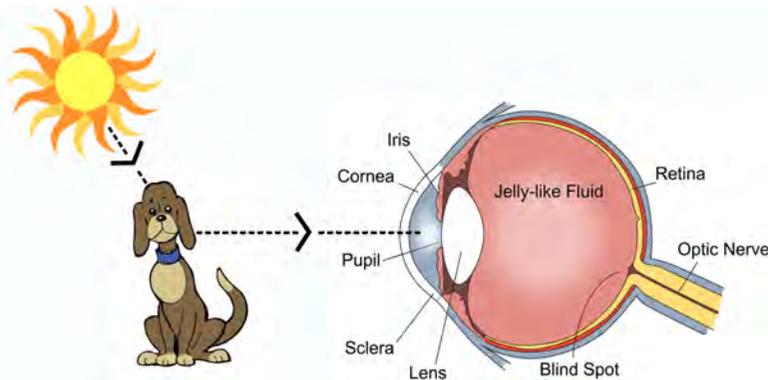


How the Eye Works

Our eyes show us the size, shape and colour of objects in the world around us. They can see something as small and near as a tiny insect or as far off and large as the Moon. The eye is a ball bigger than a marble. It works much like a camera.

The eye collects images carried by light. Light comes from a light source, such as the sun, a candle or an electric light bulb. The light travels in straight lines to an object (e.g. your pet dog), bounces off and enters your eye, carrying a picture similar to a photograph.

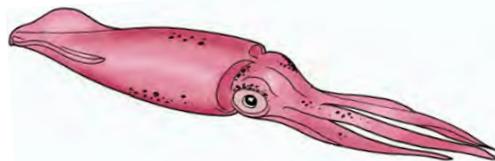


The light enters the eye through the pupil, the black spot you can see in the centre of your eye. This opens wider in poor light and goes smaller when light is very strong such as on a sunny day. The light passes through a crystalline lens, which projects an upside down image on the retina, the sensitive surface inside the back of the eye.

The sensitive surface collects information about the image and sends it to the brain along the optic nerve. The nerves carrying the sensations pass out through a hole at the back of the eye, which is not sensitive to light. This is called the blind spot. The brain automatically corrects the 'upside down image' so you see things the right way up!

Animal Facts

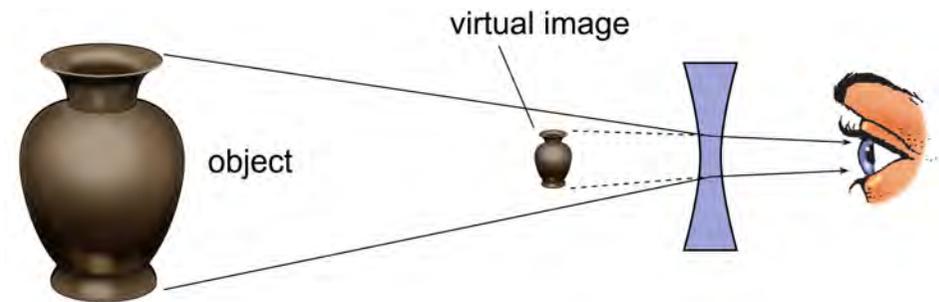
The animal with the largest eye is the giant squid. They can have eyes of nearly 40cm in diameter. The biggest whales have eyes about 10cm across.



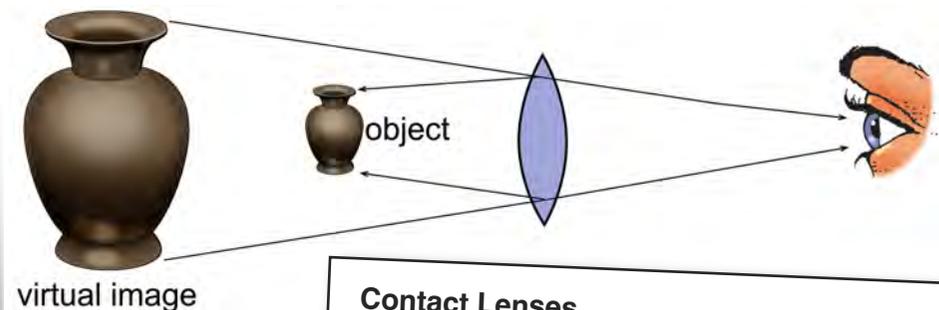
Why do some people wear glasses?

Lenses are used to make things look bigger or smaller. They are usually made of glass or plastic. The lens inside your eye is made of protein. Sometimes eye lenses do not work properly. Wearing spectacles helps to correct this problem.

There are two main kinds of lens. Lenses where the edges are thicker than the middle are called concave lenses. Concave means 'hollowed out'. If you look at something through a concave lens, it looks smaller than it really is. Short-sighted people use spectacles that have concave lenses.



Lenses where the middle is thicker than the edges are called convex lenses. Convex means 'rounded'. If you look at things through a convex lens, they seem larger. People with long sight have spectacles with convex lenses.



Contact Lenses

Contact lenses are worn on the surface of the eye as an alternative to spectacles. Early forms were made of glass but after 1938 plastic was used. A.E. Fick invented them in 1887. Many people wear them for playing sport.

How the Eye Works

Section A

Choose the best word or group of words to fit the passage and put a ring around your choice.

Our eyes show us the size, shape and

1 **smell** **taste** **sound** **colour**

of objects in the world. The eye is a ball bigger than a

2 **balloon** **football** **golfball** **marble**

and works like a camera. Light comes from a source such as

3 **the Sun.** **the Moon.** **Mars.** **Venus.**

Light collects pictures similar to

4 **posters** **photographs** **paintings** **prints**

and enters your eye through the

5 **nose.** **teacher.** **pupil.** **ear.**

The sensitive surface collects information about the image and sends it to the

6 **brain.** **nerves.** **blood.** **bones.**

The 'upside down image' is automatically corrected so you see things the right way up.

Section B

1 Complete the table below:

Concave means...	
Looking through a concave lens things seem...	
Convex means...	
Looking through a convex lens things seem...	

2 Why do you think your eye opens wider when the light is poor?

3 What is the 'retina'?

4 What is 'the blind spot'?

5 What are the two main types of lenses?

6 What sort of lenses do short-sighted people need?

7 What sort of lenses do long-sighted people need?

8 Why do you think some people wear contact lenses instead of glasses?

Section C

Write a short story in which you meet a giant squid with an eye 50cm in diameter.

Louis Braille 1809 - 1852

Early Life

Louis Braille, the son of a saddler and harness maker, was born in Coupvray near Paris in 1809 and was the youngest of four children. At the age of three Louis was playing with his father's tools in the workshop when he slipped and cut one of his eyes. He was taken to the doctor immediately but the damaged eye became infected. The infection spread to his other eye and by the age of five Louis was blind.

Louis was befriended by the new village priest, Abbé Palluy, who encouraged him to attend the village school where he became one of the best pupils. When he was ten, Louis was offered a place at the Royal Institution for the Blind in Paris with a small scholarship to help with the fees. Louis, a talented pupil, learned history, geography, grammar, arithmetic and crafts which included basket weaving, slipper making, knitting and music. He learned to play the piano and had lessons from a local organist. He had natural talent and ability and his love of music remained with him all his life.

The School and its Founder

The Royal Institute for Blind Children in Paris was in a poor area of the city near the River Seine. Valentin Haüy, a man aware of people's negative attitudes towards teaching the blind, founded the school in 1773. Haüy invented a way of producing books to teach his pupils to read. It was called 'embossing' and entailed pressing the shapes of large letters onto soft, damp paper thus producing letter shapes that children could feel with their fingertips. Although this method created the opportunity for the children to read, the letters were so big and it took so long to feel them, that they found it difficult to remember the beginning of a sentence by the time they had come to the end.

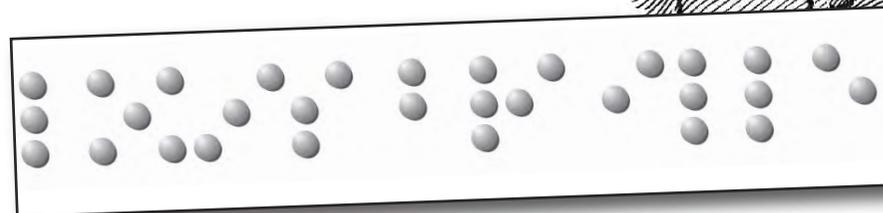
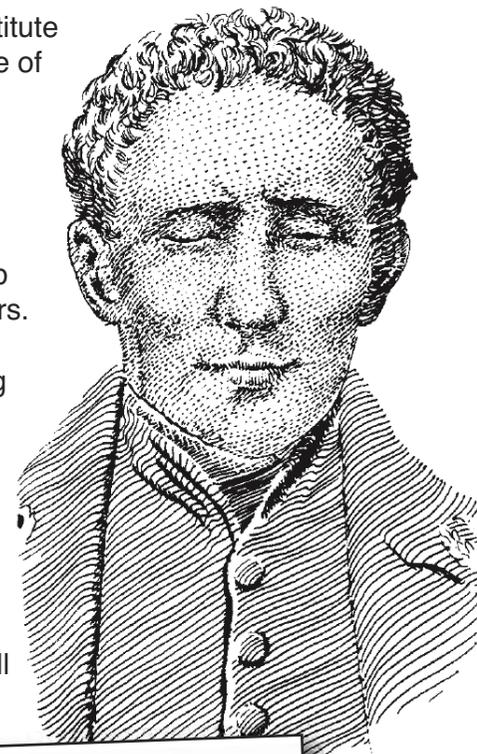
Louis' Alphabet

Frustrated by the need to read as quickly as sighted people, Louis pondered on the best way to teach the blind to read. Charles Barbier, a captain in the French army, had invented a method of 'night reading' for his soldiers based on a system of dots and dashes. Barbier suggested that this system could be used as an alphabet for the blind. The system was an improvement on Haüy's books, but still far from satisfactory.

Louis used Barbier's idea to develop his own and after two years of experimenting, he had invented a new alphabet. It was based on a series of dots put together in groups of six, each forming a letter. His system even included punctuation marks, numbers and music. To write, Louis had a flat piece of metal in a frame, with six holes in it. A stylus was pushed through the holes to make dents in the paper that could easily be 'read' when turned over. Now blind people could not only write, but also read back what they or someone else had written.

Louis eventually became a teacher at the Institute and was popular with all his students because of his gentle manner and lively mind. He also became an organist at several churches and lived a contented and busy life. Louis had always been frail and in 1835 was diagnosed with tuberculosis. The Institute reduced his teaching load so he could continue to develop and refine his alphabet over the next few years.

By now Louis' health was rapidly deteriorating but he remained at the Institute, teaching a little, playing his music and visiting his family at Coupvray. In 1851 he went into the Institute's hospital and died in January 1852. He was buried in Coupvray. Two years later 'Braille' became the standard reading method for the blind in France and gradually his system was, and still is, used by people all over the world.



Louis Braille 1809 - 1852

Section A

Choose the best word or group of words to fit the passage and put a ring around your choice.

At the age of

- 1 **three** **six** **seven** **nine**

Louis Braille slipped and cut one of his

- 2 **hands.** **ears.** **eyes.** **feet.**

By the age of

- 3 **four** **five** **eight** **ten**

he was blind. Louis loved music and learned to play the

- 4 **violin.** **recorder.** **piano.** **trumpet.**

He went to school in Paris and learned to read letters pressed into soft damp

- 5 **wood.** **paper.** **sand.** **card.**

Because these letters took so long to read, Louis invented a new system based on a series of

- 6 **dots.** **lines.** **circles.** **squares.**

The new system was given the name 'Braille' and is now used throughout the world to enable blind people to read and write.

Section B

- 1 How did Louis Braille become completely blind?

- 2 What unusual subjects were taught at the School for the Blind?

- 3 What do you understand by the phrase 'people's negative attitudes towards teaching the blind'?

- 4 What did blind people find so difficult about Valentin Haüy's embossed books?

- 5 Why do you think books invented for soldiers to read in the dark would be suitable for blind people?

- 6 How do you think Louis Braille felt when he finally came up with an effective method to enable blind people to read and write easily?

- 7 Which of the following phrases suggests Louis Braille would be a good teacher? Give reasons for your choices.

'contented and busy life'	'lively mind'
'gentle manner'	'always been frail'
- 8 How do you think Louis would have felt if he had lived to see his teaching method used all over the world?

Section C

Close your eyes and imagine you have become blind. Write about a day in your life telling of the things you are still able to enjoy and some of the things you find difficult.

RIVER RESCUE

“Finest sport in the world and it can be very exciting when you catch a fish,” said Uncle Ted as they walked along the river bank, “now this looks a lovely spot for us to set up our rods.” He put down the bags and boxes he was carrying and spread out a rug.

Laura and Paul were staying with Uncle Ted for the weekend and when he’d said he’d take them out for the day while Auntie June was busy, they’d expected something a bit more exciting than spending the day sitting on the river bank waiting to catch a fish.

“Now, I’ve got rods for you both,” said Uncle Ted and they waited patiently while he assembled them and opened the box containing the hooks and weights. An hour went by; Laura thought it was the longest hour in her life. Apart from seeing a couple of ducks and a man walking his dog, nothing had happened. “Wonderful!” said Uncle Ted, “nothing like a day by the river for cheering you up.”

“And boring you to death,” whispered Paul to Laura.

“What time’s lunch?” asked Laura.

Uncle Ted looked at his watch, “Oh, another half hour or so,” he said. Half an hour passed and they began to unpack the picnic that Auntie June had given them. There were sandwiches and sausage rolls, crisps and cakes, bottles of fruit juice and a flask of coffee. Paul had just taken a bite of a tuna sandwich when Uncle Ted leapt to his feet and yanked hold of one of the rods. “We’ve got one!” he yelled reeling in the line as fast as he could, “get the net ready! Quick!”

They put down their sandwiches, hurried to get out the net and watched as Uncle Ted jerked the line out of the water. There was nothing on the end of it. It was very disappointing but not half as disappointing as returning to their lunch to find that a wiry brown terrier was munching his way through their sandwiches.

Uncle Ted shouted loudly at the dog and its owner appeared and shouted at Uncle Ted at exactly the moment a pair of silvery white swans swam into view followed by three cygnets. The dog dropped the sandwich, barked enthusiastically and raced up the river bank towards the swans.

“Come back, Toby!” yelled his owner as he chased after him.

“Mind those rods!” yelled Uncle Ted,

diving towards the edge of the bank.

Uncle Ted over balanced and fell into the river just as the dog leapt through the rushes into the water right into the path of the male swan which reared up and flapped its wings wildly. The dog paddled away quickly and was soon scrambling back up on to the path. It hurtled away from its owner at top speed as the man ran after it shouting and waving the dog’s lead.

As soon as the dog had gone, the swans turned their attention to Uncle Ted as he splashed about in the water.

“Help!” screamed Laura after the man, “Don’t just leave us! Help us!” But the dog and his owner had disappeared around the bend in the river.

Paul snatched up one of the rods and waved it towards the hissing, angry swans, “Get back! Get away!” he shouted but only succeeded in making them more angry.

Uncle Ted was swimming frantically towards the bank but didn’t seem to be making any progress and they were just beginning to panic when they heard another voice and the hum of an engine, and looking up saw a small boat heading towards them. It was the dog owner. He steered the boat towards the swans, they backed away and sailed away in the opposite direction.

“Here! Let me help you,” said the man to Uncle Ted and he reached over the side and hauled him aboard the boat.

The man moored up the boat and helped Uncle Ted climb out onto the bank. The dog was standing up on its hind legs peering over the side of the boat. It gave a friendly woof. It didn’t seem to realise that it had caused such a calamity.

“I’m sorry about that,” said the man, “I’m Bob by the way. He gets a bit excited does Toby. He’s made a bit of a mess of your lunch.” They looked at the half eaten sandwiches

“I thought you’d run away and left us,” said Laura, “it was really scary.”

“Well, the boat was just round the corner, you see, and I knew Toby would jump onto it as soon as he saw it. Now what about sharing my lunch with me?”

It sounded like a good idea and they knew Bob was trying to be kind but Uncle Ted was wet through and they decided it would be best if they packed up and went home.

“Sorry about that,” said Uncle Ted as they drove to the main road, “spoilt our day, that did. And I’m going to be in a lot of trouble with your Auntie June when she sees my clothes. I told you fishing was exciting!”



RIVER RESCUE

Section A

Choose the best word or group of words to fit the passage and put a ring around your choice.

Laura and Paul were staying with Uncle Ted and

- 1 **Auntie Joan.** **Auntie June.** **Auntie May.** **Auntie April.**

Uncle Ted decided to take them

- 2 **climbing.** **shooting.** **cycling.** **fishing.**

In their picnic lunch they had

- 3 **pork pies** **apples** **oranges** **crisps**

and sandwiches. Suddenly Uncle Ted leapt to his feet and shouted

- 4 **“We’ve got one!”.** **“Look at that dog!”.** **“It’s got away!”**

Uncle Ted overbalanced and

- 5 **‘fell into the water’.** **‘leapt through the rushes’.**
‘tripped over the dog’. **‘dived at the dog’.**

Suddenly they heard the hum of an engine as

- 6 **a car** **a motorbike** **a bus** **a boat**

headed towards them. Uncle Ted was pulled aboard and rescued. Uncle Ted drove home soaking wet.

Section B

- 1 What did Uncle Ted think about fishing?

- 2 ‘Laura thought it was the longest hour in her life’. Why did she think this?

- 3 How do you think Uncle Ted was feeling when he leapt to his feet and yanked hold of one of the rods?

- 4 What was more disappointing than finding there was nothing on the end of the fishing line?

- 5 What was Laura asking the man to do when she shouted, “Don’t just leave us!”?

- 6 What could have happened to Uncle Ted if the man had not returned in the boat?

- 7 Why do you think the author used the words ‘silvery white’ to describe the swans?

- 8 Which two of the following phrases best describes the disaster caused by the dog? Give reasons for your choices.
‘munching his way through the sandwiches’
‘leapt through the rushes’
‘raced towards the swans’
‘hurtled away from its owner’

Section C

Uncle Ted got a lot of pleasure and satisfaction from going fishing. Describe in your own words how an activity such as fishing (or any other activity of your own choice) gives you pleasure and satisfaction.

The River Amazon

The Amazon is the world's second longest river and the chief river of South America. It is 4,000 miles long. At many points along its course the Amazon is so wide that you can stand on one shore and not see the other. The river ranges from 1 to 6 miles wide during most of its course. At its mouth it is about 90 miles wide.

The area around the river, called the Amazon Basin, makes up the world's largest tropical rain forest. This region is approximately two-thirds as large as the United States of America. The temperature in the basin averages about 85° F (29° C) and varies little throughout the year. Throughout most of the river basin, the air is very humid (this means it is very damp). These conditions are ideal for many unique plants and animals.

Large ships can sail about 2,300 miles up the Amazon to Iquitos in Peru. Brazilian ports along the Amazon include Belém, at the mouth of the river, and Manaus, 1,000 miles upstream. Ships bring in clothing, food, tools and other products. They pick up raw materials such as animal skins, Brazil nuts, timber and rubber. The ships also take aboard live birds, fish and other animals bought by pet shops and zoos.

Many kinds of fish live in the Amazon River including the fierce, flesh-eating piranha. The Amazon Basin is home to animals such as alligators, anacondas, monkeys, parrots, sloths and many species of insects. The forest has a great variety of plant life. Over 3,000 species of plants have been found in one square mile there. The

trees stand as tall as 61 metres. Their tops grow so close together that only a little sunlight can reach the ground.

A few isolated tribes still exist in the remoter parts and live in the same way as their ancestors did many generations ago. They can be seen paddling long canoes that have been dug out of solid tree trunks. On the banks there are native villages built of mud and logs. Some of the huts are on poles above the water, and on the platforms outside are families with naked children.

South American Indians lived in the Amazon River basin long before Europeans first came to the area. Vincente Pinzón, a Spanish explorer, was probably the first European to see the Amazon. In 1500, he sailed to the coast of what is now Brazil. In 1541, another Spaniard, Francisco de Orellana, led the first exploration of the river by a European. His expedition followed the Amazon from the mouth of the Negro River in Peru to the Atlantic. During Orellana's journey, his group was attacked by what appeared to be female Indian warriors. The Spaniards called their attackers Amazons, after the female warriors in Greek mythology. The name was later given to the river and the surrounding area.

In recent decades tree fellers, farmers, miners and road builders have developed the region. Between them they have destroyed more than 200,000 square miles of forest. Despite such development much of the Amazon Basin region remains a wilderness. It is still possible to fly for hours over the region and see no sign of human settlement.



The River Amazon

Section A

Choose the best word or group of words to fit the passage and put a ring around your choice.

The Amazon is the world's

- 1 **third** **fifth** **second** **fourth**

longest river. The area around the river makes up the world's largest tropical

- 2 **marsh land.** **wood land.** **farm land.** **rain forest.**

The area is very humid which means it is very

- 3 **dry.** **damp.** **wet.** **boggy.**

Large ships sail to ports such as

- 4 **London** **Manaus** **Liverpool** **Rotterdam**

and Iquitos. The Amazon Basin is home to animals such as

- 5 **monkeys** **crocodiles** **kangaroo** **budgies**

and sloths. A few tribes still live in the remote parts of the forest. Their homes are built from mud and

- 6 **sticks.** **logs.** **bricks.** **cement.**

In recent years more than 200,000 square miles of forest have been destroyed.

Section B

- 1 Complete the table below:

Length of river		Number of plant species	
Average temperature		Height of trees	
Distance ships can sail up the Amazon		Area of forest recently destroyed	

- 2 How did the Amazon River get its name?
-

- 3 Ships 'trade' up and down the river. What sorts of things are brought into the Amazon ports?
-

- 4 What sorts of things are taken away from the Amazon ports by ship?
-

- 5 What do you think about wild animals from the Amazon Rain Forest being brought to zoos or pet shops in this country?
-

- 6 'In recent decades tree fellers, farmers, miners and road builders have developed the region.' What does this mean? Do you think this is a good or a bad thing? Give reasons for your answer.
-

- 7 'Despite such development, much of the Amazon Basin region remains a wilderness.' Why is this the case?
-

Section C

A few isolated tribes still exist in the Amazon Rain Forest. Imagine a child your age from such a family becomes your new pen pal. Write a letter telling them about some of the things you like to do in your home. Remember, they have no experience of anything electrical!

Evening Post

Letters To The Editor

Fury Over Thames Toll Charges

Dear Sir/Madam,
I wish to bring to the attention of the readers of your newspaper the problems I encounter during my daily journey to work from Brentwood in Essex to Dartford in Kent. This is only a distance of fifteen miles but the issue of course is the fact that I have to use the M25, one of the busiest orbital Motorways in the UK (if not the world!) followed by crossing the River Thames using the Queen Elizabeth II toll suspension bridge.

My journey to work every morning is a nightmare! On a good day it takes at least thirty minutes to travel the fifteen miles, an average speed of thirty miles per hour. On a really bad day, the journey can take up to four hours which is an average speed of

approximately four miles per hour. I could just as well still be living in Victorian times when motorised vehicles had to follow a man carrying a red flag warning of the imminent danger of an approaching motor vehicle!

The worst journeys occur when the toll bridge crossing suffers from major congestion caused either by a road traffic accident or high winds when the bridge can be closed altogether. On days like these I might as well just turn round (if you could actually manage to do that on the motorway!) and go home. Fortunately, on most days, the traffic travels smoothly but at an alarmingly slow pace. The problem of course is having to pay a toll to cross the bridge.



Travelling from Brentwood, which is north of the bridge, the traffic slows right down even before the bridge comes into sight. You then have to crawl in first or second gear for what seems an eternity until you approach the toll booths. Now in this day and age you'd think you could just show your credit card and be waved through – but no! They want cash, admittedly you can pay in Euros if you have forgotten your English money. But cash it is! So, the poor motorist has to squeeze his hand into his trouser pocket (or her handbag) to find £1.50 (soon to rise to £2) each time they cross. People who cross regularly know to have the correct money ready. However, many people

are making an occasional visit to the channel port of Dover, in order to holiday on the continent and are not prepared for this archaic payment system. Hence virtually everyone is stationary at the toll booth for up to two minutes resulting in huge queues.

My solution is simple. Remove the toll booths and let the traffic flow freely. The government has already made millions of pounds out of this bridge and should, from now on, let everyone use it for free.

Yours,
Angry Driver

Fury Over Thames Toll Charges

Section A

Choose the best word or group of words to fit the passage and put a ring around your choice.

Dear Sir, I wish to complain about my daily journey to work. I use the

1 **M6** **M1** **M26** **M25**

motorway and cross the River Thames using the

2 **Queen Elizabeth I** **Queen Victoria**

Queen Mary II **Queen Elizabeth II**

toll bridge. On a good day it takes

3 **15 minutes** **30 minutes** **4 hours** **6 hours**

to make this journey. On a bad day the bridge may be closed by

4 **hot sun.** **a flood.** **heavy rain.** **high winds.**

The main problem is having to stop to

5 **buy an ice cream.** **pay to cross the bridge.**

fix a flat tyre. **have a rest.**

Each time you cross you have to pay

6 **50p.** **£1.** **£1.50.** **£2.00.**

If the toll booths were taken away the traffic would flow freely all of the time.

Yours, Angry Driver

Section B

1 What is a toll bridge?

2 'My journey to work every morning is a nightmare!' Why do you think the writer feels this way about his/her journey to work?

3 Why do you think the writer compares a bad journey to work to living in Victorian Times?

4 On which days does the writer feel like turning round and going home?

5 Why is having to pay a toll to cross the bridge a problem for the writer?

6 What has the writer used the phrase 'cash it is' to emphasise?

7 What is the writer describing when he/she uses the phrase 'archaic payment system'?

8 What do you understand by the term 'major congestion'?

Section C

Imagine you work for the organisation which operates the toll bridge. Write a letter to the editor of the newspaper telling how important it is for every motorist to stop and pay to use this expensive bridge.