Starters for STEM

Starters for STEM are 10 activities that parents can use at home to help children develop their science, technology, engineering and maths skills. Theses activities are easy to resource and provide children with the stimulus to talk about the world around them. If you see a link you can explore how to extend these activities, you will need to sign up, for free, to access these materials. Don't forget to share your work on social media #ScienceFromHome

Make some butter

You will need some full fat milk and a clean jar with a lid. Shake the milk in the jar. You'll need to do this for quite a long time. After a while you should feel there is a solid forming. This is butter. What does it taste like?

The world's largest steel structure

The Bird's Nest is the world's largest steel structure and was built in China for the 2008 Olympic Games. It is made out of 26 miles of steel.

Use strips of paper, card or wool to create your own birds nest style building. You might like to search for photos of the 'Birds nest' to help you with your design.

Mission X – Astro agility course

Complete an agility course to improve movement skills, co-ordination, and speed. Record your speed and see if you can get faster with practise. https://bit.ly/2z4AQLZ

Snail inheritance

After it has been raining have a look in the garden or out on the local paths. Can you see any snails? Have a look at the patterns on their shells? What do you notice? Are there any with similar patterns? Snail shell patterns are inherited from their parents. Can you find a potential family of snails? How many different shell patterns can you spot? https://www.stem.org.uk/rx33o6

Rose Mitchtom and Margarette Steife

Over 120 years ago two women came up with the idea to make a teddy bear. Collect all your teddy bears. Are they all the same? What do you think makes a good teddy bear? If you were going to invent a new teddy bear what would it look like?

Design a sports kit

Design a sports kit suitable for a sport you choose. Think about the type of material you will use and why you have used it.

https://explorify.wellcome.ac.uk/en/activities/problem-solvers/design-a-sports-kit

I'm Alive!

You're alive! How do you know? What are the features of being alive? Are these the same in other living things, such as a plant? Look around your home. What things can you find that are alive, were once alive and were never alive?

https://www.stem.org.uk/rx33gh

Mirror writing

Put a piece of paper in front of a mirror. Without looking at the paper, look into the mirror and try to write your name on the paper. Is it difficult? Why do you think this is?

Silly shapes

Find or make some playdough. How many different shapes can you make by squashing, bending, twisting and stretching your dough?

What the Ladybird Heard

In the storybook 'What the Ladybird Heard', the Ladybird helped the farm animals by carefully listening to the sounds she heard in the farmyard. In the story the two thieves have a map of the farm with all the animals on it and they work out where they are by listening to the sounds the animals make.

Can you make a map of your house or garden and add all the sounds you hear? If you had to direct someone round your map what sounds would you tell them to listen out for?

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Brilliant bodies

Try testing your body by seeing how long you can balance for or make a reaction tester to see how good your reactions are. Download a reaction tester here. https://bit.ly/3cp0FED

https://bit.ly/2K3Tnu9

Which chocolate melts the quickest?

Place some white chocolate buttons and some milk chocolate buttons on a plate and leave them in the sunshine.

Which one do you think will melt first? Are there other chocolate you could test? Can you solidify the chocolate so you can eat it?

https://bit.ly/36zMB9Hf

Natural art

Collect a few leaves or petals from your garden. Place them between 2 pieces of paper or a piece of spare white material. Using a stone bash the leaves and petals through the paper. When you open up the paper or material what do you see?

World's tallest tower

In 2020 the new world's largest tower will be the Jeddah Tower, in Saudi Arabia. It will have 200 floors and will the reach 1008 meters high.

Use scrap paper and junk box materials to build a tower. You might like to search for photos of the 'Jeddah Tower' to help you with your design.

What is the tallest tower you can build?

Melting coloured ice

Freeze some ice cubes that you have coloured different colours using food colours. Take them out of the freezer and put them all in the same place. Which one do you think will melt first? Why?

https://www.stem.org.uk/rx33mj

Using your senses

Put some objects, such as a hairbrush, a tube of toothpaste, a packet of biscuits, an ice cream scoop, a packet of tissues and a wooden spoon into a bag. You will also need something to act as a blindfold. Use your senses to feel what is on the bag. Play with a partner and see who guesses most of the objects.

Heart beaters

Can you tickle yourself?

How many litres of blood do you have in your body?

How many times does your heart beat in a day?

Test your family with a body trivia quiz.

Create your own cards or download some from here: https://bit.ly/2RFJVRN

Keeping cold drinks cold

Which cup is best at keeping your cold drink cold in the summer? A glass, a mug or a plastic cup?

Place an ice-cube in your drink and see which one stays frozen the longest. What other cups could you test?
https://bit.ly/3c4klND

Floaty boats

Using just 1 sheet of paper and some paperclips design a raft that will hold as many coins or marbles as possible.
You can download the activity card here to help you.
https://bit.ly/34E7YWs

Building a bionic hand

It is difficult and tiring for humans to work in space. Bionic hands that can be remotely operated can help humans work more efficiently in space. Try making a model bionic hand using cardboard, straws, string and elastic bands. You will need to think about how a human hand works to help you with your design. https://bit.ly/2XDvx0j

Sign up to Mission X resources here: https://www.stem.org.uk/missionx

Starters for STEM

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#ScienceFromHome

Spacecraft Models

Make paper models of ESA spacecraft through cutting out and sticking the templates provided in this link:

https://www.stem.org.uk/rxetru.

Floating and Sinking

What can you find in your house that sinks in the bath?

Are there things that float? What do you notice? Can you sort them.

Felt pen chromatography

Do you have any coffee filters or sugar paper? With some felt pens colour a little square onto the paper. Then place a drop of water onto the colour. What do you see? Is it the same for different colours? What do you think is happening?

https://www.stem.org.uk/rx32hb

Magnet games

Use a fridge magnet and some paper clips to design a game.

It could be a fishing game or maybe a maze on a paper plate. You will need to test to make sure you magnet will attract the paper clip through the different materials.

There are lots of possibilities when you use your imagination!
https://bit.ly/3gQUpsw

Creating crystals

Fill an old jar with water and pour salt, stirring to dissolve it. Keep adding salt until no more can dissolve. Tie a paperclip onto a length of cotton and hang it from a straw, or piece of wood placed across the top of the jar. Leave the jar somewhere safe and obverse what happens over the next few days and weeks.
https://www.stem.org.uk/rxyxp

Good vibrations

Cut a piece of thread, make sure it is a bit longer than your arm. Tie the middle of it around the handle of a fork.

Wind each end of the thread around one finger on each of your hands, so you are holding the thread, with the fork dangling down.

Place your fingers just near your ears, but not inside them! Knock the fork gently against a table.

What can you hear?
https://bbc.in/2XrXHuG

Beulah Henry 1912 – 1970

Beulah was a famous American inventor who invented over 100 new products. She made several umbrella inventions from clip on covers to special umbrella bags.

If you were going to design an umbrella what would it look like and what materials would you use?

Try making a model umbrella using junk box materials you might find at home.

https://bit.ly/2XYFu72

Lovely Lava Lamp

Create coloured water by adding a few drops of food colouring. Fill a tall container with a mixture of equal parts coloured water and cooking oil. Stir them up and watch what happens. Have a think why? Add a effervescent vitamin C tablet and watch what happens now. You have created your own lava lamp.

https://www.stem.org.uk/rx32ha

Sorting salt and pepper

The salt and pepper has be mixed together. How can you separate the two ingredients? Use everything you know about separating materials to help solve the problem.

You will need some kitchen roll, cups a plate, water and salt a pepper.
https://bit.ly/3d7bqMV

Food chains

All animals need food to live. Some animals eat plants, herbivores, and some animals eat other animals, carnivores.

Create a paper chain to show what different animals eat and how they are linked. E.g. first link - leaves, second link caterpillar, third link mouse. What could go on the fourth link?

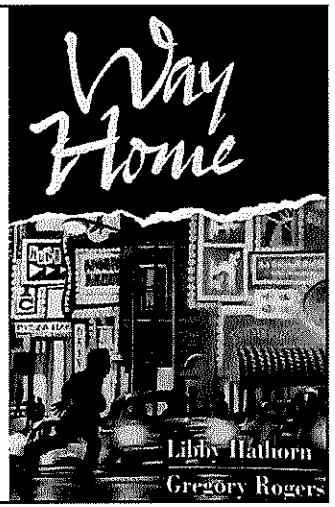
https://bit.ly/2XtCO28

Week beginning 8th June 2020

Formal and Informal Language

What is **formal** and **informal** register and when do we use it?

How do contractions, question tags, slang and ellipsis affect the register of our language?



Audience and Context

The **register** depends on *situation* and *audience*.
The same person will use *different registers* in *different contexts*.

At home with family	In school with the headteacher	In formal writing
You're going to wear that, are you?	*When will we be going on the museum trip?*	*I wonder, might I be permitted to enquire about progress?*
Informal	More Formal	Very Formal

Register

Formal language is often used for:

Situation	Audience
Official or formal situations	People you don't know
Generalised or impersonal writing	People in official/important roles
Written communication more than spoken	People as a group

We would like to request your presence at a dinner in aid of our charity.

We regret to inform you that your attendance at the school will be terminated at the end of term.

Please remain in the shelter after dark.

Cats have been domesticated for thousands of years.

Register

Informal language is often used for:

Situation	Audience
Everyday conversation	Family, friends and people you know well
Social media and texts	People similar to you
Most spoken communication	People you meet in day-to-day life

It's okay, man. Thanks for trying.

Eeew! That's disgusting - that is.

I'm outta here. Coming?

Formal and Informal Vocabulary

Formal and informal *registers* tend to use different **vocabulary**.

Informal

Formal

*Could you **assist** me?*
*Can you **help** me?*
*It is time to **flee**.*
*It is time to **leg it**.*
*Who is the **champion**?*
*Who's the **champ**?*
*He was **pursued** by the youths.*
*He was **chased** by big kids.*

With formal vocabulary, words are often *longer*.

I'd what's mustn't

Contractions

Contractions appear in informal language.

we're you're haven't

Spoken language often contains contractions...
but written formal language uses the longer versions of the word/s.

We might *write*:

***Do not** say that I **did not** warn you.*

but we are more likely to *say*:

Don't say I didn't warn you.

*What are the **formal** versions of the **contractions** above?*

Question Tags can be used in informal *language*.

Tags are questions added to a clause to encourage a listener to respond.

main clause | Tag

You're joking, aren't you?

main clause | Tag

Look at that Fatcat , will you?

The tag changes a statement into a question.

Tags can be used to soften a **command**.

main clause | Tag

We're mates, aren't we?

In very informal speech *right* and *yeah* can be used as tags.

main clause | Tag

You're ready, yeah?

Breaking Grammar Rules!

Informal language sometimes breaks grammar rules.
This is effective when used *sparingly* for writing realistic dialogue...
(or in text messages and on social media).

You and me in a Jag. Vroom vroom.
I am imagining how fun it would be to drive in a Jaguar together. Can you imagine the noise that the engine might make?

See they cook stuff right on the table in front of you.
Look through this window with me. You will see how the food is cooked at the diner's table.

Breaking Grammar Rules!

Ellipsis (omitting words) has not changed the meaning but the grammar is now incorrect. This is common in informal spoken language.

Nobody lives in them – no way.
*Nobody lives in them; **there is** no way **that they are occupied.***

Slang can be used to write realistic dialogue. Slang can help to make the speech sound authentic.

Whaddo you reckon?
What do you think about that?

Hamilton

supporting teachers

Explore more Hamilton Trust Learning Materials at https://wrht.org.uk/hamilton/ .

What to do today

IMPORTANT Parent or Carer – Read this page with your child and check that you are happy with what they have to do and any weblinks or use of internet.

1. Read the start of a book

- Look closely at the *Front Cover* of Way Home.
- Make brief notes about five things that you notice and what you think might happen in the book.
- Read *First Page Text*. Is this how you expected it would be from the front cover. What do you think about Shane? What do you think might happen?
- Listen to the *Reading* of the first part of the book, **stop the video at 6.14,** https://www.youtube.com/watch?v=rjzP18bsSdQ.

2. Answer questions

- Read *Book Questions*. Think carefully about your answers.
- Write your answers as sentences making a paragraph for each section.

3. Make predictions

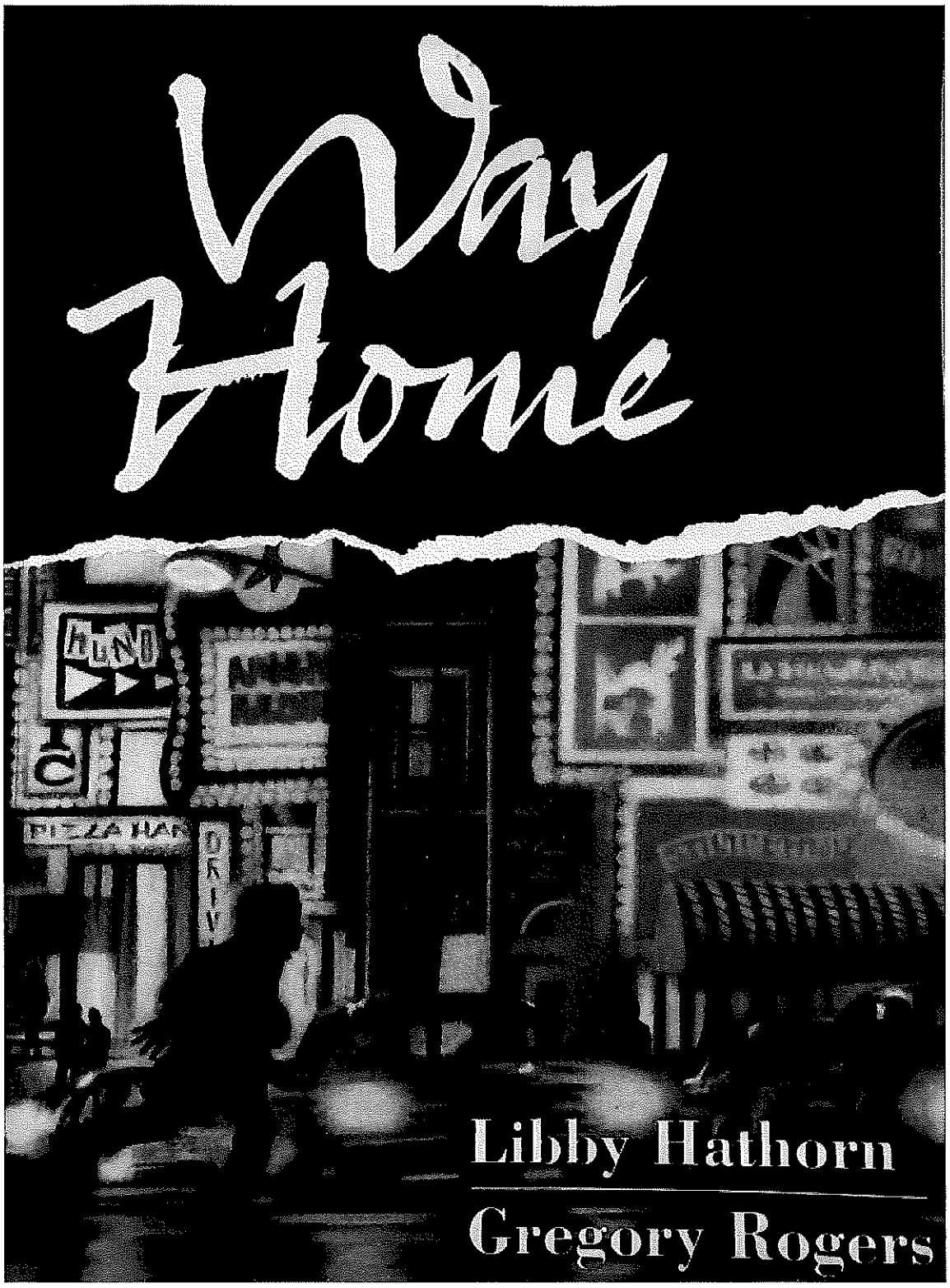
- Use *Development/Resolution* to note down with words and pictures what you think will happen in the rest of the book.
- Write about your predictions. What will happen to Shane? What will happen to the cat? How might the story end?

Well done. Show your predictions to a grown-up. Explain to them how the story has started, what has happened and why you are making these predictions.

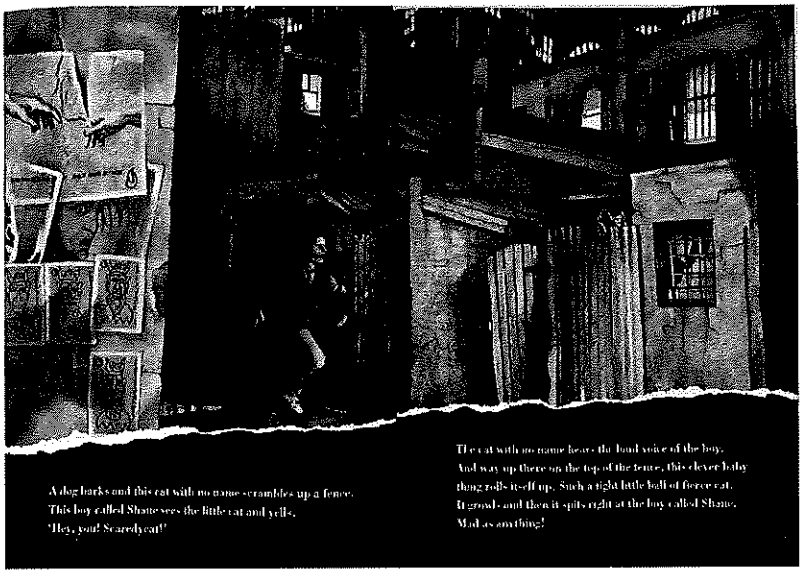
Try the Fun-Time Extra

Write your own story about meeting a stray cat. What would you call it? Where would you take it? What would you show it?

Front Cover



First Page Text



A dog barks and this cat with no name scrambles up a fence.
This boy called Shane sees the little cat and yells,
'Hey, you! Scaredycat!'

The cat with no name hears the loud voice of the boy. And way up there on the top of the fence, this clever baby thing rolls itself up. Such a tight little ball of fierce cat. It growls and then it spits right at the boy called Shane.
Mad as anything!

Book Questions

What do you like about the book? Is there anything that you dislike? Why?	What does the book make you think about? Anything you have read or seen? Anything that people have talked about? Anyone you know?
What makes the book striking? Which page particularly caught your eye? What is your favourite phrase, sentence or paragraph so far?	What issue and questions does the book raise?

Development/Resolution

What do you predict will happen next? How will the story end? Use words and pictures to show your ideas.

Your Predictions

Write about what you think might happen in the story.

What to do today

IMPORTANT Parent or Carer – Read this page with your child and check that you are happy with what they have to do and any weblinks or use of internet.

1. Listen to a story

- Listen to the *Reading* of the second part of Way Home, **start the video at 6.14**, where you ended it yesterday https://www.youtube.com/watch?v=rjzP18bsSdQ.
- Did the story end as you predicted? What could happen in a sequel to the story?

2. Revise informal language

- Use the ***PowerPoint*** *on informal language* or, if this is not possible, remind yourself using the *Revision Card* about this.
- Complete *Formal and Informal.*

3. Now for some writing

- Read *Through the Windows*. This is what Shane says to the cat as they look through the three sets of windows in the book.
- Look at *Windows*. Pick one window and imagine what Shane would say to the cat about it. Write 2 or 3 sentences of speech, making sure that you keep to Shane's informal style.
- Challenge yourself to write about the other windows or to imagine and write about other windows.

Well done. Show your writing to a grown-up. Show them the informal features that you have included in Shane's language. You can look at possible answers to Formal and Informal at the end of this pack.

Try the Fun-Time Extra

Can you imagine Shane coming to your school? What might he say in the classroom, in the playground, to your friends and to your teacher? Write some of your ideas.

Revision Card – Informal Language

Audience and Context

The **register** depends on *situation* and *audience*.
The same person will use *different registers* in *different contexts*.

At home with family

You're going to wear that, are you?

Informal

In school with the headteacher

When will we be going on the museum trip?

More Formal

In formal writing

I wonder, might I be permitted to enquire about progress?

Very Formal

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Nobody lives in them – no way.
Nobody lives in them; there is no way that they are occupied.

Slang can be used to write realistic dialogue. Slang can help to make the speech sound authentic.

Whaddo you reckon?
What do you think about that?

Formal and Informal

Annotate these sentences to show any informal features.
Rewrite them in a formal style.

(Informal features: vocabulary, question tags, contractions, slang, ellipsis)

"Whaddo you reckon, Catlegs?"

"Take a look at that Fatcat, will you?"

"You'n me together."

"Act kinda cool. Cool, right. That's us."

"Uh, oh, they're coming. Gotta get out of here. Away from them."

"You and me in a Jag. Vroom vroom."

"We gotta go down right now."

"But we got each other, right?"

Through the windows

The other cat

"Take a look at that Fatcat will you? I'm telling you that cat's a loser. Eats fancy mince, no kidding. Heaps of it. Right there at the window. Disgusting. And get that collar. What a joke!"

Car showroom

"You can come out now Whiskettes.

No worries. Hey, just take a look.

Vroom vroom. You and me in a Jag. Vroom vroom.

Huh, but they've only got red...and we want green."

Chinese restaurant

"See they cook stuff right on the table in front of you.

Stacks of meat and things.

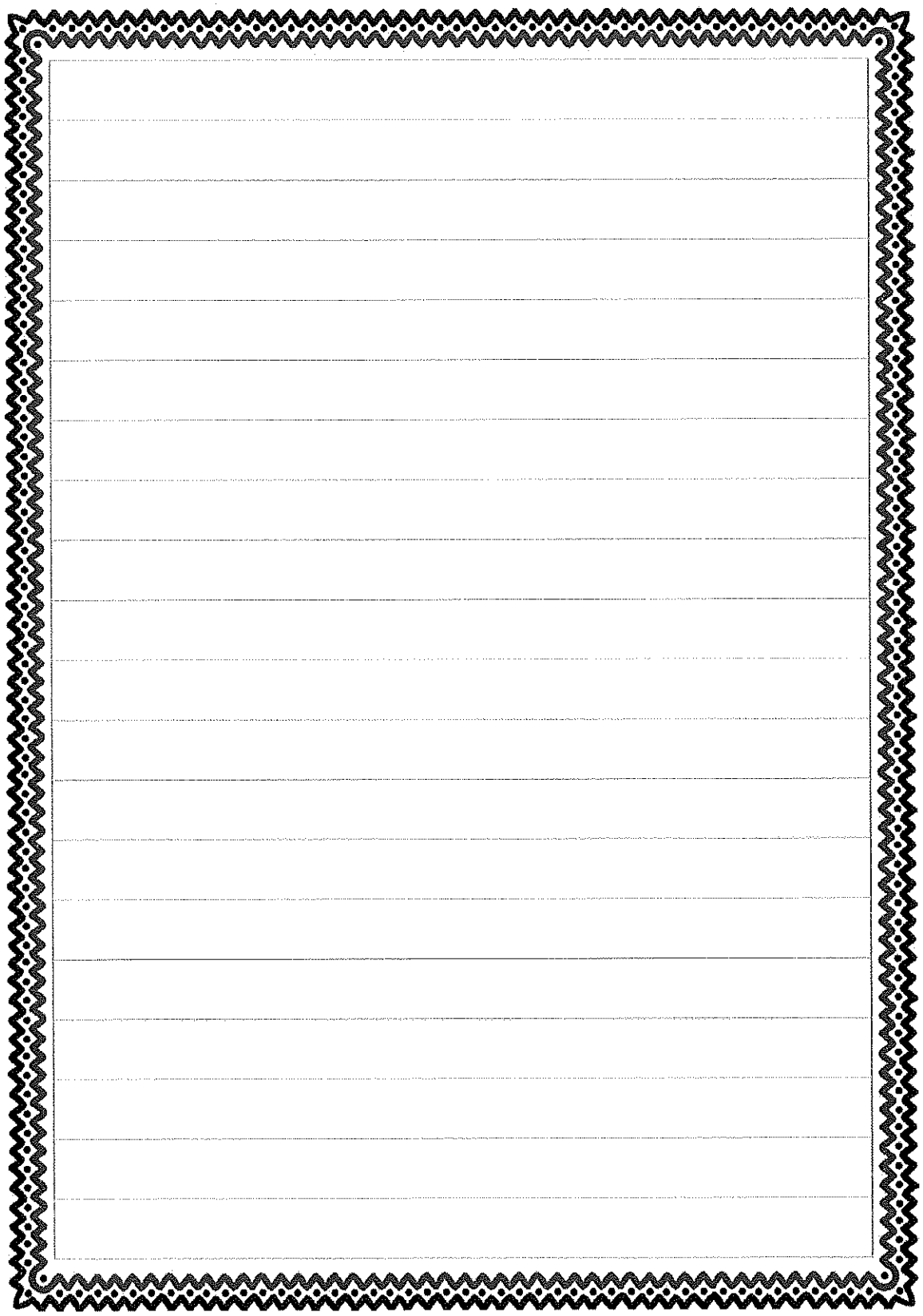
But don't get ideas, Hungry.

No pets allowed, places like this."

Windows

Through the Window

Write your speech for Shane here.



Formal and Informal – Possible Answers

Annotate these sentences to show any informal features.
Rewrite them in a formal style.

(Informal features: vocabulary, question tags, contractions, slang, ellipsis)

"Whaddo you reckon, Catlegs?"

What is your opinion, Catlegs?

"Take a look at that Fatcat, will you?"

Please look at the fat cat in the window.

"You'n me together."

We are united.

"Act kinda cool. Cool, right. That's us."

Behave causally as that would be our typical style.

"Uh, oh, they're coming. Gotta get out of here. Away from them."

I am concerned that the hostile group are approaching and believe that it is important for us to depart rapidly.

"You and me in a Jag. Vroom vroom."

I am imagining driving in a Jaguar car with you. I think we would enjoy the sound and power of the engine.

"We gotta go down right now."

We have to go down immediately.

"But we got each other, right?"

We are able to look after one another.

What to do today

IMPORTANT Parent or Carer – Read this page with your child and check that you are happy with what they have to do and any weblinks or use of internet.

1. Track emotions through a story

- Look carefully at the *Emotions Graph – Example.*
- Listen to the story again and make an *Emotions Graph for Shane* https://www.youtube.com/watch?v=rjzP18bsSdQ .
  Try to find 4 or 5 key events and imagine his emotions.
- Now make an *Emotions Graph for the cat*. Compare your two graphs. Are there points when they both have similar emotions? When are their emotions most different?

2. Read two 'cat-narrator' extracts

- Read *Cat Speaks 1 and 2*.
- Complete *Cat Speaks* questions.

3. Now for some writing

- Write *Way Home* as though it is told by the cat.
- Use your *Emotions Graph* and some of the ideas that you saw in *Cat Speaks 1 and 2*.

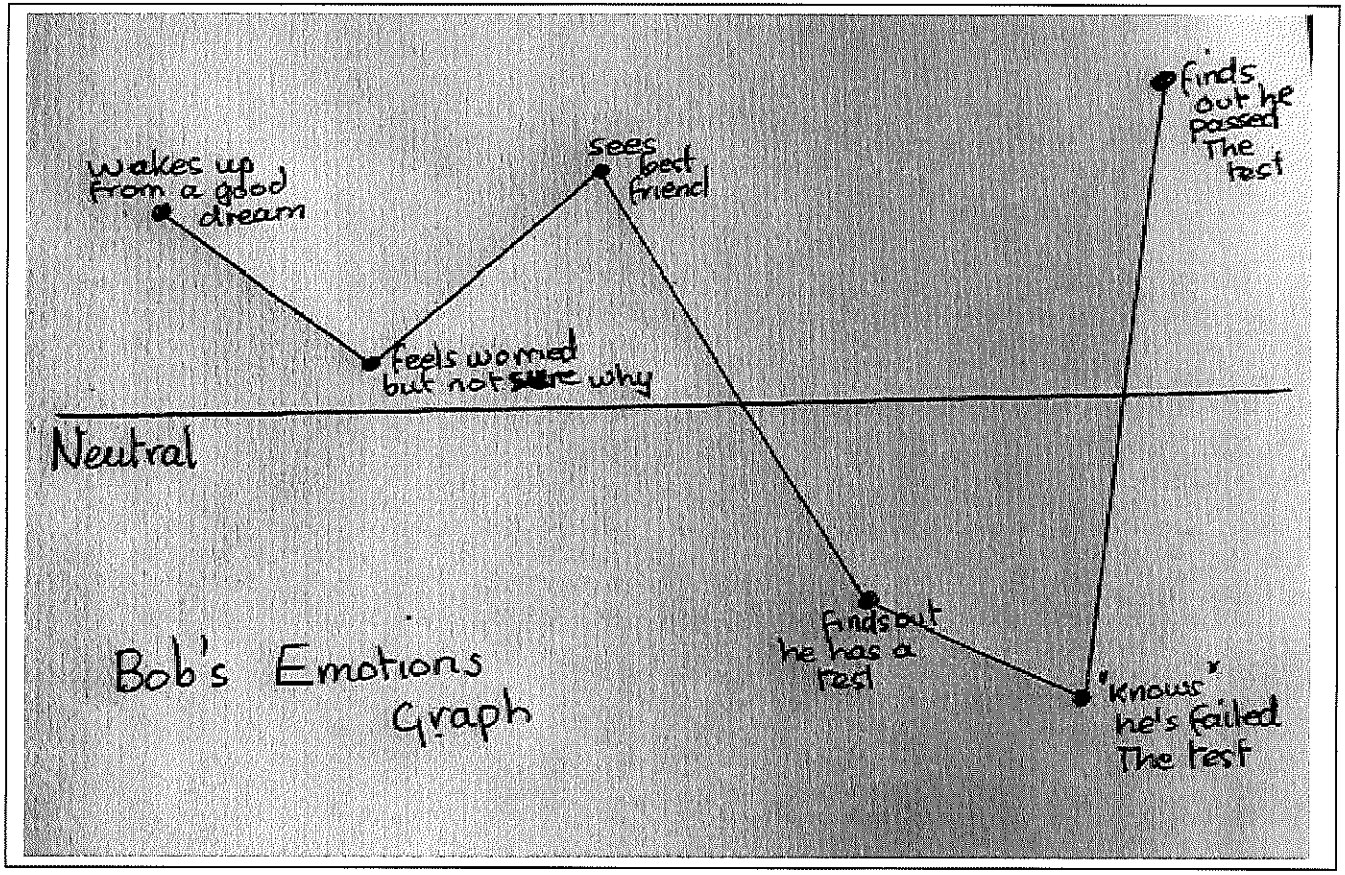
Well done. Show your writing to a grown-up. Explain to them how you have used your Emptions Graph and the ideas in Cat Speaks 1 and 2.

Try the Fun-Time Extras

Write a diary for a pet that you know well. Try to imagine how they would see and understand the activities of the humans around them.

Emotions Graph – Example

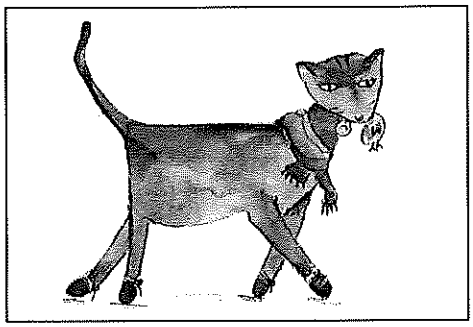
Above the neutral line for positive emotion, below for negative. Give short reason.



Emotions Graph - Shane

Emotions Graph - Cat

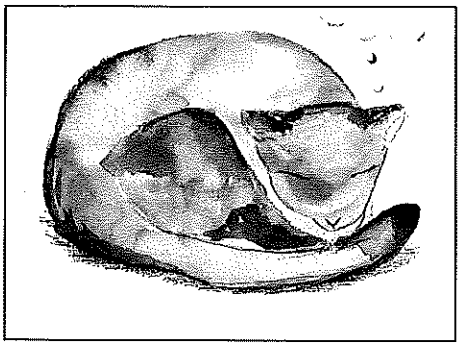
Cat Speaks 1



Okay, okay. So hang me. I killed the bird. For pity's sake, I'm a cat. It's practically my job to go creeping round the garden after sweet little eensy-weensy birdy-pies that can hardly fly from one hedge to another. So what am I supposed to do when one of the poor feathery little flutterballs just about throws itself into my mouth? I mean, it practically landed on my paws. It could have hurt me. Okay, okay. So I biffed it. Is that any reason for Ellie to cry in my fur so hard I almost drown, and squeeze me so hard I almost choke? 'Oh, Tuffy!' she says, all sniffles and red eyes and piles of wet tissues. 'Oh, Tuffy. How could you do that?' How could I do that? I'm a cat. How did I know there was going to be such a giant great fuss, with Ellie's mother rushing off to fetch sheets of old newspaper, and Ellie's father filling a bucket with soapy water?

By Anne Fine. The Diary of a Killer Cat

Cat Speaks 2



I AM A cat. As yet, I have no name. There's a famous cat in our country who once made this very statement.

I have no clue how great that cat was, but at least when it comes to having a name I got there first. Whether I like my name is another matter, since it glaringly doesn't fit my gender, me being male and all. I was given it about five years ago – around the time I came of age.

Back then, I used to sleep on the bonnet of a silver van in the parking lot of an apartment building. Why there? Because no one would ever shoo me away. Human beings are basically huge monkeys that walk upright, but they can be pretty full of themselves. They leave their cars exposed to the elements, but a few paw prints on the paintwork and they go *ballistic.*

At any rate, the bonnet of that silver van was my favourite place to sleep. Even in winter, the sun made it all warm and toasty, the perfect spot for a daytime nap.

I stayed there until spring arrived, which meant I'd survived one whole cycle of seasons. One day, I was lying curled up, having a snooze, when I suddenly sensed a warm, intense gaze upon me. I unglued my eyelids a touch and saw a tall, lanky young man, eyes narrowed, staring down at me as I lay prone.

'Do you always sleep there?' he asked.

I suppose so. Do you have a problem with that?

'You're really cute, do you know that?'

So they tell me.

'Is it okay if I stroke you?'

No, thanks. I batted one front paw at him in what I hoped to be a gently threatening way.

'Aren't you a stingy one,' the man said, pulling a face.

Well, how would you like it if you were sleeping and somebody came by and rubbed you all over?

By Hiro Arikawa. The Travelling Cat Chronicles

Cat Speaks – Questions

How would you sum up the character of these cats?

Diary of a Killer Cat	The Travelling Cat Chronicles

How are these cats similar?

How are they different?

What do you think is the most memorable thing that each of these cats say?

Diary of a Killer Cat	The Travelling Cat Chronicles

What do you think their owners might say about these cats?

Diary of a Killer Cat	The Travelling Cat Chronicles

Way Home – the cat's story

Write Way Home as though it is told by the cat.

What to do today

IMPORTANT Parent or Carer – Read this page with your child and check that you are happy with what they have to do and any weblinks or use of internet.

1. Make notes about a character

- Make notes on *Shane* that show what you know about this character. You could include questions that you have about him as well.
- Listen to the story again https://www.youtube.com/watch?v=rjzP18bsSdQ and add to your notes as you do.

2. Look closely at an illustration

- Look at the *Last Page* of the book.
- Read *Picture Prompts* and think about your answers.
- Choose five of your answers to write as sentences.
- Complete *Objects*. Imagine how Shane got each of these objects and why it might be important to him.

3. Imagine interviewing Shane

- Think of 5-10 questions that you would like to ask Shane.
- Write these down and then imagine his answers to each of them. Write his answers, trying to make them sound like the way he talks in the book.

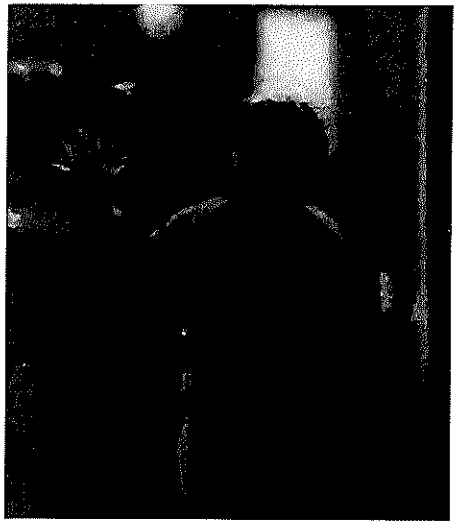
Well done. Explain your ideas about the objects to a grown-up. Show them the answers that you have imagined for Shane too.

Try these Fun-Time Extras

What would you choose if you could have seven objects around you? Draw or photograph the objects and write about why they are important to you.

Interview some other people to find what objects they would choose and why.

Shane



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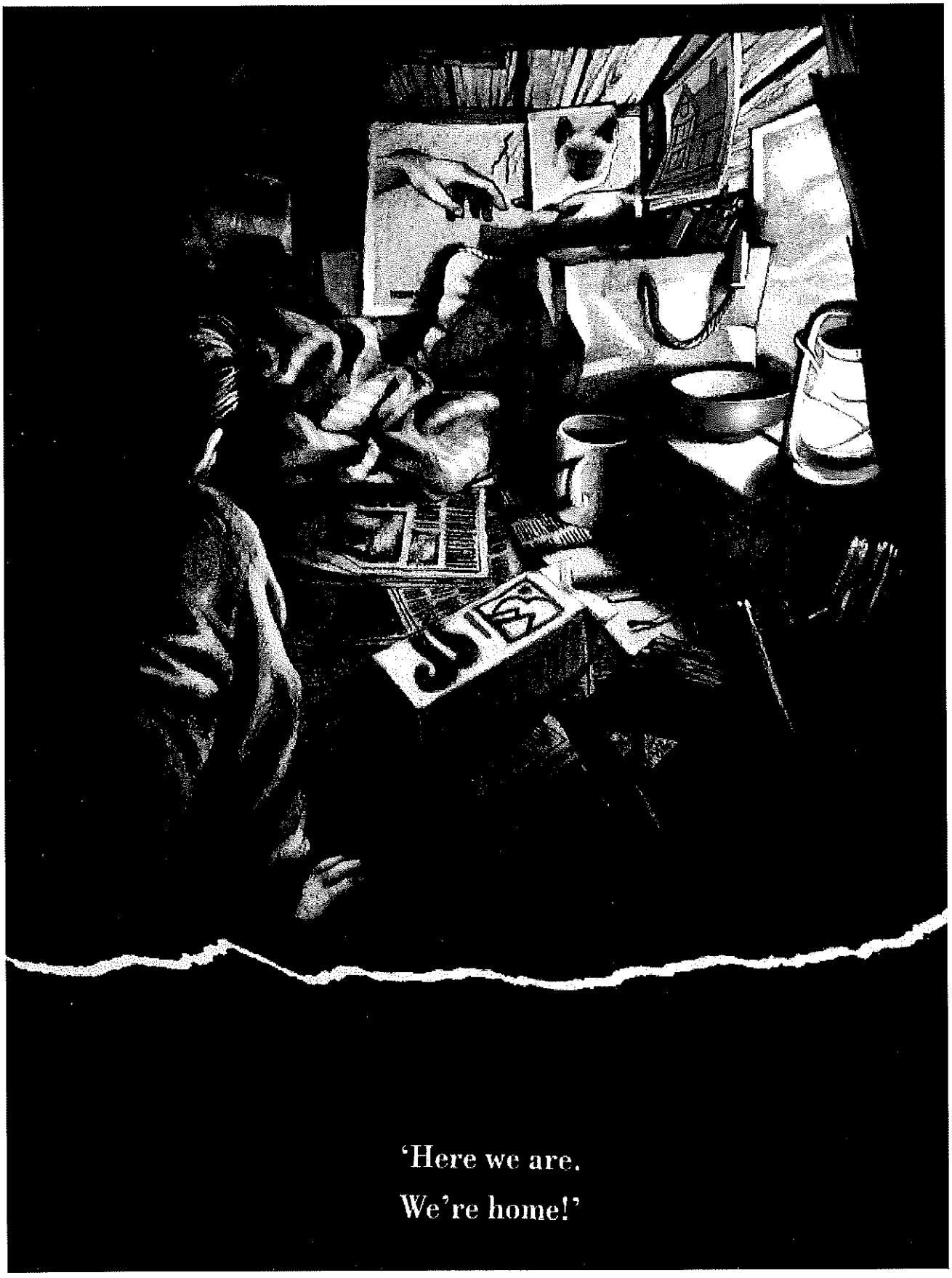
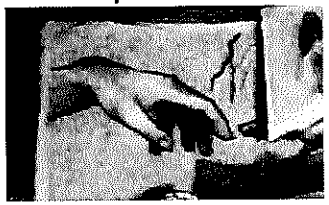
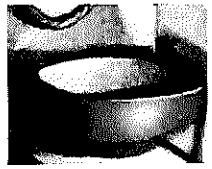


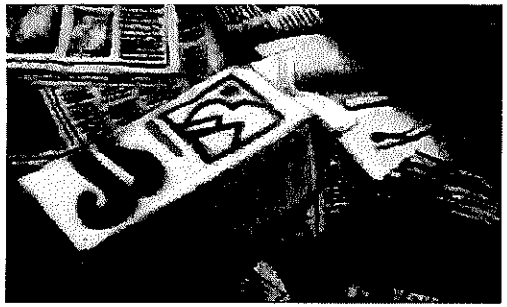
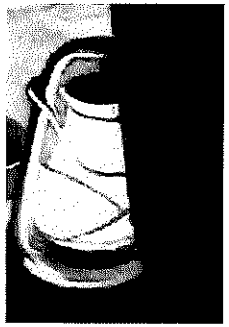
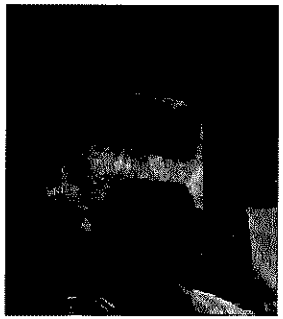
Picture Prompts

1. What was your first reaction to this artwork? Why do you think you had the reaction?
2. Describe the lines in this artwork
3. Describe the colours in the artwork
4. Which area of the artwork is most important? Why?
5. What adjectives would you use to describe this artwork?
6. What verbs would you use to describe this artwork?
7. If you could ask the artist a question, what would you ask him/her?
8. What emotions do you notice in the artwork?
9. Who do you know that would really like this artwork? Why would they like it?
10. Who do you know that would really dislike this artwork? Why would they dislike it?
11. If this artwork were music, what would it sound like?

from https://artclasscurator.com/82-questions-to-ask-about-a-work-of-art/

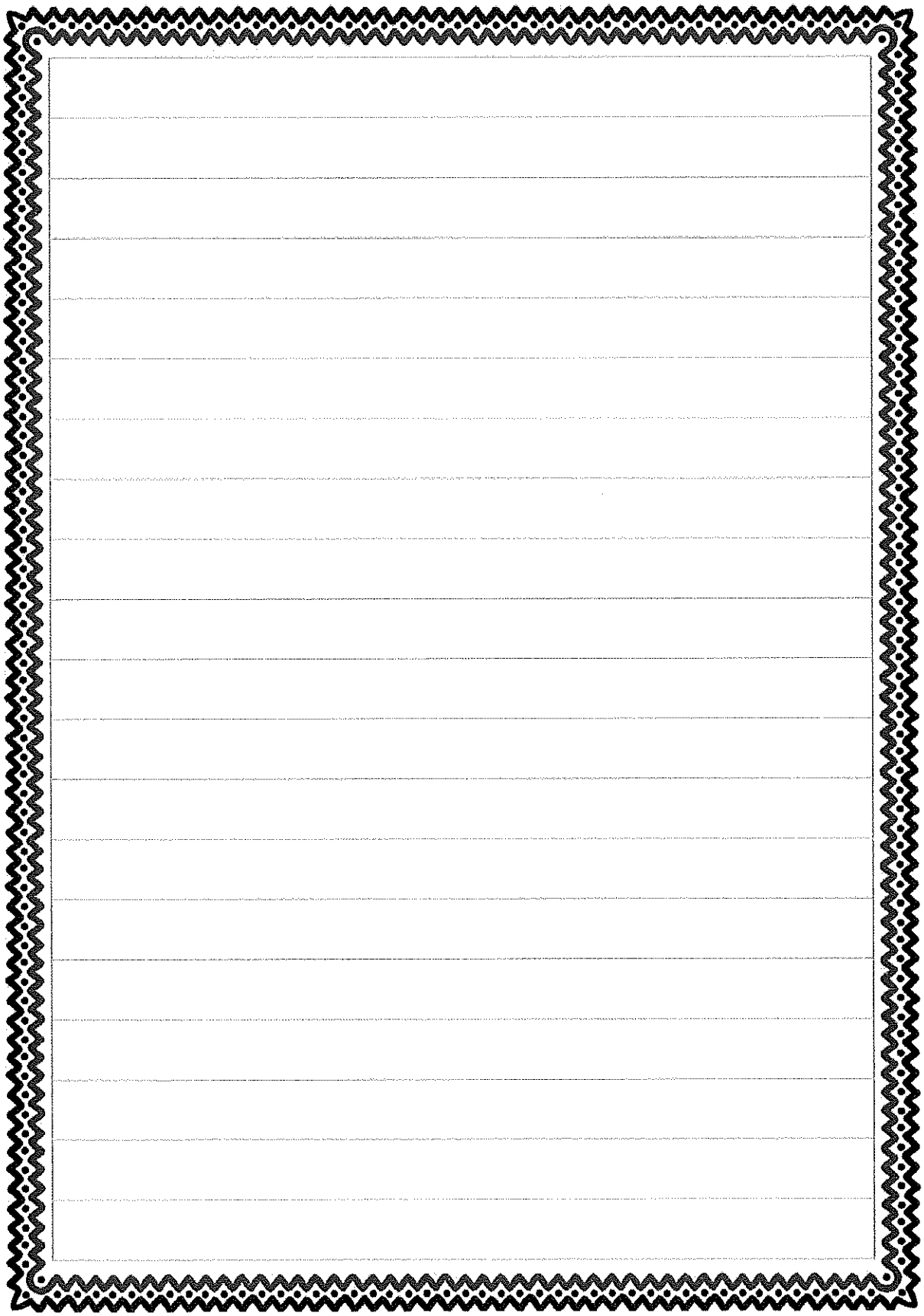
Objects

Object	How he may have got it	Why it might be important
Picture of a cat		
Picture of a house		
Michelangelo – Creation of Adam picture 		
Chinese bowl 		

Milk carton 		
Hurricane Lamp 		
Picture of a green Jaguar 		

Questions for Shane

Write down 5-10 questions that you would like to ask Shane.



Shane's Answers

Imagine Shane's answers and write them here.

What to do today

IMPORTANT Parent or Carer – Read this page with your child and check that you are happy with what they have to do and any weblinks or use of internet.

1. Find out about a true story

- Watch the trailer for *A Street Cat named Bob*.
  https://www.youtube.com/watch?v=s13Fnj8LzD8
  * This film is rated 12 and the trailer and extract (included in the resources from the associated book) make passing reference to substance addiction – please watch / read first to check suitability specifically for your child.
- How does this true story seem similar to Way Home? How does it feel different? Try to think of three different ways.
- Read the *Extract* and answer the *Questions*.

2. Learn about homelessness in Britain

- Visit this Newsround website about homelessness. Read all the information and take notes about the five things that most stand out to you. https://www.bbc.co.uk/newsround/50631620
- Watch Natasha's story on this website. How is it similar to Way Home? How is it different?
- Make a poster that shows the five things that you chose as most important from this website. What do you want to tell people about homelessness?

3. Read poems about home

- Read the two poems about home: *A Home Song* and *There's No Place Like Home*. Read each twice: once in your head and once out loud.
- Choose your favourite poem and practise reading it out loud. Use the *Top Tips* to help you.

Well done. Talk to a grown-up about three things you have learned today.

Try the Fun-Time Extra

Write a poem about the place you feel most at home.

Extract

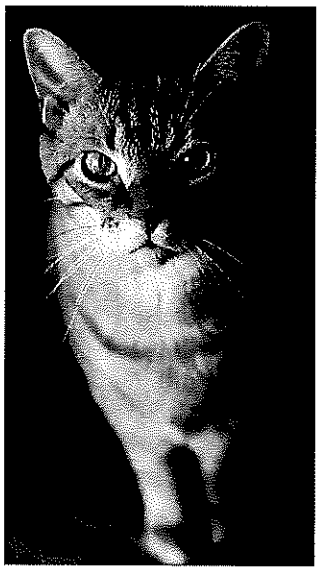
There's a famous quote I read somewhere. It says we are all given second chances every day of our lives. They are there for the taking, it's just that we don't usually take them.

I spent a big chunk of my life proving that quote. I was given a lot of opportunities, sometimes on a daily basis. For a long time, I failed to take any of them, but then, in the early spring of 2007, that finally began to change. It was then that I befriended Bob. Looking back on it, something tells me it might have been his second chance too.

I first encountered him on a gloomy, Thursday evening in March. London hadn't quite shaken off the winter and it was still bitingly cold on the streets, especially when the winds blew in off the Thames. There had even been a hint of frost in the air that night, which was why I'd arrived back at my new, sheltered accommodation in Tottenham, north London, a little earlier than usual after a day busking around Covent Garden.

As normal, I had my black guitar case and rucksack slung over my shoulders but this evening I also had my closest friend, Belle, with me. We'd gone out together years ago but were just mates now. We were going to eat a cheap takeaway curry and watch a movie on the small black and white television set I'd managed to find in a charity shop round the corner.

As usual, the lift in the apartment block wasn't working so we headed for the first flight of stairs, resigned to making the long trudge up to the fifth floor.



The strip lighting in the hallway was broken and part of the ground floor was swathed in darkness, but as we made our way to the stairwell, I couldn't help noticing a pair of glowing eyes in the gloom. When I heard a gentle, slightly plaintive meowing I realised what it was.

Edging closer, in the half-light I could see a ginger cat curled up on a doormat outside one of the ground-floor flats in the corridor that led off the hallway.

I'd grown up with cats and had always had a bit of a soft spot for them. As I moved in and got a good look I could tell he was a tom, a male.

I hadn't seen him around the flats before, but even in the darkness I could tell there was something about him, I could already tell that he had something of a personality.

He wasn't in the slightest bit nervous, in fact, completely the opposite. There was a quiet, unflappable confidence about him. He looked like he was very much at home here in the shadows and to judge by the way he was fixing me with a steady, curious, intelligent stare, I was the one who was straying into his territory. It was as if he was saying: 'So who are you and what brings you here?'

I couldn't resist kneeling down and introducing myself. 'Hello, mate. I've not seen you before, do you live here?' I said. He just looked at me with the same studious, slightly aloof expression, as if he was still weighing me up.

I decided to stroke his neck, partly to make friends but partly to see if he was wearing a collar or any form of identification. It was hard to tell in the dark, but I realised there was nothing, which immediately suggested to me that he was a stray. London had more than its fair share of those.

He seemed to be enjoying the affection, and began brushing himself lightly against me. As I petted him a little more, I could feel that his coat was in poor condition, with uneven bald patches here and there. He was clearly in need of a good meal. From the way he was rubbing against me, he was also in need of a bit of TLC.

'Poor chap, I think he's a stray. He's not got a collar and he's really thin,' I said, looking up at Belle, who was waiting patiently by the foot of the stairs.

She knew I had a weakness for cats.

'No, James, you can't have him,' she said, nodding towards the door of the flat that the cat was sitting outside. 'He can't have just wandered in here and settled on this spot, he must belong to whoever lives there. Probably waiting for them to come home and let him in.'

Reluctantly, I agreed with her. I couldn't just pick up a cat and take him home with me, even if all the signs pointed to the fact it was homeless. I'd barely moved into this place myself and was still trying to sort out my flat. What if it did belong to the person living in that flat? They weren't going to take too kindly to someone carrying off their pet, were they?

Besides, the last thing I needed right now was the extra responsibility of a cat. I was a failed musician and recovering drug addict living a hand-to-mouth existence in sheltered accommodation. Taking responsibility for myself was hard enough.

James Bowen A Street Cat Named Bob: How one man and his cat found hope on the streets

Questions

1. Where does James first meet the cat?

2. What tells him that the cat might be a stray?

3. Why does James think about taking the cat?

4. Why does he decide that he shouldn't take the cat?

5. How would you describe the mood of this extract?

6. What do you think might happen next?

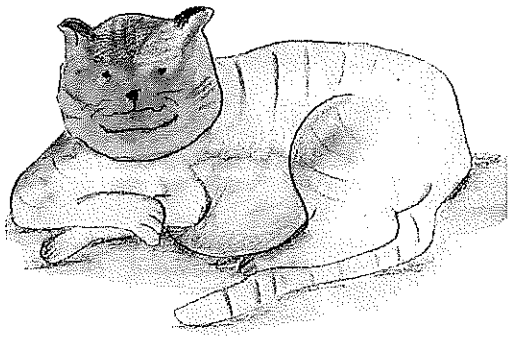
A Home Song

I read within a poet's book
A word that starred the page:
"Stone walls do not a prison make,
Nor iron bars a cage!"

Yes, that is true; and something more
You'll find, where'er you roam,
That marble floors and gilded walls
Can never make a home.

But every house where Love abides,
And Friendship is a guest,
Is surely home, and home-sweet-home:
For there the heart can rest.

by Henry Van Dyke



There's No Place like Home

Mid pleasures and palaces though we may roam,

Be it ever so humble, there's no place like home;

A charm from the sky seems to hallow us there,

Which, seek through the world, is ne'er met with elsewhere.

Home, home, sweet, sweet home!

There's no place like home, oh, there's no place like home!

To thee I'll return, overburdened with care;

The heart's dearest solace will smile on me there;

No more from that cottage again will I roam;

Be it ever so humble, there's no place like home.

Home, home, sweet, sweet, home!

There's no place like home, oh, there's no place like home!

by John Howard Payne

Top tips for reading a poem aloud

- Work on the **tricky words.** Find out what they mean and how they are said. Practise saying them.
- Look for the **full stops.** Make sentences flow to the full stop, even when there's a new line.
- **Slow down.** Speak slowly when you're reading a poem, so that others can hear the words.
- **Project your voice**. Imagine someone on the other side of the room and speak to them.
- **Practise**. Read and read and read your poem, so that you get better each time.

Arithmetic

1. 2,592 ÷ 9

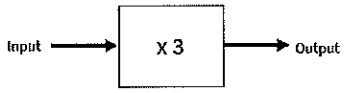
2. 476 + 36 ÷ 3

3. $\frac{2}{5}$ ÷ 9

4. 5.4 x 3.2

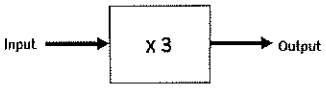
Practice: Find a Rule (1 and 2 steps)

5. Recap: Explain how to use this function machine.



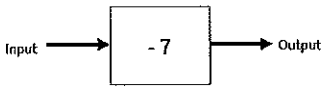
6. What are the outputs to this function machine if these are the inputs?

a. 7 b. 9 c. 100



7. What are the inputs to this function machine if these are the outputs?

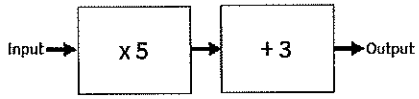
a. 5 b. 20 c. -2



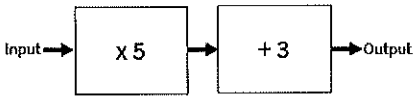
8. Work out the missing function.

9. What are the outputs if these are the inputs?

a. 2
b. 30
c. 100

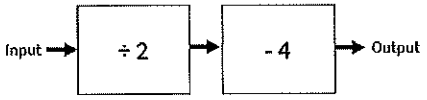


10. Explain how to use a function machine with two functions.



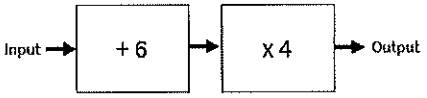
11. What are the inputs if these are the outputs?

a. 6
b. 20
c. 0.2



12. What are the outputs if these are the inputs?

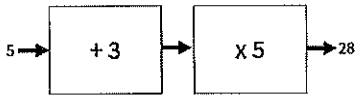
a. 4
b. -3
c. $\frac{1}{2}$



13. Chelsy is using the function machine.

Is Chelsy correct?

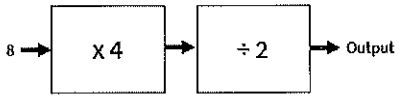
Explain.



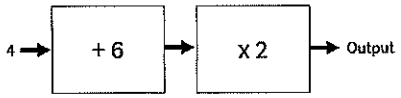
Challenge

14. Circle the odd one out and explain your answer.

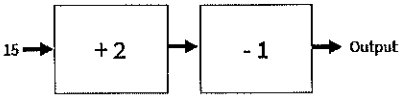
a.



b.



c.



You might want to talk to an adult

Spot the mistake

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Answers

Q no.	Question	Answer
1	2,592 ÷ 9	288
2	476 + 36 ÷ 3	488
3	$\frac{2}{5} \div 9$	$\frac{2}{45}$
4	5.4 x 3.2	17.28
5	Explain how to use this function machine.	To use the function machine with the function 'x 3' you take your number (input) and multiply it by 3 to give the answer (output).
6	What are the outputs to this function machine if these are the inputs?	a. 21, b. 27, c. 300
7	What are the inputs to this function machine if these are the outputs?	a. 12, b. 27, c. 5
8	Work out the missing function.	÷ 5
9	What are the outputs to this function machine if these are the inputs?	a. 13, b. 153, c. 503
10	Explain how to use a function machine with two functions.	To use a function machine with two function, first take your input number, complete the first function then complete the second function. This will provide you with an answer (output). For example, input = 1 1 x 5 = 5 5 + 3 = 8 Output = 8
11	What are the inputs to this function machine if these are the outputs?	a. 20, b. 48, c. 8.4
12	What are the outputs to this function machine if these are the inputs?	a. 40, b. 12, c. 26
13	Is Chelsy correct? Explain.	Chelsy has multiplied her number by five before adding 3. By confusing the order of her calculation, Chelsy has found the wrong answer (output). The correct answer is 40.
14	Circle the odd one out and explain your answer.	Each answer could be the odd one out, the pupil must make their decision clear in their explanation. a. output = 16 b. output = 20 c. output = 16 Possible answers could be: a is the odd one out as it is the only calculation involving division. b is the odd one out as the output is 20, not 16 like the other calculations. c is the odd one out as it does not involve multiplication or division.

Arithmetic

1. 5,550 ÷ 6

2. (37 + 19) x 2

3. $\frac{2}{9} \div 7$

4. 1.1 x 5.3

Practice: Forming and Solving One Step Equations

5. Recap: Explain what the = sign means.

6. Using y to represent the missing number, write this as an algebraic equation.

I think of a number. I subtract 5. My answer is 20.

7. Write this as an algebraic equation.

I think of a number. I multiply it by 2 and add 3. My answer is 5.

8. Write this as an algebraic equation.

I think of a number. I divide it by 10 and subtract 2. My answer is 6.

9. Solve the equation to find y.

$y + 7 = 11$

10. Explain how to find y in this equation.

$y - 5 = 20$

11. Solve the equation to find y.

$5y = 25$

12. Solve the equation to find y.

$22 = 30 - y$

13. Cindy is trying to find y in this expression. $\frac{y}{2} + 7 = 13$.
She thinks $y = 10$.
Explain her mistake.

Challenge

14. Complete the table below using the information given.

w	5w	5w - 8
8		
	10	
		67

You might want to talk to an adult

Spot the mistake

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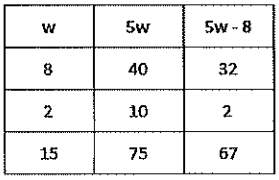
Answers

Q no.	Question	Answer
1	5,550 ÷ 6	925
2	(37 + 19) x 2	112
3	$\frac{2}{9} \div 7$	$\frac{2}{63}$
4	1.1 x 5.3	5.83
5	Explain what the = sign means.	The = sign does not mean 'the answer is'. It shows that the totals of each side of the symbol are equal.
6	I think of a number. I subtract 5. My answer is 20.	y – 5 = 20
7	I think of a number. I multiply it by 2 and add 3. My answer is 5.	2y + 3 = 5
8	I think of a number. I divide it by 10 and subtract 2. My answer is 6.	y/10 – 2 = 6
9	Solve the equation to find y.	y = 4
10	Explain how to find y in this equation.	With this question, the answer is not as important as the explanation the pupil provides. To solve the calculation, use the inverse. 20 + 5 = 25, therefore, 25 - 5 = 20. y = 25
11	Solve the equation to find y.	y = 5
12	Solve the equation to find y.	y = 8
13	Explain Cindy's mistake.	Cindy has added 13 and 7 then divided both by 2 instead of finding the inverse for each part of the expression. The correct answer is 12.
14	Complete the table below using the information given.	

w	5w	5w - 8
8	40	32
2	10	2
15	75	67

For more free resources and intervention support go to thirdspacelearning.com

Arithmetic

1. 4,592 ÷ 7

2. $5^3 - 52 \div 4$

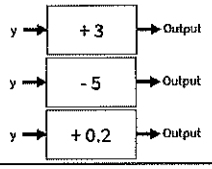
3. $\frac{4}{11} \div 5$

4. 4.7 x 7.4

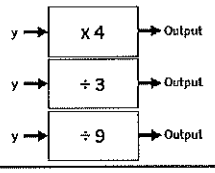
Practice: Forming Expressions

5. Recap: In maths, why are letters sometimes used instead of numbers? Why can this get confusing (think about the symbol for multiplication)?

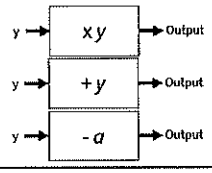
6. Write the expressions to match these function machines.



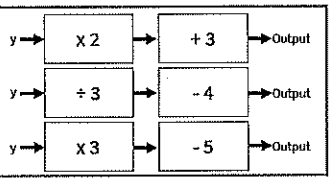
7. Write the expressions to match these function machines.



8. Write the expressions to match these function machines.

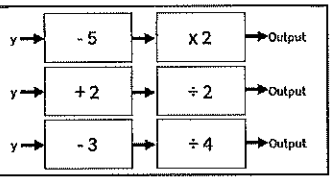


9. Write the expressions to match these function machines.

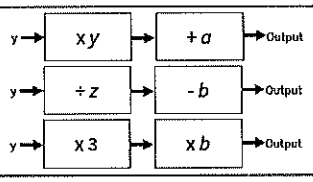


10. What does 'expression' mean in algebra?

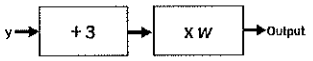
11. Write the expressions to match these two-step function machines.



12. Write the expressions to match these two-step function machines.



13. Lewis is forming an expression for the function machine.
He writes: y+3y x w
Is this correct?



Challenge

14. Create at least 3 different function machines with two functions that would form this expression.

y+3

You might want to talk to an adult

Spot the mistake

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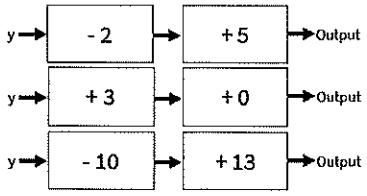
Answers

Q no.	Question	Answer
1	4,592 ÷ 7	656
2	$5^3 - 52 \div 4$	112
3	$\frac{4}{11} \div 5$	$\frac{4}{55}$
4	4.7 x 7.4	34.78
5	In maths, why are letters sometimes used instead of numbers?	Letters are used to generalise relationships between quantities. This eliminates the need to give individual specific examples containing actual values. This can be confusing as the letter x looks similar to the multiplication symbol.
6	Write the expressions to match these function machines.	y+3, y-5, y+0.2
7	Write the expressions to match these function machines.	4y, $\frac{y}{3}$, $\frac{y}{9}$
8	Write the expressions to match these function machines.	y^2, 2y, y-a
9	Write the expressions to match these two-step function machines.	2y+3, $\frac{y}{3}$ – 4, 3y - 5
10	What does 'expression' mean in algebra?	An expression is a statement that is written in algebraic form including any combination of letters, symbols and numbers.
11	Write the expressions to match these two-step function machines.	2(y-5) or (y-5)x2 or 2x(y-5) (y+2)/2 or (y+2)÷2 (y-3)/4 or (y-3)÷4
12	Write the expressions to match these two-step function machines.	y2+a $\frac{y}{z}$ – b 3by or 3yb
13	Is Lewis correct?	This is incorrect, he has written 3y which is the same as 3 x y, which is not what he has been asked to do. The correct answer is (y +3)w or w(y+3) or (y+3)xw or wx(y+3).
14	Create at least 3 different function machines with two functions that would form this expression. y+3	Possible answers include 

Arithmetic

1. 4,625 ÷ 5

2. 328 – 29 x 3

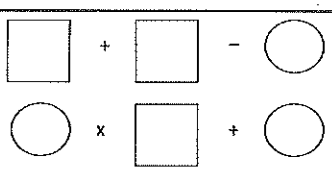
3. $\frac{3}{7} \div 2$

4. 2.1 x 4.5

Practice: Substitution and Formulae

5. Recap: Explain what 'substitution' means.

6. If square = 5 and circle = 3, work out these:



7. Substitute these values into the expressions to work them out. x = 3, y = 4, z = 5

a. x + y + z b. xy – 7 c. 3 + 2z

8. Substitute these values into the expressions to work them out. a = 10, b = 2, c = 6

a. abc b. $\frac{a}{b}$ + 13 c. c^2 – ab

9. A taxi driver charges £5 for a journey plus 25p for each mile. If c = total cost and m = number of miles, write the formula to represent this.

10. Explain what it means when two letters are next to each other in an equation.

For example, ab

11. With the formula from question 9, work out the cost of a 10-mile journey.

12. How long was the journey if it cost £8.75?

8.75 = 5 + 0.25m

13. Using the formula ab+c, Zeshan substitutes these values into the expression a = 2, b = 4, c = 7. He says the answer is 13. Explain Zeshan's mistake.

Challenge

14. a, b and c are two digit whole numbers above 2.

What numbers could a, b and c be?

ab - c = 45

You might want to talk to an adult

Spot the mistake

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Answers

Q no.	Question	Answer
1	4,625 ÷ 5	925
2	328 – 29 x 3	241
3	$\frac{3}{7} \div 2$	$\frac{3}{14}$
4	2.1 x 4.5	9.45
5	Explain what 'substitution' means.	A substitution is when you substitute a letter or symbol with a value. The same symbol or letter could have multiple values, depending on the substitution.
6	If [square] = 5 and [circle] = 3, work out these:	7, 18
7	Substitute these values into the expressions to work them out.	a. 12, b. 5, c. 13
8	Substitute these values into the expressions to work them out	a. 120, b. 18, c. 16
9	Write the formula to represent the information.	c = 5 + 0.25m
10	Explain what it means when two letters are next to each other in an equation.	When letters are next to each other in an equation, it means they are multiplied together. ab means a x b.
11	With the formula from question 9, work out the cost of a 10-mile journey.	£7.50
12	How long was the journey if it cost £8.75?	15 miles
13	Explain Zeshan's mistake.	Zeshan has added all the substitutions instead of following the expression. The correct answer is 15.
14	a, b and c are two digit whole numbers above 2. What numbers could a, b and c be? ab - c = 45	Accept substitutions that satisfy the expression. For example, a = 5, b = 11, c = 10 a = 3, b = 17, c = 6 a = 8, b = 7, c = 11

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Independent Recap

Algebra
Week 7

Year 6

THIRD SPACE LEARNING

Arithmetic

1. 2,592 ÷ 9

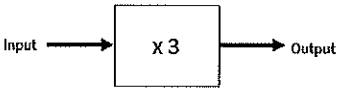
2. 476 + 36 ÷ 3

3. $\frac{2}{5}$ ÷ 9

4. 5.4 x 3.2

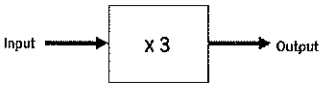
Practice: Find a Rule (1 and 2 steps)

5. Recap: Explain how to use this function machine.



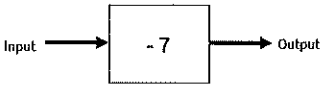
6. What are the outputs to this function machine if these are the inputs?

a. 7 b. 9 c. 100

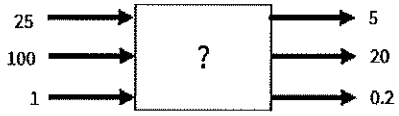


7. What are the inputs to this function machine if these are the outputs?

a. 5 b. 20 c. -2

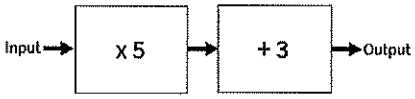


8. Work out the missing function.

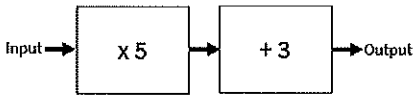


9. What are the outputs if these are the inputs?

a. 2
b. 30
c. 100

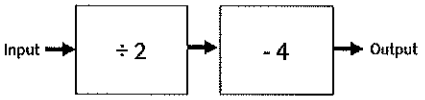


10. Explain how to use a function machine with two functions.



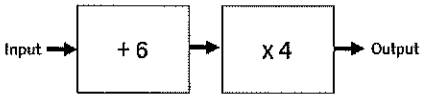
11. What are the inputs if these are the outputs?

a. 6
b. 20
c. 0.2



12. What are the outputs if these are the inputs?

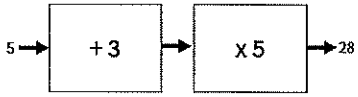
a. 4
b. -3
c. $\frac{1}{2}$



13. Chelsy is using the function machine.

Is Chelsy correct?

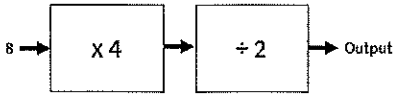
Explain.



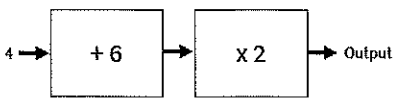
Challenge

14. Circle the odd one out and explain your answer.

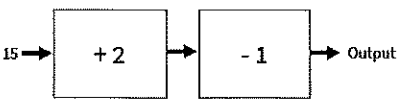
a.



b.



c.



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Spot the mistake

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Answers

Q no.	Question	Answer
1	2,592 ÷ 9	288
2	476 + 36 ÷ 3	488
3	$\frac{2}{5} \div 9$	$\frac{2}{45}$
4	5.4 x 3.2	17.28
5	Explain how to use this function machine.	To use the function machine with the function 'x 3' you take your number (input) and multiply it by 3 to give the answer (output).
6	What are the outputs to this function machine if these are the inputs?	a. 21, b. 27, c. 300
7	What are the inputs to this function machine if these are the outputs?	a. 12, b. 27, c. 5
8	Work out the missing function.	÷ 5
9	What are the outputs to this function machine if these are the inputs?	a. 13, b. 153, c. 503
10	Explain how to use a function machine with two functions.	To use a function machine with two function, first take your input number, complete the first function then complete the second function. This will provide you with an answer (output). For example, input = 1 1 x 5 = 5 5 + 3 = 8 Output = 8
11	What are the inputs to this function machine if these are the outputs?	a. 20, b. 48, c. 8.4
12	What are the outputs to this function machine if these are the inputs?	a. 40, b. 12, c. 26
13	Is Chelsy correct? Explain.	Chelsy has multiplied her number by five before adding 3. By confusing the order of her calculation, Chelsy has found the wrong answer (output). The correct answer is 40.
14	Circle the odd one out and explain your answer.	Each answer could be the odd one out, the pupil must make their decision clear in their explanation. a. output = 16 b. output = 20 c. output = 16 Possible answers could be: a is the odd one out as it is the only calculation involving division. b is the odd one out as the output is 20, not 16 like the other calculations. c is the odd one out as it does not involve multiplication or division.

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Arithmetic

1. 4,592 ÷ 7

2. $5^3 - 52 \div 4$

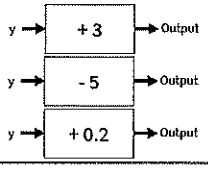
3. $\frac{4}{11} \div 5$

4. 4.7 x 7.4

Practice: Forming Expressions

5. Recap: In maths, why are letters sometimes used instead of numbers? Why can this get confusing (think about the symbol for multiplication)?

6. Write the expressions to match these function machines.



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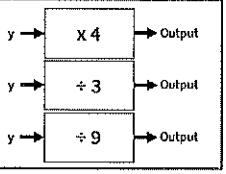

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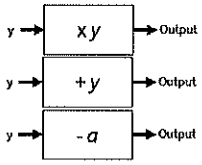

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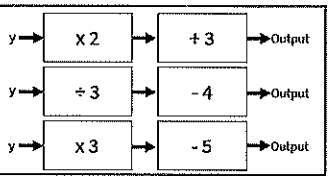
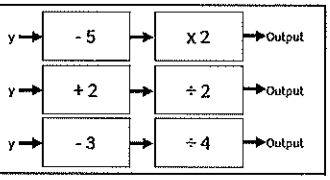


10. What does 'expression' mean in algebra?

11. Write the expressions to match these two-step function machines.



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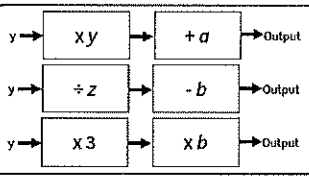

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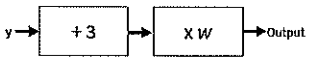
Is this correct?



Challenge

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y+3

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5	In maths, why are letters sometimes used instead of numbers?	Letters are used to generalise relationships between quantities. This eliminates the need to give individual specific examples containing actual values. This can be confusing as the letter x looks similar to the multiplication symbol.
6	Write the expressions to match these function machines.	y+3, y-5, y+0.2
7	Write the expressions to match these function machines.	$4y$, $\frac{y}{3}$, $\frac{y}{9}$
8	Write the expressions to match these function machines.	y^2, 2y, y-a
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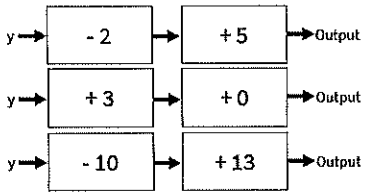
13	Is Lewis correct?	This is incorrect, he has written 3y which is the same as 3 x y, which is not what he has been asked to do. The correct answer is (y +3)w or w(y+3) or (y+3)xw or wx(y+3).
14	Create at least 3 different function machines with two functions that would form this expression. y+3	Possible answers include 

Arithmetic

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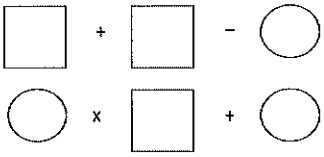

7. Substitute these values into the expressions to work them out. x = 3, y = 4, z = 5

a. x + y + z b. xy – 7 c. 3 + 2z

8. Substitute these values into the expressions to work them out. a = 10, b = 2, c = 6

a. abc b. $\frac{a}{b}$ + 13 c. c^2 – ab

9. A taxi driver charges £5 for a journey plus 25p for each mile. If c = total cost and m = number of miles, write the formula to represent this.

10. Explain what it means when two letters are next to each other in an equation.

For example, ab

11. With the formula from question 9, work out the cost of a 10-mile journey.

12. How long was the journey if it cost £8.75?

8.75 = 5 + 0.25m

13. Using the formula ab+c, Zeshan substitutes these values into the expression a = 2, b = 4, c = 7. He says the answer is 13. Explain Zeshan's mistake.

Challenge

14. a, b and c are two digit whole numbers above 2.

What numbers could a, b and c be?

ab - c = 45

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6	If [square] = 5 and [circle] = 3, work out these:	7, 18
7	Substitute these values into the expressions to work them out.	a. 12, b. 5, c. 13
8	Substitute these values into the expressions to work them out	a. 120, b. 18, c. 16
9	Write the formula to represent the information.	c = 5 + 0.25m
10	Explain what it means when two letters are next to each other in an equation.	When letters are next to each other in an equation, it means they are multiplied together. ab means a x b.
11	With the formula from question 9, work out the cost of a 10-mile journey.	£7.50
12	How long was the journey if it cost £8.75?	15 miles
13	Explain Zeshan's mistake.	Zeshan has added all the substitutions instead of following the expression. The correct answer is 15.
14	a, b and c are two digit whole numbers above 2. What numbers could a, b and c be? ab - c = 45	Accept substitutions that satisfy the expression. For example, a = 5, b = 11, c = 10 a = 3, b = 17, c = 6 a = 8, b = 7, c = 11

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Arithmetic

1. 5,550 ÷ 6

2. (37 + 19) x 2

3. $\frac{2}{9} \div 7$

4. 1.1 x 5.3

Practice: Forming and Solving One Step Equations

5. Recap: Explain what the = sign means.

6. Using y to represent the missing number, write this as an algebraic equation.

I think of a number. I subtract 5. My answer is 20.

7. Write this as an algebraic equation.

I think of a number. I multiply it by 2 and add 3. My answer is 5.

8. Write this as an algebraic equation.

I think of a number. I divide it by 10 and subtract 2. My answer is 6.

9. Solve the equation to find y.

$y + 7 = 11$

10. Explain how to find y in this equation.

$y - 5 = 20$

11. Solve the equation to find y.

$5y = 25$

12. Solve the equation to find y.

$22 = 30 - y$

13. Cindy is trying to find y in this expression. $\frac{y}{2} + 7 = 13$.
She thinks y = 10.
Explain her mistake.

Challenge

14. Complete the table below using the information given.

w	5w	5w - 8
8		
	10	
		67

You might want to talk to an adult

Spot the mistake

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Answers

Q no.	Question	Answer
1	5,550 ÷ 6	925
2	(37 + 19) x 2	112
3	$\frac{2}{9} \div 7$	$\frac{2}{63}$
4	1.1 x 5.3	5.83
5	Explain what the = sign means.	The = sign does not mean 'the answer is'. It shows that the totals of each side of the symbol are equal.
6	I think of a number. I subtract 5. My answer is 20.	y – 5 = 20
7	I think of a number. I multiply it by 2 and add 3. My answer is 5.	2y + 3 = 5
8	I think of a number. I divide it by 10 and subtract 2. My answer is 6.	y/10 – 2 = 6
9	Solve the equation to find y.	y = 4
10	Explain how to find y in this equation.	With this question, the answer is not as important as the explanation the pupil provides. To solve the calculation, use the inverse. 20 + 5 = 25, therefore, 25 - 5 = 20. y = 25
11	Solve the equation to find y.	y = 5
12	Solve the equation to find y.	y = 8
13	Explain Cindy's mistake.	Cindy has added 13 and 7 then divided both by 2 instead of finding the inverse for each part of the expression. The correct answer is 12.
14	Complete the table below using the information given.	<table><tr><th>w</th><th>5w</th><th>5w - 8</th></tr><tr><td>8</td><td>40</td><td>32</td></tr><tr><td>2</td><td>10</td><td>2</td></tr><tr><td>15</td><td>75</td><td>67</td></tr></table>

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