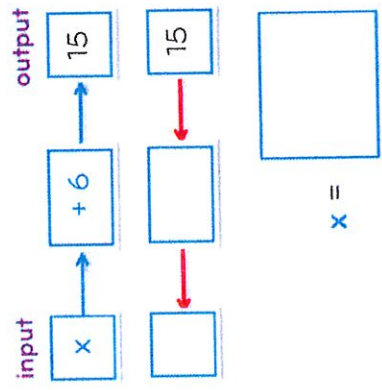
$$\boxed{\phantom{00}} + \boxed{\phantom{00}} = 6 \quad a = \boxed{\phantom{00}}, \quad b = \boxed{\phantom{00}}$$

$$\boxed{\phantom{00}} + \boxed{\phantom{00}} = 6 \quad a = \boxed{\phantom{00}}, \quad b = \boxed{\phantom{00}}$$

## Finding a missing number represented by a letter

Here  $x$  represents a missing number.

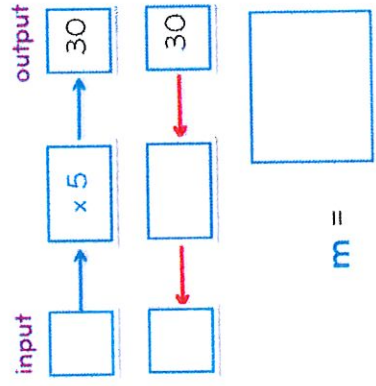
$$x + 6 = 15$$



## Finding a missing number represented by a letter

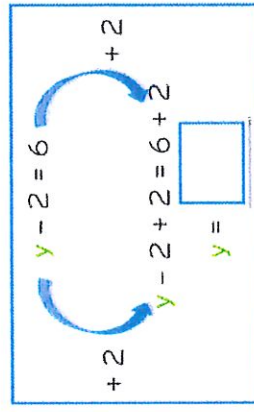
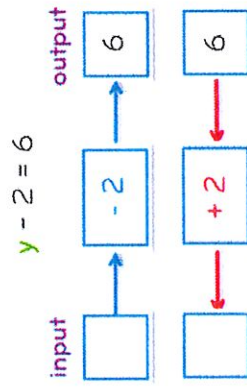
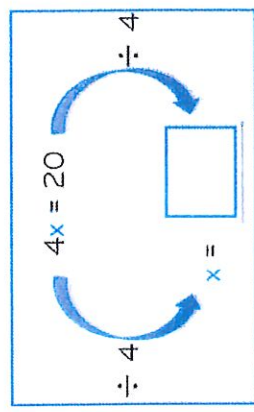
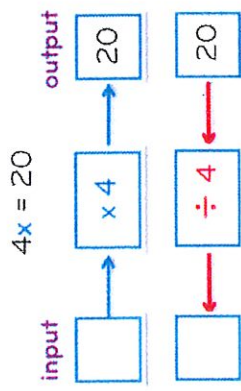
You can use any letter to represent a missing number.

$$5m = 30$$



## Solving equations

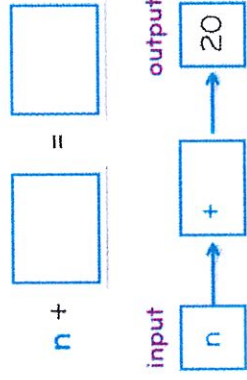
Solve the equations using function machines and inverse operations.



## Solving equations

Write an equation to solve a missing number problem.

I think of a number, add 4 and the answer is 20. What is my number?  
Use  $n$  for the number I think of.



## Practice time

1. Find three pairs of values for  $x$  and  $y$  that satisfy this equation.

$$x - y = 7$$

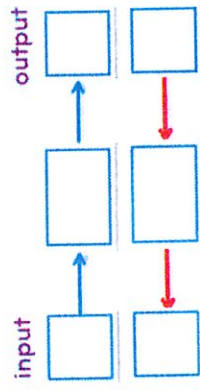
|                      |   |                      |   |   |                      |   |                      |     |                      |
|----------------------|---|----------------------|---|---|----------------------|---|----------------------|-----|----------------------|
| <input type="text"/> | - | <input type="text"/> | = | 7 | <input type="text"/> | = | <input type="text"/> | $y$ | <input type="text"/> |
| <input type="text"/> | - | <input type="text"/> | = | 7 | <input type="text"/> | = | <input type="text"/> | $y$ | <input type="text"/> |
| <input type="text"/> | - | <input type="text"/> | = | 7 | <input type="text"/> | = | <input type="text"/> | $y$ | <input type="text"/> |

## Practice time

2. Write  $a + 10 = 17$  in a function machine.

Find the value of  $a$ .

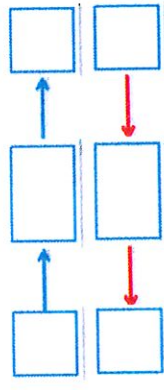
$a =$



3. Write  $b - 8 = 5$  as a function machine.

Find the value of  $b$ .

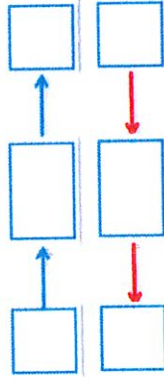
$b =$



4. Write  $3c = 24$  as a function machine.

Find the value of  $c$ .

$c =$



## Practice time

5. Solve these equations.

a)  $x + 9 = 14$

b)  $6y = 24$

c)  $z - 5 = -3$

6. For these 'think of a number' problems, write an equation and solve it to find the missing number:

a) I think of a number, add 5 and the answer is 4. What is my number?

b) I think of a number, multiply by 3 and the answer is 18. What is my number?

## Practice time

7. Make an 'I think of a number' problem for each equation.

a)  $3n = 15$

I think of a number,

and the answer is

What is my number?

b)  $m - 5 = 11$

I think of a number,

and the answer is

What is my number?

c)  $s + 3 = 5$

I think of a number,

and the answer is

What is my number?

## Warm up for linear sequences

Write the missing numbers.

1.  $\boxed{\phantom{00}} + 59 = 110$

2.  $86 - \boxed{\phantom{00}} = 72$

3.  $\boxed{\phantom{00}} \div 3 = 14$

4.  $6 \times \boxed{\phantom{00}} = 78$



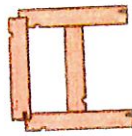
## Linear sequences

**In this session we are going to learn:**

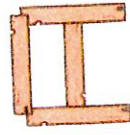
-  To continue linear sequences
-  To describe the term-to-term rule for linear sequences
-  To find missing terms in linear sequences

## Continue linear sequences

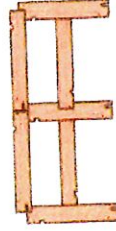
A fence is built in sections like this:



Four 1m pieces of wood are needed for one section of fence.



1 section



2 sections

|  |
|--|
|  |
|  |
|  |
|  |

How many pieces of wood are needed for:

2 sections of fence

3 sections of fence

4 sections of fence

5 sections of fence



3 sections

## Continue linear sequences

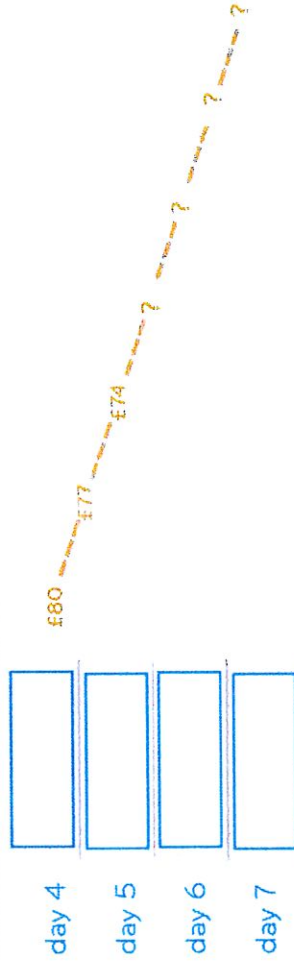
On the first day of the month Arthur has £80 in his bank account.

Every day the same amount of money is taken from his bank account to pay for his gas and electricity.

On **day 2** there is £77 in his bank account.

On **day 3** there is £74 in his bank account.

How much money is there in his bank account on:



## Continue linear sequences

Continue these linear sequences:

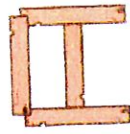
1. 17    23    29    35

2. 238    299    360    421

3. 194    182    170    158

4. 6    1    -4    -9

## Describe the term-to-to-term rule for linear sequences



Four 1m pieces of wood are needed for one section of fence.

How many pieces of wood are needed for:

2 sections of fence

7

3 sections of fence

10

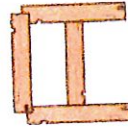
4 sections of fence

13

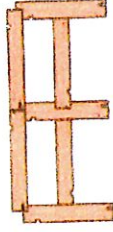
5 sections of fence

16

1 section



2 sections



3 sections



Look at this question again. What is the pattern in the results?

Why is that pattern happening?

## Describe the term-to-term rule for linear sequences

On the first day of the month Arthur has £80 in his bank account.

Every day the same amount of money is taken from his bank account to pay for his gas and electricity.

On **day 2** there is £77 in his bank account.

On **day 3** there is £74 in his bank account.

How much money is there in his bank account on:



Look at this question again. What is the pattern in the results?

Why is that pattern happening?

## Describe the term-to-term rule for linear sequences

What is the term-to-term rule for each of these sequences?

1. 17   23   29   35

2. 238   299   360   421

3. 194   182   170   158

4. 6   1   -4   -9

## Find missing terms in linear number sequences

Write the term-to-term rule for each sequence and find the missing number.

Term-to-term rule

- |                      |    |                      |                      |                      |                      |     |
|----------------------|----|----------------------|----------------------|----------------------|----------------------|-----|
| <input type="text"/> | 1. | 45                   | 52                   | 59                   | <input type="text"/> | 73  |
| <input type="text"/> | 2. | -50                  | -40                  | <input type="text"/> | -20                  | -10 |
| <input type="text"/> | 3. | 1000                 | <input type="text"/> | 740                  | 610                  | 480 |
| <input type="text"/> | 4. | <input type="text"/> | 12                   | -1                   | -14                  | -27 |

## Practice time

Continue the linear sequences:

1. 56 67 78 89

|  |  |
|--|--|
|  |  |
|--|--|

2. 1000 945 890 835

|  |  |
|--|--|
|  |  |
|--|--|

Write the term-to-term rule for each sequence and find the missing number.

Term-to-term rule

|  |
|--|
|  |
|--|

3.

45 52 59

|  |
|--|
|  |
|--|

73

|  |
|--|
|  |
|--|

4.

-50 -40

|  |
|--|
|  |
|--|

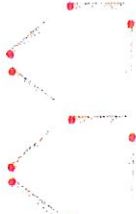
-20

-10

You are learning to solve problems with linear sequences

## Practice time

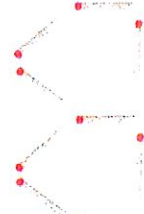
5. Kayleigh is building a terrace of houses with matchsticks.



Here is Kayleigh's street when it has one house.



Here is Kayleigh's street when it has two houses.



How many matchsticks are needed for:

a) 1 house

b) 2 houses

c) 3 houses

d) 4 houses

e) What is the term-to-term rule?

6. Find the missing terms in this linear sequence:

8

22

36

### Warm up for collecting terms

1.  $8 + 4 + 2 - 11 =$

2. Rewrite  $4 \times h =$

3. Find the area and perimeter of this rectangle.

15 cm

2 cm

If  $a = 8$ ,  $b = 4$  and  $c = 3$  calculate:

4.  $bc =$

6.  $a^2 =$

5.  $a - b =$

7.  $\frac{a}{b} =$

You are learning about simplifying by collecting like terms



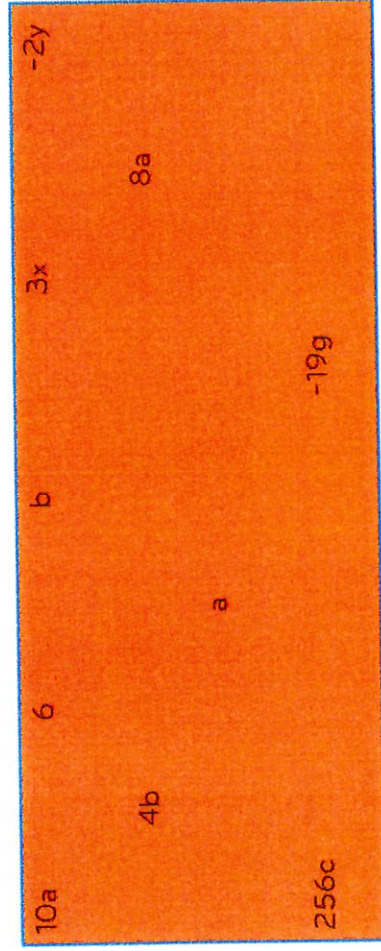
## Simplifying by collecting like terms

In this session we are going to learn to:

-  Recognise like terms
-  Simplify simple expressions by collecting like terms

## Terms

1.



2.



You are learning about simplifying by collecting like terms

## Subtracting like terms

1.  $8 - 3 =$

2.  $8g - 3g =$

3.  $10b - 9b =$

4.  $15t + 5t - 2t =$

5.  $12a + 15a - 3a - 5a + 10a =$

## Collecting like terms and simplifying

1.  $8g + 4b =$

4.  $6c + 10d + 4c + 11d =$

2.  $4b + 5b + 11c + 2c$

$b$  +   $c$

=

3.  $5a + 11d + 3a + 4d$

+



=

You are learning about simplifying by collecting like terms

## Collecting like terms and simplifying

1.  $8t - 4b =$

4.  $6c - 2d - 4c + 11d =$

2.  $7b - 5b + 11c - 2c$

$b$  +   $c$

=

3.  $5a + 11d - 3a - 4d$

+

=

You are learning about simplifying by collecting like terms

## Practice time

1. True or false. Are these like terms?

a)  $4g$  and  $6g$

b)  $10a$  and  $-4a$

c)  $7t$  and  $7s$

d)  $8a$ ,  $7a$  and  $11t$

e)  $3b$  and  $3b^2$

## Practice time

2. Simplify:

a)  $a + a + a + 3a =$

d)  $7g + 10g - 3g + 4g - 8g =$

b)  $18c + 11c + 14c =$

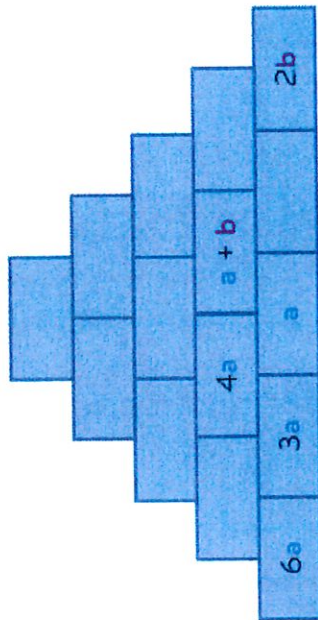
e)  $4x + 2y + 10x + 3y =$

c)  $14b - 4b =$

f)  $6j + 10k - 3j - 4k =$

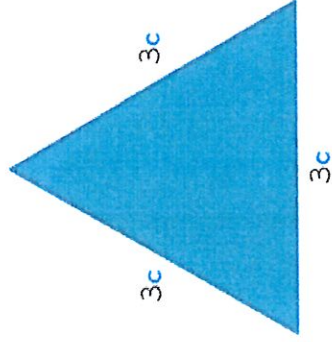
## Practice time

- Complete the addition pyramid.



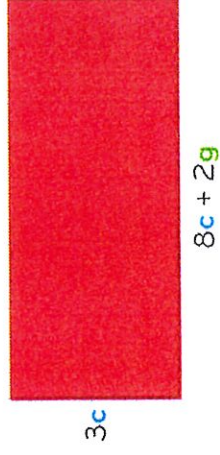
## Practice time

4.



Perimeter =

5.



Perimeter =

## Warm up to substituting into simple expressions

- 1 What is the formula for finding the area of a rectangle?
- 2 What is the formula for finding the perimeter of a rectangle?
- 3 Given that the length of a rectangle is 16cm and the width is 2cm, what is the area and perimeter of the rectangle?
- 4 Given that  $C = \frac{5}{9}(F - 32)$ , what is the value of  $C$  when  $F = 41$ ?
- 5 Use inverse operations to find the value of  $F$  when  $C$  is 30.



You are learning about substituting into simple expressions



## Substituting into simple expressions

In this session we are going to learn:

-  To understand the meaning of different types of expressions
-  To substitute positive and negative integers into expressions

## Rules

$$2a = 2 \times a$$

$$ab = a \times b$$

$$cd = c \times d$$

$$\frac{a}{b} = a \div b$$

$$ab^2 = a \times b^2 = a \times b \times b$$

$$(ab)^2 = (a \times b)^2 = (a \times b) \times (a \times b)$$

You are learning about substituting into simple expressions

## Rules

Write equivalent expressions for:

1.  $\frac{p}{r}$  =

2.  $4 \times g$  =

3.  $bca$  =

## Applying rules

When  $a = 5$ ,  $k = 6$ ,  $t = 1$  and  $d = 3$  find:

1.  $a + k =$

+=

2.  $k + d + t =$

4.  $= \frac{k}{d}$

=

5.  $adt =$

3.  $ad =$

=

6.  $\frac{a + k + t}{d} =$

You are learning about substituting into simple expressions

## Code

|    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|
| a  | b  | c  | d  | e  | f  | g  | h  | i  | j  | k  | l  | m  |
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| n  | o  | p  | q  | r  | s  | t  | u  | v  | w  | x  | y  | z  |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |

Use the value of the letters above.

|        |            |         |          |                  |          |
|--------|------------|---------|----------|------------------|----------|
|        | 1) $t - a$ | 2) $cg$ | 3) $d^2$ | 4) $\frac{y}{e}$ | 5) $acf$ |
| Answer |            |         |          |                  |          |
| Letter |            |         |          |                  |          |

## Practice time

If  $b = 3$ ,  $c = 6$  and  $a = 12$ , find the value of these expressions.

1.  $\frac{a}{c}$  =

4.  $b - \frac{a}{c}$  =

2.  $4 + a$  =

5.  $b^2$  =

3.  $a - 4b$  =

6.  $ab$  =

## Practice time

7. Crack the code.

|    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|
| a  | b  | c  | d  | e  | f  | g  | h  | i  | j  | k  | l  | m  |
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| n  | o  | p  | q  | r  | s  | t  | u  | v  | w  | x  | y  | z  |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |

|          |    |         |          |           |               |       |                |          |
|----------|----|---------|----------|-----------|---------------|-------|----------------|----------|
| $2c + b$ | ce | $z - c$ | $cb - e$ | $d^2 + b$ | $\frac{y}{e}$ | $e^2$ | $\frac{ef}{b}$ | $2l - c$ |
|----------|----|---------|----------|-----------|---------------|-------|----------------|----------|

Answer

Letter

You are learning about substituting into simple expressions

## Warm up for simple formulae

1. What is the area of this rectangle?



Area =

2.  $(2 + 4) \times 8 =$

3.  $6 \times 3 + 5 =$

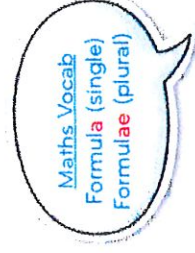
4.  $1.6 \times 10 =$

5.  $\frac{6}{7}$  of 42 =

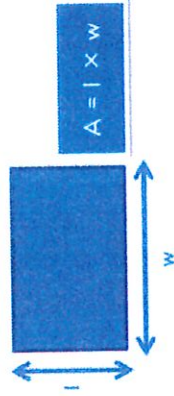
## Using Simple Formulae

**In this session we are going to learn:**

-  What a formula is
-  To use simple formulae
-  To substitute in positive integers to find missing numbers in simple formulae



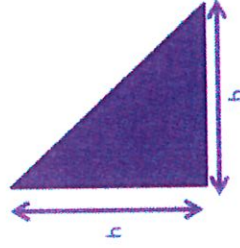
## Formula



$$C = \frac{5}{9} (F - 32)$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$E = mc^2$$

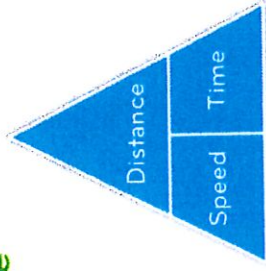


$$\text{Area} = \frac{b \times h}{2}$$

You are learning to use simple formulae

## Using Formulae

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$



1. Distance =

2. Time =

What is the distance travelled with a speed of **60mph** over **3** hours?

3. Distance =

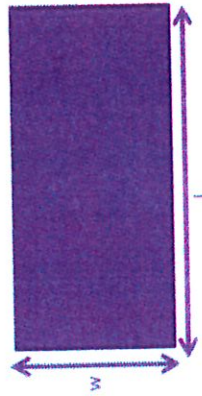
 x 

Distance =

miles

You are learning to use simple formulae

## Substituting into formulae



$$A = l \times w$$

$$P = 2l + 2w$$

Don't forget...

A = Area

l = Length

w = Width

P = Perimeter

When  $l = 5\text{cm}$  and  $w = 2\text{cm}$ , find A and P

1.  $A =$    $\times$

5.  $P =$    $\text{cm}$

2.  $A =$    $\text{cm}^2$

6. When  $l = 4\text{cm}$  and  $w = 3\text{cm}$  find A and P:

3.  $P = 2 \times$

$+ 2 \times$

Area =

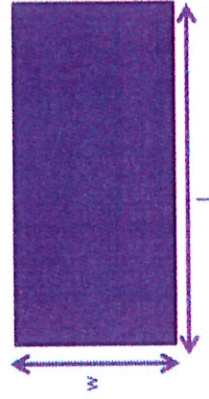
4.  $P =$

$+$

Perimeter =

You are learning to use simple formulae

## Practice Time



$$A = l \times w$$

$$P = 2l + 2w$$

Don't forget...  
A = Area  
l = Length  
w = Width  
P = Perimeter

1. A rectangle has a width of 7m and length of 10m.

Find its area and perimeter.

A =

P =

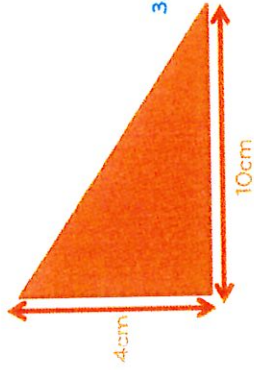
2. A rectangle has width of 200cm and a length of 3m.

Find its area and perimeter.

A =

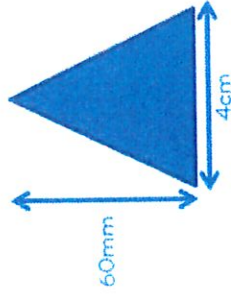
P =

## Practice time

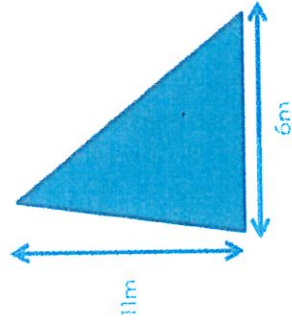


3. Area =

$$\text{Area} = \frac{b \times h}{2}$$



5. Area =



4. Area =

You are learning to use simple formulae

## Practice time

6. A train is travelling at 100mph for 3 hours. How far did it travel?

miles



7. Fred walked 6 miles in 2 hours.  
How fast was he walking?

mph