HILL WEST Primary

FOUR OAKS

Home Learning Pack

Year 6

Week Beginning 11.1.21

Home Learning Links

Oak National Academy
Oak National Academy is an online classroom and resource hub. It provides high-quality video lessons and resources to support teachers, parents and pupils.
www.thenational.academy

BBC Bitesize
With BBC Bitesize it is easy to keep learning at home. You can access regular daily lessons in English, maths and other core subjects.
https://www.bbc.co.uk/bitesize

World Book Online
World Book online have just made their fabulous collection of over 3,000 e-books and audiobooks available for free for children to access at home. They have books suitable for all ages. Click on the following link to access them.
https://worldbook.kitaboo.com/reader/worldbook/index.html?usertoken=Mjk5MzQ6MTpJUjA5MjAxNjoyOmNsaWVudDE2OTc6MTY5NzoyMjE2Mjg4OjE6MTU4NDM4MDExMzA2Mjp1cw%3D%3D

Read Works.org
Read Works offers access to 3000+ comprehension for all age groups. Just sign up for a free account to access fantastic texts.
https://www.readworks.org/

Tutortastic
An online platform with tutorials and videos for home learning.
https://www.tutortastic.co.uk/blog/homelearning

Education Quizzes
A series of short quizzes for children to complete related to the National Curriculum subjects. Just select KS1 for Reception, Year 1 & Year 2 and select KS2 for Years 3-6.
https://www.educationquizzes.com/ks2/

Top Marks
A range of activities here but especially good interactive activities for maths.
https://www.topmarks.co.uk/

Classroom Secrets
Classroom Secrets Kids is offering free access to everyone until the end of April 2020. The platform is aimed at primary aged children and covers subjects such as maths, reading, grammar and spelling. The platform is really child-friendly so that they're able to access it on their own. There are a load of games and interactive activities from phonics to SATs
https://kids.classroomsecrets.co.uk/

National Geographic
National Geographic is a great platform for learning and it's totally free. There are online games, resources and competitions, too.
https://www.natgeokids.com/uk/teacher-category/primary-resources/

Reading Eggspress
https://readingeggs.co.uk/

Top Marks – Division
We have been learning about division this week, mostly looking in-depth at partitioning and we will transition into using the short method for division. Here are some great maths games to play on Laptops or iPads.
https://www.topmarks.co.uk/Search.aspx?q=division

Times Tables Rockstars
This is a great times tables game, practice all of the tables up to 12 x 12. Your child's username and password can be found in their Homework Book.
https://ttrockstars.com/

Monster SATs
On-screen and paper-based resources, including curriculum-based games for primary schools.
https://www.monstersats.co.uk/group-login-page/

SPaG.com
SPaG.com provides KS1 and KS2 practice punctuation & grammar tests. Plus 80 additional tests covering grammar objectives for every year group
https://www.spag.com/

White Rose Maths Hub
Daily 'home learning' lessons for Years 1-9. Every lesson comes with a short video showing you clearly and simply how to help your child complete the activity successfully.
https://whiterosemaths.com/homelearning/

Khan Academy
A great website for learning, with all activities and videos for every topic. A favourite of Mr Ellison.
https://www.khanacademy.org

Codeclub
Fancy something a bit different. Try out the Code Club website for free tutorials and guides no creating code in a range of platforms.
https://projects.raspberrypi.org/en/codeclub

Duolingo
Fancy something a bit different. Try out the Code Club website for free tutorials and guides no creating code in a range of platforms.
https://projects.raspberrypi.org/en/codeclub

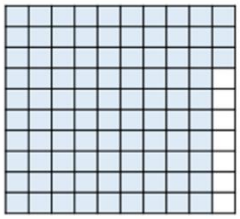
Key Question Week 2: Does the crime always fit the time?
Key Text for Linked Learning: Oliver Twist by Charles Dickens
Linked Learning: English, History
This week, children will be learning about how inventions supported the developments in textile production and the impact of the steam engine on the railways. They will explore how this revolutionised the lives of the British people. Linking to their History learning, the children will use what they have learnt about Victorian lives and the events from the text Oliver to write their newspaper reports about the Murder of Nancy Brown. They will use grammatical devices such time connectives, causal conjunctions and figurative devices to excite the reader. They will also revisit their understanding of using direct and indirect speech.
Maths: Children will begin the topic of algebra by identifying rules for given one and two-step equations, in addition to forming expressions using the four operations. They will also substitute into simple formulae to find values.
Science: In Science, children will describe what initial and final energy stores are, identify the initial and final energy stores in a range of scenarios along with describing the energy transformations that take place during a bungee jump.
History: As above.
Computing: Children will continue to use a text-based language to create code using Python.
Art: In Art, children will be continuing their learning about the artist Lowry and his art which was inspired by the industrial districts in North West England. They will begin using shape and colour to create an industrial landscape. They will create perspective through line and shape.
PDW/RE: How did the Christian Victorians celebrate Christmas and the New Year?
P.E: Children will continue to learn the basic rules of hockey and apply them to basic invasion games. Tune into Joe Wicks for his live PE sessions on You Tube.
MFL: Children will revisit their French phonics and learn to say basic classroom instructions in French.

Monday

Algebra	
Find a Rule – One step	https://www.bbc.co.uk/bitesize/topics/zghp34j

1) Which is bigger, 35% or 0.6?

2) What percentage is shaded?



3) Work out $3\frac{4}{5} - 2\frac{3}{10}$

4) Divide 2,496 by 8

1	725 - 100 =	1 mark
2	674 + 90 =	1 mark
3	$\frac{5}{12} + \frac{7}{12}$ =	1 mark
4	2077 - 103 =	1 mark
5	132 ÷ 12 =	1 mark
6	0.02 + 5.5 =	1 mark

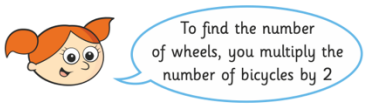
Find a rule – one step

1 Whitney makes a pattern of triangles using sticks.

Complete the table below.

Number of triangles	1	2	3	4	5	10	
Number of sticks							90

2 Complete the tables.



a)

Number of bicycles	1	2	5			16
Number of wheels	2			18	24	

b)

Number of ants	1	2	5			16
Number of legs		12		18	24	

Explain how to find the number of legs.

3 Calculate the outputs for the function machines below.

a) input 50 → + 5 → output ☐

b) input 50 → − 7 → output ☐

c) input 50 → × 2 → output ☐

d) input 50 → ÷ 10 → output ☐

4 Calculate the inputs for the function machines.

a) input ☐ → + 9 → output 45

b) input ☐ → − 2 → output 21

c) input ☐ → × 10 → output 350

d) input ☐ → ÷ 3 → output 9

5 Write the missing functions in the function machines.

a)

input	output
2	10
5	25
10	50

b)

input	output
8	15
0	7
−3	4

6 Calculate the missing inputs and outputs for the function machine.

input		output
8		☐
☐		14
5.5	+10	☐
☐		8

7 Look at the function machine.

input		output
15		65
20	☐	70
50		100

a) What is the output, if the input is zero? ☐

b) What is the input, if the output is zero? ☐

8 Here is a function machine.

input 6 → ☐ → output 15

Dora: The rule is add 9

Dexter: The rule is multiply by 2.5

Who do you agree with? _____

Explain your answer.

9 In a function machine, if the input is 3 and the output is 12, what could the function be?

Write two different functions and complete the table of outputs for each function.

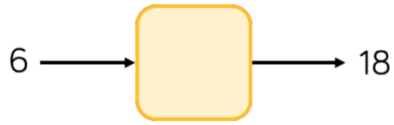
input 3 → ☐ → output 12

Input	3	4	5	10	20	100
Output	12					

input 3 → ☐ → output 12

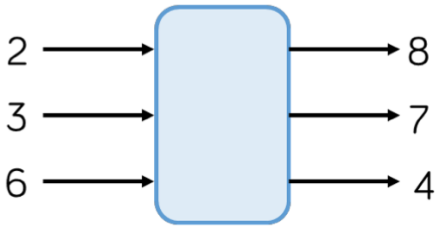
Input	3	4	5	10	20	100
Output	12					

Eva has a one-step function machine.
She puts in the number 6 and the number 18 comes out.



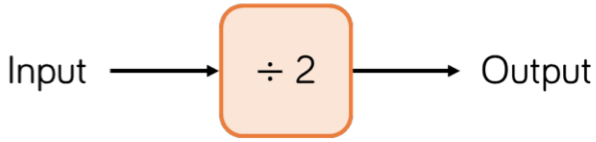
What could the function be?
How many different answers can you find?

Amir puts some numbers into a function machine.



What is the output from the function when the input is 16?

Dora puts a number into the function machine.



Dora's number is:

- A factor of 32
- A multiple of 8
- A square number

What is Dora's input?
What is her output?

Can you create your own clues for the numbers you put into a function machine for a partner to solve?

English

Handwriting

Copy a line of each word into your books. Check your spelling as you go.
Write each word into a sentence.
Not sure what it means? Check the internet or grab a dictionary! ☺

embarrass

environment

SPaG

Section 1

Place the correct punctuation into this sentence to show the relative clause.

Kirsty who was a very talented dancer performed in the school musical.

Section 2

Can you think of more formal synonyms to replace these past tense verbs? (Use a thesaurus if you need to!)

found _____

asked _____

Section 5

Add a suffix to the word '**beauty**' to create a verb:

_____

Section 3

Look at the sentence below and add two modal verbs:

I _____ go to Paris next year and I _____ make sure that I visit the Eiffel Tower while I'm there.

Section 4

Mr Whoops has accidentally jumbled up two adverbs that show frequency. Can you help him to unjumble them?

QUFRENYLET **NETFO**

_____

_____

Section 6

Can you add appropriate punctuation around the parenthesis in this sentence?

Prince William the Duke of Cambridge is second in line to the throne.

Complete Reading Eggs Lesson

Writing Lesson

Clip from Thursday's session

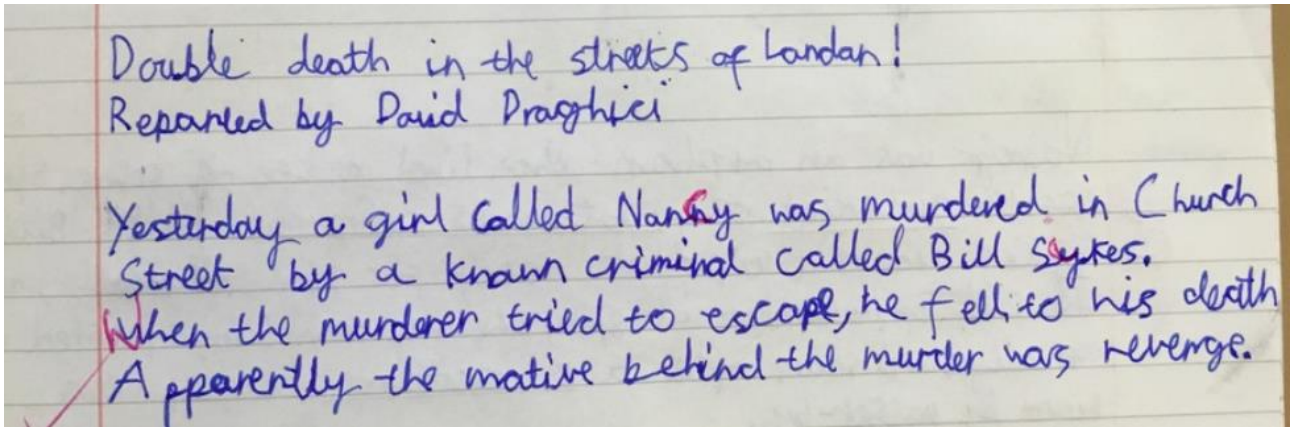
https://www.bing.com/videos/search?q=nancy+killed+by+bill+sykes&docid=6080040405849905 33&mid=50D194E899343BEA1C0650D194E899343BEA1C06&view=detail&FORM=VIRE

Orientation

- Interesting short introduction
- Summarises main points of the article

Where **What** **Why** **When** **Who**

Can you identify the 5Ws in the following orientation?



Double death in the streets of London!
Reported by David Draghici

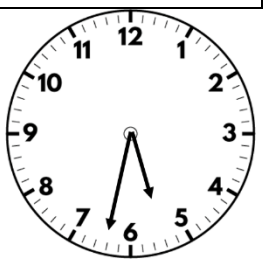
Yesterday a girl called Nancy was murdered in Church Street by a known criminal called Bill Sykes. When the murderer tried to escape, he fell to his death. Apparently the motive behind the murder was revenge.

Can you make this even better?
Use the Year 6 Standards.

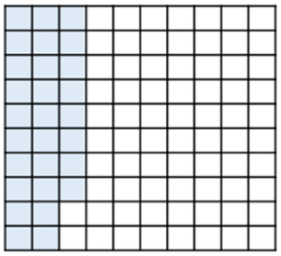
Tuesday

Algebra	
Find a Rule – Two step	https://www.bbc.co.uk/bitesize/topics/zghp34j

1) Work out 50% of 80 kg



2) What percentage is shaded?



3) Work out $1 - \frac{5}{8}$

4) Change 3.5 m to cm

7 5000 - 1700 =

1 mark

8 $4\frac{2}{3} \times 3 =$

1 mark

9 $7^2 + 12 =$

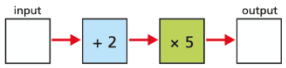
1 mark

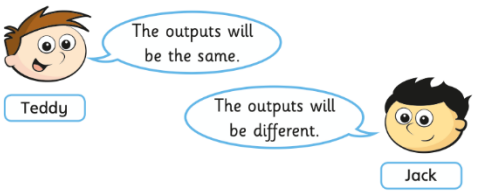
Find a rule – two step

1 Use the function machine to complete the table.

Input	1	2	3	5	10	50
Output						

2 Here is the same function machine with the steps in the reverse order.





Explain to a partner who you think is correct.

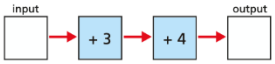
Use the function machine to complete the table.

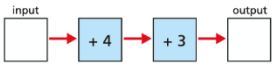
Input	1	2	3	5	10	50
Output						

Who is correct? _____

4 Tick the pairs of function machines that will give the same outputs for a given input.

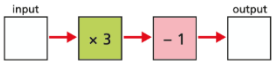
a)

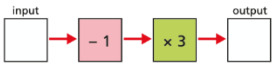




☐

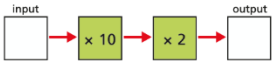
b)

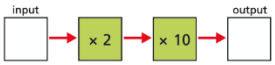




☐

c)





☐

Explain your reasoning to a partner.

5 Here are some 2-step function machines.

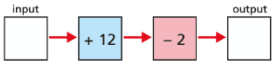
For each machine, write a single step that would give the same output.

Check your answers by inputting values.

a)

_____

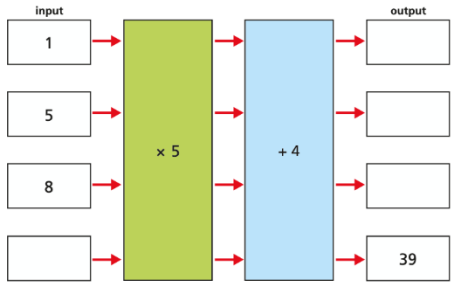
b)



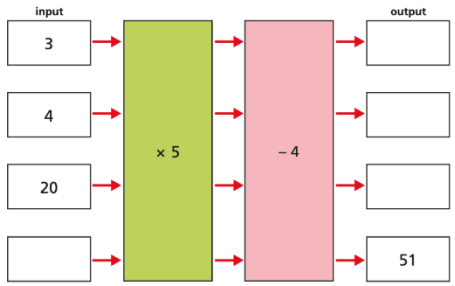
_____

3 Work out the missing outputs and inputs.

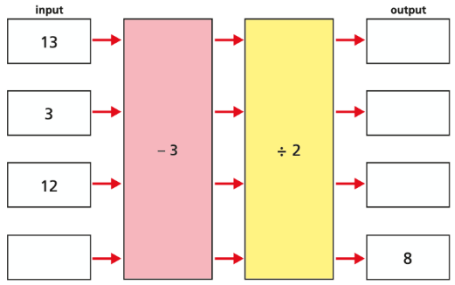
a)



b)



c)



c)

_____

Can all 2-step function machines be written as a 1-step function machine?

Talk about it with a partner.

6 Here is a function machine.

a) Complete the table.

Input	10	3		
Output			40	280

b) Rosie puts a number into the machine and she gets out the same number.

Work out Rosie's number. ☐

7 Mr Hall and Mrs Rose order some photos online.

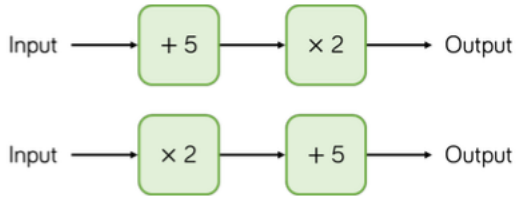
a) Mr Hall orders 16 photos.

How much does he pay? ☐

b) Mrs Rose pays £6.05

How many photos did she order? ☐

Teddy has two function machines.



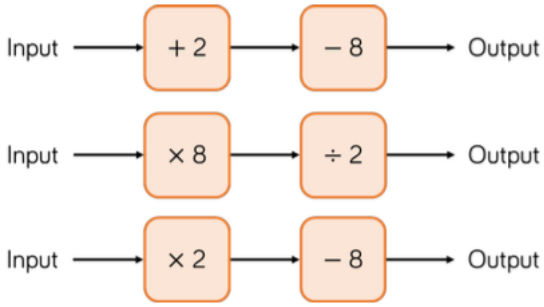
He says,

The function machines will give the same answer.

Is Teddy correct?

Is there an input that will give the same output for both machines?

Mo has the following function machines.



Explain which of these can be written as single function machines.

English

Handwriting

Copy a line of each word into your books. Check your spelling as you go.
Write each word into a sentence.
Not sure what it means? Check the internet or grab a dictionary! ☺

equipment

equipped

SPaG

Section 1
Rewrite this sentence with the adverbial phrase at the beginning. Add in any extra punctuation that is needed.

The children found the gravitational pull of different objects using a newton meter during the science experiment.

Section 2
Circle the TWO words that are synonyms of each other in the following sentence:

Vik was disgusted at the decision to knock down the local library and he knew that other community members would be outraged too.

Section 3
Can you invent the other debate speaker's next sentence and turn it into a direct speech sentence that uses inverted commas?

Section 4
Rewrite the sentence below with an embedded relative clause about Mrs Conner. Don't forget to mark it with commas!

Mrs Conner cried during the assembly to celebrate her retirement.

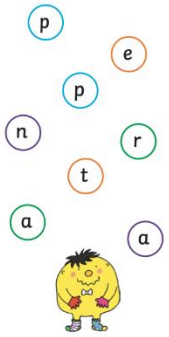
Section 5
Match the prefix to the correct root word:

dis	look
mis	judge
over	loyal

Which of the words you have made is a synonym of supervise? _____

Section 6
Mr Whoops has been juggling with the letters from one of his Y6 spelling words - can you spot what it is?

a _____



Complete Reading Eggs Lesson

Writing Session

Using Speech within Writing

Within writing, there are two ways to narrate the words spoken by a character. These are called:

- direct speech
- indirect (or reported) speech

In a direct speech sentence, we would narrate Iggy's spoken words like this:

"I bid you farewell Earthlings!" shouted Iggy from his spaceship.

If we were writing an indirect speech sentence, we would narrate Iggy's spoken words like this:

From his spaceship, Iggy bid farewell to the Earthlings.

The Sporting Telegraph

www.sporting-telegraph.com — The Number One Sports Newspaper

Brilliant Bolt Grabs Gold Again!

Jamaican Sprinter Takes London by Storm Winning Three Olympic Gold Medals

Exclusive Report by John Stevenson

Usain Bolt reaffirmed his title as the World's Fastest Man by achieving a marvellous third gold medal of the games this week. In front of a deafening capacity crowd in London's Olympic Stadium, the 25-year-old world record holder completed a remarkable set of victories to establish himself as one of the greatest sprinters of all time.

Following earlier victories in both the 100m and 200m individual sprint, Bolt inspired his Jamaica team-mates to a third triumph in the 4x100m relay. The three gold medals are added to his personal collection alongside similar achievements in the corresponding individual events of Beijing in 2008.

Afterwards, the reigning 100m and 200m world champion was understandably buoyant in his celebrations.

"It's a brilliant feeling. It's been a long road. I'm happy, but I'm relieved. It's great to be in the history books as one of the greatest. I'm proud of myself," he told reporters.

Although other athletes have won more medals than Bolt, including American sprinter Carl Lewis who was commentating for a television network, no-one else can match the explosive power and unrivalled pace exhibited by

Usain Bolt: winner of three Olympic gold medals in London

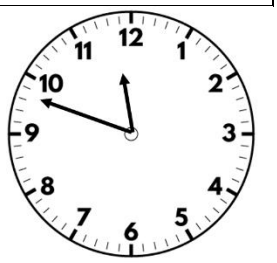
The sprinter's Jamaican team-mates were equally jubilant following their relay victory, describing it as a momentous day in Athletics history. Even the American team, who were disqualified from the relay following a disastrous illegal baton handover, were gracious in defeat. Admitting disappointment at missing out on a team medal, Justin Gatlin promised supporters that the team had given it all they could and refused to criticise the officials' decision, but did apologise to the US fans.

Now thinking ahead to his future and the potential of bringing down the curtain on a glittering Athletics career, Bolt confirmed that he intends to compete in 2016 but retire before the next Olympic Games in 2020. Instead, he will focus on charity work, a likely ambassador role in the sport or could even consider a dramatic switch to another sport such as football. As the crowds filtered out of the magnificent stadium, the talk was all about just one man - the incredible Usain Bolt, who is surely already an Olympic legend.

Wednesday

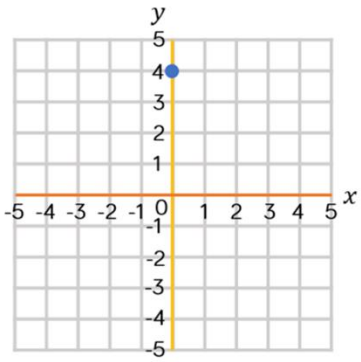
Algebra	
Forming expressions	https://www.bbc.co.uk/bitesize/topics/zghp34j

1) Work out 25% of £20



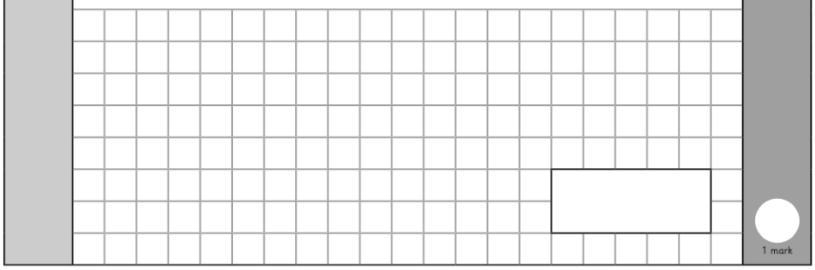
2) Write 0.7 as a percentage

3) What are the coordinates of the point?



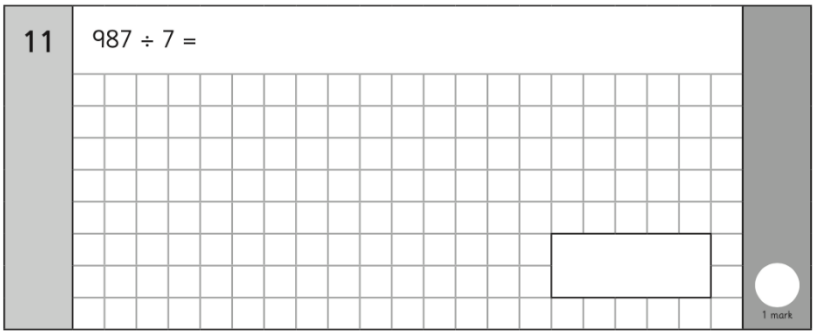
4) Work out 5.3 × 7

10 60 x 8 =



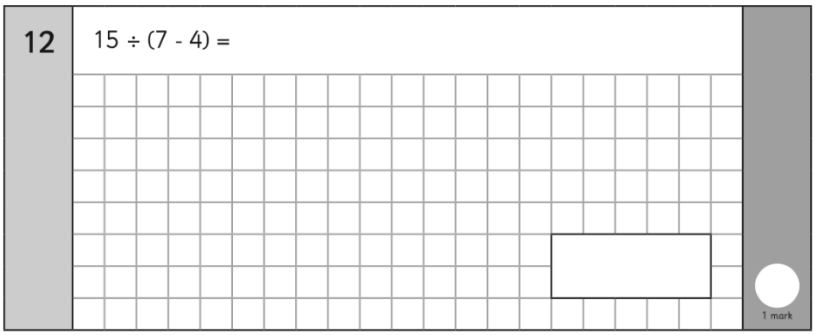
1 mark

11 987 ÷ 7 =



1 mark

12 15 ÷ (7 - 4) =



1 mark

Forming expressions

1 Tommy uses multilink cubes to represent an unknown number and base ten ones to represent 1

= x = 1

Write algebraic expressions to describe the sets of cubes.

The first one has been done for you.

a)  $2x + 3$

b) 

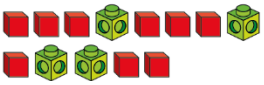
c) 

d) 

e) 

f) 

g) 

h) 

c)

input	output
6	3
12	9
y	

d)

input	output
30	3
50	5
y	

5 Match each statement to the equivalent algebraic expression.

Write the missing statements.

5 more than y	$2y$
y less than 5	$y - 5$
y multiplied by 5	$5 - y$
y divided by 5	$y + 5$
double y	$5y$
	y^2
	$\frac{y}{5}$

2 Use Tommy's method to represent these expressions.

a) $x + 2$

b) $2x$

c) $3x + 1$

d) $x + 6$

Compare answers with a partner.

3 Use cubes to help you simplify the following expressions.

The first one has been done for you.

a) $2y + 5 + y$  $3y + 5$

b) $3a + 2 + a + a$ 

c) $6p + 2 - 2p$ 

d) $m + 4 + 3m - 3$

4 Complete the function machines.

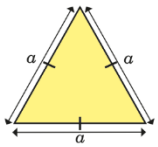
a)

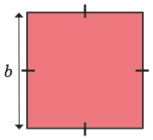
input	output
2	6
7	11
y	

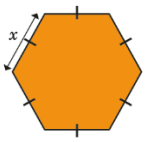
b)

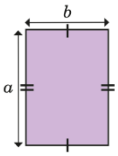
input	output
2	4
5	10
y	

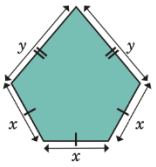
6 Write an algebraic expression to represent the perimeter of each shape.

a) 

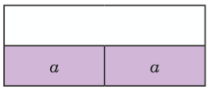
b) 

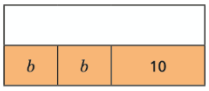
c) 

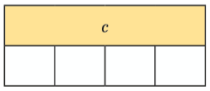
d) 

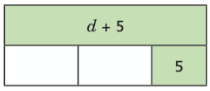
e) 

7 Complete the bar models.

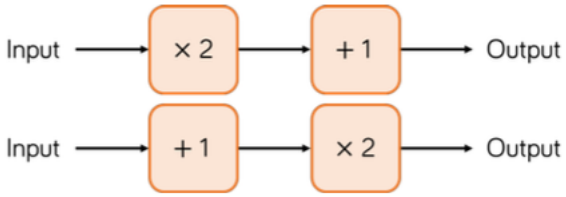
a) 

b) 

c) 

d) 

Amir inputs m into these function machines.

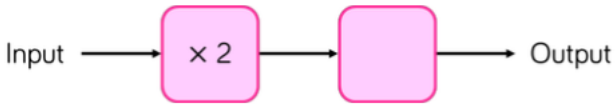


He says the outputs of the machines will be the same.

Do you agree?

Explain your answer.

This function machine gives the same output for every input.
For example if the input is 5 then the output is 5 and so on.



What is the missing part of the function?

What other pairs of functions can you think that will do the same?

English

Handwriting

Copy a line of each word into your books. Check your spelling as you go.
Write each word into a sentence.
Not sure what it means? Check the internet or grab a dictionary! ☺

especially

exaggerate

SPaG

Section 1
Write a sentence about the picture that contains a modal verb and a fronted adverbial. Underline them.

Section 2
Can you underline the all of the possessive pronouns in this passage of dialogue?

"Once you have moved your left leg, I will move mine," instructed Tasha.

"This race is ours to lose," giggled Courtney. "We are miles in the lead!"

Section 3
Rewrite these sentences in the past progressive (continuous) tense.

Hamid is coming to my party at the weekend.

In the restaurant kitchen, the chefs prepared the three-course meal.

Section 4
Add a prepositional phrase to the following sentence.

Using a hosepipe and sponge, Penny cleaned her new car _____.

Section 5
Mr Whoops has made THREE spelling mistakes in his diary entry. Can you underline them and correct them? Use a dictionary if you need to.

Today, I went down to the local cummunity centre to see what night courses they had avaleable that might interest me. I immediatelly signed myself up for a French course.

Section 6
Read the sentence below and add in a word or words to turn it into a question.

You won't tell anyone, _____?

Complete Reading Eggs Lesson
Writing

Writing

Direct and indirect speech

Write a couple of indirect and direct sentences to go with these pictures.

Challenge

Have you got some photographs at home that you could create some indirect and direct sentences for?

sentences using colon, semi colon,dashes linked to text.

Thursday

Algebra	
Substitution	https://www.bbc.co.uk/bitesize/topics/zghp34j

1) Work out 10% of 160

2) Write 65% as a decimal.

3) Simplify $\frac{25}{30}$

4) The sides of a square are 7 cm.
Work out the area of the square.

13 67 x 82 =

	6	7
x	8	2

2 marks

14 1932 ÷ 12 =

1	2	1	9	3	2

2 marks

Substitution

1 = 4 = 5

Use the given facts to work out the calculations.

a) + +

b) + −

c) + + + + +

2 = 12 = 5

Use the given facts to work out the calculations.

a) −

b) ×

c) Create your own calculation that will be equal to 22

3 If $x = 5$, write the values of the expressions in the corresponding grid.

The first one has been done for you.

$3x$	x^2	$2x - 5$
$4x + 2$	$\frac{x}{2}$	$2(x + 1)$
$7x$	$x + 9$	$x - 7$

15		

4 If $a = 10$ and $b = 6$, work out the values of the expressions.

a) $a + b =$ d) $2a + b =$

b) $a - b =$ e) $3a - 17 =$

c) $2a =$ f) $2(a - b) =$

5 If $m = \frac{4}{5}$ and $k = 0.1$, work out the value of $m + 2k$

6

Mo

It does not matter what p and q are, $p + q$ and $q + p$ will always give the same answer.

Do you agree with Mo? _____

Explain your answer.

7 $m = 7$ $n = 5$

Write >, < or = to compare the expressions.

a) $2m$ ◯ 10

b) $n - 1$ ◯ 5

c) $2n + m$ ◯ $2m + n$

d) $7n$ ◯ $5m$

8 $a = 10$

Write the expressions in order, starting with the smallest value.

$5a$	$a + 5$	$\frac{a}{5}$	a^2

9 $a = 15$

Write three different algebraic expressions that give a value of 40

_____ _____ _____

10 Complete the table.

x	$5x$	$5x - 1$
2		
10		
12		
	25	
		34
		99

$$x = 2c + 6$$

Whitney says,

$x = 12$ because c must be equal to 3 because it's the 3rd letter in the alphabet

Is Whitney correct?

Here are two formulae.

$$p = 2a + 5$$

$$c = 10 - p$$

Find the value of c when $a = 10$

Amir says,

When $c = 5$, $x = 31$

Amir is wrong.
Explain why.
What would the correct value of x be?

English

Handwriting

Copy a line of each word into your books. Check your spelling as you go.
Write each word into a sentence.
Not sure what it means? Check the internet or grab a dictionary! ☺

foreign

forty

SPaG

Section 1
Rewrite this sentence in Standard English.
I didn't see nothing.

_____

_____

Section 2
Change these nouns/adjectives into verbs by adding the suffixes -ise, -ify or -en.

apology _____

false _____

Section 3
Mr Whoops has lost the antonyms to these words. Can you help him to add 'in', 'im' or 'il' prefixes?

literate	_____
mobile	_____

Section 4
In the spaces, write the word class of each of the underlined words. Use the words from the list given. The first one has been done for you!

The owl and the pussycat went (verb) to sea in a beautiful (_____), pea-green boat. They (_____) took some (_____) honey and (_____) plenty of money wrapped up in (_____) a five-pound note.

preposition verb pronoun adjective determiner conjunction

Section 5
Can you place the commas in the correct place in these sentences:

The mischievous cat was stuck up the highest tree in the street which meant Mrs Brown had to phone the fire brigade.

Isabelle was learning to play the drums the recorder the piano and the ukulele.

Section 6
Can you add the correct form of the verb to make this a subjunctive mood sentence.

If I _____ a NASA astronaut, I would be brave enough to go on an expedition to Mars.

Complete Reading Eggs Lesson

Writing

TEXT TYPE WRITING MAT

NEWSPAPER ARTICLES

SUCCESS CRITERA:

- [ ] **Headline**
- [ ] **Byline** - include the name of the writer of the article.
- [ ] **Hook paragraph** - this should answer the 5 'w' questions: what? who? where? when? and why?
- [ ] **Past tenses**
- [ ] **Logical steps** - events should be recounted in a logical order.
- [ ] **Connectives to link paragraphs**
- [ ] **Quotes** - includes quotations from those involved in the news story or people reacting to it. Ideally, both formal and informal quotes should be included in your story.
- [ ] **Captioned photographs or diagrams**

IDIOMS AND PHRASES:

These are often used in newspaper articles:

A bone of contention - something that people argue about for a long time.

As the crow flies - the distance between two places measured in a straight line.

At the eleventh hour - at the last minute.

A red letter day - an important day.

A nine-day wonder - pleasure for a short time.

Against the clock - in a hurry to do something before a set time.

At loggerheads - when people are in strong disagreement.

Get to the bottom of - to find the truth about something.

Level playing field - a fair situation where people are treated equally.

Lose sight of - to forget about something important because you are focused on something less important.

Red-faced - embarrassed.

Set your sights on - to choose a goal and try to achieve it.

Wake-up call - an event which acts as a warning.

Witch hunt - an attempt to find and punish people with unpopular opinions.

Wreak havoc - to cause great damage.

USEFUL PHRASES:

...a member of the public...

...a spokesperson for...

...according to witnesses...

...alerted the police...

...as expected...

...bystanders declared...

...despite this claim...

...detained by the police...

...an eyewitness said...

...further information...

...mystery surrounds...

...peace of mind...

...potentially fatal...

...shocked by the news...

...was quoted as saying...

NEWSPAPER VOCABULARY:

alleged	detained	observers
assistance	disputed	occurred
budding	distraught	protests
bystander	embattled	quizzed
campaigners	error	reported
catastrophe	eyewitness	responsible
claimed	explained	scapegoat
confirmed	feted	scene
controversial	firearm	scrutiny
crisis	injuries	shock
critical	inquiry	suspect
deepening	linked	troubled

WRITING PLAN:

HEADLINE:

BYLINE:

Who has written the article?

PHOTOGRAPH WITH CAPTION:

What is the photograph showing?

HOOK PARAGRAPH:

Tell your reader who? What? Where? When? Why?

EVENTS:

Recount what has happened in a logical order.

Friday

Algebra	
Formulae	https://www.bbc.co.uk/bitesize/topics/zghp34j

1) Work out 20% of 90

2) Write three-quarters as a percentage.

3) Work out $2\frac{1}{2} + 3\frac{3}{4}$

4) Subtract 264 from 1,000

15 $\frac{9}{10} + 3\frac{1}{3} =$

1 mark

16 $\frac{4}{7} \div 3 =$

1 mark

17 672 ÷ 1000 =

1 mark

18 50% of 7248 =

1 mark

Formulae

1 Scott builds a pattern using triangles and circles.

a) Draw the next diagram in the pattern.

b) Scott records the number of triangles and circles in a table.

Complete the table.

Number of triangles	1	2	3	4	5
Number of circles	3				

c) c = number of circles and t = number of triangles

Circle the formula that describes the pattern.

$c = t + 3$ | $c = 3t$ | $t = 3c$ | $t = 3 + c$

d) How many circles will there be with 10 triangles?

Show your working.

2 **a)** Complete the table.

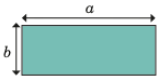
Number of weeks	1	2	3	5	10
Number of days	7				

b) Complete the formula to show the relationship between days (d) and weeks (w).

$d =$ ☐ w

c) How many days are there in 32 weeks?

3 **a)** Write a formula for the area and perimeter of the rectangle.



area = _____

perimeter = _____

b) Work out the area and perimeter of the rectangle if a = 17 cm and b = 8 cm

Show your workings.

area = ☐ perimeter = ☐

4 **a)** Write a formula for the area and perimeter of the square.

area = _____

perimeter = _____

b) Work out the area and perimeter of the square if d = 8.5 cm

Show your workings.

area = ☐ perimeter = ☐

5 Dora makes a square pattern using lolly sticks.

She records the number of squares and sticks in a table.

a) Continue the pattern and complete the table.

Number of squares, s	1	2	3	4	5
Number of lolly sticks, l	4	7			

b)

Eva

You need 35 lolly sticks to make 10 squares. I multiplied the number needed for 2 squares by 5

Show that Eva is wrong.

How many sticks are needed to make 10 squares?

c) Circle the formula that describes the pattern.

$l = 3s + 1$ | $l = 4s + 1$ | $l = 3(s + 1)$

6 Here are a dog walker's prices.

a) How much does the dog walker charge for a 2-hour job?

b) Write a formula to show the cost (c) for (h) hours.

7 The Wooden Letter Company sells wooden letters for £2 each, plus £1.50 for delivery of each order.

a) Whitney places an order for the letters to spell out her name.

How much does it cost?

£ ☐

b) Write a formula to show the cost (c) for the number of letters (n).

Jack and Dora are using the following formula to work out what they should charge for four hours of cleaning.

Cost in pounds = 20 + 10 × number of hours

Jack thinks they should charge £60
Dora thinks they should charge £120

Who do you agree with?
Why?

The rule for making scones is use 4 times as much flour (f) as butter (b).

Which is the correct formula to represent this?

A

$$f = \frac{b}{4}$$

B

$$f = 4b$$

C

$$f = b + 4$$

D

$$4f = b$$

Explain why the others are incorrect.

English

Handwriting

Copy a line of each word into your books. Check your spelling as you go.
Write each word into a sentence.
Not sure what it means? Check the internet or grab a dictionary! ☺

frequently

government

SPaG

Section 1
Correct these sentences that are written in non-standard English:

You done good in your work.

_____

_____

I seen you yesterday.

_____

_____

Section 2

The car was stuck in the snow _____

_____

_____

_____

_____

Add a subordinating conjunction and continue the complex sentence.

Section 3
Can you think of the correct 'ei' words to match the definitions?

A person that lives next door _____

The proof of a purchase _____

Section 4
Mr Whoops has got in a terrible muddle turning these root words into new words using the prefixes 'ir' or 'anti'. Can you help him?

relevant _____

social _____

Section 5
Look at the sentences below. Tick all the sentences that are commands.

Where did Benji run off to?

My new trainers are cool.

Take your dishes into the kitchen.

Come back here.

Section 6
Can you mark the parenthesis in this sentence with dashes?

The evil witch a jealous and bitter woman wanted to cast her spells.

_____

_____

_____

Complete Reading Eggs Lesson

Writing

Today you are going to write up your Orientation for your newspaper article. You are then going to create your headline and byline.

Year 6 Writer's Prompts

Use this checklist and prompt to help make your writing as good as it can be. This resource is great for you to use before you write, while you are writing and even after you think you have finished.
Use these features consistently and accurately and your writing will be awesome! When you think you have used them, use a pencil to write the short date in the white boxes next to the criteria.

I have done 'the basics'					
I have used joined up writing					
I have used **expanded noun phrases**					
I have used **prepositional phrases**					
I have used a conjunction other than but					
I have used a range of **direct speech** layouts. The dialogue moves the action on not just chatting					
I have used **modal verbs**					
I have used reported speech					
I have used words with **hyphens**					
I have used some more **fronted adverbials within paragraphs** (with the comma)					
I have used a **dictionary** to look up EVERY word that I am unsure of.					
I have used **passive voice** (...was...by...)					
added **parenthesis** using ( ) , , and - -					
I have started sentences with **subordinating conjunctions;** with a comma in the right place					
I have used **commas ACCURATELY**: list, after fronted adverbial, around parenthesis					
I have started **new paragraphs with a fronted adverbial** and a comma in the right place					
I have used **semi-colons in a detailed list**.					
I have used subjunctive form • If John **were** to get an A on his test, I would be very surprised • **Were** I a little bit taller, I would be able to reach the shelf. • I would run if I **were** younger • If I **were** him, I'd try a lot harder at school.					
I have selected **verb forms** for **meaning** and **effect**					
I have used the full range of punctuation taught at KS2 mostly correctly, including: • **semi-colons** to mark the boundary between independent clauses. • **colons** to mark the boundary between independent clauses					
Formal • Technical vocabulary • Descriptive detail – *The moon rested on the velvet sky like a pearl in an oyster.* • Use of certain modal verbs, e.g. *Might I borrow...* • Subjunctive verb form, e.g. *If I were you... I suggest that...* Informal • Conversational vocabulary • Use of second person • Colloquialisms, e.g. *It was **wicked** fun! Alright, **mate**?*	F / I	F / I	F / I	F / I	F / I

The Basics

Capital letters at the beginning of sentences and for proper nouns:
Jahmar is going to Spain on Tuesday.
Correct choice of full stop:
The dog slept.
What are you doing?
Come here, now!
Commas for lists:
She wanted boots, a football, socks and a shirt for Christmas.

Apostrophe for contraction and possession:
Nadra's pen wasn't working so she couldn't write in Miss Lynch's lesson.
Paragraphs to organise ideas
Co-ordinating conjunctions: for, and, nor, but, or, yet, so
Subordinating conjunctions: before, if, because, although, while, when, as, even though, after

Vocab and sentence structure

Create atmosphere
Use figurative language to describe the settings:
His eyes were like lava. **(simile)**
His teeth were razor blades. **(metaphor)**
The trees groaned as the wind howled between them. **(personification)**
The brave, bald, brute... **(alliteration)**

Adverbs:
beautifully, enthusiastically, patiently, ferociously, fast, cautiously
Adverbials:
With caution, as usual, in the kitchen...
Fronted Adverbials:
Firstly, he told us to turn around.
During break time, everyone was looking at us.
At the very, very end, Gary told us...
First of all, I loved it when you were sitting on the benches.
Consequently, graffiti is mostly in places...
To conclude, I believe...
Last week, we did an experiment...
All of a sudden, Anna fell, and fell, and fell.
Menacingly, a snow-leopard approached her, as if from nowhere.
Determined to escape, she flung one of the boots...
Just after we had finished our lunch, we took an interesting stroll....
Prepositional Phrases:
beneath the..., through the, under a..., between..., with hope..., in the..., up the...

Modal Verbs:
can, could, may, might, ought, shall, should, will, would not
Modal adverbs:
rarely, perhaps, definitely, possibly, occasionally, certainly, unquestionably, undoubtedly

Passive voice:
Instead of: The snake attacked Mrs Kaur
Use:
Mrs Kaur was attacked by the snake.

Use a range of cohesive devices:
Use pronouns:
Mr Brindley loves playing the guitar. He finds it interesting.

Make your writing flow:
Finally... At that very moment...
As she walked through the door...
When she finished working...

Use of hyphenated words:
Used to join two words or to separate parts of words:
man-eating shark, vicious-looking, ice-cream, run-down, family-owned blond-haired, mid-July

Clause structures:
Subordinate clauses can go at the beginning middle (as parenthesis and sometimes a **relative clause**) and at the end of your sentences.
Because her dad taught her lots of tricks, Miss Kemp was good at football.
Miss Kemp **(whose dad had taught her lots of tricks)** was good at football.
Mrs Kemp was good at football **because her dad taught her lots of tricks.**
Relative clauses link to the object of the sentence, with relative like the second example.
Relative pronouns: that, who, which, whichever, whom, whoever, whomever

Expanded noun phrases:
- a rectangular box wrapped in brown, crusty paper
- the young soldier with brown hair and ocean blue eyes
- the soldier's shotgun wound
- the cream wooden door
- a little more time
- the misty, murky moors
- the king's wounded body

Spelling and punctuation

Parenthesis
Add extra information to a sentence:
Bart, the oldest child in the Simpson family, was caught fighting with his classmates.

( ) , , - -

Commas for clarity:
An introductory phrase or clause:
Once upon a time, there was...
When Mr Price visited the garden, he saw...

Directly addressing:
Let's eat Mr Millington.
Let's eat, Mr Millington.

In noun phrases:
The green, sparkly, blue-eyed fish...
Working in pairs for parenthesis

Dashes:
Extra information at the end of a sentence:
It was a long wait – the longest wait I've ever had.
Extra information in the middle of a sentence:
The usually trusty ship – which was already running late- had encountered another problem.

Inverted commas and dialogue:
Vary the way you set out dialogue, making sure it is used with purpose to move your writing on.
Don't forget to check you have punctuated correctly.
"Come on, Milo!" his owner called.

"I've just found it," she replied. "It was buried under the old oak tree."

Mrs Kaur announced: "There will be lots of homework this weekend."

Semi-colons (;) :
In a list where the items are more than one word:
The shopping was packed: free-range eggs for Mum; beans and cheese for Dad; and lots of sweets for me!
Connect main clauses that are closely related:
May was warm; it was pleasant.
It was freezing; he was grateful for his coat.

Think about the Y5/6 word list

Consider the prefixes:
ab-, de-, im-, un-, over-, sub-, dis-, anti-, ex-, mid-, re-, self-, under-
Consider suffixes:
-able, -ible, -ate, -cy, -er, -ed, -ing, -hood, -ice, -ism, -less, -ly, -ment, -y
Main Homophones:
to/too/two, your/you're, their/there/they're
There are lots more so be sure to check

Science

Knowledge Organiser • Energy • Year 6

The energy stored in an object has describes its has the ablity to make something happen.

Energy facts:

- All energy that is available in the universe already exists
- Energy cannot be created or destroyed
- An energy transfer is when one type of energy is passed to another (e.g. kinetic energy when two things collide)
- An energy transformation is when energy is moved from one stored into another (e.g. chemical to heat when a match is burned)

Efficient

When most of the total energy in to a machine is converted to useful energy out.

Calculation:

$$\text{Efficiency} = \frac{\text{Useful energy output}}{\text{Total energy input}}$$

High efficiency	**Low efficiency**
When VERY LITTLE energy is wasted	When A LOT of energy is wasted
E.g. when a car converts most of its chemical enegy into kinetic energy	E.g. when a car converts most of its chemical enegy into kinetic energy

Power

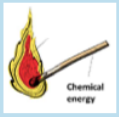
How much energy is transformed each second. It is measured in Watts (W).

Calculation:

$$\text{Power} = \frac{\text{Energy transformed}}{\text{Time taken}}$$

High power	**Low power**
A lot of energy transformed each second	Small amount of energy transformed each second
E.g. an oven transfers 2.400 Joules each second (2.400 W)	E.g. an lightbulb transfers 60 Joules each second (60 W)

Energy Store Examples

Gravitational potential energy	Energy stored in an object when it is raised above the ground	
Kinetic energy	Energy stored in an object that is moving	
Chemical energy	Energy stored inside the chemical bonds inside of substance	
Elastic Potential Energy	Energy stored in objects that have been stretched or squashed when that will spring back to their original shape	
Heat energy	Energy stored in the vibrations and movement of individual particles as heat	

Speed

The distance an object will cover in a certain time. Can be measured in metres per second, miles per hour or some others.

Calculation:

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

High speed	**Low speed**
When something covers a large distance in a short time	When something covers a short distance in a long time
E.g. a car travelling 32 metres per second	E.g. a snail travelling 1 centimetre per second

Kinetic energy is larger if:

- The mass of an object is bigger
- The object is moving faster

Using a calculator

Kinetic Energy = 0.5 x mass x speed x speed

High kinetic energy	**Low kinetic energy**
a car moving at 32 m/s, with a mass of 1000 kg	A cricket ball moving at 1 m/s, with a mass of 0.3 kg
Kinetic energy = 512.000 J	Kinetic energy = 0.15 J

Lesson
02

What is energy transformation?

Retrieval practice

1. What is energy?

2. Which type of energy is stored in a battery?

3. Which type of energy is stored in a stretched elastic band?

4. What can we say about creating or destroying energy?

From previous learning:

5. Draw the particles in a solid that is cold and a solid that is hot:

Cold Hot

1. Which energy type is being described in each statement below:

1. Energy stored in an object when it is raised above the ground _____
2. Energy stored in an object that is moving _____
3. Energy stored inside the chemical bonds inside of substances _____
4. Energy stored in objects that have been stretched or squashed when that will spring back to their original shape _____
5. Energy stored in the vibrations and movement of individual particles _____

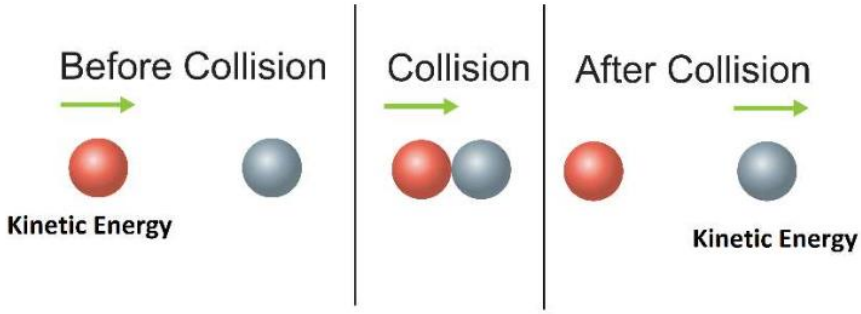
2. For each of the scenarios below, which energy stores are present?

Scenario	Which energy stores are present?	Scenario	Which energy stores are present?
			
			
			

3. Read the following passage about energy transfer and energy transformation

Energy can be moved from one store to another in two different ways. One way this can happen is for the same type of energy to move from one object to another. This is known as an energy transfer.

An example of this can be seen when the kinetic energy of a ball is transferred to another when they collide. Therefore kinetic has moved from one object to another.



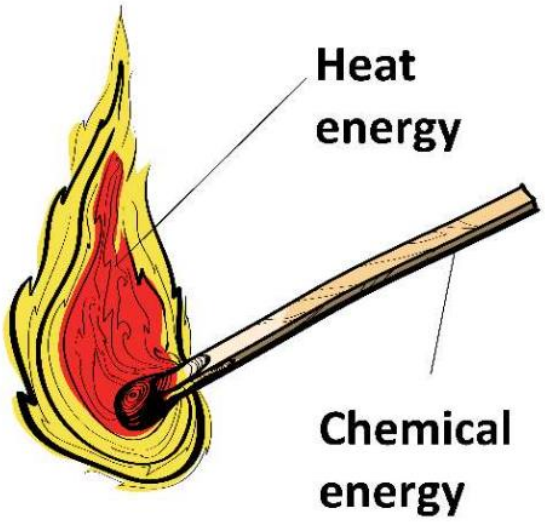
4. What is an energy transfer?

_____

_____

The other way that this can happen is for energy in one store to be converted into another type of energy store. This is known as energy transformation.

For example, this happen when a match is lit as chemical energy in the match is converted to heat energy in the particles in the air.

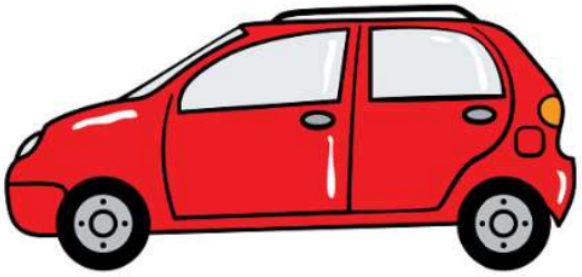


5. What is an energy transformation?

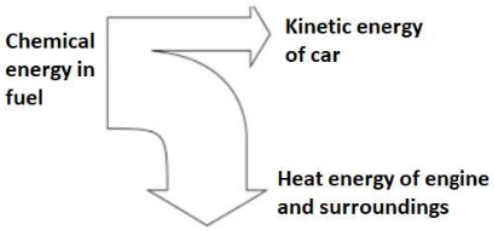
When we have a transfer or conversion of energy, we start with energy in one store to energy in another store. We say that the energy store we start with is the 'initial energy store' and we say that the store the energy ends up is the 'final energy store'. One example of this the energy used by a car to make it accelerate forward. The chemical energy stored in the car's fuel is converted to kinetic energy to help move the car forward. Therefore the initial energy store is chemical energy in the fuel and the final energy store is the kinetic energy of the car.

6. What do we mean by an initial energy store?

7. What do we mean by a final energy store?



However, it is not always as simple as one initial energy store and one final energy store. Sometimes, energy is transferred or converted into more than one final store. Often, the transfer into one of these stores is not water – we therefore say that this energy is 'wasted'. The example of the car, heat energy is also a final energy store as well as kinetic energy so we say that this energy is wasted.

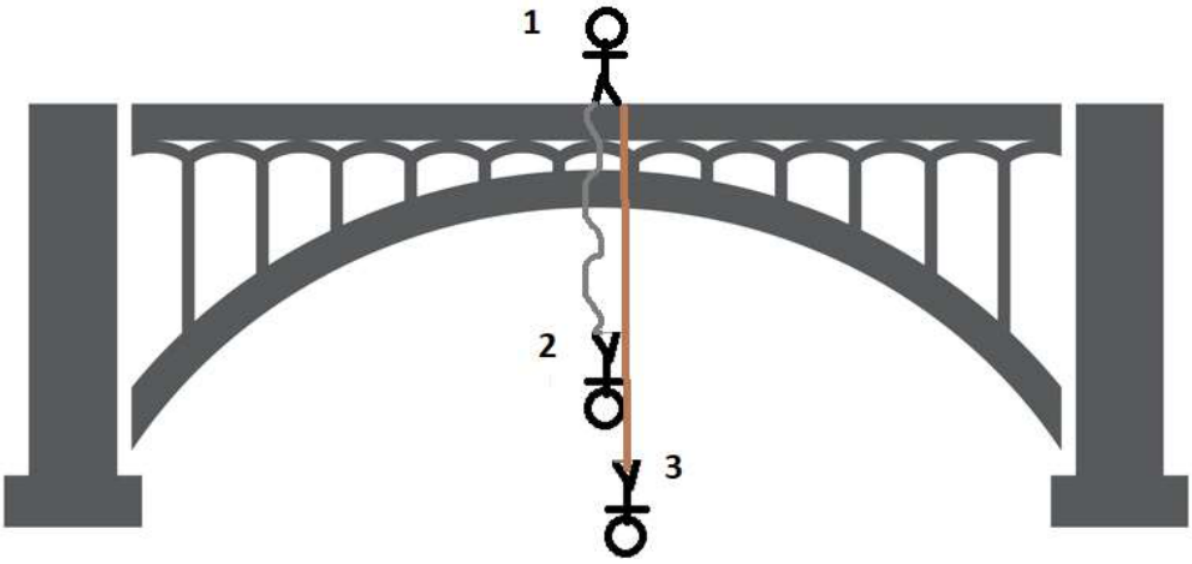


8. What do we mean when we say energy is wasted?

9. Return to the examples you look at previously – this time, write down what the initial energy store is and what the final energy store is.

Example	Initial energy store	Final energy store or stores

10. What would the initial energy store and final energy stores be for a bungee jumper?



11. Write a description of the energy transfers that take place during a bungee jump

_____

_____

_____

_____

History

Knowledge Organiser • Industrial Revolution • Year 6

Vocabulary	
Industry	The Process of making products by using machines and factories.
Industrial Revolution	A time of great change in Britain between 1760-1900. Shift to mass-production of products.
Population	The number of people living in a particular place.
Economy	The system of how money is used and products distributed within a particular country.
Agriculture	Process of producing food by farming: growing crops and rearing animals.
Poverty	The lack of basis human needs such as clean water, food, healthcare, education and shelter.
Mass production	Process of making multiple products of the same standard quickly, e.g. textiles.
Era	Clear period of time on history.
Sanitation	Process of cleaning drinking water and getting rid of sewage (waste).
Child labour	Employment of children in a business or industry

Important People	
Robert Peel	Created the first Metropolitan Police force in Londonin 1829, to try to reduce crimes including robbery and violence.
Dr. John Snow	Prove that cholera spread through contaminated water in 1854.
Queen Victoria	Queen of Great Britain from 1837 to 1901 and Empress of India from 1876 to 1901.

Legal Act	
1829 Metropolitan Police Act	Robert Peel created the Metropolitan Police Service (the first police force) with headquarters in Scotland Yard, London.
1883 Factory Act (applied to large textile factories)	Banned children under 9 from working, 2 hours education a day for children under11, lowered working hours.
1842 Mines Act	Banned biys under 10, women and girls from working in mines.
1844 Factory Act	3 hours education a day for children under 13, lowered working hors.
1850 The 10 Hour Act	Set working hours to 10,5 hours per day for all.
1857 Factory Act	Previous rules applied to all workshops with 50+ workers.

Inventions	
The water frame 1767 Richard Arkwright	A machine powered by water tospin cotton into yarn quickly and easily. Could be used by unskilled workers. Allowed factoriesand mills tobe built.
The spinning Jenny 1764 James Hargreaves	A machine which spins more than one ball of yarn at a time, making it easier and faster to make cloth. Allowed more workers to make cloth more cheaply and increased the amount of factories built.
The steam engine 1712 Thomas Newcomen	Replaced water and horse power in a wide range of industries, including trains, ships, factories.
The locomotive 1825 Stepherson	A new high-pressure steam engine which could be used to reliably move goods and passengers on the railway tracks.

Lesson
04

What inventions revolutionised the lives of British people?

Retrieval Practice

1. Cholera was a disease which spread through _____

2. The Industrial Revolution took place between _____ and _____

3. Most coal mines were:
   a. In London
   b. In the South of England
   c. In the North of England

4. Children working in factories were paid _____% of an adult male wage.

5. List two negative effects of a sudden increase in population in cities:
   a. _____
   b. _____

6. The Factory Act of which year banned children under the age of 9 from working and gave children under 11 years old 2 hours of education per day?
   a. 1821
   b. 1833
   c. 1844
   d. 1867

The Spinning Jenny

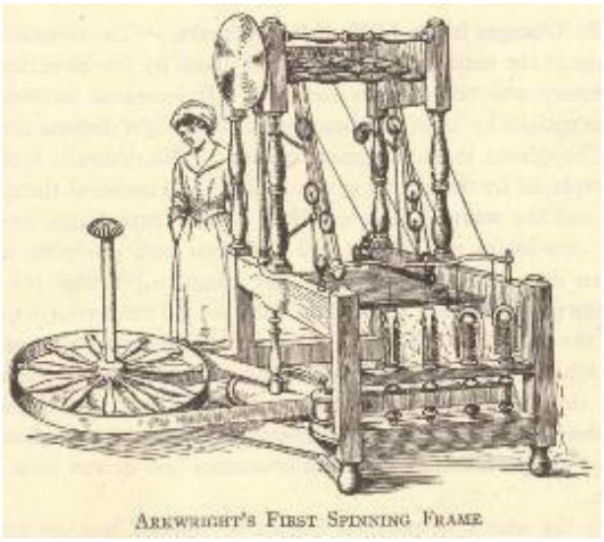
The Spinning Jenny was one of the key developments in the industrialization of weaving during the early Industrial Revolution. It was a spinning frame for multiple balls of yarn (length of material fibres, like thread or wool).

It was invented in 1764 by James Hargreaves in Lancashire, England. The device reduced the amount of work needed to produce cloth, with a worker able to work eight or more balls of yarn at once. This grew to 120 as technology advanced.

The Water Frame

The yarn produced by the Spinning Jenny was not very strong until Richard Arkwright invented the water-powered 'water frame' in 1767, which produced yarn harder and stronger than that of the Spinning Jenny.

The water-wheel powered spinning frame designed for the production of cotton thread, was able to spin 128 threads at a time, which was an easier and faster method than ever before.



ARKWRIGHT'S FIRST SPINNING FRAME

In 1771, Arkwright installed the water frame in his cotton mill at Cromford, Derbyshire, on the River Derwent, creating one of the first factories that was specifically built to house machinery rather than just bringing workers together.

The machines did not need skilled workers so Arkwright paid unskilled women to run them. This invention started the factory system which grew rapidly during the Industrial Revolution.

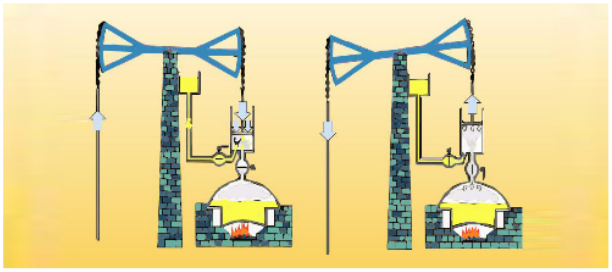
1. Why was it helpful for Arkwright to be able to employ unskilled workers?

2. What difference did the water frame make to production?

_____

_____

_____



The Steam Engine

In 1712, Thomas Newcomen invented the steam engine. The engine was operated by condensing steam which created pressure to push the piston. It was the first practical device to harness steam to produce mechanical work.

These engines were used throughout Britain and Europe, initially to pump water out of mines. They replaced water and horse power in a range of industries, including on trains, ships and in factories. Hundreds were constructed through the 1700s and 1800s.

The impact of the steam engine was significant. Firstly it dramatically improved transportation, making it cheaper for businesses to transport their goods. Secondly, it gave flexibility about the location of factories, which no longer had to be located next to rivers.

3. Why was it easier for this invention to spread compared to the inventions of the Shang Dynasty or the Romans?

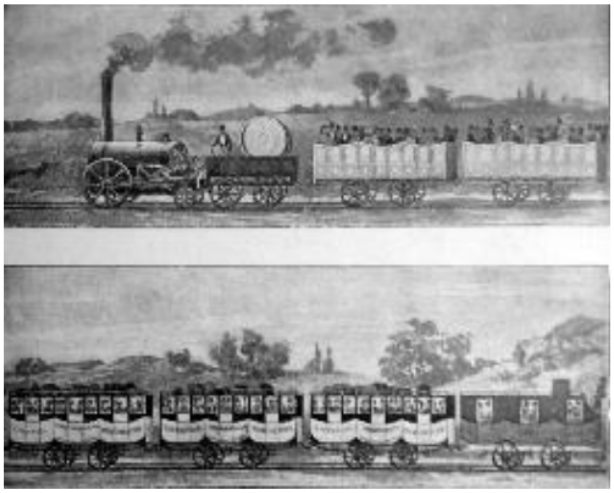
_____

_____

_____

The Locomotive

A steam locomotive was a type of railway train that produced its pulling power through a steam engine. These locomotives were fuelled by burning combustible material – usually coal or wood – to produce steam in a boiler.



(A drawing of the first passenger railway journey – Liverpool and Manchester)

Locomotion No. 1, built by the Stephenson family, was the first steam locomotive to carry passengers on a public rail line, the Stockton and Darlington Railway in 1825.

The Stephenson family also built the first inter-city railway line in the world - the Liverpool and Manchester Railway, which opened in 1830 – and went on to build locomotives for railways in USA and across Europe.

High-pressure steam engine locomotives could be used to reliably move goods and passengers on the railway tracks. This invention made transport much easier and quicker.

Railways

The impact of the railways was significant. Industry benefited as products could now be transported faster and in greater quantities than before, reducing costs. The construction of the railway network also fuelled demand for coal and steel.

Ordinary people saw the benefits too. They could now travel around the country much quicker and holidays out of the city for the working class were accessible from around 1870. Communication improved –newspapers could now be sent from London and Manchester to towns across the country. The postage system also became much quicker.

4. List 3 positive effects of the improved railway system in the 1800s

_____

_____

_____

5. How did these inventions of the Industrial Revolution change

The way factories were run?

_____

_____

The lives of ordinary people?

_____

_____

The economy?

_____

_____

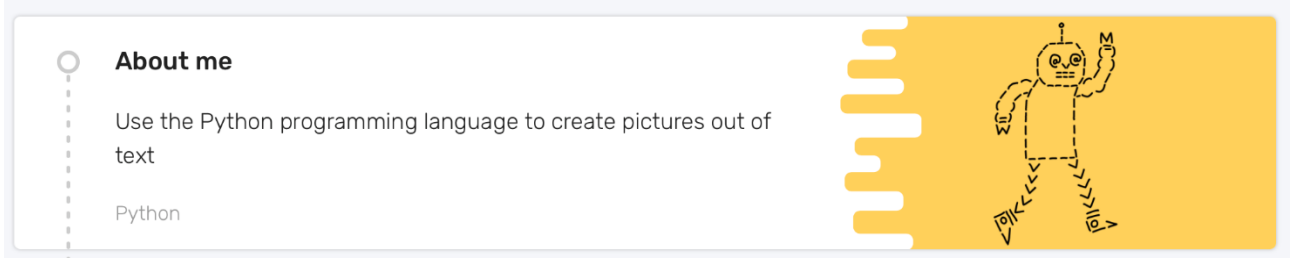
French

Revisit French Phonics. Then work on having a conversation with a partner of family member.

1. **a / à** a	2. **an / en / on** on	3. **q / qu / c / k** k	4. **ch** sssh	5. **e *** eeuh
6. **é / er */ es / ez / et / ai*** ay	7. **eu / oeu** (h)er	8. **g** guh	9. **ge / j** juh	10. **gn** nyuh
11. **i / y** eee	12. **in / ain** an	13. **o / au / eau** au	14. **oi** wa	15. **ou** ooo
16. **r / rr** grr	17. **s / ç / c+e / c+i** sss	18. **t / th** t	19. **u** (n)ew	**H** is silent at the start of a word. French consonants at the end of words are silent except C,F, L, R. Remember Clear **F**rench **L**anguage **R**ules.
20. **un** uh	21. **z** zzz	22. **ien** eean	23. **ei /ai * è / ê er*** air	

Hello!	Bonjour Salut	Good day Hi
How are you?	Comment ça va? Ça va trés bien! Ça va comme ci, comme ça. Ça va bien, merci. Ça ne va pas bien. Ça va mal.	How are you? I'm very well. So, so. Good, thank you. Not so good. Bad.
What's your name?	Comment t'appelles-tu? Je m'appelle...	What are you called? I am called ...
How old are you?	Quel âge as-tu? J'ai ... ans. Et toi?	What age are you? I am (have) ... years. And you?
Colours	What is your favourite colour?	Quelle est votre couleur préférée?
Animals	What is your favourite animal?	quel est votre animal préféré?
Good bye	Au revoir À bientôt	Good bye See you soon

Computing
Python 1



Python is a general-purpose, versatile, and powerful programming language. It's a great first language because it's concise and easy to read. Whatever you want to do, Python can do it. From web development to machine learning to data science, Python is the language for you.

Why we love it:	**World-Class Software Companies That Use Python**
• Great first language • Large programming community • Excellent online documentation • Endless libraries and packages • World-wide popularity • Powerful and flexible	• Google • Facebook • Instagram • Spotify • Quora • Netflix • Dropbox

Click the link, read the instructions – carefully – and work your way through some basics of Python programming! ☺

https://projects.raspberrypi.org/en/codeclub/python-module-1

Answers

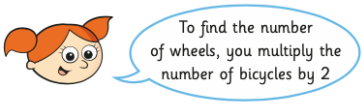
Find a rule – one step

1 Whitney makes a pattern of triangles using sticks.

Complete the table below.

Number of triangles	1	2	3	4	5	10	30
Number of sticks	3	6	9	12	15	30	90

2 Complete the tables.



a)

Number of bicycles	1	2	5	9	12	16
Number of wheels	2	4	10	18	24	32

b)

Number of ants	1	2	5	3	4	16
Number of legs	6	12	30	18	24	96

Explain how to find the number of legs.

Multiply the number of ants by 6

3 Calculate the outputs for the function machines below.

a) input 50 → + 5 → output 55

b) input 50 → − 7 → output 43

c) input 50 → × 2 → output 100

d) input 50 → ÷ 10 → output 5

4 Calculate the inputs for the function machines.

a) input 36 → + 9 → output 45

b) input 23 → − 2 → output 21

c) input 35 → × 10 → output 350

d) input 27 → ÷ 3 → output 9

5 Write the missing functions in the function machines.

a)

input		output
2	×5	10
5		25
10		50

b)

input		output
8	+7	15
0		7
−3		4

6 Calculate the missing inputs and outputs for the function machine.

input		output
8	+10	18
4		14
5.5		15.5
−2		8

7 Look at the function machine.

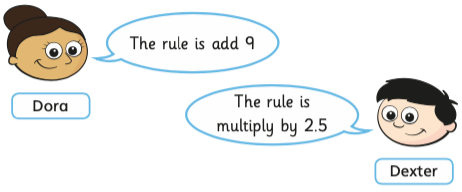
input		output
15		65
20		70
50		100

a) What is the output, if the input is zero? 50

b) What is the input, if the output is zero? −50

8 Here is a function machine.

input 6 → ☐ → output 15



Who do you agree with? Both

Explain your answer.

9 In a function machine, if the input is 3 and the output is 12, what could the function be?

Write two different functions and complete the table of outputs for each function.

input 3 → ×4 → output 12

Input	3	4	5	10	20	100
Output	12	16	20	40	80	400

input 3 → +9 → output 12

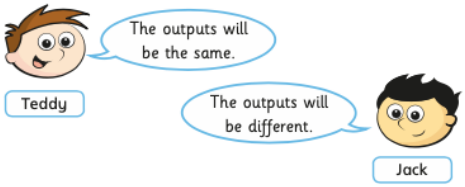
Input	3	4	5	10	20	100
Output	12	13	14	19	29	109

Find a rule – two step

1 Use the function machine to complete the table.

Input	1	2	3	5	10	50
Output	7	12	17	27	52	252

2 Here is the same function machine with the steps in the reverse order.



Explain to a partner who you think is correct.

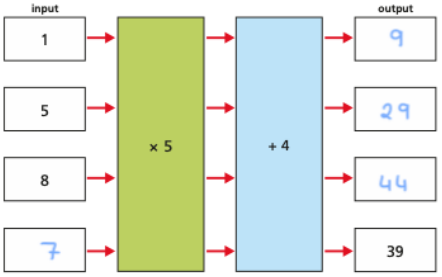
Use the function machine to complete the table.

Input	1	2	3	5	10	50
Output	15	20	25	35	60	260

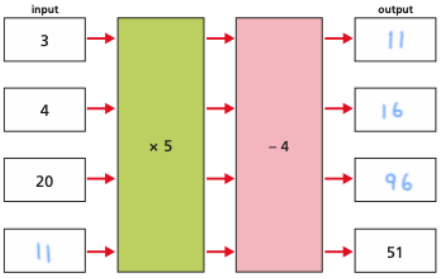
Who is correct? Jack

3 Work out the missing outputs and inputs.

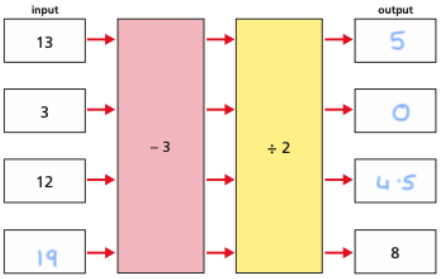
a)



b)

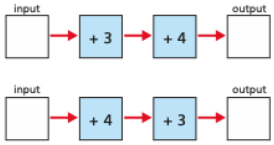


c)



4 Tick the pairs of function machines that will give the same outputs for a given input.

a)



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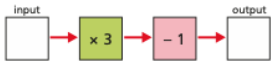
b)



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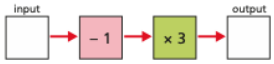
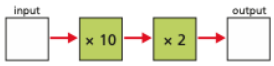


c)



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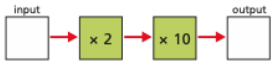


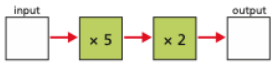
Explain your reasoning to a partner.

5 Here are some 2-step function machines.

For each machine, write a single step that would give the same output.

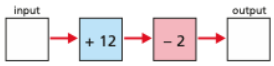
Check your answers by inputting values.

a)



×10

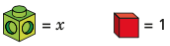
b)



+10

Forming expressions

1 Tommy uses multilink cubes to represent an unknown number and base ten ones to represent 1

 = x = 1

Write algebraic expressions to describe the sets of cubes.

The first one has been done for you.

a)  $2x + 3$

b)  $3x + 5$

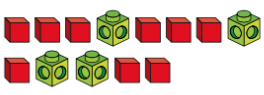
c)  $3x$

d)  $x + 3$

e)  $2x + 5$

f)  $5x + 2$

g)  $2x + 6$

h)  $4x + 9$

c)

×4

Can all 2-step function machines be written as a 1-step function machine?

Talk about it with a partner.

6 Here is a function machine.

a) Complete the table.

Input	10	3	13	73
Output	28	0	40	280

b) Rosie puts a number into the machine and she gets out the same number.

Work out Rosie's number.

4

7 Mr Hall and Mrs Rose order some photos online.

a) Mr Hall orders 16 photos.

How much does he pay?

£4.45

b) Mrs Rose pays £6.05

How many photos did she order?

24

2 Use Tommy's method to represent these expressions.

a) $x + 2$ **c)** $3x + 1$

b) $2x$ **d)** $x + 6$

Compare answers with a partner.

3 Use cubes to help you simplify the following expressions.

The first one has been done for you.

a) $2y + 5 + y$

 $3y + 5$

b) $3a + 2 + a + a$

 $5a + 2$

c) $6p + 2 - 2p$

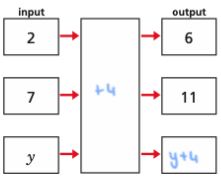
 $4p + 2$

d) $m + 4 + 3m - 3$

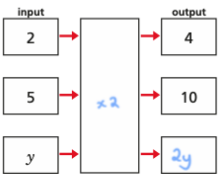
$4m + 1$

4 Complete the function machines.

a)



b)



c)

input		output
6	→	3
12	→	9
y	→	$y-3$

d)

input		output
30	→	3
50	→	5
y	→	$\frac{y}{10}$

5 Match each statement to the equivalent algebraic expression.

Write the missing statements.

5 more than y	$2y$
y less than 5	$y-5$
y multiplied by 5	$5-y$
y divided by 5	$y+5$
double y	$5y$
5 less than y	y^2
y multiplied by y	$\frac{y}{5}$

6 Write an algebraic expression to represent the perimeter of each shape.

a) $3a$

b) $4b$

c) $6x$

d) $2a + 2b$

e) $3x + 2y$

7 Complete the bar models.

a)

$2a$	
a	a

b)

$2b + 10$		
b	b	10

c)

c			
$\frac{c}{4}$	$\frac{c}{4}$	$\frac{c}{4}$	$\frac{c}{4}$

d)

$d + 5$		
$\frac{d}{2}$	$\frac{d}{2}$	5

Substitution

1 ⬟ = 4 ● = 5

Use the given facts to work out the calculations.

a) ⬟ + ⬟ + ● 13

b) ⬟ + ⬟ − ● 3

c) ● + ● + ● + ⬟ + ⬟ 23

2 △ = 12 ■ = 5

Use the given facts to work out the calculations.

a) △ − ■ 7

b) △ × ■ 60

c) Create your own calculation that will be equal to 22

e.g. △ + □ + □

3 If $x = 5$, write the values of the expressions in the corresponding grid.

The first one has been done for you.

$3x$	x^2	$2x - 5$
$4x + 2$	$\frac{x}{2}$	$2(x + 1)$
$7x$	$x + 9$	$x - 7$

15	25	5
22	2.5	12
35	14	−2

4 If $a = 10$ and $b = 6$, work out the values of the expressions.

a) $a + b =$ 16

b) $a - b =$ 4

c) $2a =$ 20

d) $2a + b =$ 26

e) $3a - 17 =$ 13

f) $2(a - b) =$ 8

5 If $m = \frac{4}{5}$ and $k = 0.1$, work out the value of $m + 2k$

1

6

Mo

It does not matter what p and q are, $p + q$ and $q + p$ will always give the same answer.

Do you agree with Mo? Yes

Explain your answer.

Addition is commutative

7

$m = 7 \quad n = 5$

Write >, < or = to compare the expressions.

a) $2m$ > 10

b) $n - 1$ < 5

c) $2n + m$ < $2m + n$

d) $7n$ = $5m$

8

$a = 10$

Write the expressions in order, starting with the smallest value.

$5a$	$a + 5$	$\frac{a}{5}$	a^2

$\frac{a}{5}$	$a+5$	$5a$	a^2

9

$a = 15$

Write three different algebraic expressions that give a value of 40

e.g.

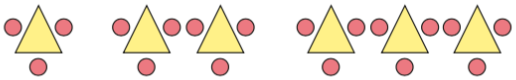
$2a+10$ $\quad$ $3a-5$ $\quad$ $\frac{8a}{3}$

10 Complete the table.

x	$5x$	$5x - 1$
2	10	9
10	50	49
12	60	59
5	25	24
7	35	34
20	100	99

Formulae

1 Scott builds a pattern using triangles and circles.



a) Draw the next diagram in the pattern.

b) Scott records the number of triangles and circles in a table.

Complete the table.

Number of triangles	1	2	3	4	5
Number of circles	3	6	9	12	15

c) c = number of circles and t = number of triangles

Circle the formula that describes the pattern.

$c = t + 3$	$c = 3t$	$t = 3c$	$t = 3 + c$

d) How many circles will there be with 10 triangles? 30

Show your working.

$3 \times 10 = 30$

2 **a)** Complete the table.

Number of weeks	1	2	3	5	10
Number of days	7	14	21	35	70

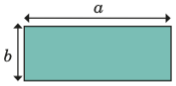
b) Complete the formula to show the relationship between days (d) and weeks (w).

$d =$ 7 w

c) How many days are there in 32 weeks?

224

3 **a)** Write a formula for the area and perimeter of the rectangle.



area = ab

perimeter = $2a + 2b$

b) Work out the area and perimeter of the rectangle if a = 17 cm and b = 8 cm

Show your workings.

area = 136 cm² perimeter = 50 cm

4 **a)** Write a formula for the area and perimeter of the square.

area = d^2

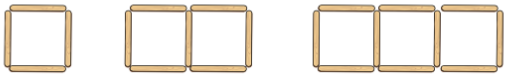
perimeter = $4d$

b) Work out the area and perimeter of the square if d = 8.5 cm

Show your workings.

area = 72.25 cm² perimeter = 34 cm

5 Dora makes a square pattern using lolly sticks.



She records the number of squares and sticks in a table.

a) Continue the pattern and complete the table.

Number of squares, s	1	2	3	4	5
Number of lolly sticks, l	4	7	10	13	16

b)

Eva

You need 35 lolly sticks to make 10 squares. I multiplied the number needed for 2 squares by 5

Show that Eva is wrong.

How many sticks are needed to make 10 squares?

31

c) Circle the formula that describes the pattern.

$l = 3s + 1$ ✓ $l = 4s + 1$ $l = 3(s + 1)$

6 Here are a dog walker's prices.

a) How much does the dog walker charge for a 2-hour job?

£29

b) Write a formula to show the cost (c) for (h) hours.

$c = 12h + 5$

7 The Wooden Letter Company sells wooden letters for £2 each, plus £1.50 for delivery of each order.

a) Whitney places an order for the letters to spell out her name.

How much does it cost?

£ 15·50

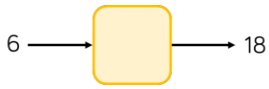
b) Write a formula to show the cost (c) for the number of letters (n).

$c = 2n + 1.5$

Find a Rule – One Step

Reasoning and Problem Solving

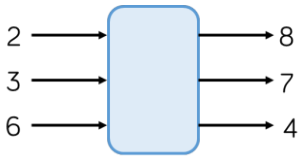
Eva has a one-step function machine.
She puts in the number 6 and the number 18 comes out.



What could the function be?
How many different answers can you find?

The function could be + 12, × 3

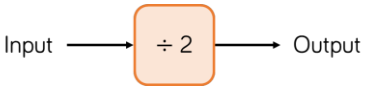
Amir puts some numbers into a function machine.



What is the output from the function when the input is 16?

The function is subtract from 10 so the output is −6

Dora puts a number into the function machine.



Dora's number is:
- A factor of 32
- A multiple of 8
- A square number

What is Dora's input?
What is her output?

Can you create your own clues for the numbers you put into a function machine for a partner to solve?

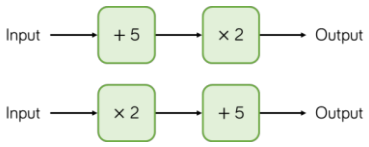
Dora's input is 16

Her output is 8

Find a Rule – Two Step

Reasoning and Problem Solving

Teddy has two function machines.



He says,

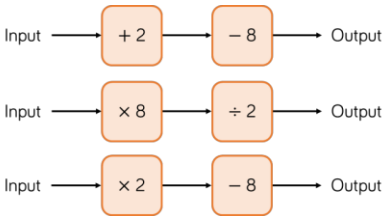
The function machines will give the same answer.

Is Teddy correct?

Is there an input that will give the same output for both machines?

No they do not give the same answer.
Encourage children to refer to the order of operations to help them understand why the outputs are different.

Mo has the following function machines.



Explain which of these can be written as single function machines.

The first one can be written as – 6

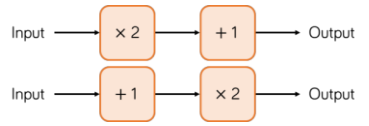
The second can be written as × 4

The third cannot be written as a single machine.

Forming Expressions

Reasoning and Problem Solving

Amir inputs m into these function machines.



He says the outputs of the machines will be the same.

Do you agree?

Explain your answer.

No, because $2m + 1$ isn't the same as $2m + 2$

$2m + 1$

Input

× 2

+ 1

$2m + 2$

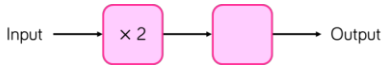
Input

+ 1

× 2

Children may use examples with numbers to show this.

This function machine gives the same output for every input.
For example if the input is 5 then the output is 5 and so on.



What is the missing part of the function?

What other pairs of functions can you think that will do the same?

÷ 2

Other pairs of functions that will do the same are functions that are the inverse of each other e.g.
+ 3, – 3

Substitution

Reasoning and Problem Solving

Here are two formulae.

$$p = 2a + 5$$

$$c = 10 - p$$

Find the value of c when $a = 10$

$c = -15$

$$x = 2c + 6$$

Whitney says,

$x = 12$ because c must be equal to 3 because it's the 3rd letter in the alphabet

Is Whitney correct?

No Whitney is incorrect. c could have any value.

Amir says,

When $c = 5, x = 31$

Amir is wrong.
Explain why.
What would the correct value of x be?

Amir has put the 2 next to the 5 to make 25 instead of multiplying 2 by 5

The correct value of x would be 16

Formulae

Reasoning and Problem Solving

Jack and Dora are using the following formula to work out what they should charge for four hours of cleaning.

Cost in pounds = 20 + 10 × number of hours

Jack thinks they should charge £60
Dora thinks they should charge £120

Who do you agree with?
Why?

Jack is correct as multiplication should be performed first following the order of operations.

Dora has not used the order of operations – she has added 20 and 10 and then multiplied 30 by 4

The rule for making scones is use 4 times as much flour (f) as butter (b).

Which is the correct formula to represent this?

A $f = \frac{b}{4}$

B $f = 4b$

C $f = b + 4$

D $4f = b$

Explain why the others are incorrect.

B is correct.

A shows the amount of flour is a quarter of the amount of butter.

C shows the amount of flour is 4 more than butter.

D shows butter is 4 times the amount of flour.