

A Tale of Slavery

▶ The character Anansi is a spider who features in traditional tales, first told in Africa hundreds of years ago. Every culture around the world has folk tales like this – old stories passed from person to person and tribe to tribe, long before people learned to write. Anansi stories are now known in many countries, especially where there are communities with African origins. It is sad to think, however, that these stories have travelled across the world as a result of the shameful practice of slavery. People were taken from West Africa to work as slaves on farms and plantations on the other side of the Atlantic Ocean; the trade was at its height around three hundred years ago.

At that time, European nations were trying to expand their empires and take control of lands far away. Large, wooden sailing ships headed east, across the Atlantic, to the islands of the Caribbean and to the huge continent of America. The sea-faring nations of Spain, Portugal, England, France and Holland all wanted to conquer the best territory in order to increase their power and wealth. As European explorers discovered new places, settlers followed, hoping to make their fortunes by trading goods to and from their home countries.

Farms were developed to grow crops that could be sold around the world for great profit. The landowners needed many people to help farm their lands as these were large plantations that required huge numbers of workers. Instead of paying workers wages, they bought slaves who were made to work for nothing, receiving only food and basic accommodation in return. These slaves were considered the property of the landowners and had no say over their lives.

The slaves came from Africa. People were forcibly taken from their villages and kept for a while as prisoners in slave castles along the coast of West Africa. When a slave ship was ready to sail, the slaves were bundled into the dark hold below the deck of the ship and kept in awful cramped, dirty conditions. The ships sailed over 5,000 miles across the ocean – a journey that would take six to eight weeks. Hundreds of men, women and children were jammed into a tiny space and the lack of food, fresh water and poor hygiene meant that

► CONTINUED FROM PAGE 1

disease spread easily. At least a tenth of the slaves died during the crossing. This trade continued for several hundred years until it was made illegal.

The Anansi stories were originally told by the Ashanti people who lived in the region now known as Ghana, in Africa. The tales were not written down but were passed down orally from generation to generation. They spread across much of West Africa, each place developing its own version. When slaves were captured and taken from these regions, the stories travelled with them. The slaves who survived their horrific journey across the ocean found themselves living and working far from their home in Africa, but it was natural that they continued to tell the stories they had learned during their childhood.

The central character of these stories is the spider, Anansi, who is full of mischief and gets up to all kinds of tricks. He is a god-like character who can influence the lives of humans. Most of the stories about him are short, funny tales of how he deceives others to get what he wants. While he doesn't sound like a typical hero, his antics usually result in him overcoming a more powerful foe, succeeding against the odds. The stories show how intelligence and quick-thinking can overcome problems more effectively than brute force.

When these stories were finally written down, they were still being told in a 'patois' – a form of English spoken by Jamaicans, using words and phrases from West African languages. It can be difficult to make sense of the stories in this early written form but some of the most popular tales have been rewritten to make them easier for English or American children to understand. One interesting aspect of the translations is that Anansi's regular opponent is known as 'Tiger'. This is odd because there have never been tigers in Africa; it is likely that Tiger was, in fact, a lion! One well-known story tells how Tiger's hair is tied around a branch. This suggests that he is an animal with a long mane.

Like many ancient myths, legends and folk tales, the Anansi stories give insight into how, long ago, people used tales of animals, gods and magic to explain the things that were important to them. However, these stories also serve to remind us of the terrible trade in human lives – a trade which uprooted people from their homes and forced them into slavery thousands of miles away.

A Tale of Slavery

1 When was the slave trade at its height?
Tick **one**.

- | | |
|--------------------------|---------------|
| <input type="checkbox"/> | 100 years ago |
| <input type="checkbox"/> | 300 years ago |
| <input type="checkbox"/> | 400 years ago |
| <input type="checkbox"/> | 500 years ago |

2 In paragraph 2, which of these countries is **not** listed as a sea-faring nation?
Tick **one**.

- | | |
|--------------------------|----------|
| <input type="checkbox"/> | Portugal |
| <input type="checkbox"/> | Spain |
| <input type="checkbox"/> | Belgium |
| <input type="checkbox"/> | Holland |
| <input type="checkbox"/> | France |

3 In paragraph 4, that starts '*The slaves came from Africa*', which of these are facts given about the slaves' journey across the ocean?
Tick **more than one**.

- | | |
|--------------------------|---|
| <input type="checkbox"/> | The journey took between six to eight weeks. |
| <input type="checkbox"/> | The slaves had little food but plenty of fresh water. |
| <input type="checkbox"/> | The ships took a route that measured over 10,000 miles. |
| <input type="checkbox"/> | A tenth of the slaves died during the journey. |
| <input type="checkbox"/> | Slaves travelled in the hold, underneath the ship's deck. |

4 What are the links between slavery and the Anansi stories?
Tick **more than one**.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Slaves continued to tell these stories after they were taken to other countries. |
| <input type="checkbox"/> | Slaves were forced to tell these stories to the slave owners' children. |
| <input type="checkbox"/> | Slaves were captured from West Africa, where the stories originated. |
| <input type="checkbox"/> | Slaves wrote the Anansi stories whilst travelling on the slave ships. |

5 According to the text, why doesn't Anansi sound like 'a typical hero'?
Tick **one**.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Because he is a powerful foe. |
| <input type="checkbox"/> | Because he is intelligent and quick-thinking. |
| <input type="checkbox"/> | Because he is a spider. |
| <input type="checkbox"/> | Because he deceives others to achieve what he wants. |

▶ CONTINUED FROM PAGE 1

6 What is 'odd' about the character of Tiger, Anansi's opponent?
Tick **one**.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Tigers are not usually main characters of folk stories. |
| <input type="checkbox"/> | Tigers have never been native to Africa, where the stories originated. |
| <input type="checkbox"/> | In real life, a tiger would easily win a fight with a spider. |

7 According to the text, which two insights can we gain from the Anansi stories?
Tick **two**.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | That the Anansi tales were spread around the world as a result of the terrible trade of slavery. |
| <input type="checkbox"/> | That tigers used to live in Africa, long ago. |
| <input type="checkbox"/> | That traditional tales, such as the Anansi stories, were used to explain important things to people, long ago. |
| <input type="checkbox"/> | That we will never fully understand people's belief in gods and magic. |

8 The statements below summarise the contents of the text's paragraphs. **Number them** to show the order they appear in the text. *The first and last have been done for you.*

	How European nations tried to increase their power
1	Who is Anansi?
	Taking African people to be slaves
	The central character, Anansi
8	Insights given by the Anansi stories
	Translating the stories
	Farms and plantations
	Origin of the Anansi stories

A World Without Bees

► Many of the world's plants use seeds as a means of reproduction. All children learn about this process at school, usually by growing bean plants or sunflowers. The seeds swell as they soak up water and send out roots and a shoot. Producing fertile seeds that can grow into healthy new plants is a very successful method of survival for many plant species. However, the existence of seed-producing plants has recently been threatened by a significant reduction in the number of bees. These busy insects are a vital part of the reproduction process and, without them, some flowering plants could become extinct.

For a plant to make seeds, a sticky, grainy substance called pollen needs to be transferred from one flower to another – preferably from one plant to another. This process of fertilising a flower by transferring pollen is called pollination. Plants have evolved different ways of pollinating, but one of the most common methods is via insects. Generally, these insects are bees.

A plant that uses insect pollination needs the bees (or other insects) to fly into, and out of, their flowers in order to transfer the pollen. The flowers produce a sweet substance called nectar to tempt the bee inside. Nectar is irresistible to a bee! As the bee clambers into the flower, the sticky pollen gets caught on its hairy legs. As the bee then flies from plant to plant and flower to flower, some of the pollen brushes off. It is estimated that one bee visits up to 5,000 flowers in a single day, so it is inevitable that the pollen from one plant's flowers will end up inside those of another. At that point, the receiving flower will stop making nectar and slowly wilt; it no longer needs to attract bees and all its energy now goes into developing seeds.

Now imagine a world without bees – the pollen would not be transferred, the flowers would not be fertilised and so there would be no seeds. No seeds would mean no new plants! It has even been argued that, without bees, we humans would become extinct. This is because many of the plants that we eat and the plants that our farm animals eat would not be able to reproduce and would die out. This demonstrates simply the huge importance

► CONTINUED FROM PAGE 1

of bees. Of course, there are other insects besides bees that can help flowers pollinate and some plants have other methods of pollination, but should bees become extinct, life on earth would be much harder. Many foods would disappear: fruits such as apples, pears, strawberries and oranges; and vegetables such as carrots, potatoes, onions, broccoli and courgettes.

But the fact remains that bees are under threat. The number of colonies (the groups that bees live in) has reduced drastically in recent years. Experts are struggling to find out why but it seems that there is not one simple answer. It is likely that a number of environmental factors are making it harder for bees to thrive. Changes in farming methods have led to less natural grassland and hedgerows. Bees need flowers, and if huge fields are covered with cereal crops such as wheat, there is nothing for the bees to feed on. Furthermore, chemical pesticides used on crops to control harmful insects also damage the bee populations. Finally, large numbers of bee colonies have been destroyed by infestations of a mite called Varroa. Once these mites get into a hive, they attach themselves to the bees and suck their body fluids. This weakens the bees and infects them with a virus that deforms their wings. It is no wonder that bee colonies are struggling to survive.

The reduction in the number of bee colonies is of great concern and everything possible needs to be done to reverse the trend. However, experts reassure us that the idea that we humans would become extinct without bees is an exaggeration. Some of our basic, everyday foods, such as rice, wheat and corn are plants that are either wind-pollinated (where the pollen is blown to other plants) or self-pollinating (where the pollen does not need to be transferred to another flower). In addition to being a staple part of our diet, the grains from these foods can also be fed to farm animals. In a world without bees, meals might consist of meat or fish with cereal grains. Dairy products such as milk or butter would still exist as long as there was enough grain to feed cattle. What is certain is that fruit and vegetables would be almost impossible to grow in great numbers and would become a rare luxury. We might not need bees to survive, but without them, and the foods they help produce, our meals would be pretty boring!

A World Without Bees

1 What is pollination?

Tick **one**.

- | | |
|--------------------------|---|
| <input type="checkbox"/> | Sending out roots and a shoot |
| <input type="checkbox"/> | Transferring pollen from one plant to another for fertilisation |
| <input type="checkbox"/> | Transferring seeds from one plant to another for fertilisation |
| <input type="checkbox"/> | Producing nectar to attract insects |

2 How do bees carry pollen?

Tick **one**.

- | | |
|--------------------------|---|
| <input type="checkbox"/> | Pollen sticks to the fibres on the bee's wings. |
| <input type="checkbox"/> | The bee drinks the pollen from the flower. |
| <input type="checkbox"/> | The bee carries the pollen in its mouth. |
| <input type="checkbox"/> | Pollen sticks to the hairs on the bee's legs. |

3 How many flowers might a bee visit in a single day?

Tick **one**.

- | | |
|--------------------------|--------------|
| <input type="checkbox"/> | up to 500 |
| <input type="checkbox"/> | up to 1,000 |
| <input type="checkbox"/> | up to 5,000 |
| <input type="checkbox"/> | up to 10,000 |

4 Which of these is **not** listed in the text as an example of a food that might no longer exist without bees?

Tick **one**.

- | | |
|--------------------------|--------------|
| <input type="checkbox"/> | carrots |
| <input type="checkbox"/> | bananas |
| <input type="checkbox"/> | strawberries |
| <input type="checkbox"/> | apples |
| <input type="checkbox"/> | onions |

5 According to the text, why are bee populations in decline?

Tick **more than one**.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Mite infestations are destroying bee colonies. |
| <input type="checkbox"/> | Bees are killed when crops are harvested. |
| <input type="checkbox"/> | Bees are killed by chemicals used on crops. |
| <input type="checkbox"/> | There is not as much grassland, due to changes in farming. |
| <input type="checkbox"/> | Animals are eating more bees. |

▶ CONTINUED FROM PAGE 1

6 The last paragraph says, "*The idea that we humans would become extinct without bees is an exaggeration.*" What does **exaggeration** mean? Tick **one**.

- | | |
|--------------------------|----------------|
| <input type="checkbox"/> | understatement |
| <input type="checkbox"/> | lie |
| <input type="checkbox"/> | truth |
| <input type="checkbox"/> | overstatement |

7 Without bees, which foods might become rare or even extinct? Tick **one**.

- | | |
|--------------------------|----------------------|
| <input type="checkbox"/> | Grains and cereals |
| <input type="checkbox"/> | Vegetables and fruit |
| <input type="checkbox"/> | Butter and milk |
| <input type="checkbox"/> | Meat and fish |

8 The statements below summarise the contents of the text's paragraphs. **Number them** to show the order they appear in the text. *The first has been done for you.*

	A world without bees
	Pollination
1	Seeds as means of reproduction
	How bees transfer pollen for plants
	How humans could survive without bees
	Reasons for the decline in bee numbers

Football Mad

► It is estimated that over one billion people watched the football World Cup Final in 2014. Of course, not all of them were crammed into the stands of the Maracana Stadium in Brazil, where the final was played. Instead, all over the world, ardent football fans were glued to their television sets to see Germany beat Argentina 1-0, proof that football is truly a global game. The most famous players – Ronaldo, Messi, Gale, Suarez, Neymar, Aguerro, and many more – are known to every football supporter, and wherever a football fan travels he, or she, will find a like-minded enthusiast, keen to talk about their favourite team and the latest game.

But when was football invented? No-one can say for certain, but historians do know that approximately 1000 years ago people played a game in England that we now call medieval or mob football. This exciting, dangerous sport is now considered the forerunner to modern-day football and rugby. In its earliest forms, mob football had few rules: the aim was to get the ball past your opponents to score by hitting a post, gate or tree. The ball, which could be kicked, carried or thrown, was made from the inflated bladder of a dead animal, usually a pig. The game was really a free-for-all: the boundaries weren't marked, and players were allowed to wrestle the ball from each other. In fact, it was even permitted to tackle opponents who weren't in possession of the ball. While it is unlikely that a player was allowed to hit or kick another player, the lack of strict rules led to many injuries and sometimes even the death of a player.

By 1660, about 400 years ago, the game was becoming more organised – and safer. An author called Francis Willughby wrote about football in his book, 'The Book of Sports'. In it, he explained the rules and the layout of the pitch. The pitch was marked out and there were some rules that helped protect the players from harm. There was no fixed duration; the game was won by the team that scored first. Participants were supposed to keep their kicks low, as a hard kick to the leg could shatter a player's shin-bone. Nowadays, players wear strong plastic pads to protect

► CONTINUED FROM PAGE 1

their shins and a dangerous tackle can lead to a red card (this means the offending player is sent off from the pitch for the remainder of the game).

Football still lacked a single set of rules followed by everyone, and this was disruptive. If you have ever played a game where the rules aren't fully understood, or where there is no referee, then you will know that disputes often occur. This was certainly the case with football matches several centuries ago, where play was often interrupted while the players argued about a rule. Eventually, in 1863, the Football Association was formed. By this time, organised teams were travelling across the country to play against each other – now, at last, they all agreed to play by the rules written down by the Football Association. Some teams, however, still disagreed with the rule that the ball shouldn't be touched by anyone's hands – they preferred to pick the ball up and run with it. This would become the separate game of rugby.

Playing under 'FA rules', teams from different towns could compete in games with fewer disagreements. It also became possible for teams to play against those from other countries. At first, these matches were played at the Olympic Games but in 1930 the world football organisation, FIFA (The Fédération Internationale de Football Association), organised the first World Cup. It was held in Uruguay, South America. Few European teams competed, however, as it was considered too far and too expensive a journey. Yet a seed had been sown and every year the competition grew in size and popularity (although it was cancelled in 1942 due to the second world war).

These days, over 200 countries compete in the World Cup and only the top-performing teams make it through to the main tournament. Today, football is seen as a glamorous sport, with top players earning multi-million pound salaries. Matches take place in huge purpose-built stadiums and tickets to see the World Cup Final cost hundreds of pounds. Football has certainly come a long way from its origins as a chaotic kick-around with a pig's bladder!

Football Mad

1 According to the text, where did most people watch the World Cup Final in 2014?
Tick **one**.

- | | |
|--------------------------|-----------------------------|
| <input type="checkbox"/> | On the internet |
| <input type="checkbox"/> | In Brazil, live |
| <input type="checkbox"/> | On TV in their own homes |
| <input type="checkbox"/> | On big screens with friends |

2 What does the phrase 'global game' mean in the first paragraph?
Tick **one**.

- | | |
|--------------------------|---|
| <input type="checkbox"/> | The World Cup has teams from every country playing. |
| <input type="checkbox"/> | Football is supported by people in every country. |
| <input type="checkbox"/> | Players travel all over the world to compete. |
| <input type="checkbox"/> | Football is played by people in every country. |

3 According to the text, which of these were allowed in mob football?
Tick **more than one**.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Arguing with the referee |
| <input type="checkbox"/> | Tackling someone that didn't have the ball |
| <input type="checkbox"/> | Kicking the ball |
| <input type="checkbox"/> | Kicking another player |
| <input type="checkbox"/> | Carrying and throwing the ball |

4 Which of these were football rules in 1660?
Tick **more than one**.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | The game is played for a fixed length of time. |
| <input type="checkbox"/> | Ball must be kept inside the boundaries of the pitch. |
| <input type="checkbox"/> | The game is played until a goal is scored. |
| <input type="checkbox"/> | The game is won by the highest number of goals scored. |

5 What helped prevent players in 1660 from having their shins broken?
Tick **one**.

- | | |
|--------------------------|----------------------------------|
| <input type="checkbox"/> | The invention of shin pads |
| <input type="checkbox"/> | Having a referee to keep control |
| <input type="checkbox"/> | Showing players a red card |
| <input type="checkbox"/> | A rule banning low kicking |

▶ CONTINUED FROM PAGE 1

6 Why was it considered so important to agree on a set of rules for the game?
Tick **more than one**.

- | | |
|--------------------------|---|
| <input type="checkbox"/> | It protected the players from injury. |
| <input type="checkbox"/> | It meant that teams from different towns and countries could play against each other. |
| <input type="checkbox"/> | It led to the game of rugby being invented. |
| <input type="checkbox"/> | It meant the game was played for a fixed amount of time. |
| <input type="checkbox"/> | It meant a game could be played without disagreement. |

7 According to the text, what prevented some teams playing in the first World Cup?
Tick **one**.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | People disagreed about where it should be held. |
| <input type="checkbox"/> | It was too costly to get to South America from Europe. |
| <input type="checkbox"/> | Many of the top players were injured. |
| <input type="checkbox"/> | The World War meant it was cancelled. |

8 The statements below summarise the contents of the text's paragraphs.
Number them to show the order they appear in the text.
The first is done for you.

	The start of worldwide football competitions
	How football became more organised
	The World Cup today
	Explanation of mob football
1	Introduction to football as a world sport
	The need for a single set of rules

Life Cycle of a Yellow-Eyed Penguin

9 Two greenish-white eggs are laid and are incubated by
19 both parents for about 43 days. When the eggs hatch,
30 the parents guard the chicks, day and night, for forty to
41 fifty days. One parent will stay with the chicks while the
44 other collects food.

54 After the chick moults and loses their soft, brown down,
63 they develop waterproof plumage and are ready to fledge
73 (leave the nest). The juvenile penguins head out to sea
83 cautiously to collect their own food: not all return. When
93 they are adults and ready to breed, most penguins return
103 to the safe place where they were born – their built-in
109 satellite navigation systems get them there!



Quick Questions



1. Which word means the same as young?



2. How long do the parent penguins guard the chicks?



3. Why do you think the penguins return to the place they were born when they are ready to breed?



4. Why does the author use the word 'cautiously' to describe how the juveniles head out to sea?

Help, I'm Stuck!

11 The week started well but it was all about to change.
20 I had been shedding my skin regularly whenever it
31 became too tight for me – after all, I had been eating
41 a lot of tasty cabbage leaves since I emerged from
50 my egg and I am now nearly one-hundred times
54 bigger than I was!

64 One day everything felt different. I knew it was time
72 to pupate, by forming a strong, hard chrysalis
79 to complete my transformation into a beautiful,
87 graceful butterfly. Everything went well and I had
97 been relaxing in a safe place under a large leaf.
104 However, today trouble struck! My chrysalis began
117 to split and I knew it was time to emerge but I was
128 stuck. I panicked as I tried to free myself from my
130 pupa prison...



Quick Questions



1. Find and copy one word in the text that means the same as 'become visible'.



2. Explain what is meant by 'pupate'.



3. How does the character's persona change through the story?



4. Will the butterfly manage to get out of the chrysalis?



The Alien Times



UFO Sighting

3 Recent bright lights
 5 and high-pitched
 8 whistles have baffled
 12 dog walkers in the
 15 woodlands of Suffolk.
 18 The disturbance has
 22 occurred in the same
 27 area as the UK's largest
 31 ever UFO sighting, in
 32 1980.

35 One astonished walker
 40 said, "I walk in these
 43 woods regularly and,
 47 although I'm aware of
 51 the unusual history of
 55 the place, I've never
 57 experienced anything
 60 like this before."

64 It seems that someone,
 67 or something, might
 71 be trying to contact



75 us again, but nobody
 80 can fathom why this is
 83 happening nearly forty
 87 years since the first
 90 incident. The 'flying
 94 saucer' was in almost
 98 the exact same position
 103 as the UFO that was
 106 spotted in December,
 107 1980.

110 Some residents are
 113 nervous but many
 117 others are excited about
 121 the prospect of contact
 123 with extra-terrestrials!

Quick Questions



1. Which word means the same as understand?



2. When and where was the UK's largest UFO sighting?



3. Find and copy a phrase that implies the area is known for being 'special' or 'different'.



4. Why do you think some walkers are nervous?

Story Starter



He carries them around with him everywhere. People often misunderstand him. People misunderstand the power he possesses.

A year ago, he found them deep inside a cave he'd stumbled across in Bulgaria, surrounded by a vast pile of ash from a fire that had long gone out but still gently smoking.

To protect them, he stores them in an egg box, which is a great way of deceiving people, but it's only a matter of time before the truth comes out...

Sentence Challenge

Can you write a sentence containing a relative clause, starting with a noun?

- ▶ E.G. The man, who had walked thousands of miles, guarded the eggs with his life.
- ▶ The eggs, which he had found in a cave, were beginning to hatch .



Question Time



- ▶ What is it that you think the man holds in his hands?
- ▶ Where did he get them from?
- ▶ What clues in the story starter tell you something about what the objects are?
- ▶ Why do you think people misunderstand the man?
- ▶ How do you think he feels about the objects he possesses?
- ▶ Where do you think the man lives?

Sick Sentences

These sentences are 'sick' and need help to get better. Can you help?

- ▶ The man carried some things in his hands. They were special. Something was about to happen.



Perfect Picture

Can you draw what might hatch from the magical eggs?



Punctuating relative clauses



Practise using commas with relative clauses

i A relative clause is a clause that starts with a relative pronoun, such as *who*, *that*, *whose* or *which*, or a relative adverb, such as *where*, *when* or *why*. A relative clause is often used in a sentence to add information about a noun. Some relative clauses are used to expand a noun phrase e.g. the noun phrase ‘the man’ can be expanded like this: the man *who lives next door*. The relative clause tells you exactly which man. Others work like any other subordinate clause - they are dropped into a sentence to add some extra information. When this

A

Which of these sentences has been punctuated correctly?

The shopping centre, which, is closed now often gets busy.

The shopping centre, which is closed now, often gets busy.

The shopping centre which, is closed now, often gets busy.

B

Add two commas to each sentence to punctuate the relative clauses:

My sister who goes to university wants to be a vet.

The library which was built in 1966 is my favourite building.

In the middle of the day when it gets too hot I usually take a break.

The boy who was often late for school made sure he was on time today.

SPaG
PRACTICE

Rewrite this sentence, adding a relative clause and using a pair of commas:

My brother is very tall.

.....

Write a sentence that includes a relative clause about this man or the fish he has just caught.

.....

.....

.....

CHALLENGE
Think • Talk • Write



Introducing relative clauses

Practise making relative clauses to describe nouns



i Often nouns are described with adjectives or adjectival phrases, e.g. *the fat cat* or *the cat with the red collar*. A relative clause can also describe a noun; it is a clause that starts with a relative pronoun (e.g. *who*, *that*, *which*, *whose*), e.g. *I want a coat that has a furry collar*. Sometimes relative clauses are used in the middle or end of a sentence to add information - these are punctuated with commas. In the middle: *My daughter, who loves pop music, would like a disco party for her birthday*. At the end: *This is my mum, who is the best mum in the world*.

A

Underline the relative clauses:

This is my bike, which I was given for my birthday.

My maths teacher, who is retiring next month, is looking happy.

My arm, which I broke last week, is still hurting.

I usually walk to school with Julie, whose house is next to mine.

B

Finish the relative clauses:

I bought a new coat that

This is my brother, who

My school, which, is really nice.

SPaG
PRACTICE

Underline the relative clause in the sentence:

My dog, who loves bones, has made some big holes in the garden.

Write about your favourite animal or pet, using a relative clause to add some information about it.

.....

.....

.....

CHALLENGE
Think • Talk • Write



Using commas with relative clauses



Know when a relative clause needs commas

i A relative clause starts with a relative pronoun (e.g. who, that, which, whose). It is used to describe a noun, picking it out from others, e.g. He rubbed the toe **that was swollen**. When a relative clause is used like this, it extends the noun phrase *the toe*. Relative clauses can also be used to comment on a noun in a sentence, e.g. He rubbed his toe, **which was swollen**. When used like this, it is separated with a comma. Similarly, if the relative clause appears in the middle, it is surrounded by commas, e.g. His toe, **which was swollen**, had been trodden on.

A

Add a relative clause to each sentence:

He has a new car,

I go to school with Suzie,

My older brother,, is visiting on Saturday.

B

Which of these sentences tells us that I have more than one sister? Explain how you know:

My sister who lives in Glasgow is having a baby.

My sister, who lives in Glasgow, is having a baby.

.....
.....

SPaG
PRACTICE

Complete the sentence with a relative pronoun:

The horses are in the stable need more hay.

Pretend your aunt is a doctor. She lives in London.
Write a sentence that describes this using a relative clause:

.....
.....

CHALLENGE
Think • Talk • Write



Spring Term 2

2

Can you circle the relative pronoun in this sentence?

a



The **beautifully-wrapped present** was a present for Harry, whose birthday was tomorrow.

Can you think of a word that ends in either -ible or -able that match these definitions?

b

fragile/able to be broken

Tick the sentence that uses the plural possessive apostrophe correctly:

c

- The people's beliefs were all different but that is what made them all unique and special.
- The peoples' beliefs were all different but that is what made them all unique and special.
- The peoples beliefs' were all different but that is what made them all unique and special.

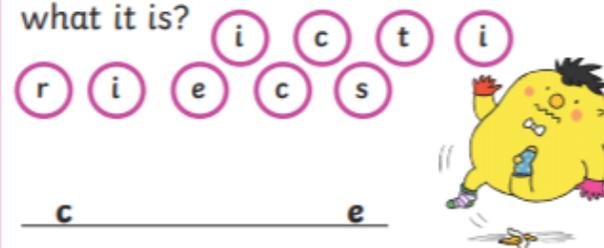
Tick to show whether the underlined word is being used as an adverb or an adjective.

d

Sentence	Adverb	Adjective
The racing driver drove the car <u>fast</u> .		

Mr Whoops has been juggling with the letters from one of his Year 5 spelling words. Can you spot what it is?

e



Choose the correct form of the verb 'to do' to fit into these sentences.

f

The boys had ____ a very kind thing by volunteering at the school fayre.

do

"Everything I ____ seems to end in disaster!" cried the gloomy man.

did

Last year, I ____ a tour of the islands of Greece.

done

Spring Term 2

Circle the possessive pronoun:

a



The children were thrilled that the idea that had been chosen for the final product was theirs.

Rewrite this sentence with the adverbial phrase at the beginning. Don't forget a comma!

b



There wasn't one piece of pizza left after the sleepover party.

A prefix word in each of these sentences is incorrect. Rewrite the prefix words correctly.

c

The training session being cancelled was very ilconvenient.

Tick the **two** sentences written in the past progressive tense:

d



- Millie was jumping during the PE lesson.**
- In the future, she hoped to be an Olympic gymnast.**
- The 9-year-old was always climbing on the bars at the park.**

Mr Whoops has made two clumsy spelling mistakes in his sentence. Can you underline them and correct them? Use a dictionary if you need to.

e

I had to cue at the accident and emergency department because I had fallen and damaged my shoalder.



Choose 'a' or 'an' as determiners in this sentence:

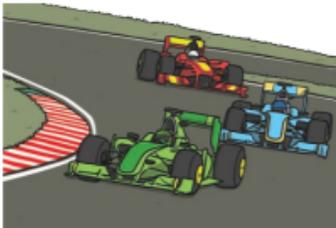
f

From the charity shop, I bought _____ old-fashioned suitcase, _____ fancy dress costume.

Spring Term 2

Can you underline the modal verbs in the following sentence?

The green car might win the championship if he could just stay in front of the following pack.



a

Circle the **two** prepositions in the sentence.

During the night, the fox crept into the garden.

b

Poor Mr Whoops can't work out whether to add the suffix '**ant**' or '**ent**'. Can you help him with these words?

differ_____

contest_____



c

Can you think of an adverb of possibility and an adjective beginning with...

	adverb of possibility	adjective
the letter p?		
the letter c?		

d

Underline the parenthesis in this sentence.

Tom Daley (the Olympic bronze medallist) is a great role model for young people in society.



f

Can you think of the word to match the definition?

(Clue: They are all words with the 'ough' letter string)

A symptom of a bad cold: _____

A feeding rack for cattle: _____

e

Number and Place Value

Counting

Count forwards and backwards in 4, 6, 7, 8, 9, 25, 50, steps of powers of 10 (10, 100, 1000, ...)

1. Continue the sequences:

7, 14, 21, 28, 35, 42, _____, _____, _____, _____, _____,

625, 600, 575, 550, 525, _____, _____, _____, _____, _____,

57 382, 67 382, 77 382, 87 382, _____, _____, _____, _____, _____,

2. Find 10, 100 or 1000 more or less than a given number

What is 100 less than 1902? What is 1000 more than 3249?

3. Count forwards and backwards through zero

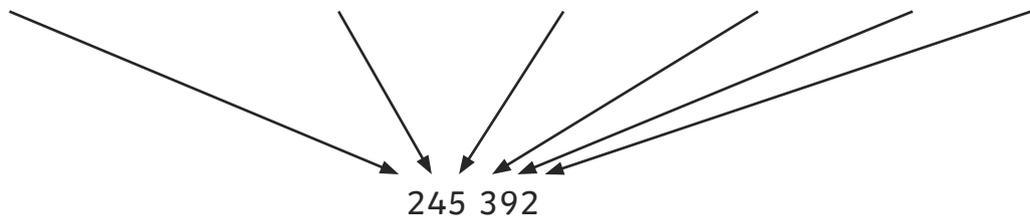
Continue the sequence:

6, 5, 4, 3, 2, 1, 0, -1, -2, -3 _____, _____, _____, _____, _____.

Place Value

Recognise the place value of each digit in up to four-digit numbers

hundred thousands ten thousands thousands hundreds tens ones



4. Underline the thousands digit in 2769.

Underline the hundred thousands digit in 347 053.

Underline the tens digit in 209 740.

Read and Write Numbers in Numerals and Words

9. Complete the table:

Numerals	Words
	Three hundred and forty-four thousand, two hundred and eighty-five
855 102	
	Six hundred and twenty-two thousand, nine hundred and sixteen
120 563	

Roman Numerals

10. Use the following Roman numerals to represent numbers to 100:

Roman	Numeral
I	1
V	5
X	10
L	50
C	100
D	500
M	1000

CCXIX = _____

DCXXVI = _____

CMXLVIII = _____

MDCCCLXXI = _____

Solve Problems

11. Here are 3 years written in Roman Numerals. Order the years from earliest to latest:

MMIX

MCMXCIX

MMXV

Addition and Subtraction

Add and Subtract Mentally

12. Add and subtract three-digit numbers and ones, tens and hundreds

$376 + 3 = \underline{\hspace{2cm}}$

$376 + 40 = \underline{\hspace{2cm}}$

$376 + 200 = \underline{\hspace{2cm}}$

Mental Methods

13. Add and subtract numbers mentally with larger numbers

$15\,672 - 3200 = \underline{\hspace{2cm}}$

Formal Methods

14. Use a formal written method to calculate:

$$\begin{array}{r} 7\ 2\ 6\ 9\ 8 \\ +\ 6\ 1\ 5\ 6\ 2 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 8\ 4\ 9\ 3\ 5 \\ -\ 1\ 2\ 4\ 2\ 3 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 6\ 4\ 8\ 1\ 2 \\ -\ 2\ 9\ 3\ 6\ 4 \\ \hline \\ \hline \end{array}$$

Estimate and Inverse

15. Estimate by rounding to check accuracy.

Use the inverse to check the following calculations. Circle 'correct' or 'incorrect.'

$$6470 + 1248 = 7718$$

correct/incorrect

$$5905 - 2674 = 2231$$

correct/incorrect

Solve Problems

Multi-step problems

16. 8451 people visit a cinema on one day. There are two films showing. 3549 adults and 946 children see an adventure film, 1263 adults and a number of children see an animation.

How many adults are there? _____

How many children are there? _____

How many children see the animation? _____

How many more children see the animation than the adventure film? _____

Multiplication and Division

Multiplication Tables

17. Fill in the missing numbers:

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1		3		5	6		8		10	11	
2		4		8	10		14		18			24
3	3		9							30		36
4					20						44	
5						30					55	
6	6					36		48		60		72
7	7		21		35		49		63		77	
8				32			56		72		88	96
9	9	18			45			72		90		108
10	10		30			60						120
11			33		55						121	
12	12		36			72						144

Multiplying and Dividing

18. Use knowledge of place value and related facts to solve these calculations:

$400 \times 5 = \underline{\hspace{2cm}}$

$630 \div 7 = \underline{\hspace{2cm}}$

Multiply by 0 and 1 and divide by 1:

$285 \times 1 = \underline{\hspace{2cm}}$

$285 \times 0 = \underline{\hspace{2cm}}$

$285 \div 1 = \underline{\hspace{2cm}}$

Multiplying and dividing whole numbers and decimals by 10, 100 and 1000:

$45 \times 10 = \underline{\hspace{2cm}}$

$6.7 \times 100 = \underline{\hspace{2cm}}$

$902 \times 1000 = \underline{\hspace{2cm}}$

$59 \div 10 = \underline{\hspace{2cm}}$

$4506 \div 100 = \underline{\hspace{2cm}}$

$382 \div 1000 = \underline{\hspace{2cm}}$

Factor Pairs and Commutativity

19. What are all the factor pairs of 56? _____

Use your factor pairs to solve:

56 pencils are shared between 4 tables. How many pencils does each table receive?

20. Change the order of the numbers in these calculation without changing the answer:

$5 \times 9 \times 2 = 90$ _____

$6 \times 3 \times 10 = 180$ _____

Prime Numbers

21. List all the prime numbers up to 20. _____

List all prime numbers between 20 and 30. _____

What would be the first prime number after 100? _____

Square and Cube Numbers

22. Write these numbers into the correct place in the table:

9, 144, 27, 4, 1, 8, 100, 81, 125, 16, 25, 64, 121

Square Numbers	Cube Numbers

Formal Methods

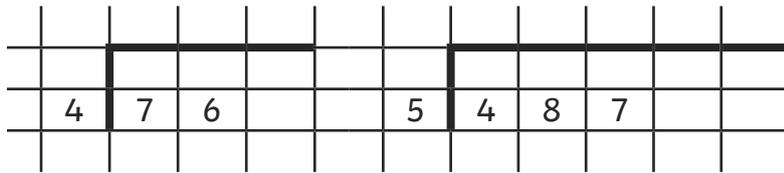
23. Use formal written methods to multiply:

			2	7
<hr/>				
		x		4
<hr/>				
<hr/>				
		3	8	2
<hr/>				
	x			7
<hr/>				
<hr/>				
	2	4	7	1
<hr/>				
x				6
<hr/>				
<hr/>				

24. a) Use the formal long multiplication method to calculate:

			2	7
<hr/>				
		x	1	4
<hr/>				
<hr/>				
<hr/>				

b) Use a short division method to solve these problems:

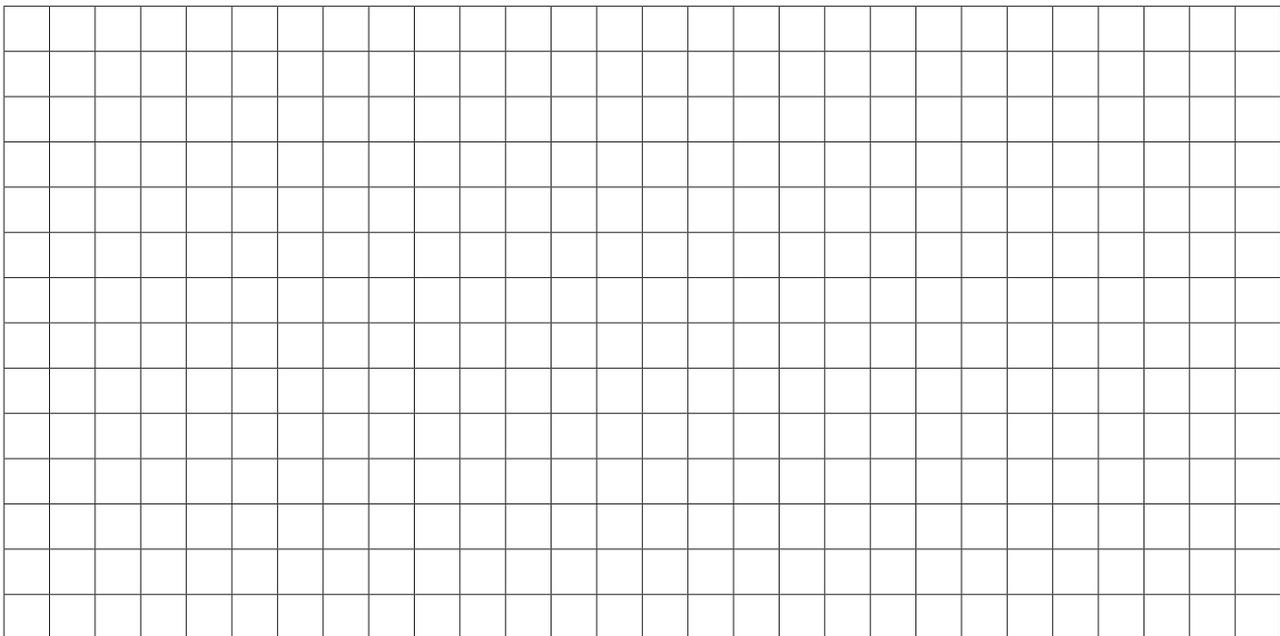


25. Fill in the missing numbers to complete the calculations.

$\times 3 = 45$ or $56 \div$ $= 14$

Word Problems:

26. A teacher has four new boxes of pencils, each with 12 pencils, and a tray with 37 pencils. The teacher shares equally all the pencils between 5 tables. How many pencils does each table receive? Show your working out below.



Scaling Problems with Simple Fractions

27. 12 pizzas are cut into quarters. Into how many pieces of pizza will the pizzas be cut?

Correspondence problems

28. Jenna has 2 t-shirts and 4 pairs of shorts. How many different combinations of the t-shirts and shorts does Jenna have? _____

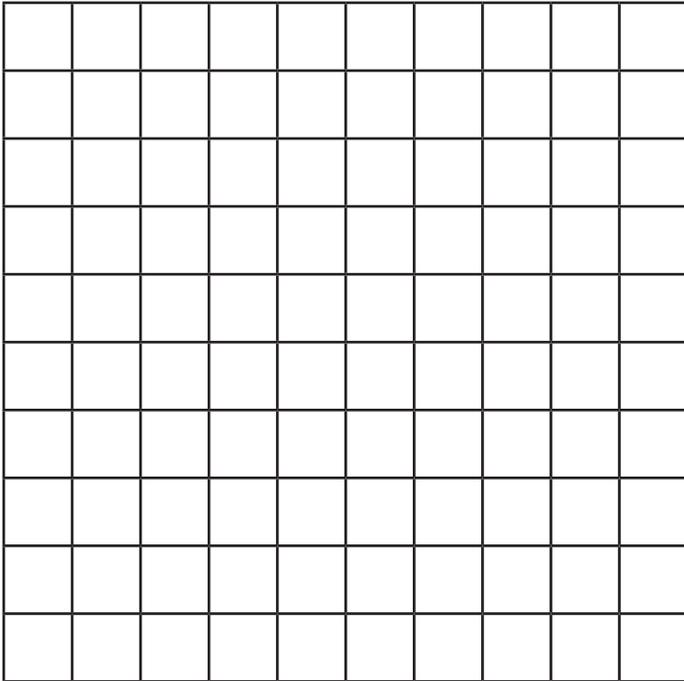
29. 120 pencils are shared equally between 3 classes. How many pencils will they each receive?

Fractions

30. Shade to show $\frac{7}{10}$:

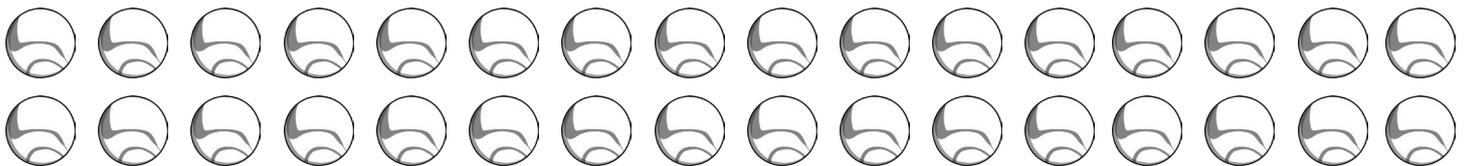


Shade to show $\frac{46}{100}$:



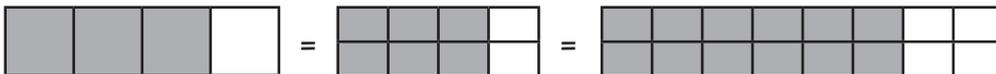
Fraction of a Set of Marbles

31. Find $\frac{5}{8}$ of these marbles by circling:



Equivalent Fractions

32. Write in the missing fractions



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

1																						
$\frac{1}{3}$						$\frac{1}{3}$						$\frac{1}{3}$										
$\frac{1}{6}$			$\frac{1}{6}$			$\frac{1}{6}$			$\frac{1}{6}$			$\frac{1}{6}$		$\frac{1}{6}$								
$\frac{1}{12}$																						
$\frac{1}{24}$																						

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

33. Write 3 fractions that are equivalent to $\frac{1}{3}$ _____, _____, _____

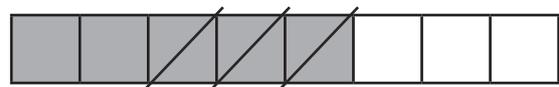
Add and Subtract Fractions with the Same Denominator and with Denominators that are Multiples

34. Find the missing equivalent fractions.

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



$$\frac{5}{8} - \frac{3}{8} = \frac{2}{8} =$$



Compare and Order

Unit fractions

35. a) Order these fractions from smallest to greatest:

smallest $\frac{1}{6}$ $\frac{1}{3}$ $\frac{1}{8}$ $\frac{1}{4}$ greatest

b) Use <, > or = to compare these fractions:

$$\frac{1}{5} \quad \square \quad \frac{3}{5}$$

$$\frac{5}{8} \quad \square \quad \frac{1}{4}$$

Mixed Numbers and Improper Fractions

36. Write the improper fraction:

Mixed fraction $1\frac{1}{5}$ = - Improper fraction

Multiply Fractions

37. Complete the missing fractions:

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

Decimal Equivalents

38. Complete the missing tenths, hundredths and decimals:

$$\frac{\quad}{10} = 0.7$$

$$\frac{\quad}{100} = 0.43$$

$$\frac{1}{4} = 0.2__$$

$$\frac{1}{2} = 0.__$$

$$\frac{3}{4} = 0.7__$$

Write decimals as a fraction:

$$0.____ = \frac{67}{100}$$

Division by 10 and 100

39.

$$2 \div 10 = \underline{\hspace{2cm}} \quad 2 \div 100 = \underline{\hspace{2cm}} \quad 25 \div 10 = \underline{\hspace{2cm}} \quad 25 \div 100 = \underline{\hspace{2cm}}$$

Rounding Decimals

40. Round these decimals to the nearest whole number:

0.5 rounds to

2.35 rounds to

Round this decimal to one decimal place:

0.05 rounds to

Read, Write, Order and Compare Decimals

41. Write the decimal in digits:

zero ones, four tenths and five hundredths.

two ones, three tenths and four hundredths.

Percentages

42. Complete the missing percentages:

$$\underline{\hspace{2cm}}\% = \frac{50}{100} = \frac{1}{2}$$

$$41\% = \frac{\underline{\hspace{2cm}}}{100}$$

Solve Problems

Fractions

43. Adil divides his marbles into tenths. He wants to give two friends an equal number of marbles but still have 3 times more than their individual amounts. What fractions could he split his marbles into?

Measure and Money Problems

44. a) Ellie buys a new shirt for £4.75 and a pair of trousers for £3.50 in a sale. She pays with a £10 note. What change will she receive?

b) A bag of potatoes weigh 2.45kg. How much will 4 bags weigh?

Decimal Problems to 3 Decimal Places

45. A packet of sugar weighs 1.348kg. $\frac{3}{4}$ kg is used to bake some cakes.

How much will the packet weigh now?

Knowing Percentage and Decimal Equivalents

46. Order the following from smallest to largest:

25%, 0.3, $\frac{2}{5}$

Measurement

Estimate, Measure, Compare, Add and Subtract

47.
Lengths (mm/cm/m)
Measure and draw lines using a ruler in centimetres (cm) or millimetres (mm).

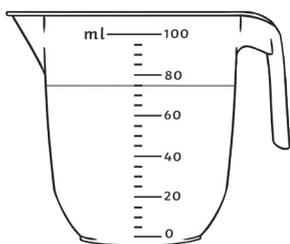
This line is _____cm or _____mm long.

Mass (g/kg)
Measure the mass of objects using different scales

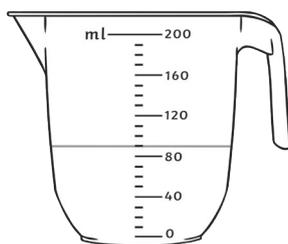
48. 3 apples weigh 435g. One is eaten, and the 2 remaining apples weigh 285g. What is the mass of the eaten apple?

Capacity (ml/l)
49.

Circle the jug which has more water:



75ml



90ml

Convert between units

50.
Complete the missing conversions:

Length:

1 km = _____m
1m = _____cm or _____mm
1cm = _____mm

Mass:

1kg = _____g

Capacity/ Volume:

1l = _____ml

Time:

1 year = _____days
1 week = _____days
1 day = _____hours
1 hour = _____minutes
1 minute = _____seconds

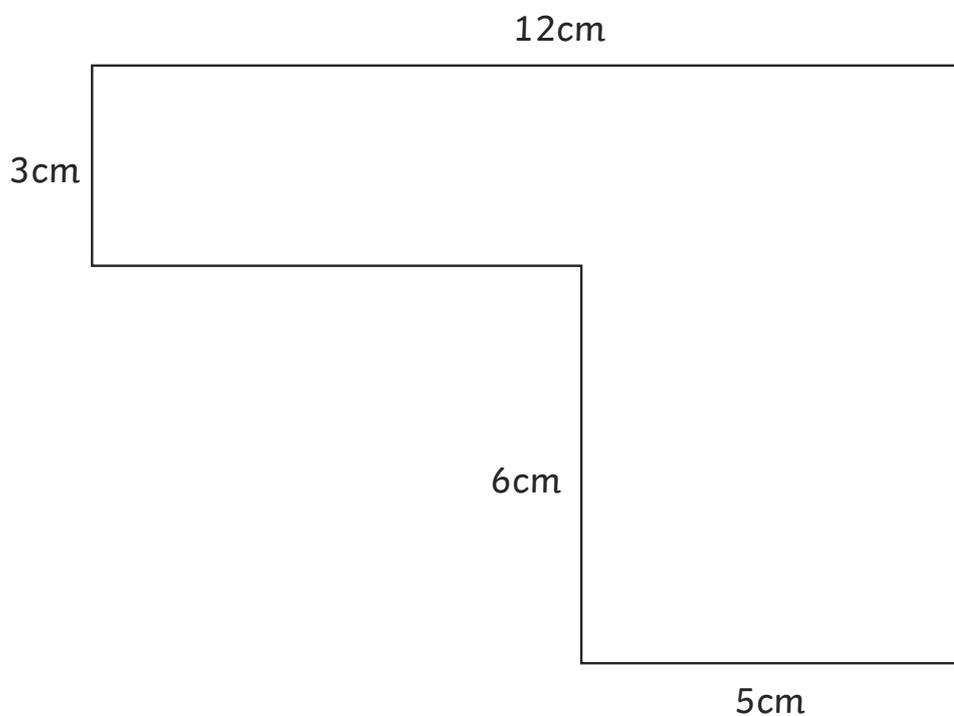
Perimeter

51. Calculate the perimeter:



Perimeter = _____ cm.

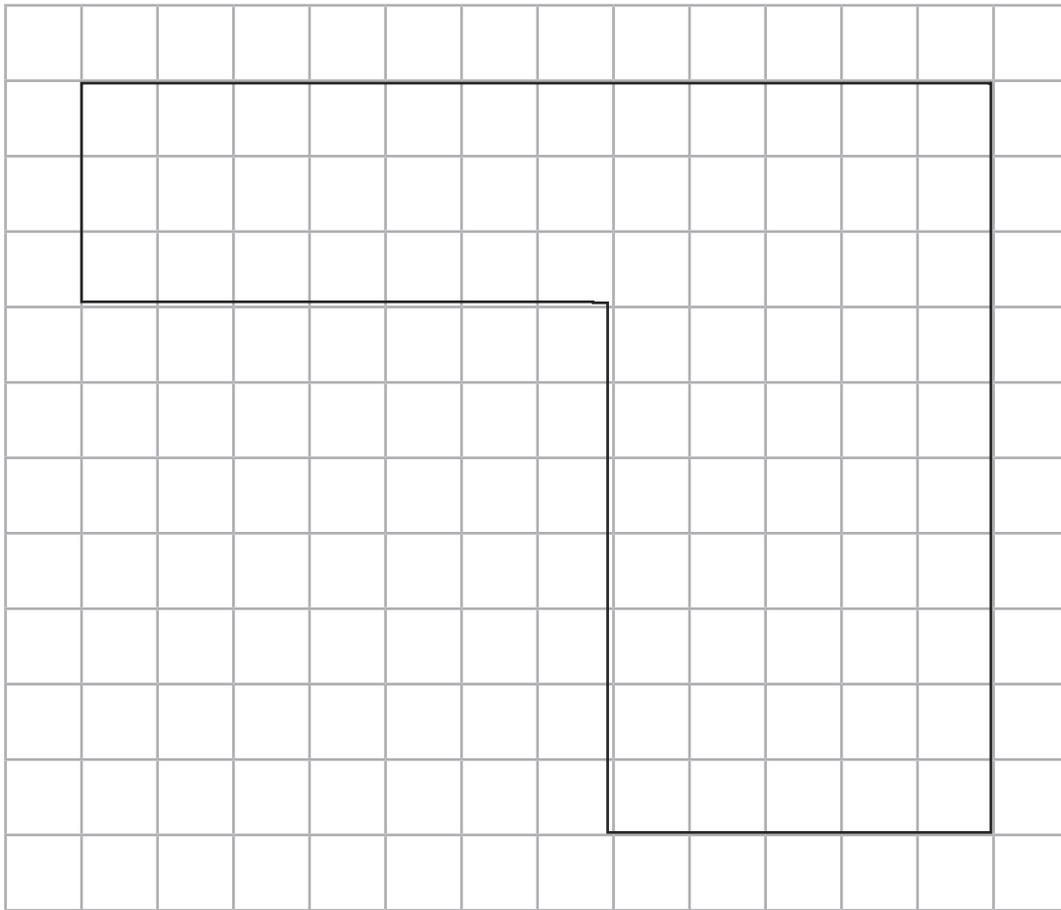
Measure and calculate the perimeter of rectilinear shapes (including squares)



Perimeter = _____ cm.

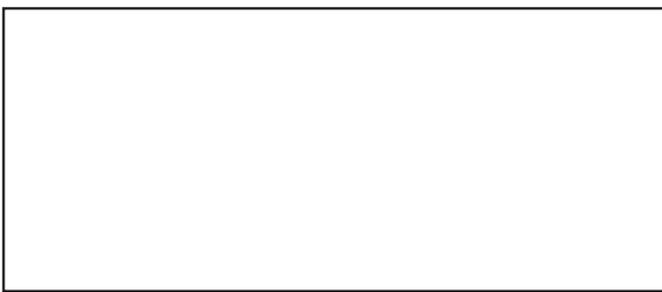
Area

52. a) Calculate the area of this rectilinear shape by counting squares:



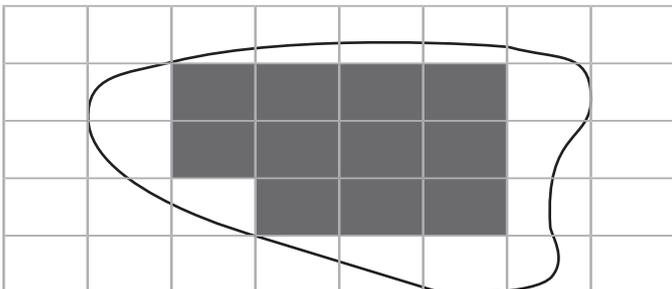
Area = _____ cm^2

b) Measure the sides of the rectangle and calculate the area:



Area = _____ $\text{cm} \times$ _____ $\text{cm} =$ _____ cm^2

c) Estimate the area of this irregular shape:



Money

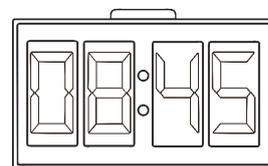
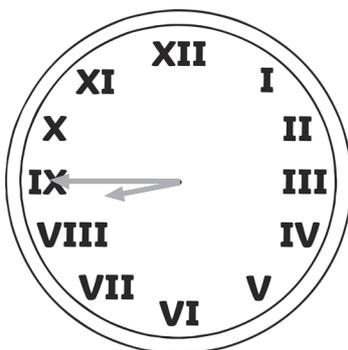
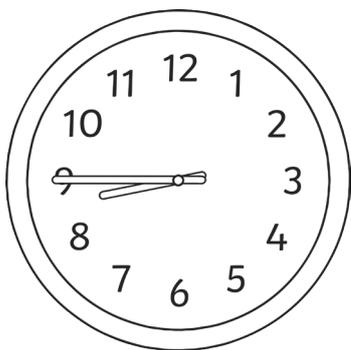
53. Add and subtract giving change

Jude buys a bag of apples for £2.25 and some avocados for £3.15. How much change will he get from £20?

Time

54. Analogue clocks and 12/24 hour time

a) What time do these clocks show? _____



b) The maths lesson lasted 1 hour and 5 minutes. The art lesson was one hour and twenty minutes. Which lesson was longer and by how long? _____

c) A film lasts 136 minutes. How long is the film in hours and minutes?

_____ hours and _____ minutes

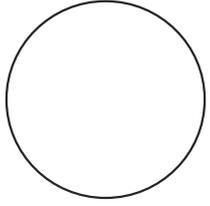
Solve Problems

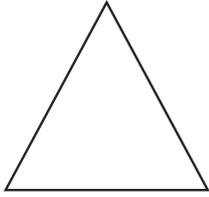
55. a) 2 equal bottles of water contain 500ml of drink. How many litres will 7 bottles hold?

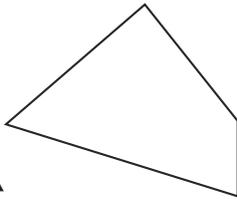
b) A 6.5kg bag of soil is divided into 20 pots equally. Each pot needs 0.5kg. How much more soil does each pot need after the bag is used up?

2D Shapes

56. Label the shapes.

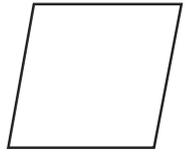




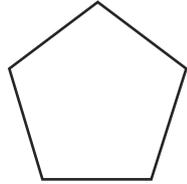


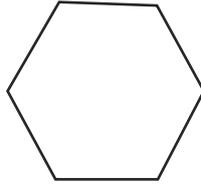


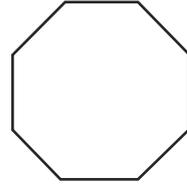


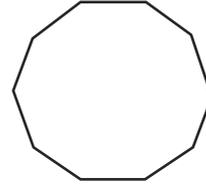




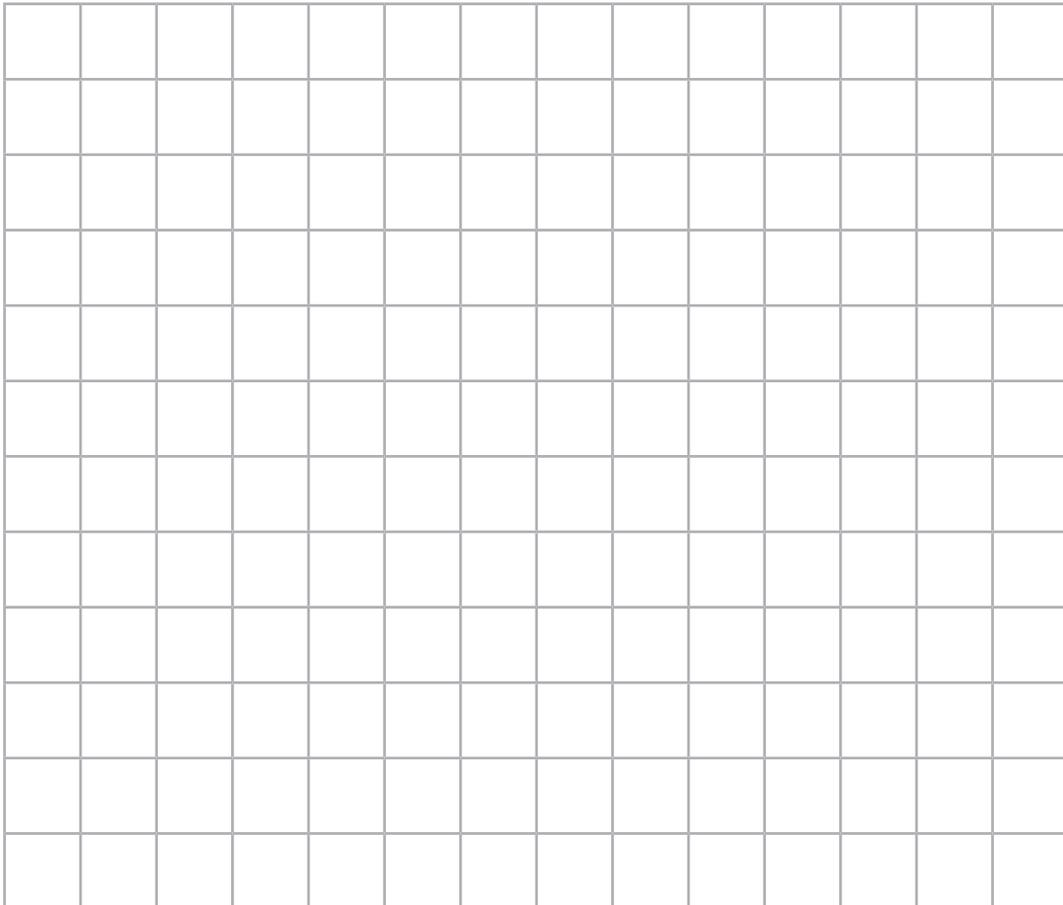




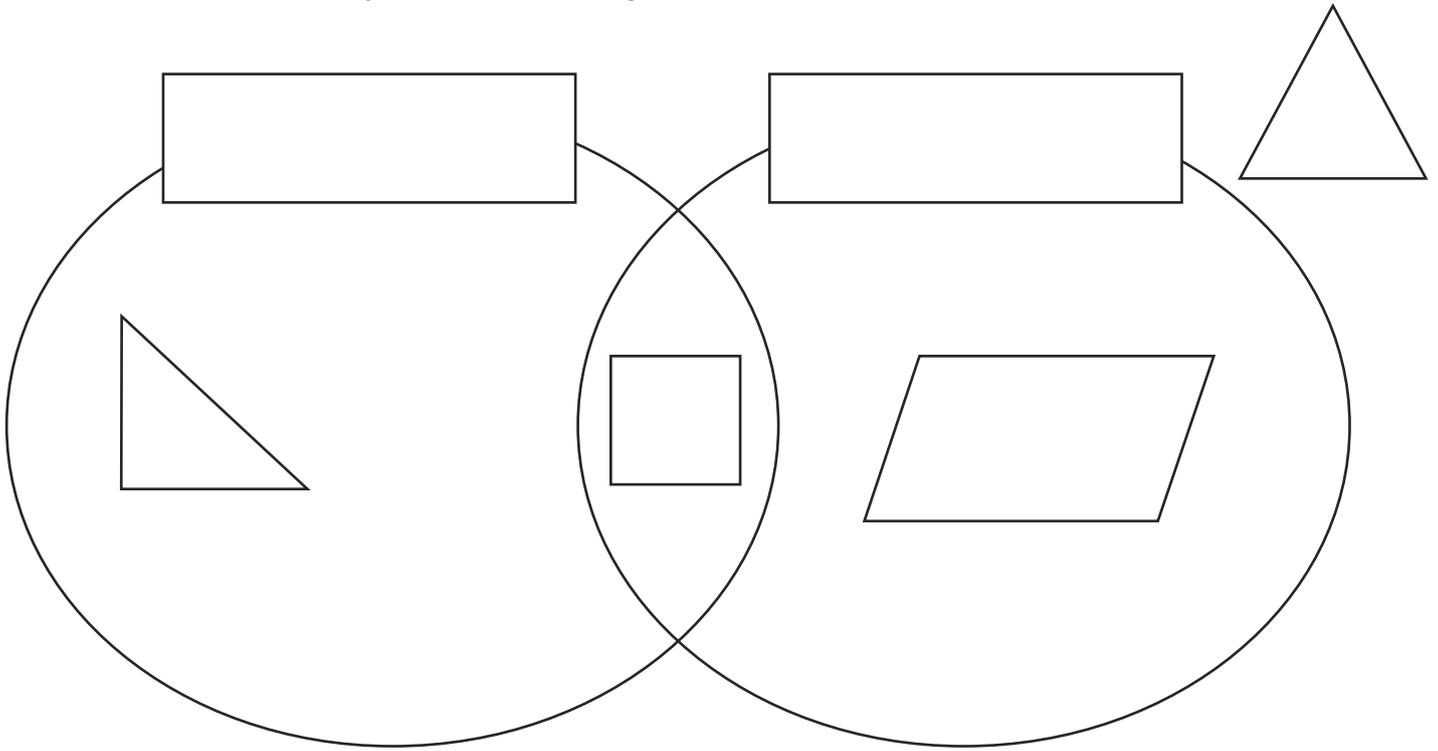




57. Draw a square on 1cm squared paper with sides of 4cm.



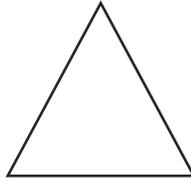
58. Write suitable titles for this Venn diagram:



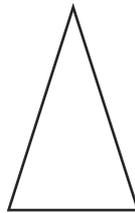
Triangles

59. Label the triangles.

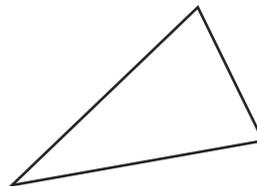
_____ (all sides and angles equal)



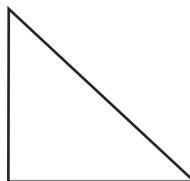
_____ (2 sides and angles equal)



_____ (no sides and angles equal)

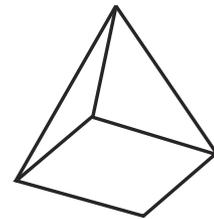
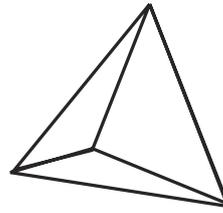
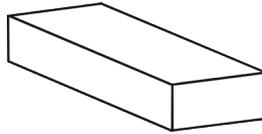
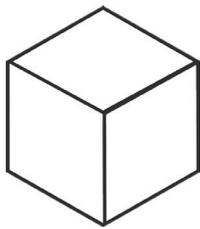
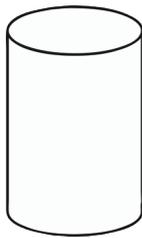
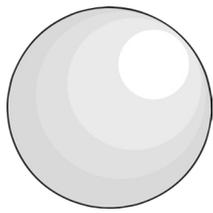


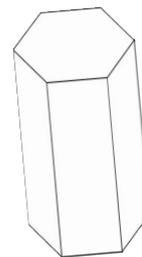
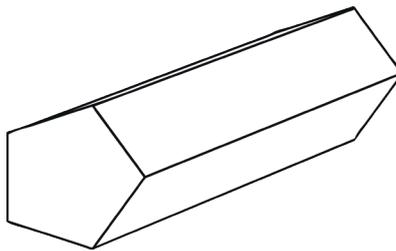
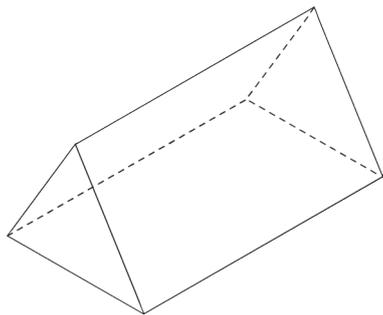
_____ (one angle a right angle)



3D Shapes

60. Label the shapes:



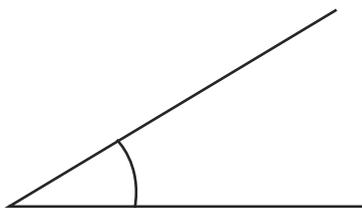


Recognise 2D representations and make models from modelling materials

Angles

61. Complete the statements:

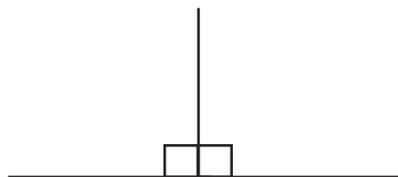
An _____ measures a turn.



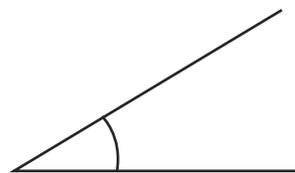
A _____ _____ is the corner of a square.



_____ right angles make a straight line.



An _____ angle is less than a right angle (90°).

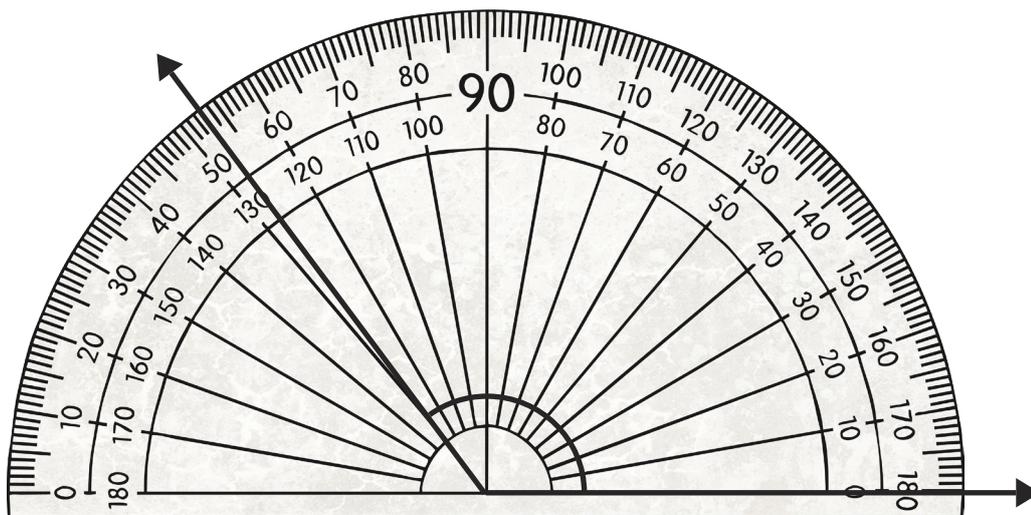


An _____ angle is between a right angle and a straight line.

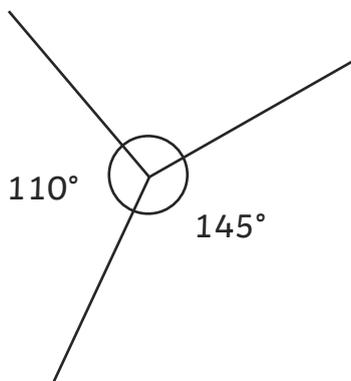


Draw and Measure Angles

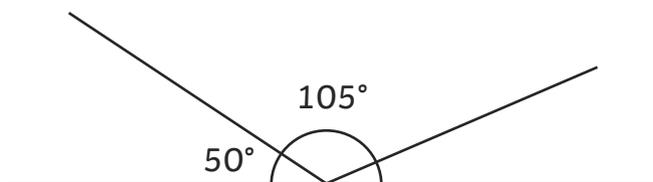
62. a) Measure the angle: _____



b) Calculate the missing angles:



c)

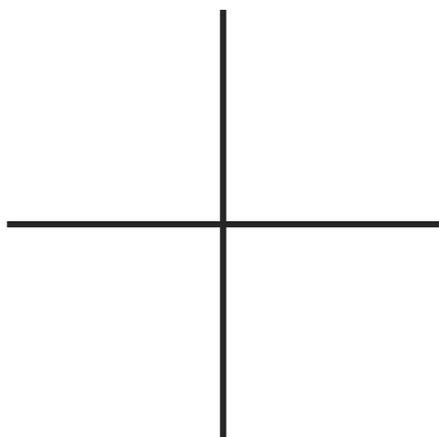


One right angle = _____° Two right angles = _____° Three right angles = _____°

Lines

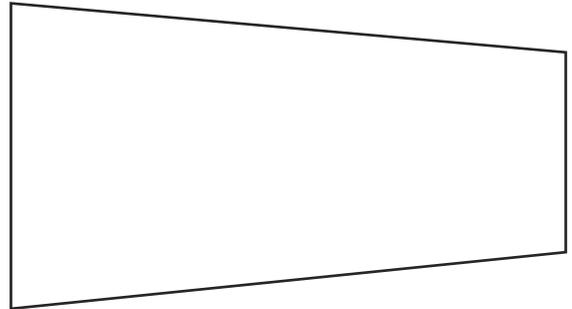
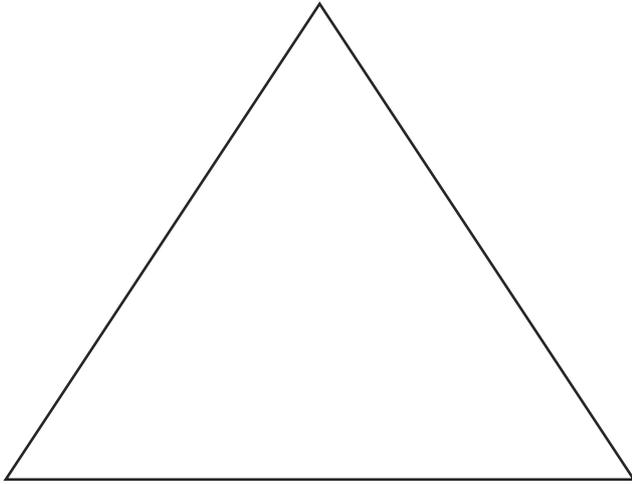
63. Label the lines using the word bank:

vertical
parallel
horizontal
perpendicular

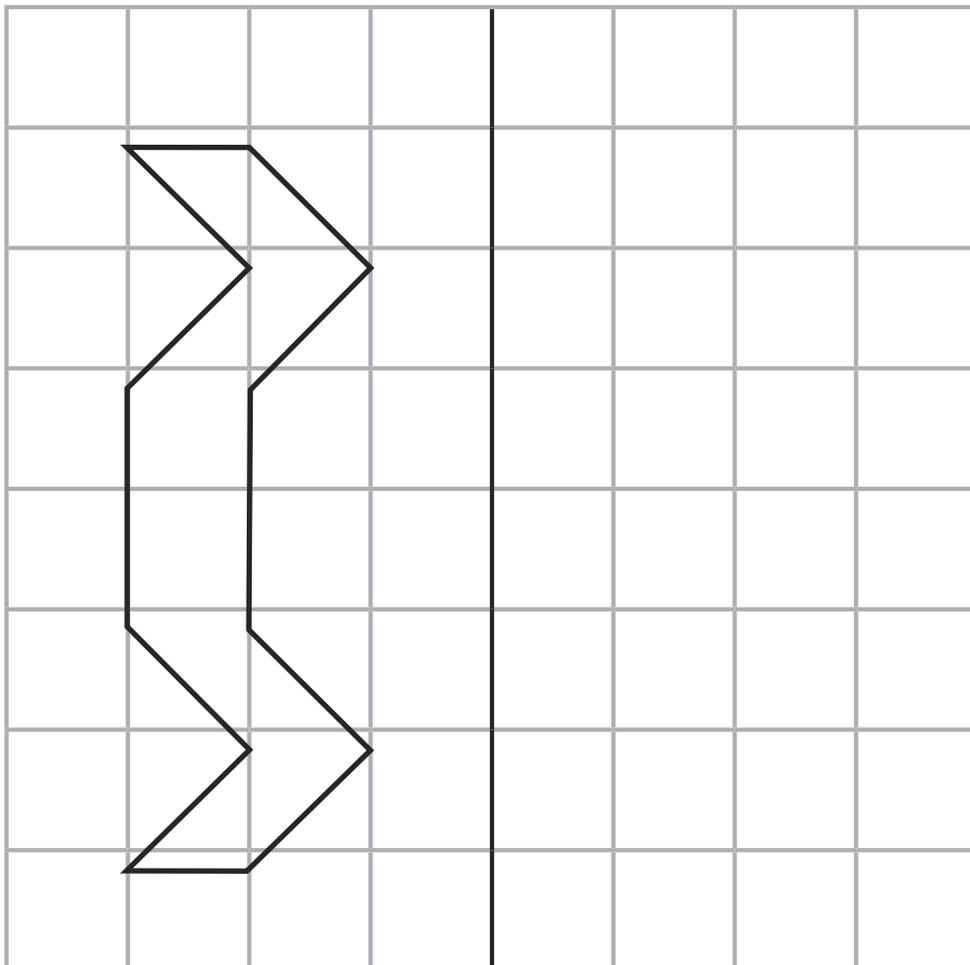


Symmetry

64. Mark the lines of symmetry in these shapes:

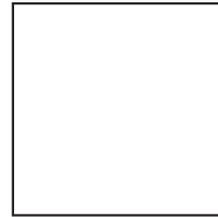
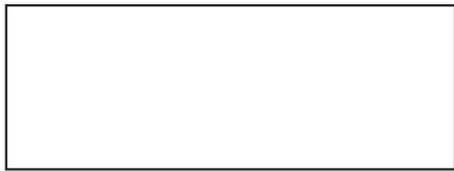
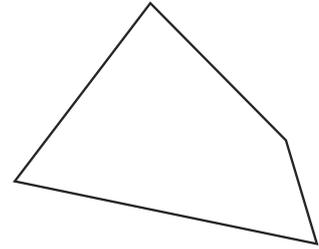
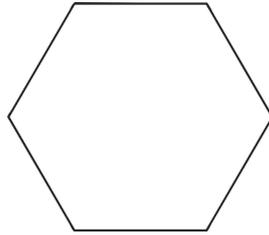
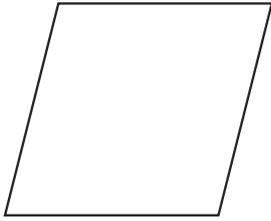


Complete the symmetrical figure:



Regular and Irregular Polygons

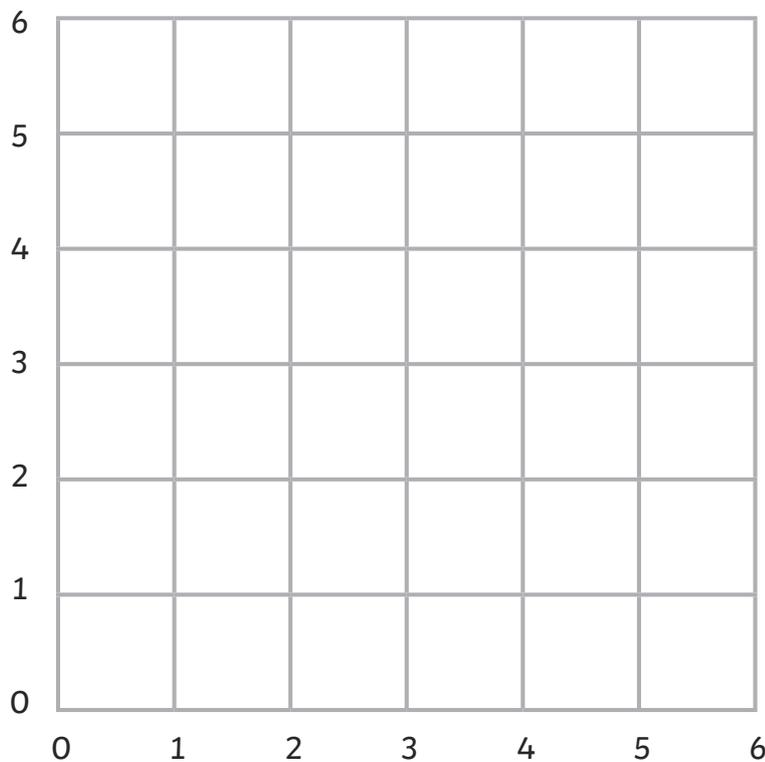
65. Circle the regular polygons:



Geometry – Position and Direction

Coordinates

66.



Label A, B and C The coordinates are

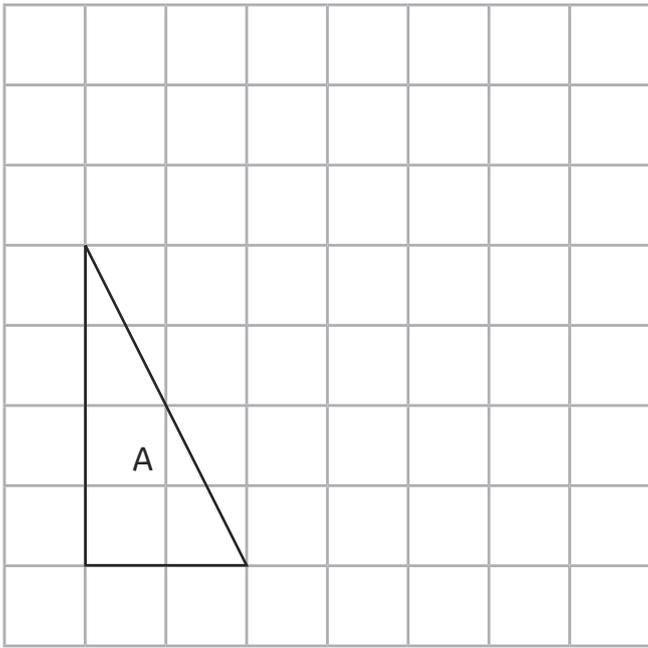
A (1,3)

B (2,4)

C (4,2)

What are the coordinates of the point that will complete a rectangle? _____

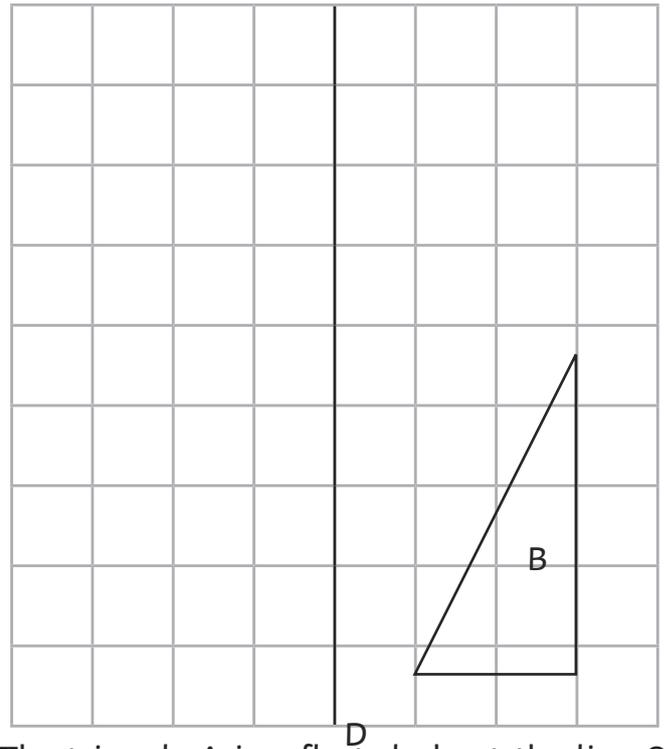
Translation



The triangle A is translated three squares to the right and two squares up to triangle B.

Mark triangle B

Reflection



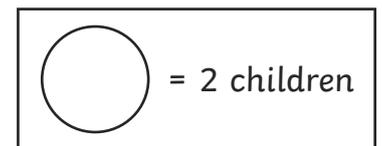
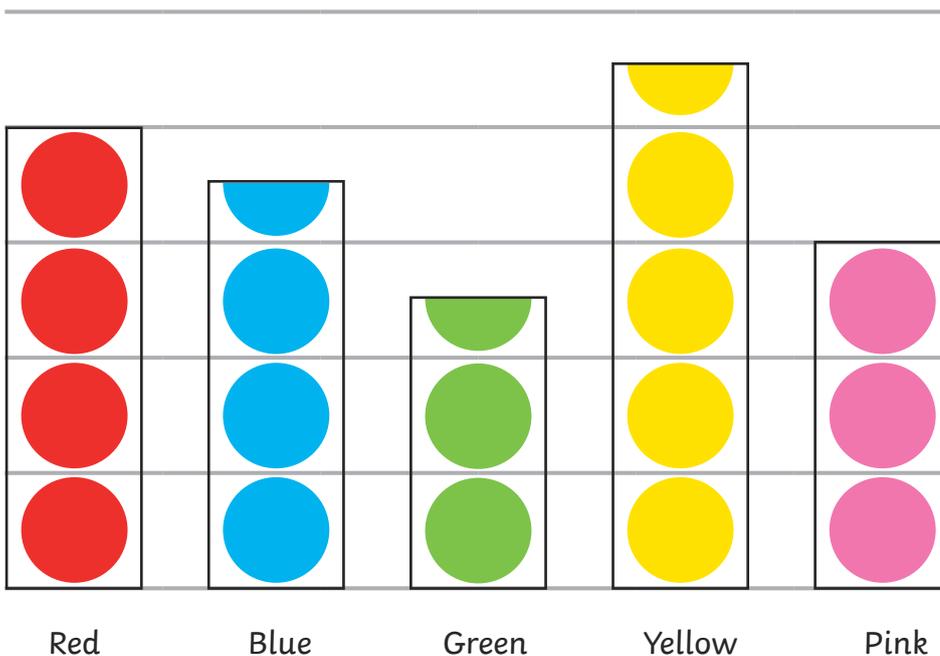
The triangle A is reflected about the line CD to triangle B.

Statistics

67. Present data in these graphs and tables and solve problems:

Pictograms

Favourite Colour



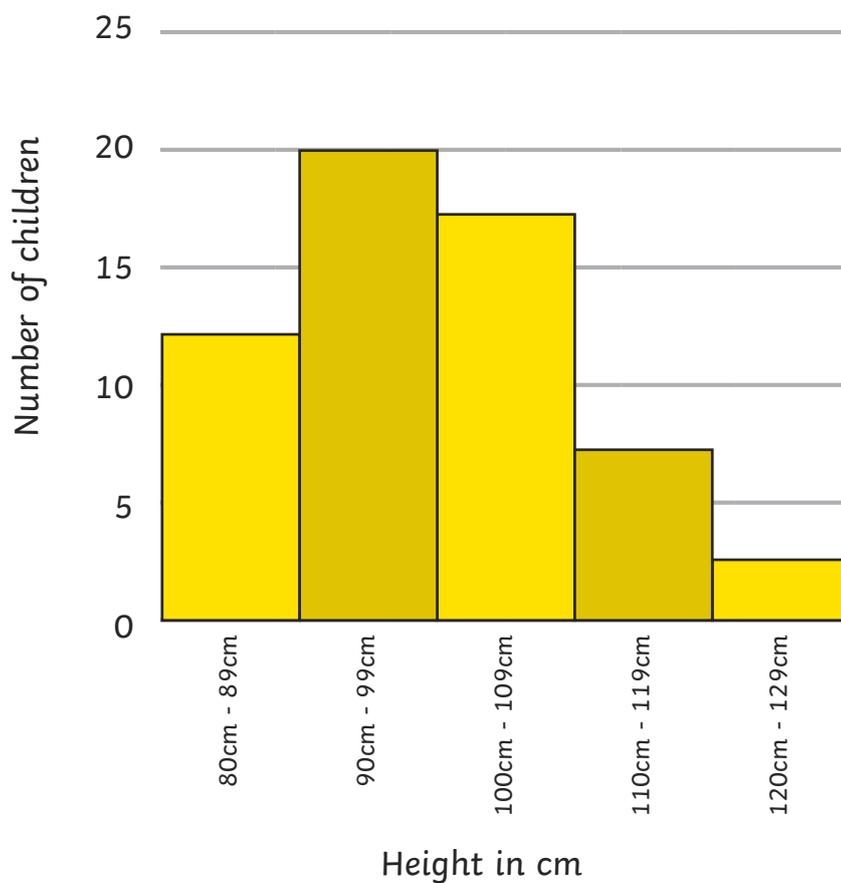
a) How many children chose their favourite colour? _____

Bar Charts



a) How many more children chose cheese and onion as their favourite crisps than ready salted?

The Height of Children



c) How many children are shorter than 1m? _____

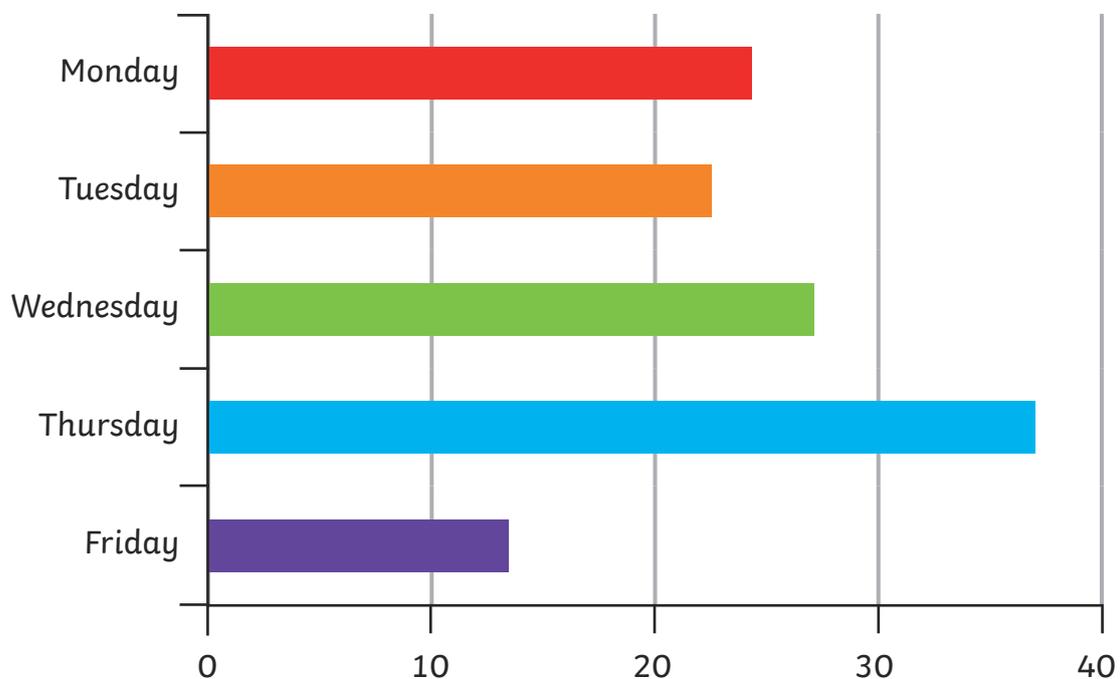
Tables

	Monday	Tuesday	Wednesday	Thursday
Saturn	2	1	3	4
Twin	0	2	2	3
Stars	5	3	2	0
Cluster	2	2	2	2
Treasure	1	3	5	0
Tiger	6	3	4	1
Plimmy	1	3	2	2

d) Which chocolate bar is the most popular? _____

Time Graphs

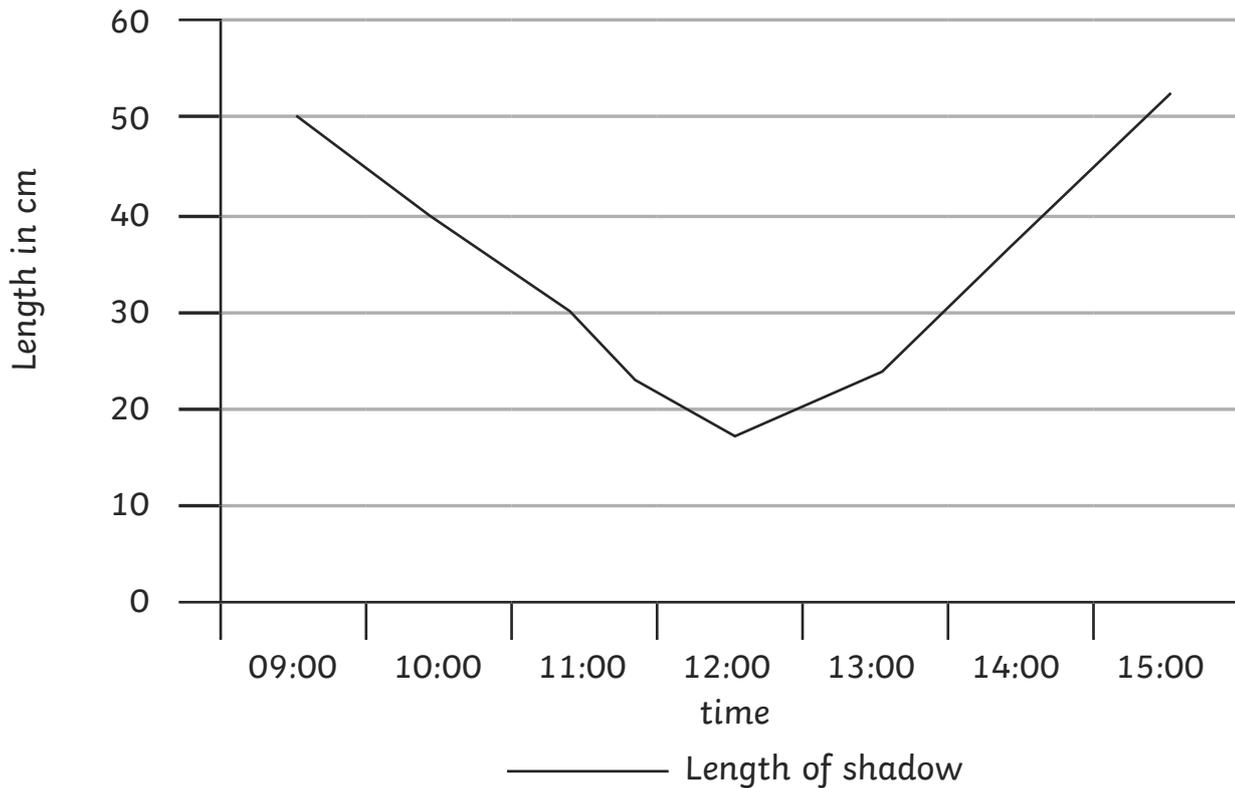
Number of Children Who Have a School Meal



e) How many children had a school meal during the week? _____

Line Graphs

Length of a Shadow



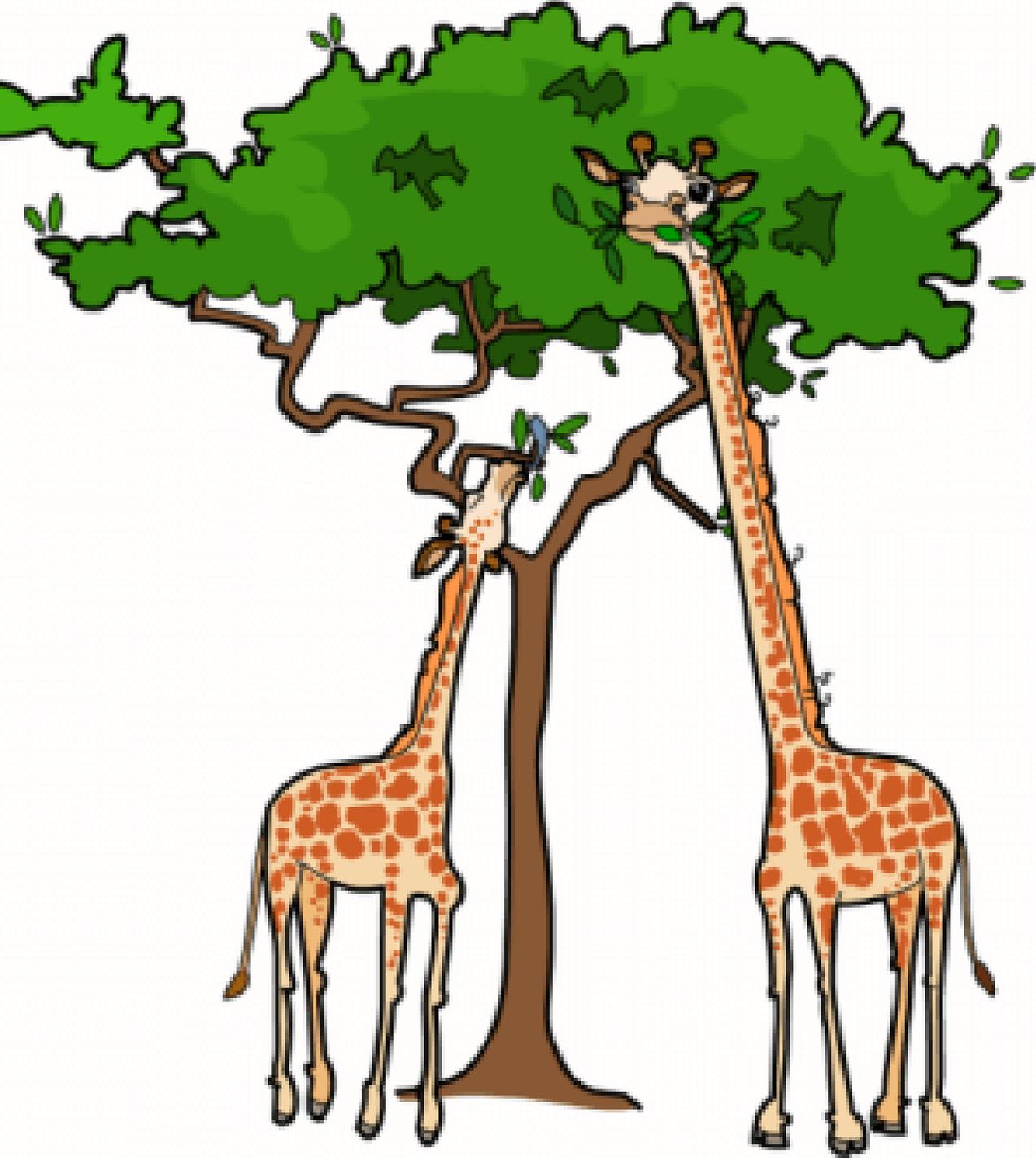
f) In which hour was the largest change in the length of the shadow? _____

Time Graphs

Train timetable from London to Newcastle

Destination	Journey A	Journey B	Journey C
London	10:20	11:30	16:40
Derby	12:20		18:00
Sheffield	12:40	13:10	18:30
Hull	13:20	13:55	19:15
Newcastle	14:25	14:40	

g) Which train takes the least time to get from London to Hull? _____



Adaptation

Today I will get better at identifying how plants and animals have adapted to suit their environments.

How has the penguin adapted to its environment?

- It lives in the Tundra biome. What is its environment like?
- Exceedingly cold, lots of ice and snow, very little foliage and cold waters.
- It has adapted to have a streamline body – this makes it an excellent swimmer to allow it to escape predators and catch prey easily.
- It has flippers which also help it to swim.
- It has two layers of feathers – one insulates the penguin and the other acts like a raincoat to keep it dry.
- It has thick skin on its feet and is able to support itself on its heel to prevent its feet getting too cold against the snow.





Fennec fox



Cape fox



Red fox



Arctic fox

Which biomes do you think these foxes live in?

- Rain forest
- Temperate deciduous forest
- Desert
- Tundra
- Taiga
- Grassland
- Savannah



Fennec fox
Desert biome



Cape fox – Desert biome



Red fox – forest, grassland



Arctic fox
Tundra biome

How do you think these foxes have adapted to their environment?

Research on your iPads the ways that they have adapted.

Choose either the Fennec fox, Arctic fox or the Cape fox and write in your books how it has adapted to its environment.

Would the Red fox be able to survive in this environment? Explain your answer.

Why do foxes come in all sorts of variations?

Foxes all stem from a common ancestor. In certain environments, specific characteristics would have helped the fox to survive. This means that the fox is more likely to reach adulthood and reproduce, therefore passing on the successful characteristics to its offspring. When this happens over and over again, this is known as natural selection – where successful traits are passed on and weaker traits die out. This causes variation amongst a species and thus results in different types on an animal.





What do you notice about these moths?

This is the peppered moth. It changed its appearance hugely in the space of 50 years in the 19th Century.

What happened in the 19th Century that changed the world massively?

The industrial revolution! The first picture is a peppered moth resting on a non-polluted birch tree. What do you notice?

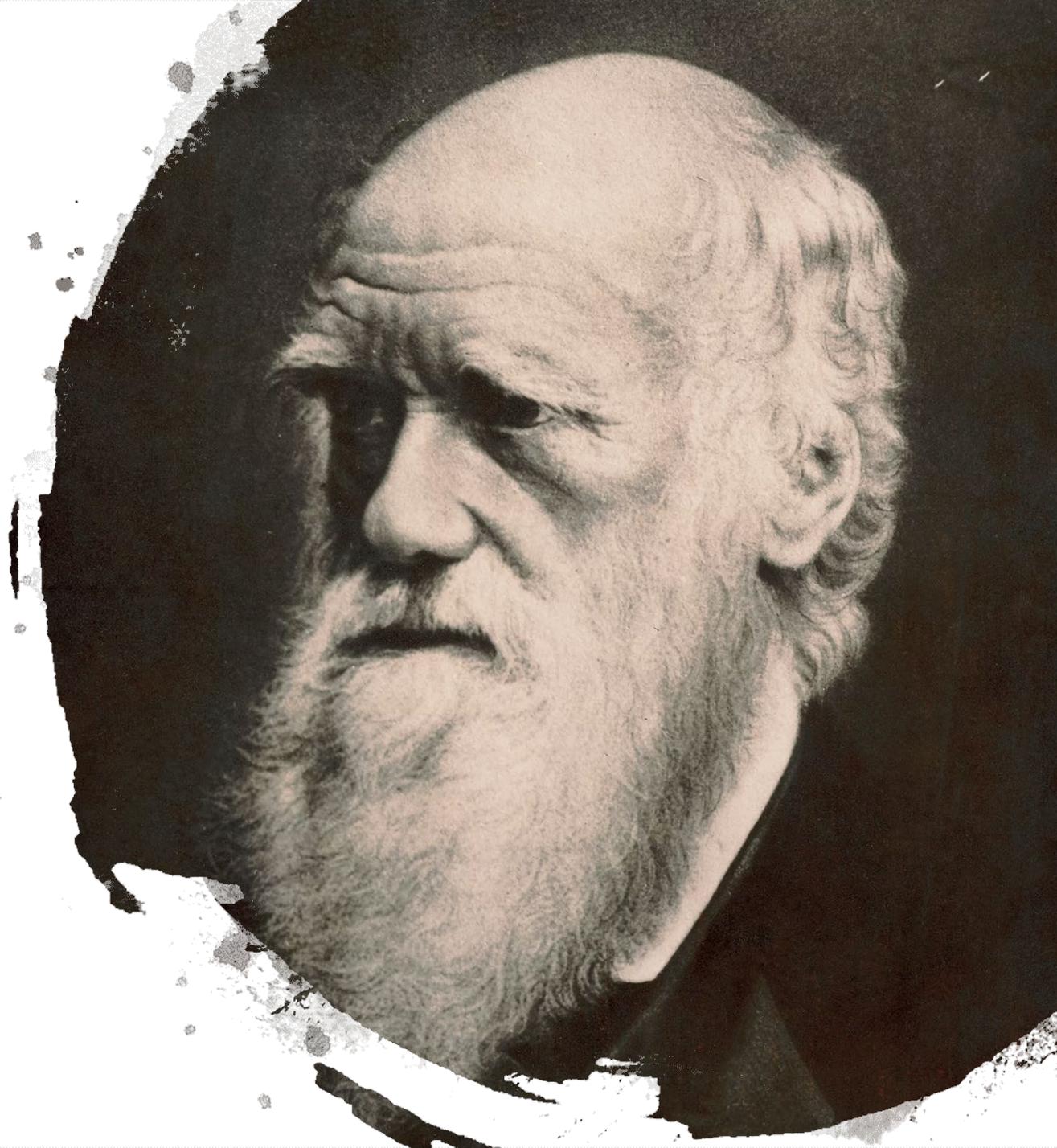
The second photo is a peppered moth resting on a polluted tree. What do you notice?

The moth changed its appearance during this time due to the increased amount of pollution. Through natural selection, it was able to camouflage itself better against the tree barks to hide from predators.

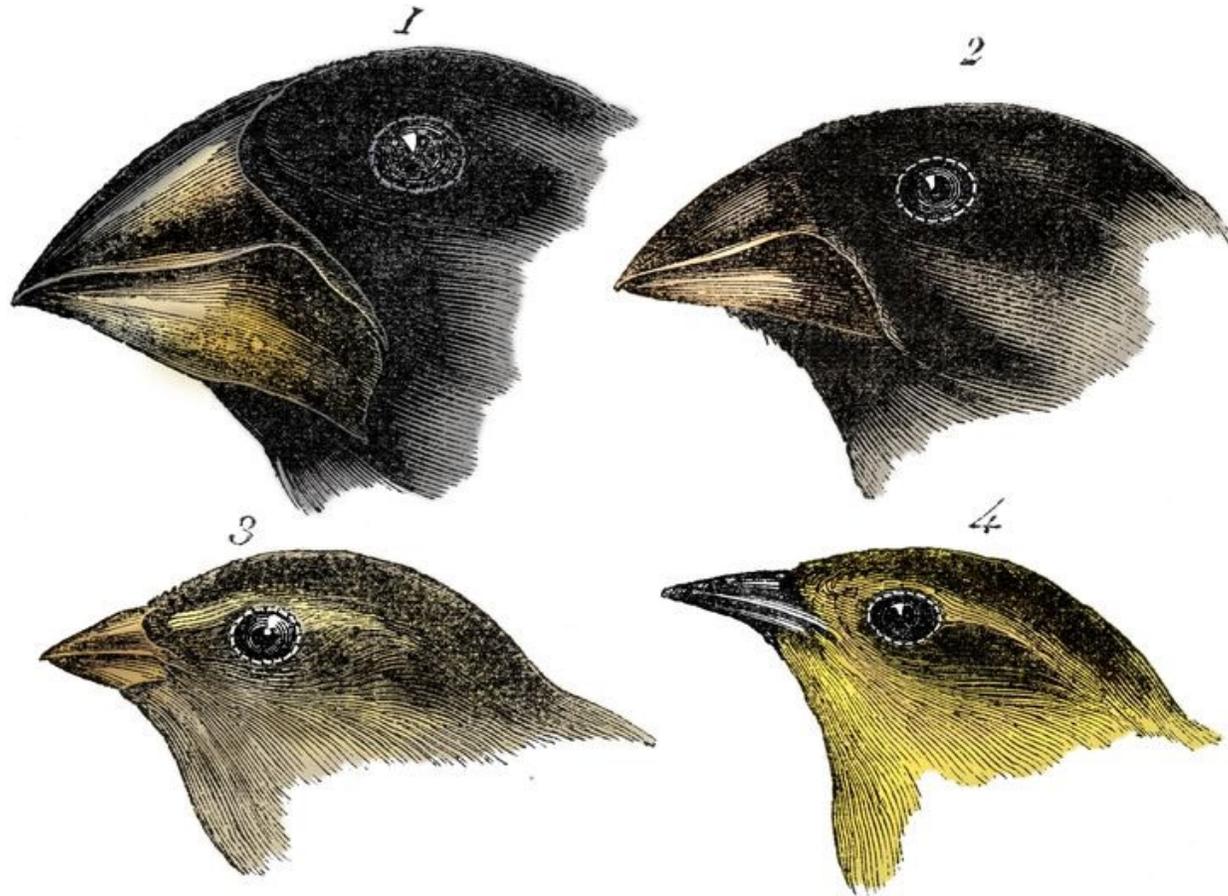
Charles Darwin

Darwin's theory of evolution is well-known amongst scientist. It argues that through adaptation, species have evolved over millions of years.

<https://www.pbslearningmedia.org/resource/tdc02.sci.life.evo.dar/evolving-ideas-who-was-charles-darwin/>



Why do the finches have different beaks?



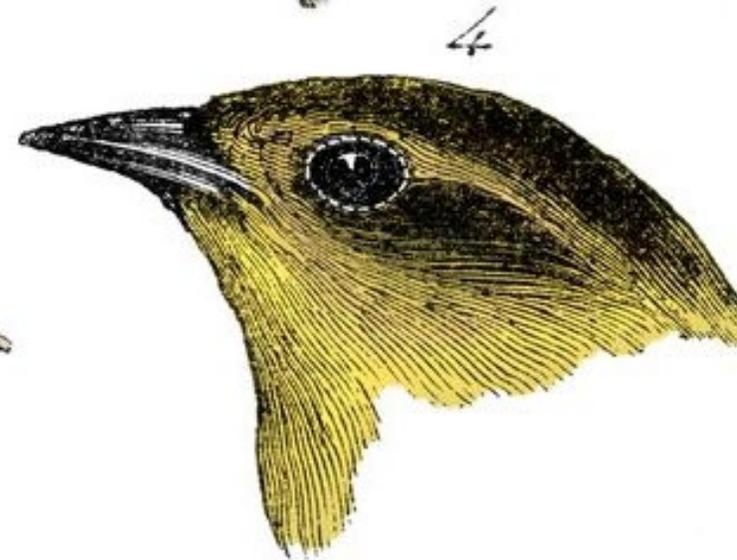
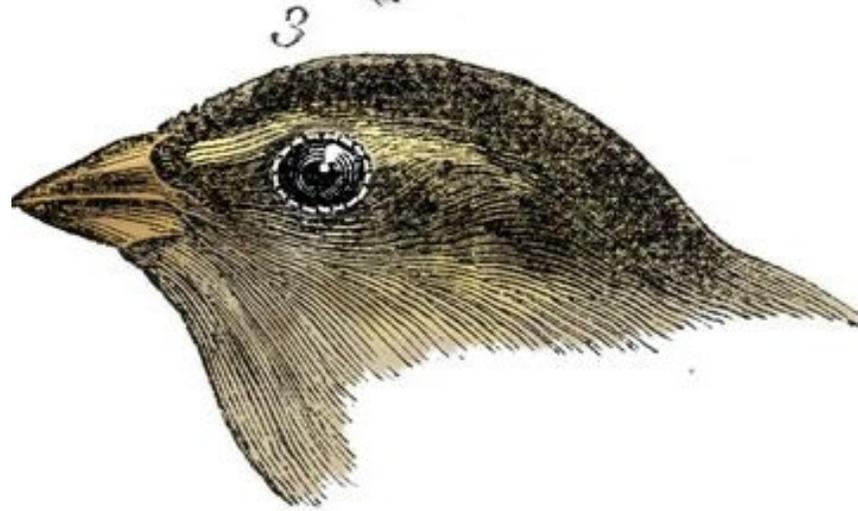
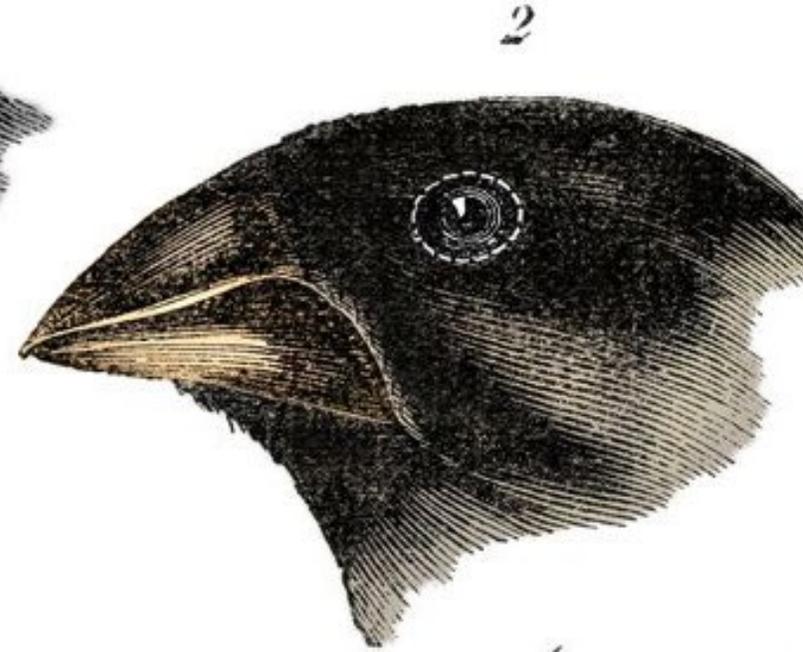
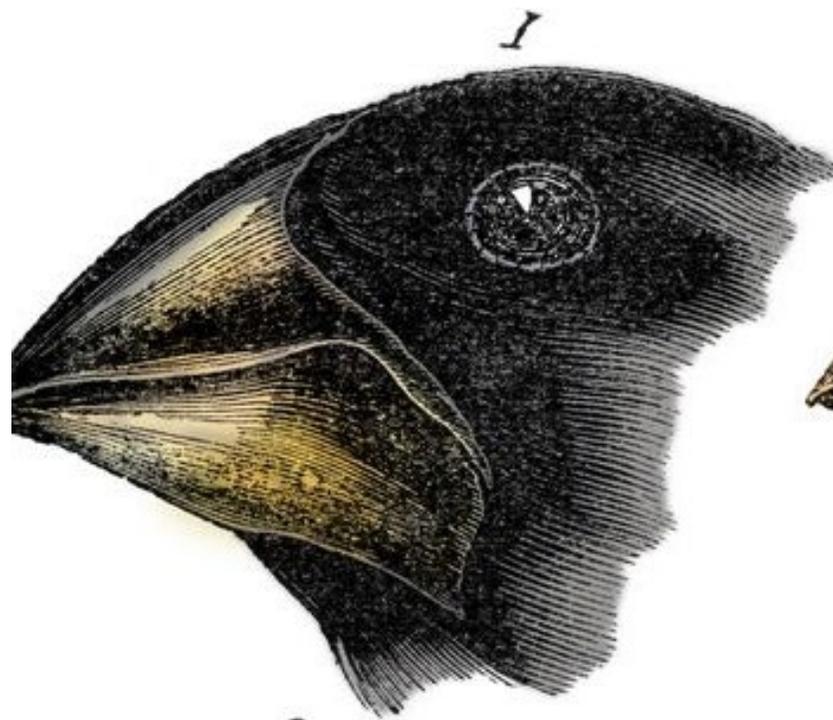
1. *Geospiza magnirostris*.
3. *Geospiza parvula*.

2. *Geospiza fortis*.
4. *Certhidea olivacea*.

<https://www.youtube.com/watch?v=s64Y8sVYfFY>

In your books...

Explain the differences in beaks, size and feet of the Darwin's finches.



1. *Geospiza magnirostris*.
3. *Geospiza parvula*.

2. *Geospiza fortis*.
4. *Certhidea olivacea*.

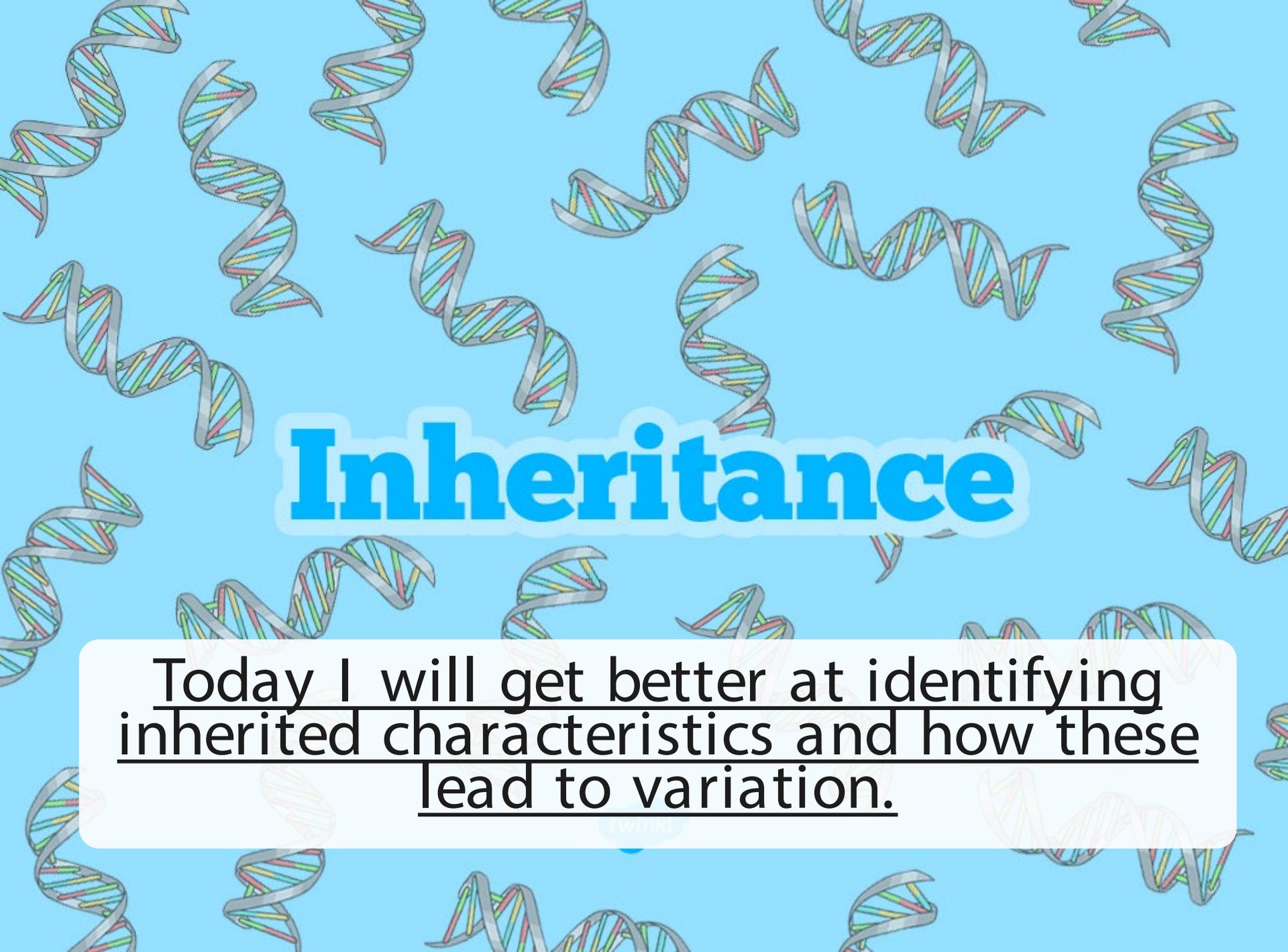
Over to you...

With a partner, choose two of the animals below to research. For each animal, you need to look at the environment it lives in and how it has adapted to be able to survive there.

Identify any variation amongst the species (e.g. different types of owls) and how this variation helps the animal to survive.

otters squirrels bats owl
deer Wild cats bears

- Which animal have you chosen?
- Which biome does it live in?
- What is this environment like?
- How has the animal adapted to the environment?
- How does this help it to survive?
- How does this species vary?
- How does this variation help it to survive in different environments?



Inheritance

Today I will get better at identifying inherited characteristics and how these lead to variation.

Aim

- I can explain the scientific concept of inheritance.

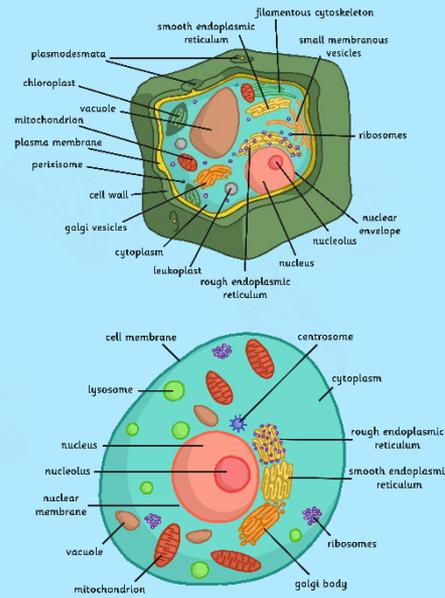
Success Criteria

- I can identify inherited characteristic that are passed on from parent to offspring.
- I can explain how inherited characteristics can lead to variation.

Cells, Chromosomes, DNA and Genes

While you will not be examining these in detail, it is helpful to know about the building blocks of life for this unit.

Cells



Cells are the building blocks of all living things. All living things are made up of cells. Amoebas have one cell. Humans have trillions of cells!

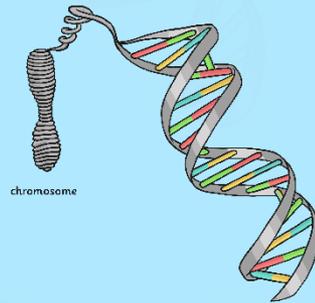
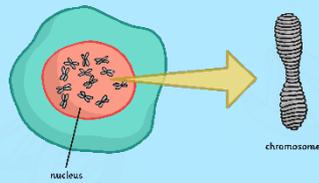
Chromosomes



DNA



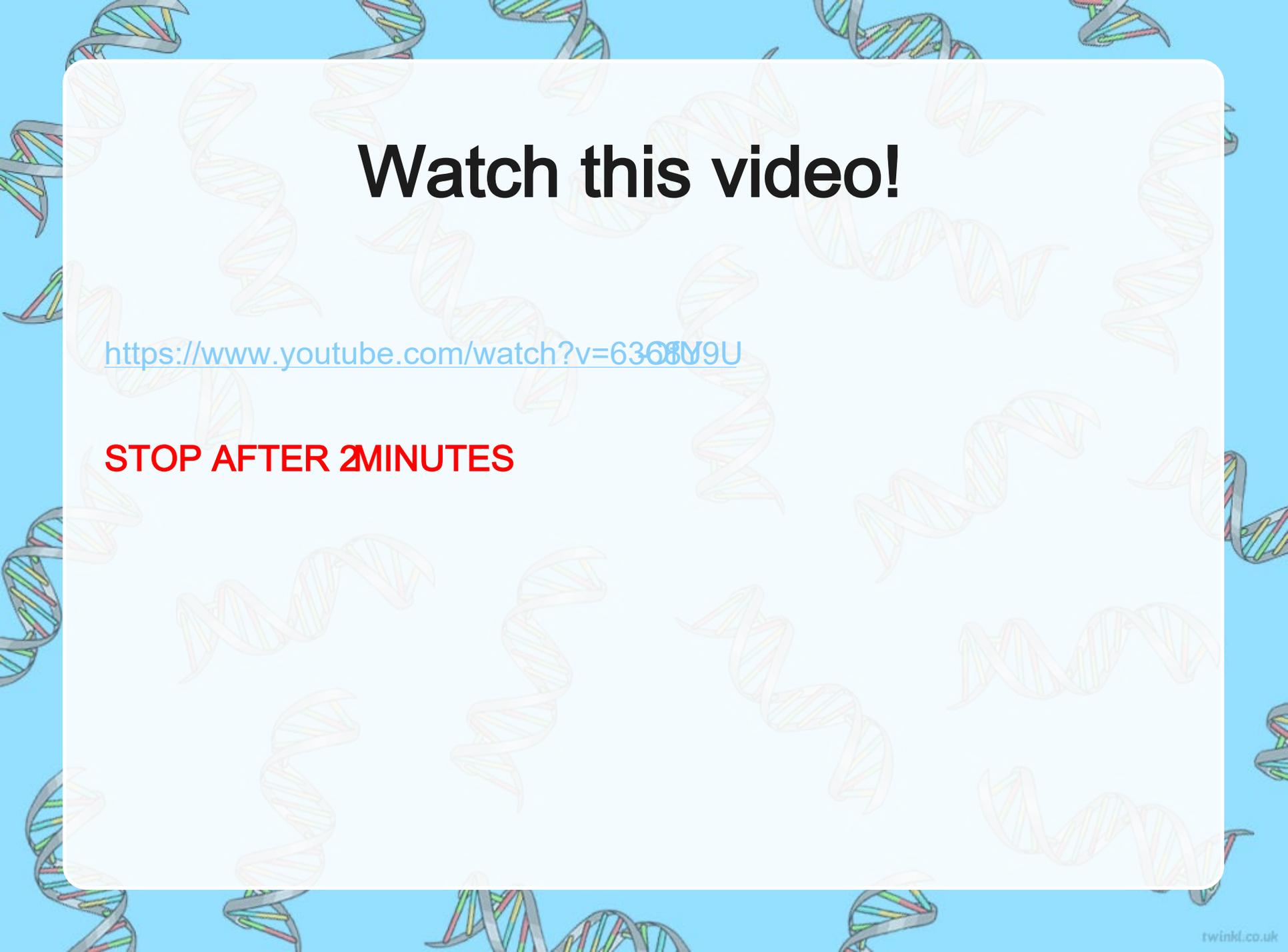
Genes



The nucleus of a cell contains chromosomes, which are made up of DNA.

DNA carries the characteristics that we inherit. It is located in two places in the cell: the nucleus and the mitochondria. DNA can replicate and make copies of itself. When cells divide, each cell needs to have an exact copy of the DNA in the old cell.

Genes are short sections of DNA that contain specific information. This is often called the genetic code. All the genes in the whole cell are called the genome.



Watch this video!

<https://www.youtube.com/watch?v=6368Y9U>

STOP AFTER 2MINUTES

Variation



What does variation mean?

What causes variation?

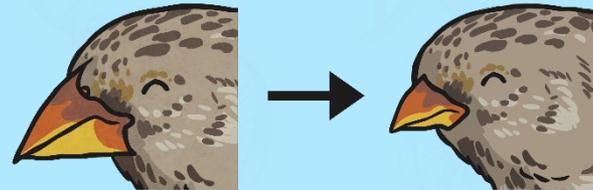
Inheritance

These are characteristics that are passed on to offspring from their parents.



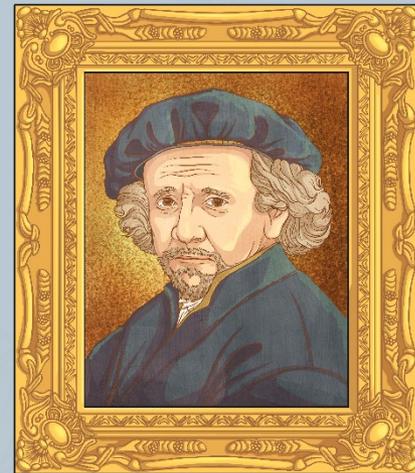
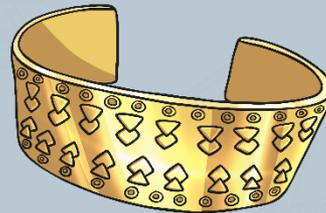
Adaptation

Over many generations, a species will adapt to its environment because the animals with the most successful characteristics are more likely to survive and pass on these characteristics to their offspring.



Inheritance

When we talk about inheritance, we often mean things that are passed on to us when one of our relatives or friends has died. Inherited items are sometimes houses or important objects.



Inheritance

In science, inheritance refers to the genes that are passed on from parents to offspring. When we refer to inherited characteristics we tend to focus on physical characteristics as these are easy to spot but inherited characteristics include abilities such as taste and smell.

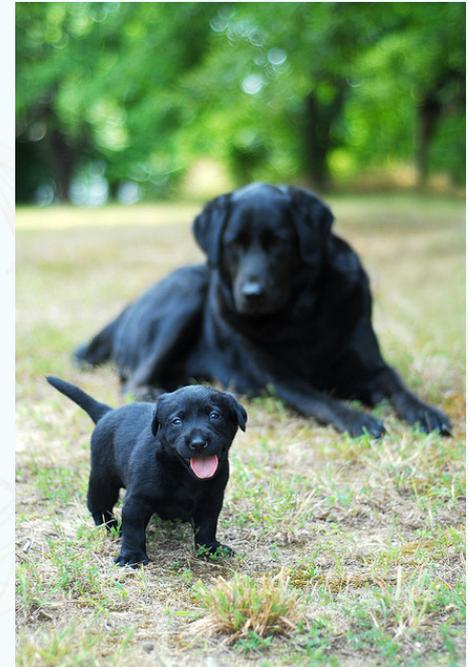


Photo courtesy of Parker Knight, blogdnd and jolly_janner (@flickr.com) - granted under creative commons licence - attribution

Parents and Offspring



Match the parent with its offspring.



How did you match the parents and offspring?
What are the inherited characteristics that you could see?

Photo courtesy of Courtney McCutchen, Steve Skater, Airwolfhound, Dan (catching up) and Tony Fischer (@flickr.com) - granted under creative commons licence - attribution

Parents and Offspring



MISCONCEPTION ALERT!

While offspring does mean child, it does not mean that you are only offspring when you are children! The inherited characteristics you gain from your parents are part of your DNA for life.

Even when you are an adult you are your parents' child!



Photo courtesy of Randen Pederson and Benh LIEU SONG (@flickr.com) - granted under creative commons licence – attribution

Inheritance and Variation

How can inherited characteristics (similarities between parent and offspring) result in variation (differences)?

Well the majority of living things are the result of sexual reproduction so they have two parents. You inherit the characteristics from both parents but the way they combine makes the offspring unique.



The inherited characteristics can combine in different ways, which is the reason why siblings inherit the same characteristics but are not identical to each other.

Even identical twins that share the exact same combination of DNA are not 100% the same! This is due to the fact that genes develop separately when the twins are embryos or during later development.



Watch this video!

<https://www.bbc.com/bitesize/articles/zp9f4qt>

Answer these questions in your books in full sentences!

Explain about DNA and genes.

DNA is... **Genes are...**

What is inheritance?

Inheritance is...

Will offspring always inherit the same genes from their parents?

Offspring...

CHALLENGE: What is the difference between inheritance and adaptation?

Explain about DNA and genes.

DNA carries the characteristics that living beings inherit. It is a molecule that is made up of atoms. DNA tells the cells how to build up your body. Genes are made up of this; they are short sections of DNA that build up a “code” to tell the body to make specific characteristics. This code determines that characteristics of a living being and makes you just the way you are.

What is inheritance?

When living things reproduce, characteristics are passed onto their offspring; this is inheritance. Characteristics are inherited from both parents and include physical features such as hair colour, height and skin colour. However, they can also include things like being colour blind or having a good sense of smell or taste.

Will offspring always inherit the same genes from their parents?

Normally, offspring are not identical to their parents because only a small change in the genetic code can make people unique. Offspring will inherit different characteristics from each parent which causes variation. Even identical twins, who share 100% DNA, are not exactly the same as the genes can develop differently when they are both in the womb.

Challenge: What is the difference between inheritance and adaptation?

Adaptation occurs over many generations whereas inheritance is directly linked between a parent and its offspring. Adaptations happen because the most successful characteristics are more likely to survive to pass on these special survival features to their offspring. For example, over many generations, giraffes have developed long necks and tongues to allow them to reach foliage from the tallest of trees which aids survival as few animals can do this.

Inherited Characteristics



We often talk about inheriting characteristics from our parents. However, it is not always the case that these are passed on through DNA. Some are learnt as we grow up.

Using the Inherited Characteristics Cards place the characteristics into two groups.

Inherited Characteristics

Acquired Characteristics

Skin colour, playing a musical instrument, hair colour, swimming, eye colour, singing, drawing, dimples, cleft chin, reading, riding a bike, freckles

Draw a table in your books showing which characteristics are inherited and which ones are acquired.

Inherited Characteristics	Acquired Characteristics

Skin colour, playing a musical instrument, hair colour, swimming, eye colour, singing, drawing, dimples, cleft chin, reading, riding a bike, freckles

Next steps:

Which characteristics have you specifically inherited from your parents and which are acquired?

E.G. From her mum, Miss Failey inherited average height, attached ear lobes and the ability to roll her tongue. From her dad, she inherited blue eyes and freckles. Over time, she has acquired the ability to use computers well and she has dyed her hair to change its colour.

Draw a table in your books showing which characteristics are inherited and which ones are acquired.

Inherited Characteristics	Acquired Characteristics
<ul style="list-style-type: none">• Skin colour• Hair colour• Eye colour• Dimples• Cleft chin• Freckles	<ul style="list-style-type: none">• Playing a musical instrument• Swimming• Singing• Drawing• Reading• Riding a bike

Inheritance in Dogs

Inheritance applies to all living things. The concepts of inheriting particular characteristics helps dog breeders to breed dogs for specific traits.

Play this game to find out more:

- http://grownups.pbskids.org/dragonflytv/games/game_dogbreeding.html

Inheritance in Dogs

Dog breeders want to breed desirable traits, often ones that are similar to their mother and father. Traits that can be inherited in dogs are its overall health (for example, some dogs may pass on issues with their hips), its temperament (whether it is good with children, intelligent, etc.) and also what its appearance is like (colour, length of fur, pointed/floppy ears, etc.)

Traits in Dogs

All breeds of dogs are measured against specific traits. On the Pets4Homes website, dog breeds are filtered using the most popular traits.

Can you use the filters to find a dog that would be exceptionally easy to train and have a low cost?

Spend some time using the filters to find dogs that have a variety of different traits.

- <https://www.pets4homes.co.uk/dogs/>

> Size	?
> Exercise Needs	?
> Easy to Train	?
> Amount of Shedding	?
> Grooming Needs	?
> Good With Children	?
> Health of Breed	?
> Cost to Keep	?
> Tolerates Being Alone	?
> Intelligence	?
> Breed Group	?

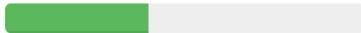
Traits in Dogs

When you click on the dog's profile and scroll down, you will see more information about their characteristics.

Breed Characteristics

Size

Small (Rating 2/5)



Exercise Needs

Extremely High (Rating 5/5)



Easy to Train

Exceptionally (Rating 5/5)



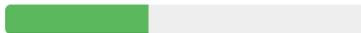
Amount of Shedding

Moderate (Rating 3/5)



Grooming Needs

Low (Rating 2/5)



Good With Children

Average (Rating 3/5)



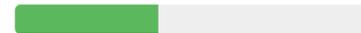
Health of Breed

Average (Rating 3/5)



Cost to Keep

Low (Rating 2/5)



Tolerates Being Alone

Moderate Time (Rating 3/5)



Intelligence

High (Rating 5/5)



Traits in Dogs

You are going to use the information to breed two dogs for specific criteria.

EXAMPLE

If I wanted a dog that was guaranteed to be medium sized, exceptionally easy to train, that could tolerate being alone for long periods of time, I would check the following filters:

▼ Size

- Tiny
- Small
- Medium
- Large
- Giant

▼ Easy to Train

- No
- Challenging
- Average
- Very
- Exceptionally

▼ Tolerates Being Alone

- No
- Short Periods
- Moderate Time
- Long Periods
- Yes

Then press “Apply filters.”

Traits in Dogs

I would then choose from two of the dogs provided in the search. Choose two dogs that you like the physical features of and can choose between. Make sure they are not too similar.



Huntaway

Popularity #138 out of 244 Dog Breeds

Lifespan

12 - 14 years

Pedigree Breed ?

No

[View Profile](#)

[Dogs for Sale](#)



Catalan Sheepdog

Popularity #178 out of 244 Dog Breeds

Lifespan

12 - 14 years

Pedigree Breed ?

No

[View Profile](#)

[Dogs for Sale](#)

Traits in Dogs

I would look at each of their profiles to check they meet the required traits.

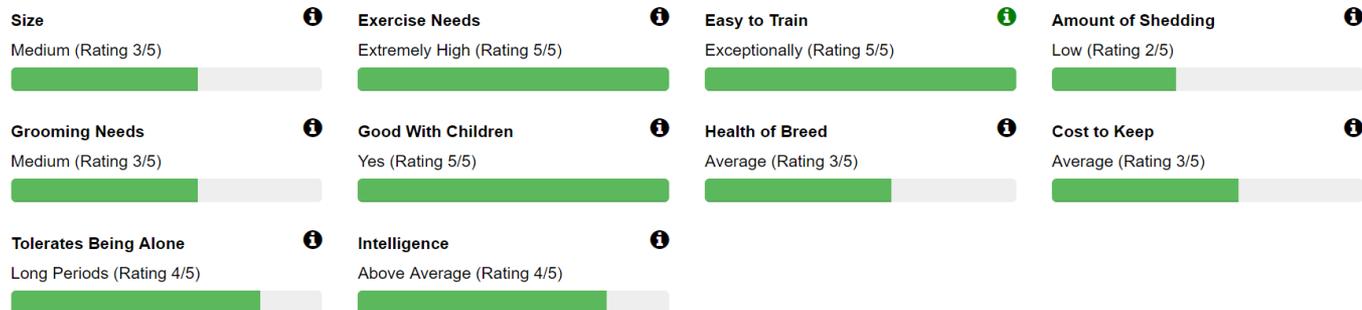
Huntaway:

Breed Characteristics



Catalan sheepdog:

Breed Characteristics



Traits in Dogs

I would then create my family tree and draw the new dog with the new traits. I have added the necessary traits plus two additional ones.

Huntaway

- Medium sized
- Exceptionally easy to train
- Good with children
- Can be left alone
- Average cost



Catalan Sheepdog

- Medium sized
- Low shedding
- Can be left alone
- Needs lots of exercise
- Exceptionally easy to train

This information then guides me to create my own crossbreed, drawing on the information given about traits. I have also added some information about physical features based on the photos and information provided on the website.



Huntaway Sheepdog

Traits from Huntaway

- Medium sized
- Can be left alone
- Exceptionally easy to train
- Good with children
- Smaller build

Traits from Catalan Sheepdog

- Medium sized
- Can be left alone
- Exceptionally easy to train
- Long, floppy ears
- Long fur
- Needs lots of exercise

Traits in Dogs

You need to use this information to breed a dog that meets one of these selections of criteria:

- 1.Small dog, long coat, easy to train and good with children.
- 2.Large dog, long coat and highly intelligent.
- 3.Weighs no more than 30kg, pointed ears and low amount of shedding.

Remember:

For the parents, choose two dogs that you like the physical features of and can choose between. Make sure they are not too similar so that you can pick the features you like (as well as the necessary ones above).

Traits in Dogs

I am trying to achieve a dog that is medium sized, exceptionally easy to train, that could tolerate being alone for long periods of time.

Huntaway

- Medium sized
- Exceptionally easy to train
- Good with children
- Can be left alone
- Average cost



Catalan Sheepdog

- Medium sized
- Low shedding
- Can be left alone
- Needs lots of exercise
- Exceptionally easy to train



Next steps

Explain why you chose to breed the two dogs you have selected to create a dog with the desired traits.

Consider:

- Traits in the parent dogs
- How did you know they had desired traits?
- Could you use a different parent dog with the same desired traits?

Challenge

Within the litter of puppies, how could the offspring vary?



Huntaway Sheepdog

Traits from Huntaway

- Medium sized
- Can be left alone
- Exceptionally easy to train
- Good with children
- Smaller build

Traits from Catalan Sheepdog

- Medium sized
- Can be left alone
- Exceptionally easy to train
- Long, floppy ears
- Long fur
- Needs lots of exercise

Inheritance

1) Explain about DNA and genes.

2) What is inheritance?

3) Will offspring always inherit the same genes from their parents?

4) Challenge: What is the difference between inheritance and adaptation?

Inherited Characteristics	Acquired Characteristics

Skin colour, playing a musical instrument, hair colour, swimming, eye colour, singing, drawing, dimples, cleft chin, reading, riding a bike, freckles

Which characteristics have you specifically inherited from your parents and which are acquired?

E.G. From her mum, Miss Failey inherited average height, attached ear lobes and the ability to roll her tongue. From her dad, she inherited blue(ish) eyes and freckles. Over time, she has acquired the ability to use computers well and she has dyed her hair to change its colour.

<https://www.pets4homes.co.uk/dog-breeds/>

Using the internet to help you, breed two dogs together so that the offspring meets one of the following sets of criteria:

1. Small dog, long coat, easy to train and good with children.
2. Large dog, long coat and highly intelligent.
3. Weighs no more than 30kg, small, pointed ears and low amount of shedding



Draw the new dog and label its physical characteristics.

Draw a family tree for the dog you have created and demonstrate which traits it has inherited from which parent – remember to include personality traits!