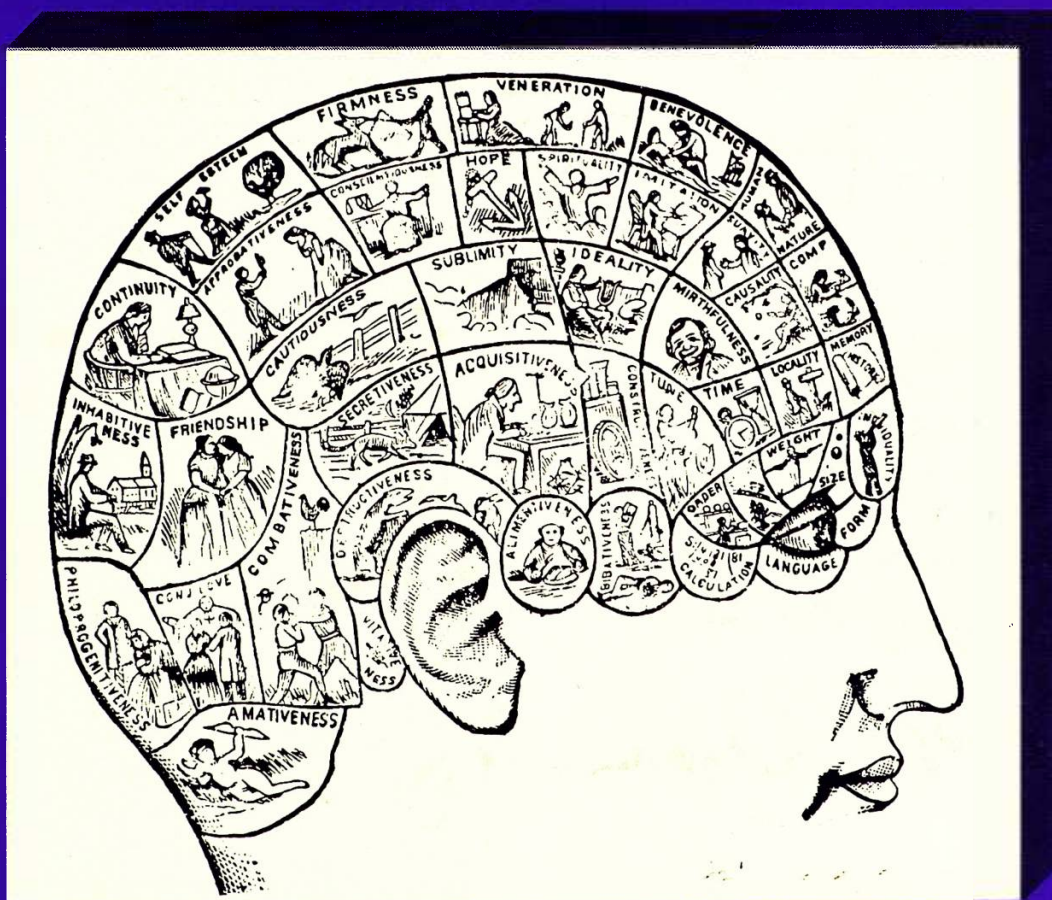


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You and Your Mind

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SCIENCE AT WORK

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	Acknowledgements	inside back cover

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TELEPEN

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1 Making sense of the world

Using different senses

Apparatus

- ★ blindfold
- ★ set of 9 pairs of objects

You are going to find out about your different senses (other than sight).

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Q1 Copy this table.

Pair number	What the objects looked like to me	Differences between the 2 objects found by partner	Sense(s) partner used to find the differences

A Work with a partner. Blindfold your partner. Collect the pairs of objects. Fill in the first 2 columns in your table.



B Give your partner the first pair of objects. Ask your partner to find the difference between them.



C Fill in the last 2 columns of your table.



D Repeat steps B and C for the other pairs of objects.

Q2 List all the senses used in the experiments to find the differences.

Q3 The things you noticed about the 2 objects in each pair can be called **stimuli**. List all the stimuli sensed in experiments.

Q4 When your eyes are covered, which stimuli can you not detect or sense?

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Making sense of the world

Information: Eyes

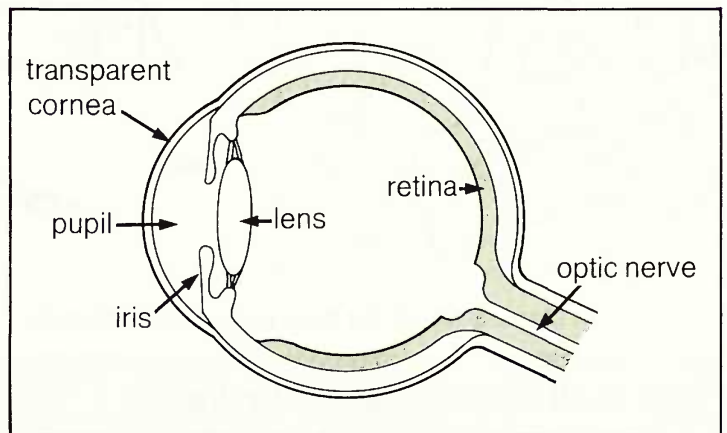
Our eyes give us much information about our surroundings. Our other senses also provide information. We do not realise how much information we get from our other senses. Blind people must rely on their other senses to find out about their surroundings.

A	B	C	D	E	F	G	H
•	:	••	••	•.	••	••	••
K	L	M	N	O	P	Q	R
•	••	••	••	••	••	••	••
U	V	X	Y	Z	and	for	of
•	••	••	••	••	••	••	••
••	••	••	••	••	••	••	••
W	Oblique stroke	Numeral sign	Poetry sign	Apostrophe sign			
••	•	••	••	•			
Lower signs							
,	;	:	.	!	()		
•	:	••	••	••	••	••	••

Blind people cannot see words on a page. They read by feeling raised dots on paper. This is called **Braille**, after the Frenchman who invented it in 1834. Blind people “read” Braille by making use of the skin’s sense of touch.

They also use books which are spoken onto tapes or records and are available in libraries. Recently a machine has been invented that can read out the pages of a book. It is called **The Talking Page**.

The front of the eye is **transparent** (clear). Light can get through the front layers of the eyeball. The light is focused by the **lens**. This focused light makes a sharp **image** (picture) on the back lining of the eye. This lining is called the **retina** and it is sensitive to light. The image is sent to the **brain** along the **optic nerve**.



Section through left eye

Q5 What is Braille?

Q6 What is a “Talking Page”?

Q7 What is the retina?

Q8 How are messages sent from the eye to the brain?

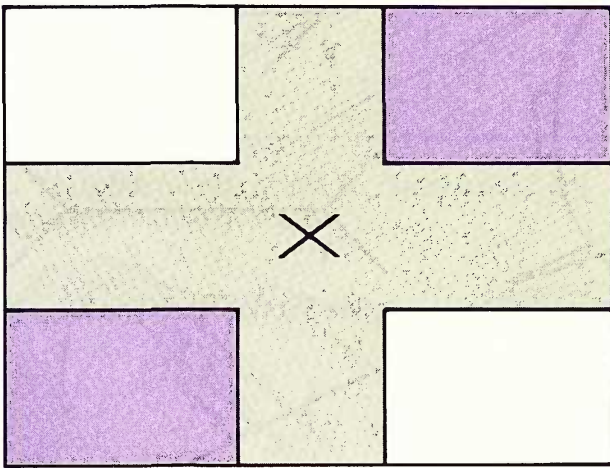
Tricking our senses (1)

Apparatus

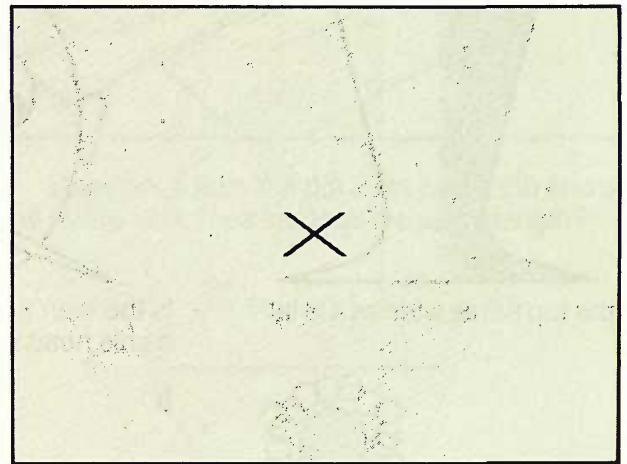
- ★ stop clock

You are going to find out what happens when you look at contrasting colours.

A Look at the X in the middle of the square for 30 seconds.



B Now look at the X in this square. What do you see?



C Look at the pattern printed below.



Q9 Does the purple colour look the same on all parts of the pattern in C?

Q10 The colours or shapes you go on seeing are called **after-images**. Can you think of a time in everyday life when you see after-image colours or shapes?

Making sense of the world

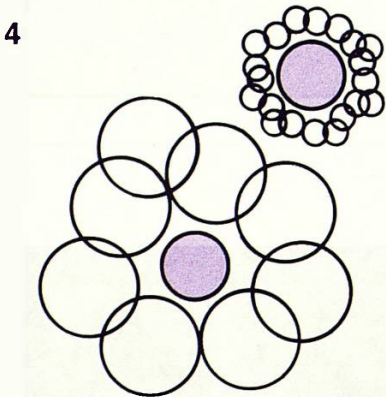
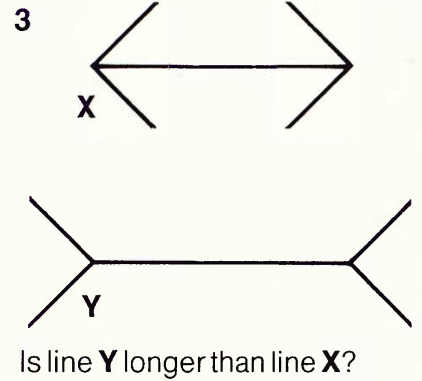
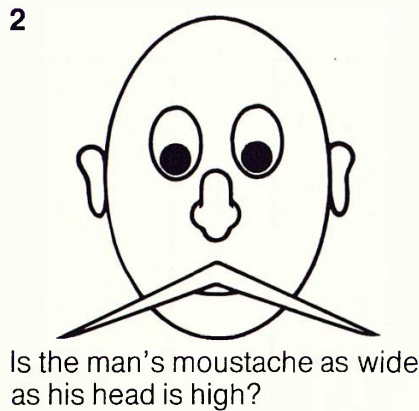
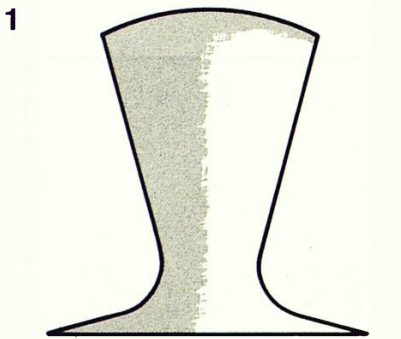
Tricking our senses (2)

Apparatus

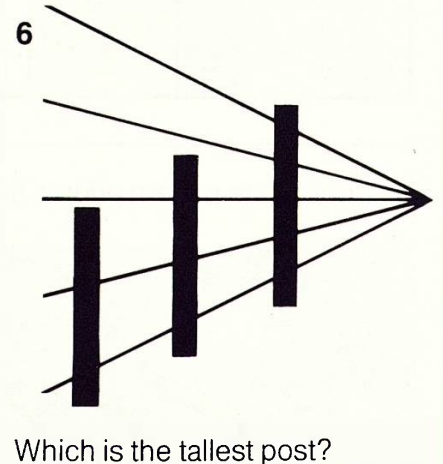
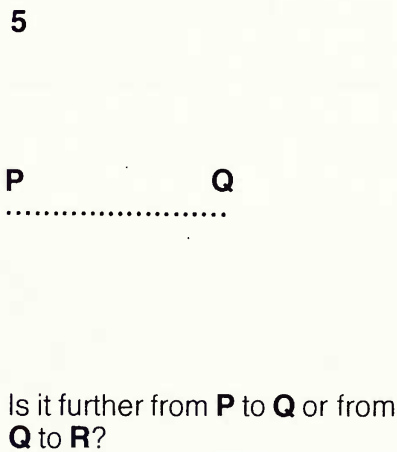
★ ruler ★ pencil ★ paper

You are going to find out if your sense of sight can be tricked.

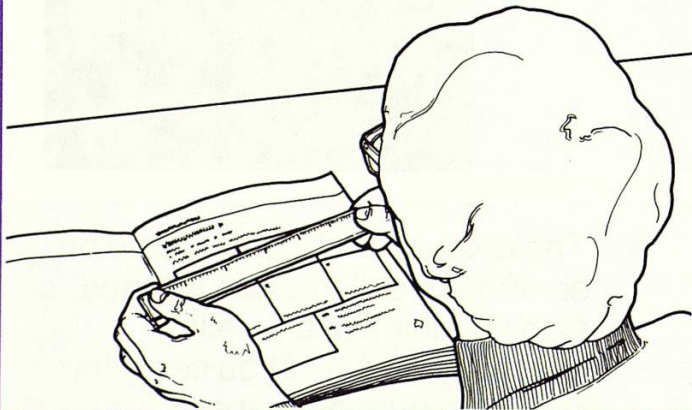
A Look at the drawings.



Are the purple circles the same size?



B Measure the lines and shapes in the drawings.



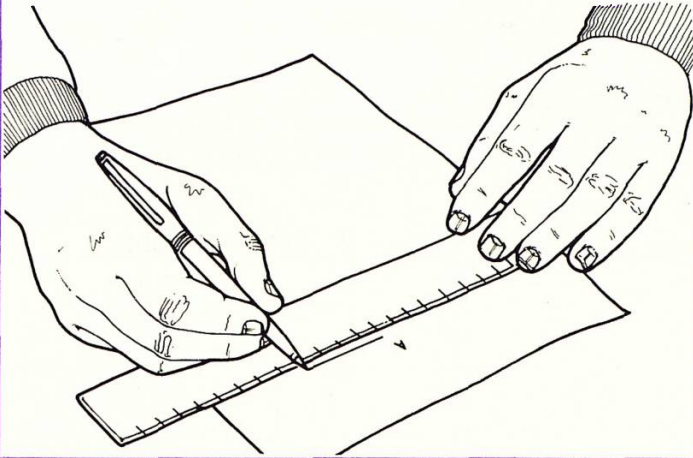
Q11 Did you get the right answers by just looking at the drawings?

Q12 What use is made of drawings like 6 in Art?

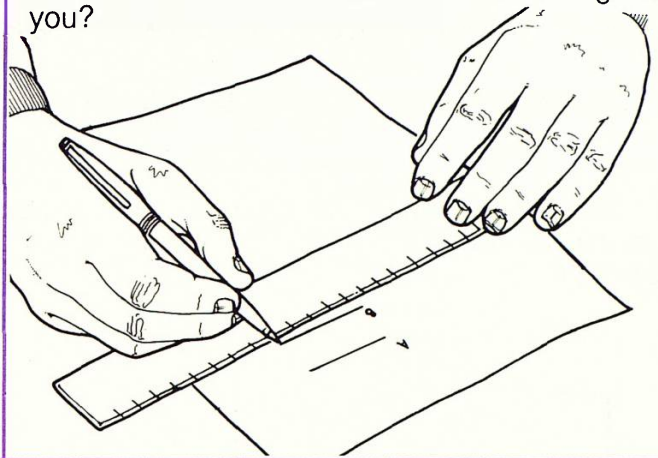


Making sense of the world

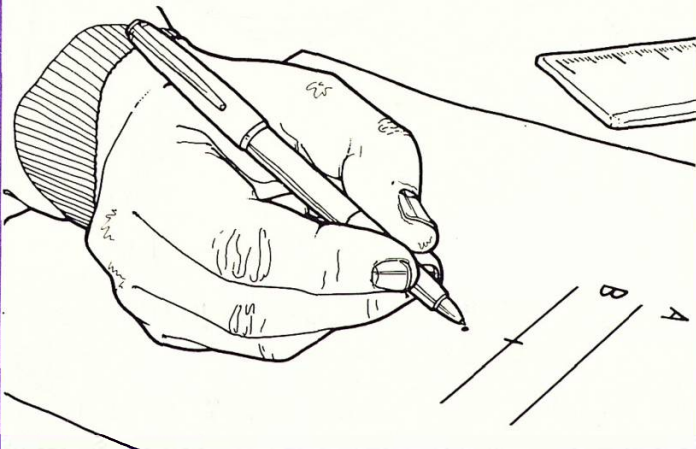
C On a piece of paper draw a line 6 cm long. Label it line **A**.



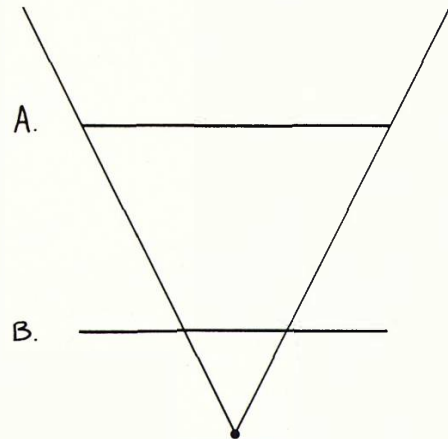
D 4 cm below line **A** draw another line 6 cm long. Label it line **B**. Do both lines look the same length to you?



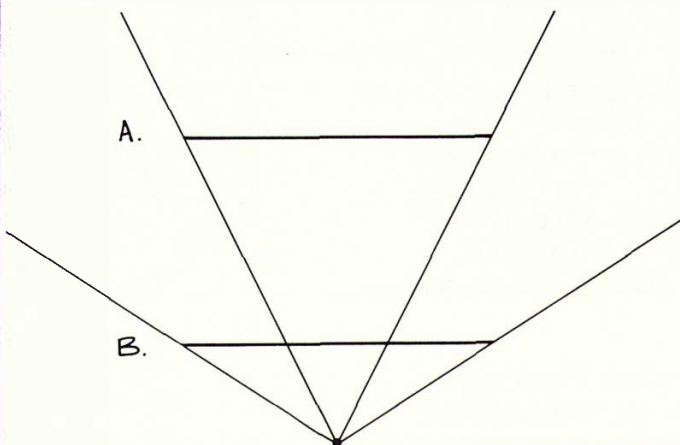
E Mark the middle of line **B**. Put in a dot 2 cm below the middle of line **B**.



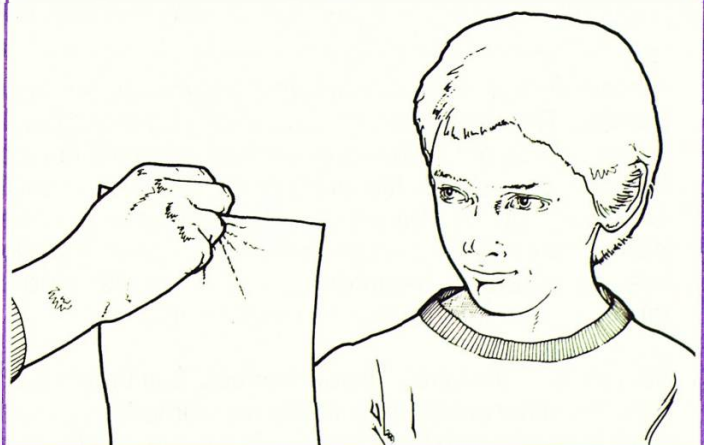
F Draw lines from the dot 2 cm past each end of line **A**. Do both lines still look the same length?



G Draw lines from the dot 4 cm past each end of line **B**.



H Show the drawing to a partner. Ask which line, **A** or **B**, looks the longest.



Q13 Did your drawing trick your partner's sense of sight?

Q14 Why was the sense of sight tricked?

Making sense of the world

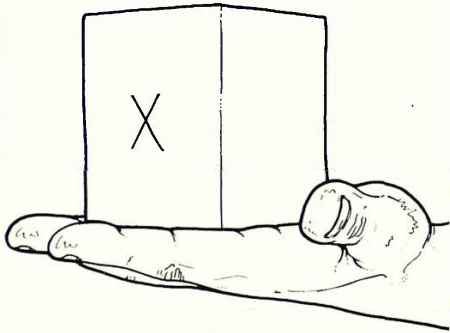
Tricking our senses (3)

Apparatus

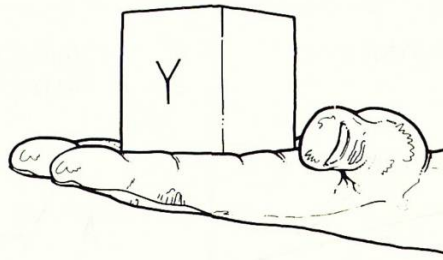
★ 2 boxes of different sizes, one labelled **X**, one labelled **Y** ★ balance

You are going to see if other senses can also be tricked.

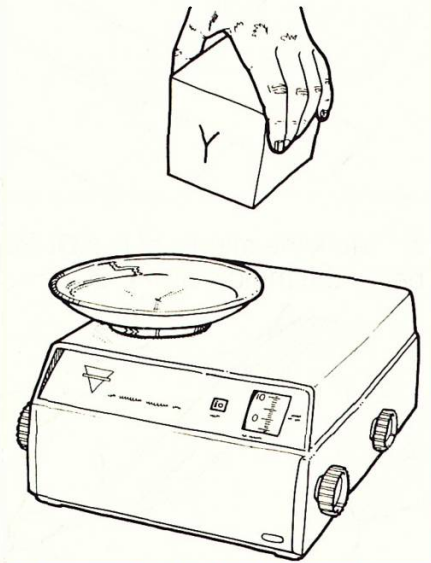
A The box **X** weighs 300 g. Pick it up in one hand and feel its weight.



B Pick up box **Y**. Guess what it weighs. Write down your guess.



C Weigh both boxes. Write down their weights.



Q15 Did you guess that the smaller box was heavier, lighter, or the same weight as the big box?

Q16 What did each box weigh on the balance?

Q17 What clues about box **Y** did you use when you guessed its weight?

Information: How our senses are tricked

When information from our senses comes to our brain it is carried along our **nerves**. These nerves just carry small electrical charges – it is the brain which makes sense out of what we see, hear and feel. For instance, our eyes “see” things upside down. It is our brain which turns everything the right way up. Our brain contains the memory of all our past experiences so we can **compare** information coming in with what we have learnt in the past. Our brain also **selects** the information that is most important to us personally and ignores other information that may confuse us.

We can be “confused” by our senses. Our brain receives a lot of information from the different senses. In this experiment box **Y** is smaller, so most people think it must weigh less than box **X**. They expect it to weigh less but when they pick it up it actually feels heavier. Their skin and muscle senses that detect the heaviness of things have been tricked.

2 How we perceive the world

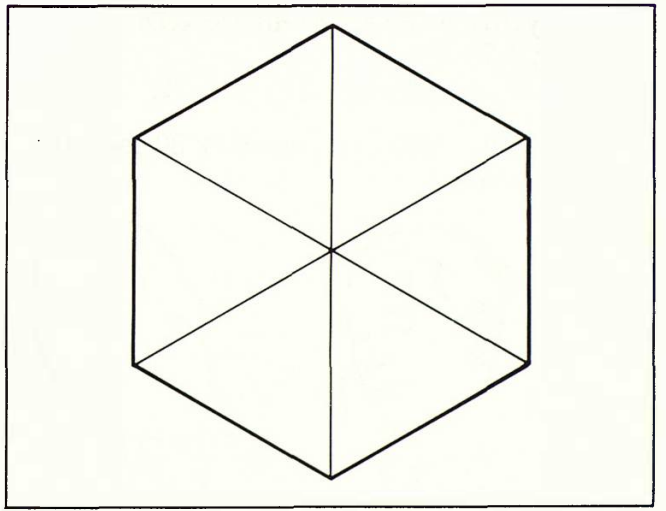
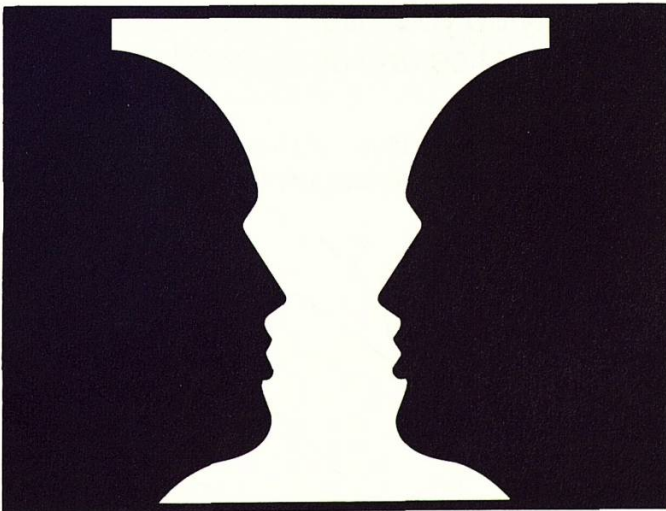
Information: Perception

Perception is what we **believe** we have seen or heard.

If you were in a house full of people in the daytime and you heard a door creaking you would not be frightened.

However, if you heard the same noise when you were alone on a dark, stormy night you would feel very different. You would **perceive** the same sound differently.

Some people see the side of a young girl's face when they look at this picture. Others see an old woman with a big nose. Your eyes pick up clues. It could be the girl's ear and nose or the old woman's mouth. Your eyes see the shapes, but your brain **interprets** or works out the shapes. This makes you perceive the object in a certain way.



These 2 pictures can be perceived in different ways. Your perception depends on how your brain interprets the clues. This kind of picture which tricks the brain is called an **optical illusion**.

Q1 What is perception?

Q3 Try to draw some optical illusions.

Q2 What is an optical illusion?

How we perceive the world

Interpreting what is seen

Apparatus

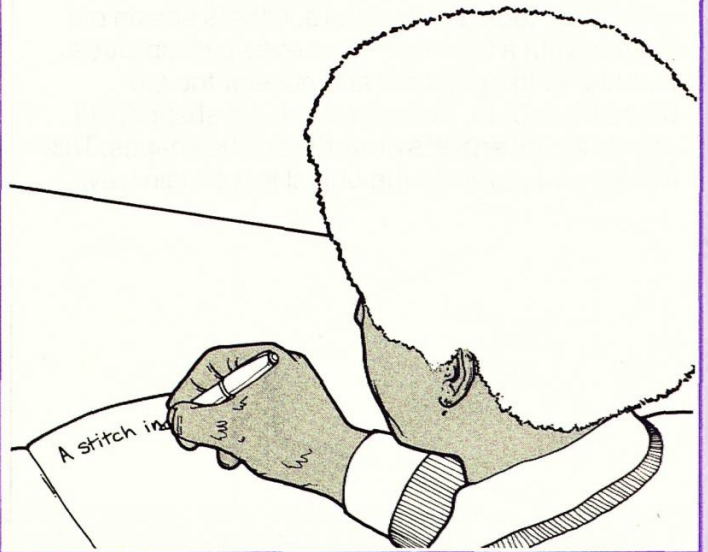
- ★ stop clock
- ★ word clue card

You are going to see how your brain tries to sort out the clues you see.

A Your teacher will hold up a card for 10 seconds. Read it. Write down what you see.



B Look at the card again. Carefully write down **each** word.



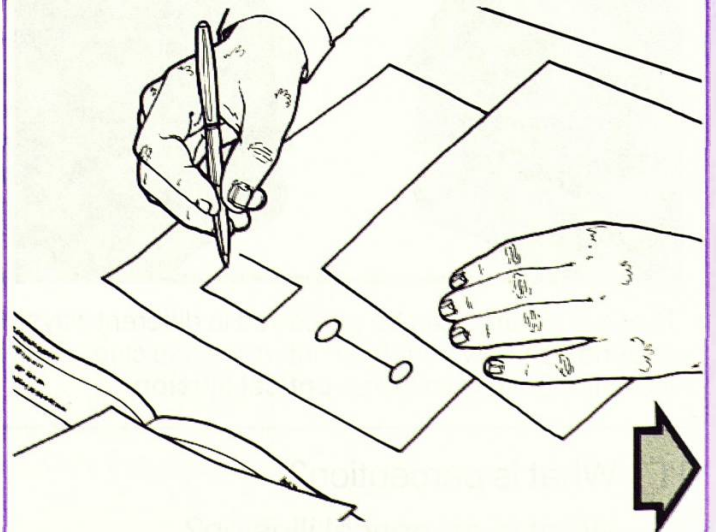
Q4 Did you write down all the words in step A?

Q5 Why do you think most people did not notice one of the words?

C Look at the shapes on page 9 for 30 seconds. Cover them up.



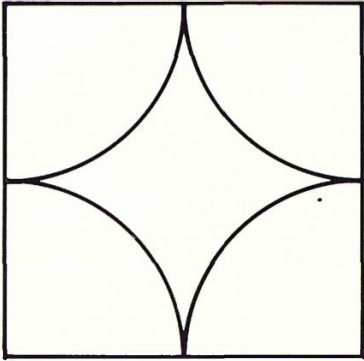
D Collect a word clue card from your teacher. Draw the shape from memory that matches each word.



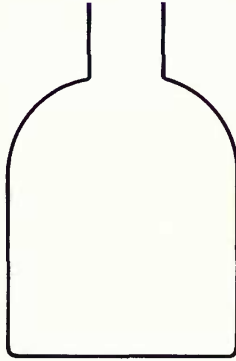
How we perceive the world

Drawings for the experiment on page 8.

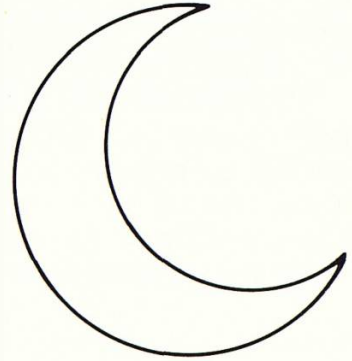
a



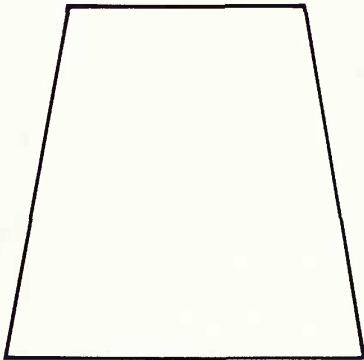
b



c



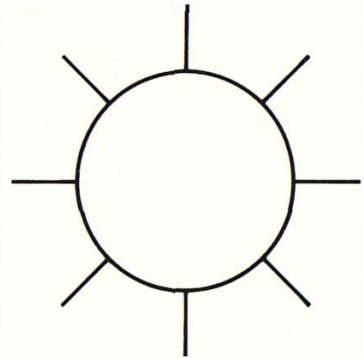
d



e



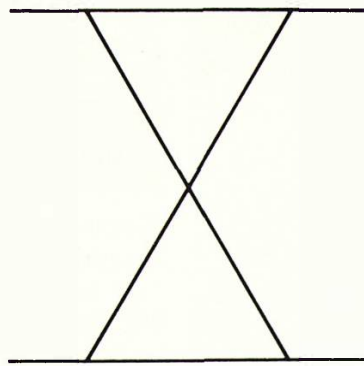
f



g



h



i



Q6 Your teacher gave out 2 **different** word clue cards in step D. Was everyone able to draw a picture to match the clue words they were given?

Q7 What does your answer to question 6 tell you about the way your brain works?

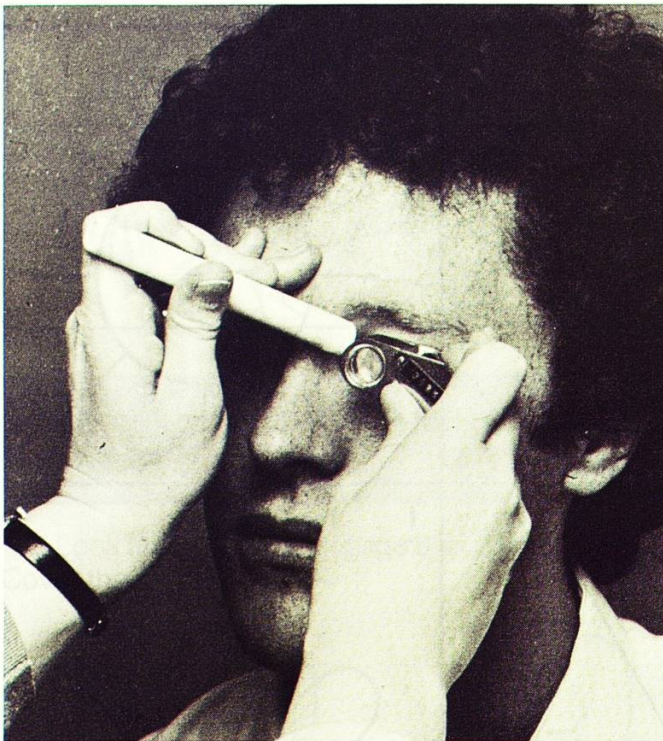
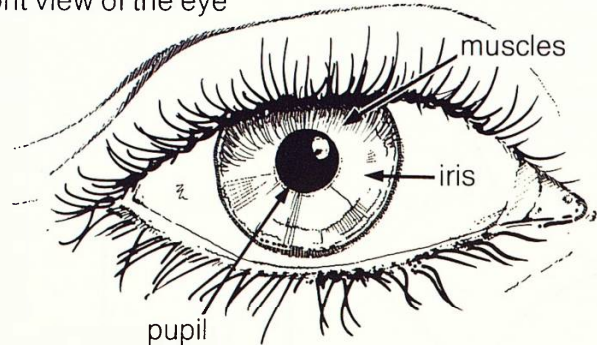
3 How we behave

Information: Reflexes

When light is shone into the eye, the **iris** gets bigger. In darkness the iris gets smaller. The movement of the iris makes the **pupil** change. We cannot control this movement. Whenever a bright light is shone into an eye its pupil will get smaller. This action is a **reflex action**.

The light is a stimulus. When the iris muscles move they are making a response. The link between sensing the stimulus and making a response is the **nervous system**.

Front view of the eye



If a doctor wants to look into an eye the iris reflex must be stopped. The doctor puts drops into the eye. These contain a drug which stops the iris muscles working. The doctor can shine a light into the eye and the pupil will stay open.



A doctor uses reflexes to test if the nervous system is working properly. If a doctor strokes the foot of a new born baby the toes will **curl up**. After 10 weeks the toes should **curl under**. The baby's skin senses the touch stimulus. The information passes along the nervous system to the muscles of the foot.

Q1 What is a reflex action?

Q2 What is the iris reflex?

Q3 What use do doctors make of reflex actions?

Q4 Name some other reflex actions.

The iris reflex

Apparatus

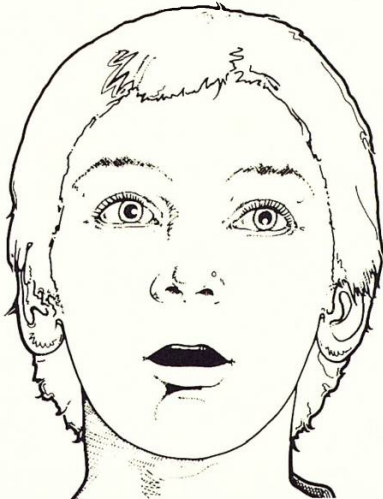
- ★ torch
- ★ blindfold
- ★ stop clock

You are going to find out about the iris reflex.

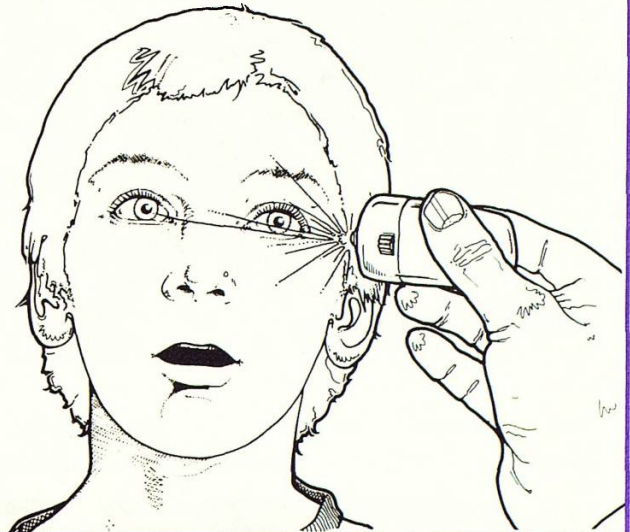
Q5 Copy this table.

Light	Size of right eye pupil	Size of left eye pupil
Daylight		
Torch		
Dim		

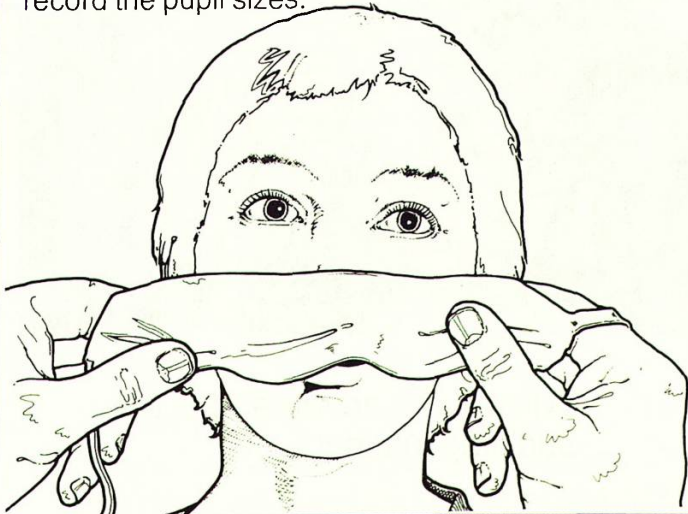
A Work with a partner. Your partner must stare into space. Look at his pupils. Record the size of each pupil (large, medium or small), in your table.



B Carefully shine a torch at both eyes. Record the pupil sizes of both eyes.



C Blindfold your partner. After 3 minutes remove the blindfold in a dim part of the room. Quickly record the pupil sizes.



Q6 What happens to the size of the pupil in bright light?

Q7 How does the pupil change in dim light?

Q8 Why do you think the pupils change size?

How we behave

Information: Instinct

When reflexes are put together they form a pattern of behaviour. This is **instinct**. It is a programme for survival.



The photo shows a young monkey and its mother. The palm of the young monkey has been touched. It reacts by gripping. The stimulus has triggered off a reflex action. The gripping action helps the young monkey to cling to its mother's fur when she is in the tree tops. The reflex helps the young monkey to **survive**.

The mammals in the photographs below are showing 2 kinds of instinct. These are the **suckling** instinct and the **grooming** instinct.



Q9 Why is the gripping reflex important to a young monkey?

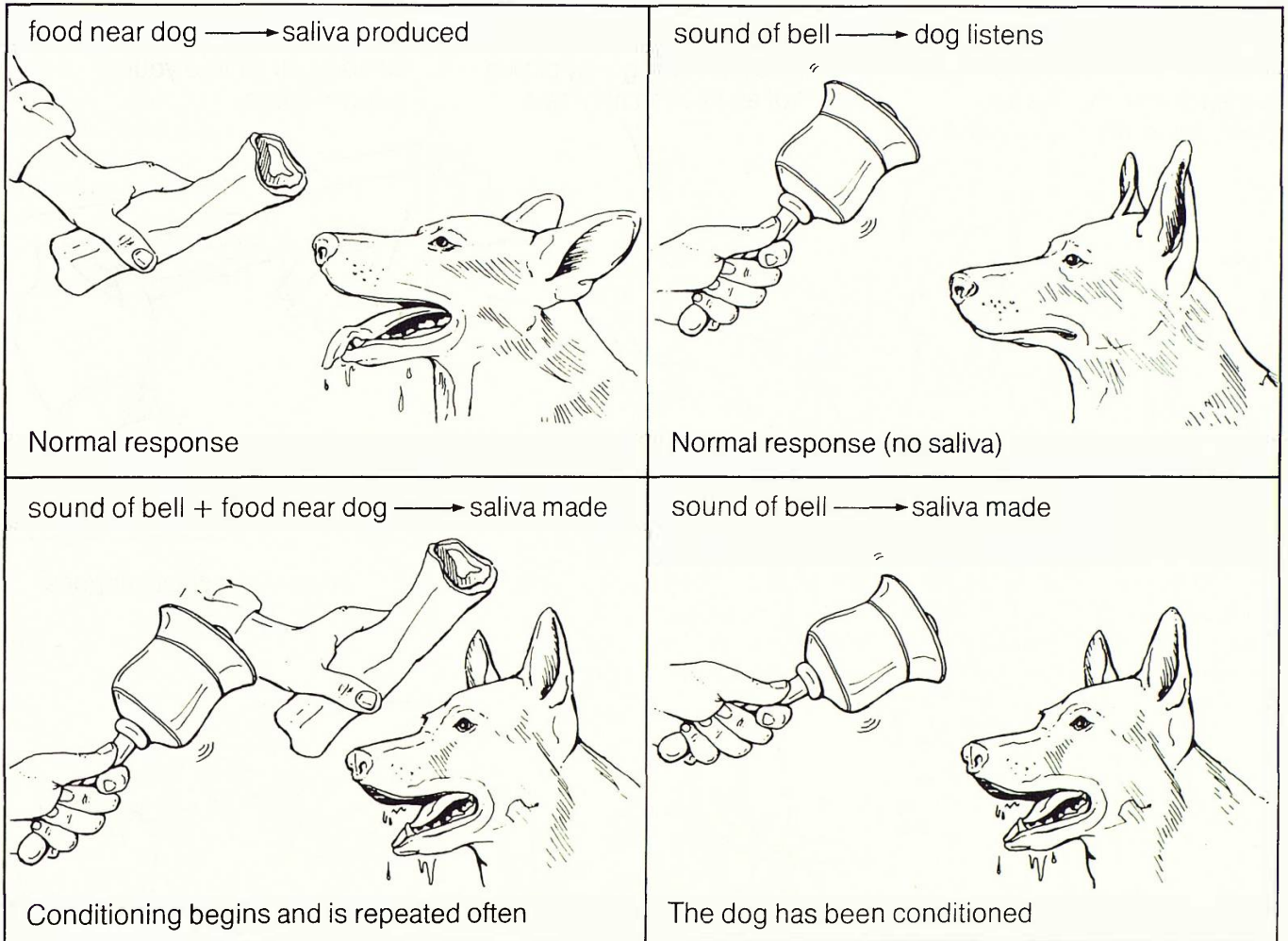
Q10 What is instinct?

Q11 What is the advantage of the suckling instinct?

4 Ways of learning

Information: Conditioning

Dogs, rats, monkeys and humans are all members of the animal group called mammals. Mammals have instincts, but they do not depend on instinct for all their behaviour. Mammals can learn new ways of behaving. One way of learning is **conditioning**. It was first worked out by a Russian scientist called Ivan Pavlov. The diagrams show how he conditioned a dog.



Today, doctors use conditioning to change the behaviour of people who are ill.

Anorexia is an illness where a person goes on a very strict diet and refuses to eat anything at all. Doctors condition the person into wanting food. The patient is put in a room with just a bed. She is not allowed any visitors, television, books or flowers. The patient is only allowed a visitor or a book as a **reward** for eating something and putting on weight. One girl gained a stone in weight in 10 days by this treatment. She learnt to eat again to get a reward.

Q1 What is a mammal?

Q3 What is anorexia?

Q2 If a conditioned dog does not get food when a bell is rung, what do you think will happen to its behaviour?

Ways of learning

Conditioning in humans

Apparatus

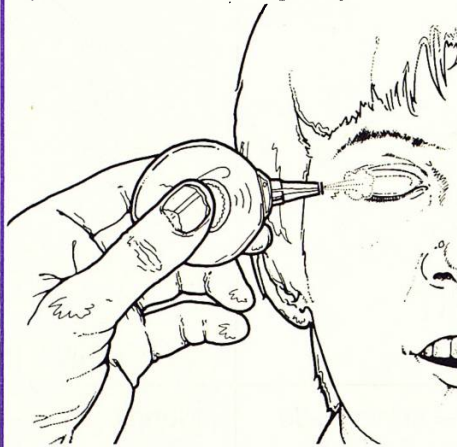
★ bell ★ puffer bottle

You are going to try and condition a human action.

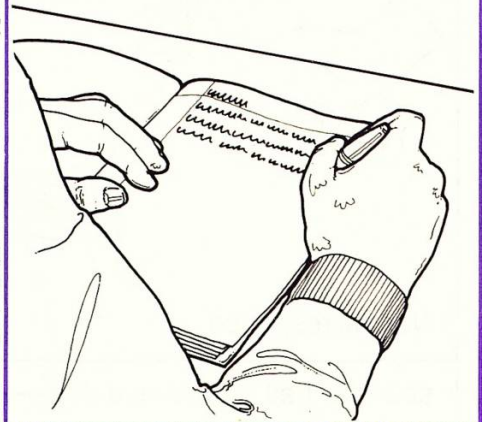
A Work with a partner. Face your partner. Look carefully at his eyes and ring the bell. Write down what the eyes do.



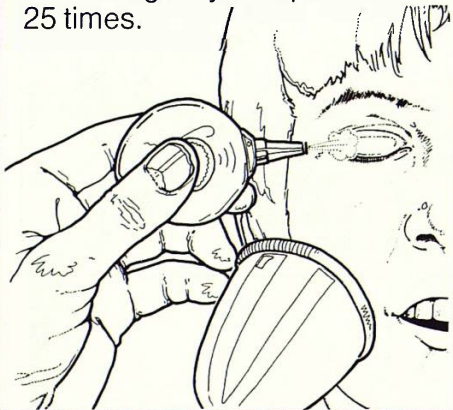
B Look at the eyes again, but this time very gently blow a puff of air into the right eye.



C Write down what happens as you puff air into your partner's eye.



D Look at the eyes again. Ring the bell and at the same time gently blow a puff of air into the right eye. Repeat this 25 times.



E Hold up the puffer bottle as if you are going to puff air into your partner's eye. Instead, just ring the bell.



F Write down what happens.



Q4 What did your partner do when you rang the bell in step A?

Q5 Do people usually blink when they hear a bell ring?

Q6 What did your partner do when you puffed air into the eye in step B?

Q7 What type of action is this?

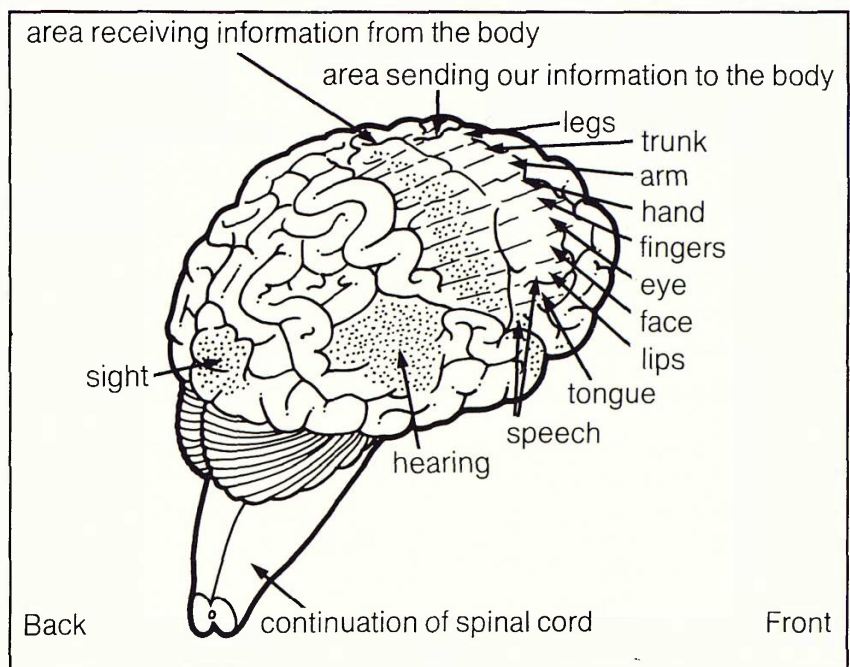
Q8 What happened when you rang but did not blow in step E?

Q9 Have you "conditioned" your partner?

Information: Learning in humans

Conditioning is one very simple way of learning. In humans learning is more complicated. Some parts of the human brain have become more developed, when compared to the size of the human body, than any other animal's brain.

The folded part of the brain that covers the top of the head is called the **cerebral cortex**. This is bigger than all other parts of the brain. Different parts of the cortex do different jobs. It is used for thinking, learning and remembering. It receives information from all parts of the body.



Map to show the functions of the cerebral cortex



These athletes have been rewarded for being the fastest.

Young children learn many things. The **approval** or **disapproval** of parents is important. A child learns that putting away toys will be approved by his parents. He may be given a **reward** – of kind words or a sweet. If a child behaves wrongly, his parents **disapprove**. The child will be **punished** by angry words or a slap.

Rewards or **punishments** can change the way we behave. This sort of learning is important throughout our lives.

Q10 What is the cerebral cortex?

Q12 What is a punishment?

Q11 What is a reward?

Q13 How have the athletes been rewarded?

Ways of learning

Learning words

Apparatus

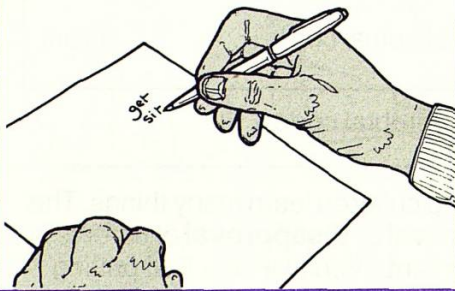
- ★ 2 pieces of card
- ★ stop clock

You are going to find out how easy it is to learn a list.

Q14 Make 2 copies of this table.

Word	Tries									
	1	2	3	4	5	6	7	8	9	10
get										
sit										

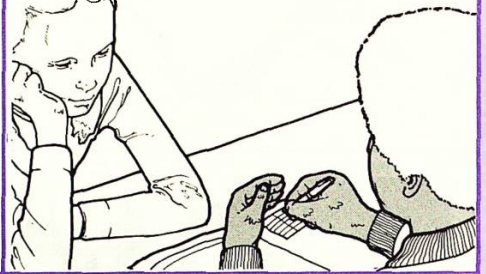
A Write a list of 10 three-letter words on one piece of card and in the first column of your table.



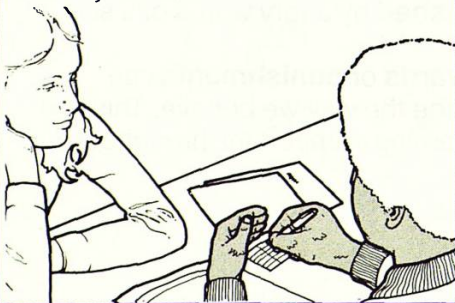
B Work with a partner. Let your partner read and learn the list for 30 seconds. Cover up the list.



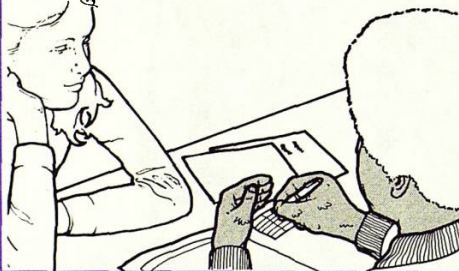
C Ask your partner for the first word. If it is right put a tick under try 1. If wrong, write in the word said. Leave a blank if your partner does not know.



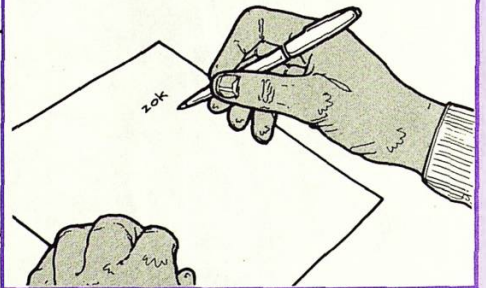
D Uncover the first word on the piece of card. Ask your partner for the second word. Fill in your table as before.



E Repeat steps C and D. Record in a different column of your table until your partner gets all 10 words right in 2 columns.



F Now take the second piece of card. Write a list of 10 three-letter nonsense words (like zok). Repeat steps A to E.



Q15 How many tries did your partner take to remember all the “real” words?

Q18 Did your partner remember any nonsense words easily? If so, which ones?

Q16 How many tries did he take to remember the nonsense words?

Q19 What does this experiment tell you about the way you should learn school work?

Q17 Is it easier to remember sense or nonsense?

Learning: reading or writing?

Apparatus

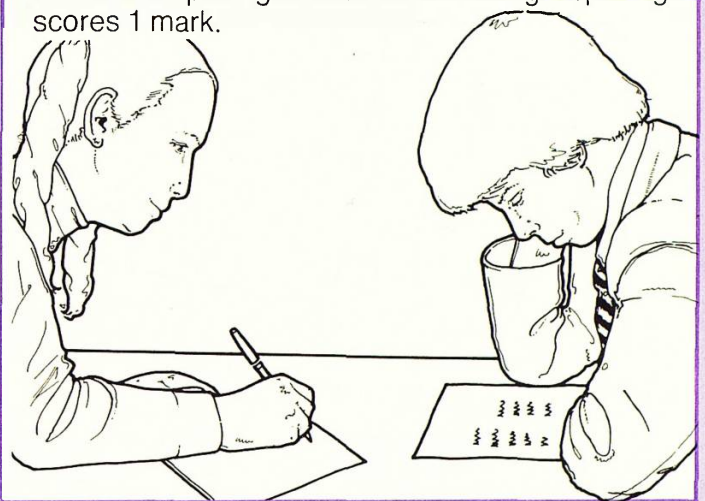
★ 2 word lists A and B

You are going to find out the best way to learn.

A Collect word list A. Read it 3 times then cover it up.



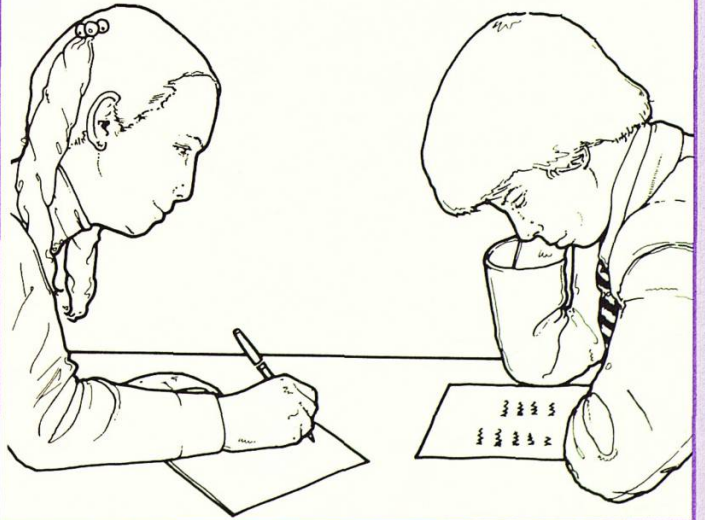
B Work with a partner. Get your partner to read out the words one by one. Write down each word. Check the spelling of each word. The right spelling scores 1 mark.



C Collect word list B. Write it out 3 times in your book. Cover it up.



D Repeat step B.



Q20 In which test did you get a better mark, A or B?

Q21 Did you find it easier to remember the words you had read or the words you had written down?

Q22 What does this experiment tell you about the way you should learn school work?

Ways of learning

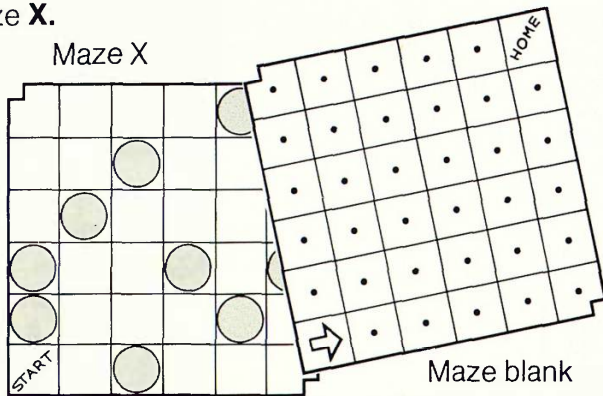
Learning to solve problems (1)

Apparatus

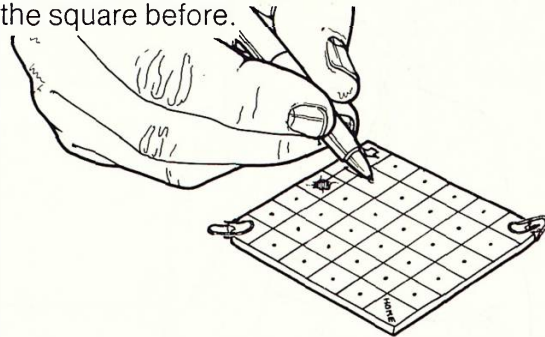
★ maze X ★ 2 maze blanks ★ 2 paper clips

You are going to find out how to solve problems.

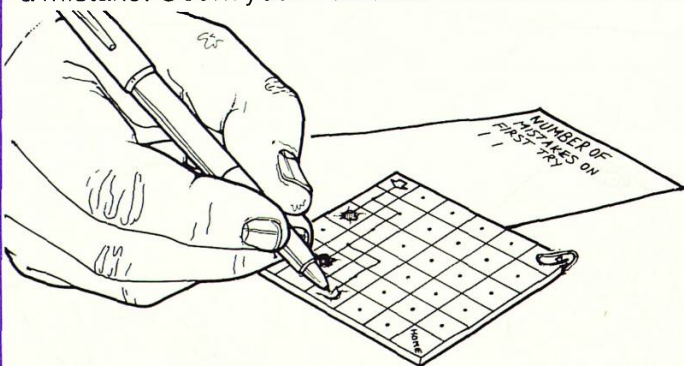
A Use the paper clips to fit a maze blank over maze X.



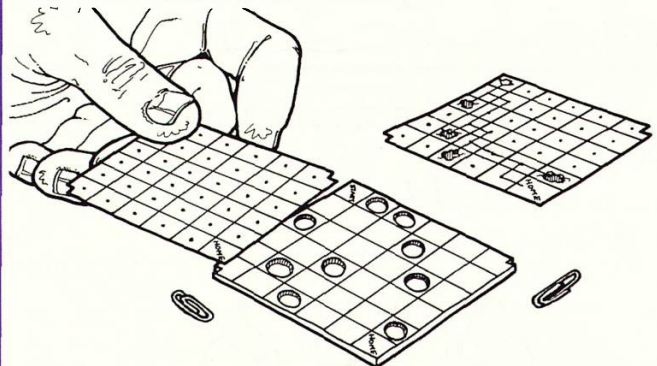
B Start at the arrow. Join the dots with pencil lines to get home. You can only go up, down or across. If your pencil goes down a hole, go back to the square before.



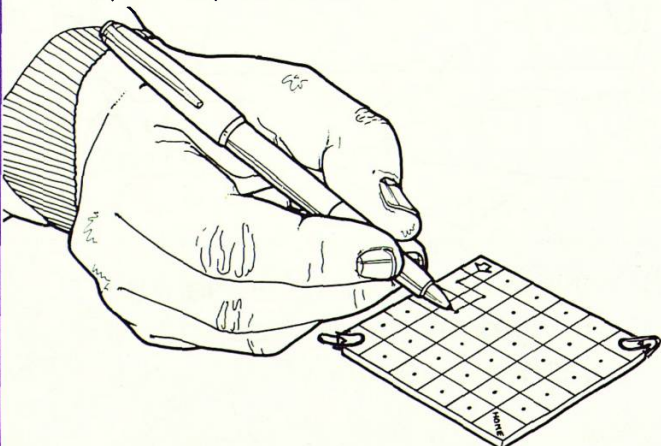
C Every time you go down a hole you have made a mistake. Count your mistakes.



D Take off your maze blank and cover it. Clip a new maze blank over maze X.



E Repeat steps B and C.



Q23 How many mistakes did you make on your first try?

Q24 How many mistakes did you make on your second try?

Q25 Did you learn by making mistakes?

Q26 Why is this kind of learning called "trial and error"?

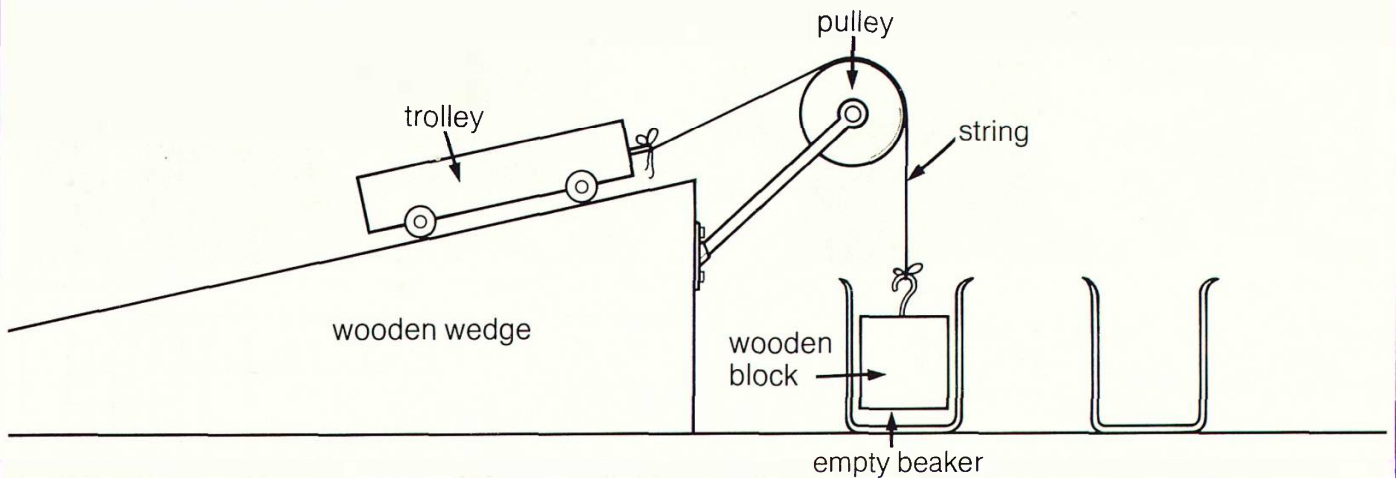
Learning to solve problems (2)

Apparatus

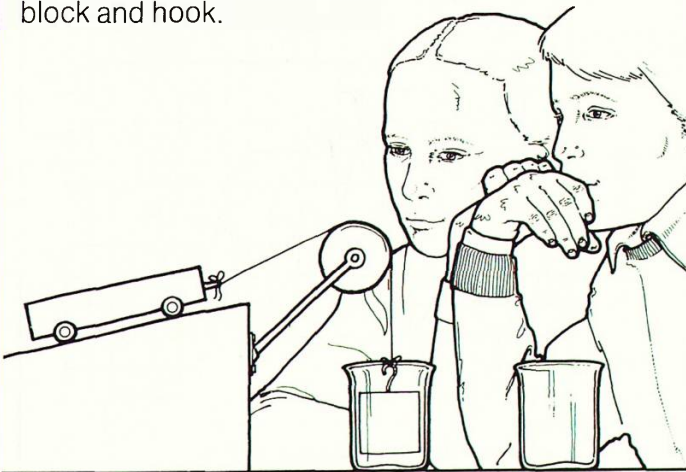
- ★ piece of string 30 cm long
- ★ wooden trolley
- ★ wooden block with a hook in it
- ★ wooden wedge with pulley attached
- ★ two 250 cm³ beakers

You are going to try and solve another problem.

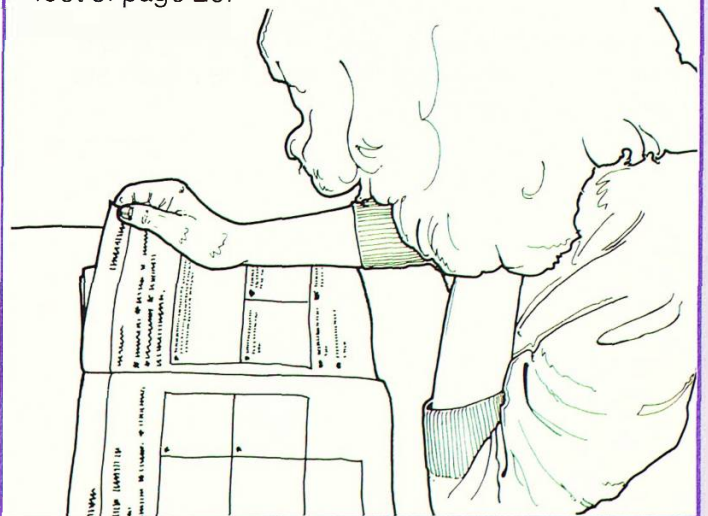
A Set up the apparatus. Tie one end of the string to the trolley and the other end to the hook in the wooden block. Place the wooden block in one of the beakers. Place the trolley near the top of the wedge. Run the string over the pulley. Make sure it is not slack.



B Try to make the trolley move down the slope. You must not touch the trolley, string or the wooden block and hook.



C If you cannot work it out, look at the hint at the foot of page 20.



Q27 Write down how you solved the problem.

Q29 What fact did you need to know to solve the problem?

Q28 Did you work out the problem in your head or by discussion?

Ways of learning

Information: Learning and remembering

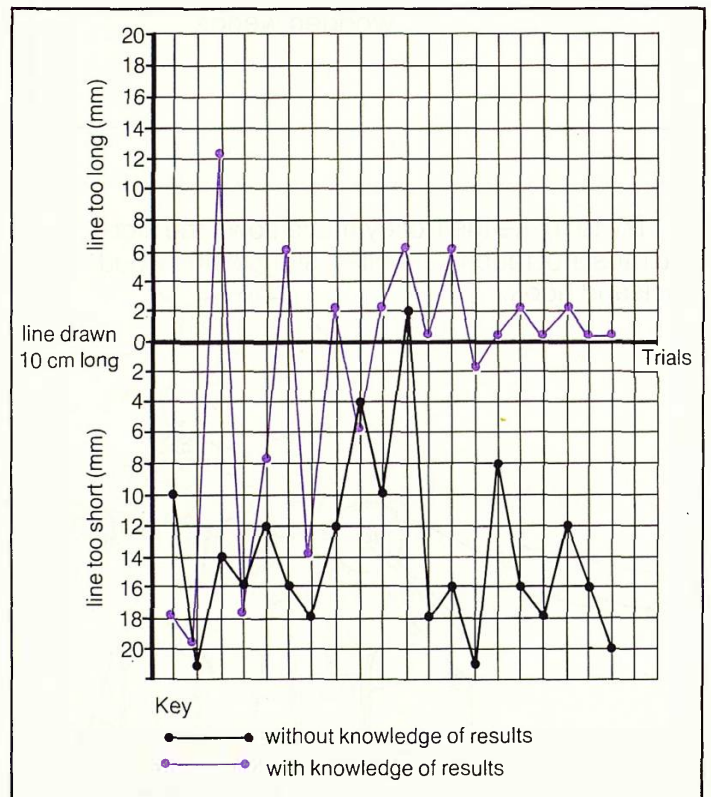
When you learn, the way you behave changes in some ways. By the time you were 2 years old you had learned to walk. By now you can probably swim. In the future you will learn to drive a car, and in a job you may learn a **skill**.



If you are going to learn a skill or task you must know if what you are doing is right or wrong. The importance of knowing your **results** is shown by this experiment.

A person is blindfolded and asked to draw a line 10 cm long. He does this 20 times. He is **not** told if the lines are too long or too short.

The experiment is repeated. This time he is told if each line is too long or too short. The results are shown on the graph.



Q30 When a person does **not** know his results what happens to the way he does a task?

Hint: wood floats in water, use the other beaker to help you.

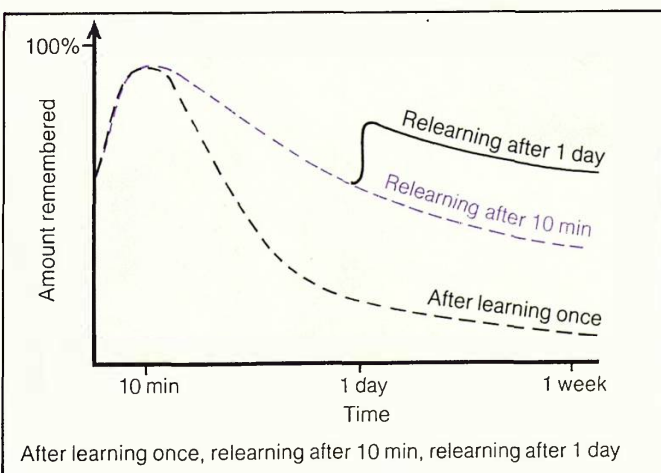
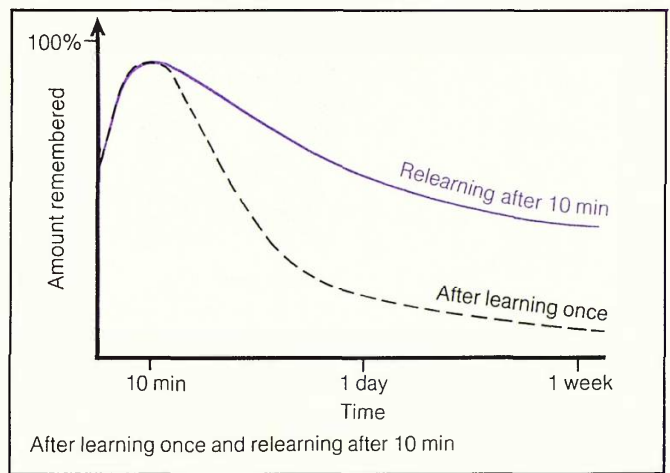
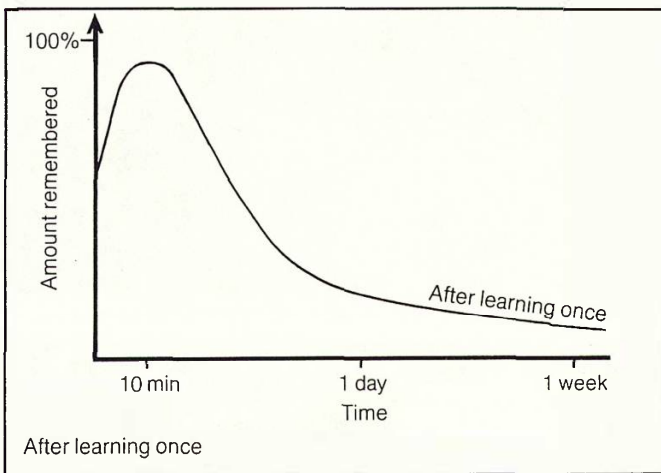
Q31 When a person knows his results what difference does this make to the task?



When you have learned a task or fact you may **remember** it. You can also **forget** it. It is easier to remember a fact if you look at it again a short time after first learning. It may take someone about 9 minutes to learn a short poem perfectly. One day later they are asked to learn the poem again. The **relearning** takes only 3 minutes. So the more often a fact is learned, or a task practised, the better it will be remembered.



When you revise for tests you relearn. The graphs below show how you will remember more if you practise regularly.



Q32 What is the best way to learn facts?

5 How we think and feel

Information: Trends and opinions

We are affected by the opinions and attitudes of the people around us. In the 1950s some people dressed as Teddy Boys. Teddy Boys tried to dress and behave in the same way. They were **conforming**. Since the 1950s there have been many fashions or **trends**. They are often linked with a certain kind of music.



There are many things working on us to persuade us to change our attitudes or conform. Friends, parents and teachers can all influence us. A **survey** may be made to find out the opinions of a group of people. Before elections surveys are done to find out about people's political opinions. These surveys are called **opinion polls**.



Q1 List some of the trends that have taken place since 1950.

Q2 What does conform mean?

Q3 Name 4 influences that help us form our attitudes.

Q4 What is an opinion poll?

Testing attitudes

Apparatus

- ★ Attitude score card

You are going to try and find out people's attitudes to sport on television.

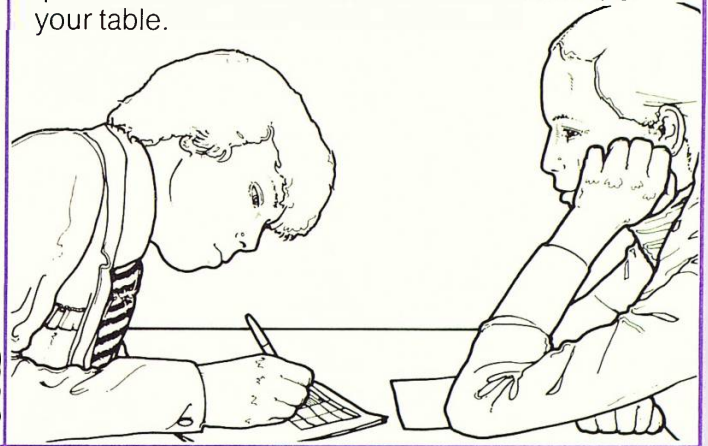
Q5 Copy this table.

Attitudes to sport on television			Attitude
Name	Question number and score	Total score	
	Q1		
	Q2		

A Read the questions on the attitude score card.



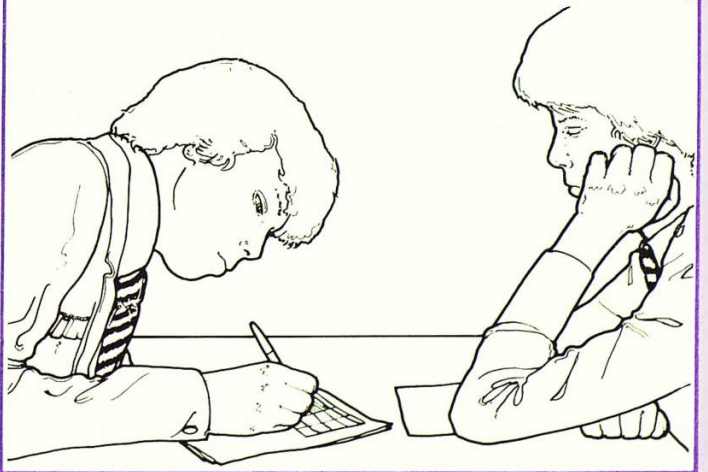
B Work with a partner. Ask your partner each question on the card. Fill in the first 2 columns of your table.



C Add up your partner's scores. Use the table on the attitude score card to find out your partner's attitude. Fill in the last 2 columns of your table.



D Repeat steps B and C with 4 more people.



Q6 Did everyone have the same attitude to sport on television?

Q7 Who could make use of this kind of survey?

Q8 You asked 5 people in your survey. Do you think your findings are reliable?

Q9 Why do opinion polls ask large numbers of people?

How we think and feel

Information: Advertising

The aim of the advertiser is to make us buy his product. There are many ways to do this.

This advertisement claims **scientific proof** that the toothpaste helps prevent tooth decay. If parents buy this brand their children will have fewer fillings.



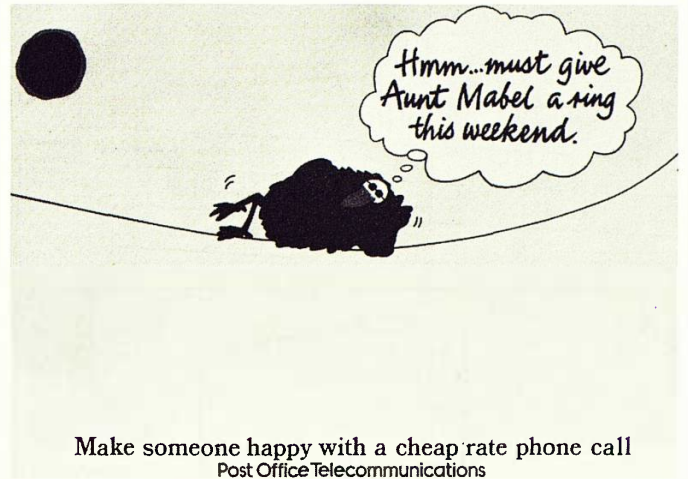
The advertiser has to make us remember the name of his particular product. The dog has nothing to do with the product, it is just a **cue** to our memory. Many people call this type of dog a 'Dulux Dog', not an 'Old English Sheepdog'.

This sort of advertisement suggests that by wearing a particular make of jeans you become more attractive to others. Wearing these jeans will give you **sex appeal**.



Information: Attitudes to advertising

Some television advertisements use **cues** to help us remember their product. Cues can be a funny event or character, or a certain tune, or scene.



Advertisers can try and make us feel ashamed or try and make us want to **conform**. They appeal to our sex drive, sense of humour, love of animals or desire for holidays. Often these things have nothing to do with the product being advertised. They are influencing our attitudes.

Advertisements should be honest. The Advertising Standards Authority was set up to deal with complaints about advertisements. If an advertisement makes claims that are not true, it has to be taken from view.

**If you find
an ad
unacceptable,
don't turn
the page:
turn to us.**

Every week, millions of advertisements appear in the press, on posters and in the cinema.

Most of them comply with the rules contained in the British Code of Advertising Practice and are legal, decent, honest and truthful.

But if you find one that, in your opinion, is wrong in some way, please write to us at the address below.

We would like you to help us keep advertising up to standard.

The Advertising Standards Authority ✓
If an advertisement is wrong, we're here to put it right.
ASA Ltd, Brook House, Sandringham Park, London WC1E 7BE

Q10 Name 3 things used by an advertiser to help us remember his product.

Q11 Would advertisers be as successful if they just told you how good the product was?

Q12 Name 2 TV advertisements you remember.

Q13 Why do you remember them? Would you buy their product?

How we think and feel

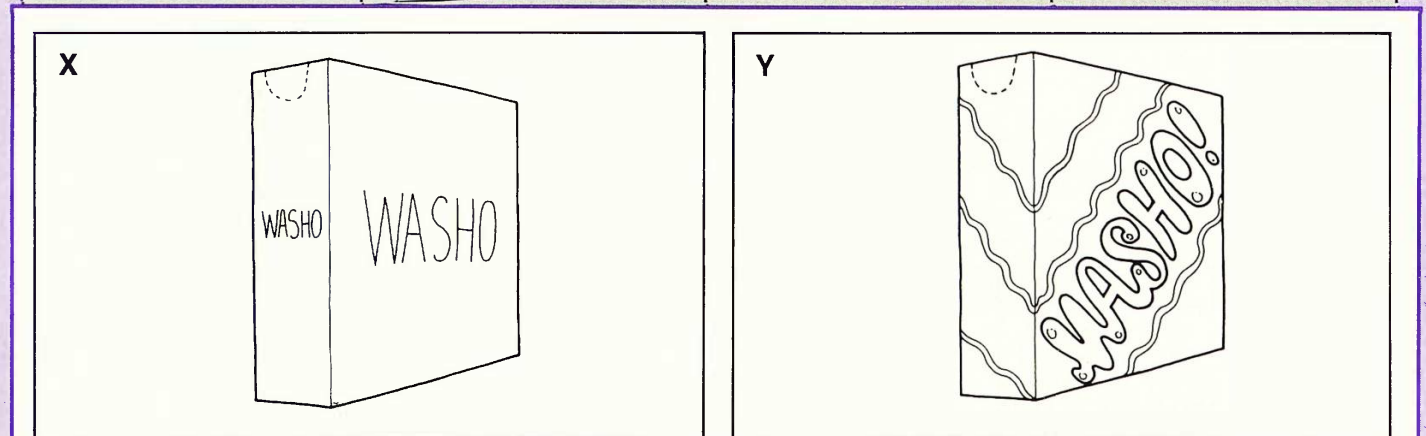
Packets that persuade

Apparatus

★ Attitude score card

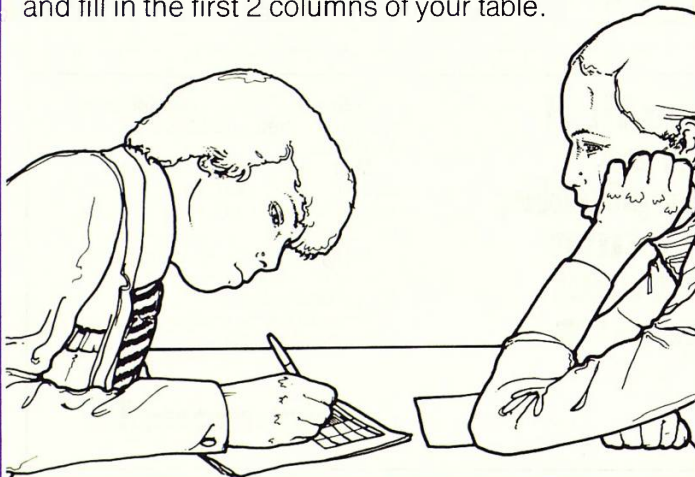
Q14 Copy this table.

Attitudes to soap powder packet			Attitude
Name	Question number and score	Total score	
	Q1		

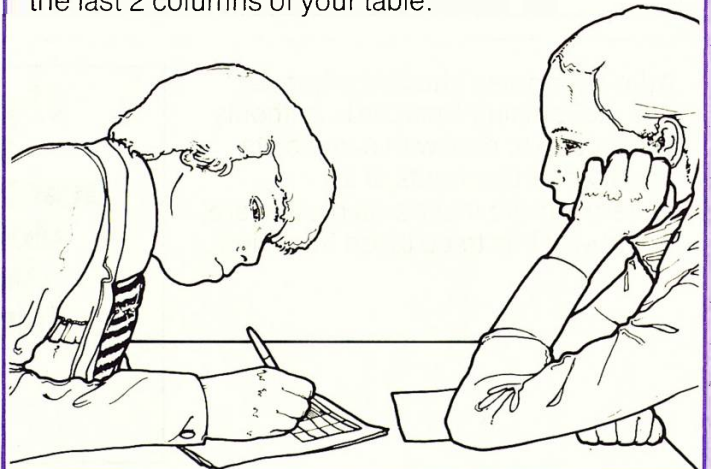


The 2 pictures are of soap powder packets. The soap powder in each packet is exactly the same. They are the same size and the same price.

A Work with a partner. Read the questions on the attitude score card. Ask your partner each question and fill in the first 2 columns of your table.



B Add up your partner's scores. Use the table on the attitude score card to find out his attitude. Fill in the last 2 columns of your table.



C Repeat steps A and B with 4 more people.

Q15 Which packet would people be more likely to buy, X or Y?

Q16 Why do you think they would buy that packet?

Q17 What influenced their choice?

Q18 Did the quality of the soap powder have anything to do with their choice?

6 What kind of person are you?

Information: Personality

Boring, moody, clumsy, nervous and cheerful are all words used to describe people. A person could be nervous and tense at one time. Later she might be bright and cheerful. All the ways in which a person behaves make up the **personality**.

Many people judge another person's personality just by looking at, or **observing** them. A first meeting can be the start of the **personality assessment**. These **first impressions** can be important.



First impressions are often important

Clues about someone's personality come from their appearance. The way someone dresses, stands or sits can **communicate** something about their personality. This is called **body language**.



Q1 Look at the drawings above. From this list choose words that you think describe each personality shown.

untidy, business-like, lazy, reliable, bored, attractive, overworked, scruffy, swot, down-at-heel, tired, responsible, heavy drinker, intelligent.



What kind of person are you?

It is very hard to measure personality. In one kind of test a person is given a list of questions about himself. He has to answer "yes" or "no". The questions are about honesty, cheerfulness and other **personality traits**.

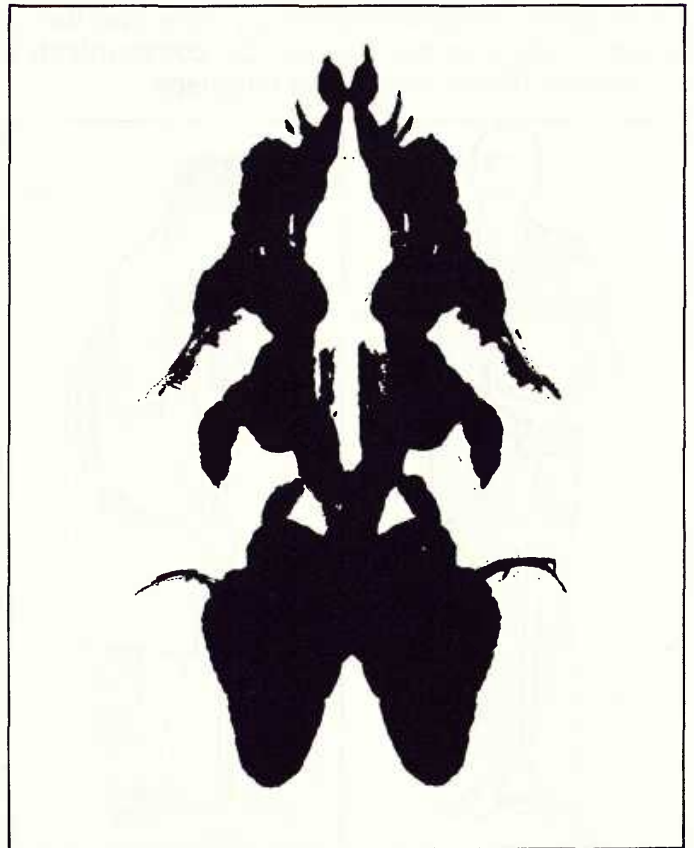
Anxiety Test

- 1 I often feel I might be sick.
- 2 My sleep is often disturbed.
- 3 When embarrassed I break out in a heavy sweat which is very annoying.
- 4 Life is often a strain for me.
- 5 I feel anxious about something or someone almost all the time.
- 6 I blush about as often as others.

Answer the questions true or false.

In another test a person has to work out, or **interpret**, what a drawing means to him. One of these tests was invented in 1921 by a Swiss doctor, Hermann Rorschach. It is called the **Rorschach Inkblot Test**.

The way in which a person interprets the pattern can give a trained psychiatrist information about the personality.



This design shown is similar to those used in the Rorschach Inkblot Test.

Q2 What is a first impression?

Q3 What is body language?

Q4 What is a personality trait?

Q5 What is the Rorschach Test?

What kind of person are you?

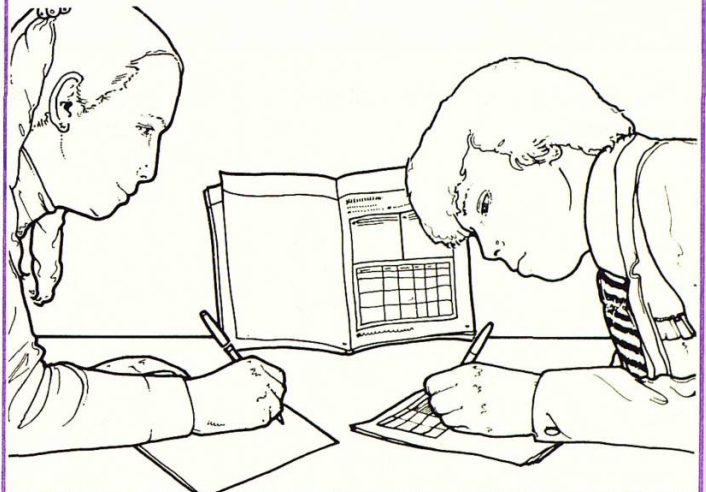
Testing personality

You are going to try to measure your personality.

A Look at the table below. In your book, write down the trait and the **characteristic** that describe you best.



B Work with a partner. Your partner must choose the traits and characteristics that he thinks describe you best.



Trait	Characteristics				
Friendliness	likes meeting people, very friendly	friendly	friendly sometimes, but enjoys being alone	not much interest in others, tends to be a loner	shy, timid doesn't join in
Self confidence	very confident and aggressive usually gets own way	confident enjoys winning	listens to others' point of view, but can make own mind up	unsure of himself	always gives in to others
Cheerfulness	very cheerful and witty, always joking	often smiling enjoys jokes	usually looks on the bright side	often anxious, always sees problems in things	depressed anxious always worried
Honesty	very honest, you would trust them with your money	usually honest, only cheats at snakes and ladders	quite honest but doesn't pay full bus fares, and tries to get into the cinema for half price	you would be worried if they worked in your bank	would take the tissue you were just going to blow your nose on

Q6 Did you and your partner agree on your characteristics?

What kind of person are you?

Interview techniques

Apparatus

- ★ Application form
- ★ Interviewer's card

You are going to hold a mock interview to find out the importance of body signals and personality.

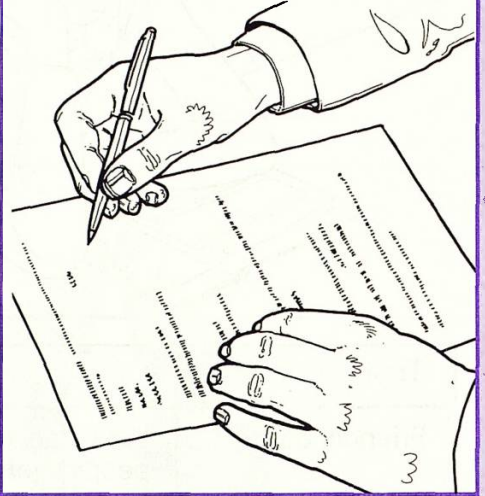
A Read the job descriptions on page 31.



B Work with a partner. One of you is the **interviewer**, the other is the **applicant**.



C Applicant Choose one of the jobs and fill out the application form for it.



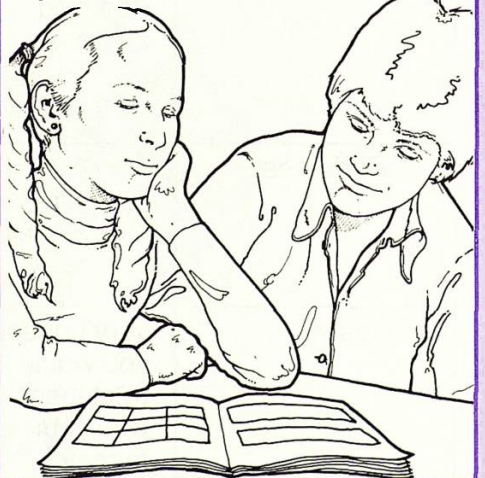
D Interviewer Read the interviewer's card.



E Interviewer Ask the applicant the questions on your card and mark them as shown.



F Tell the applicant his marks, and explain why you gave them.



Q7 Did your body movements affect your marks?

Q9 On which things did you score low marks?

Q8 What did your body language tell the interviewer?

Q10 How could you improve on these things?

Job Description 1

Wanted: **OFFICE JUNIOR**

Qualifications

Must have a good general education.

A good telephone voice would be an asset, as would a pleasant manner and smart appearance.

Some contact with customers is necessary.

Must be willing to learn.

Pay £27.50 per week, plus luncheon vouchers

Hours 9.00 a.m. – 5.00 p.m. 5 day week, 1 hour for lunch

Job Description 2

Wanted: **TRAINEE FURRIER**

Qualifications

Must have a good general education.

An accurate eye and good practical sense would be an advantage, also some skill with hands and machinery.

All training will be given.

Pay £30.00 per week, use of staff canteen

Hours 9.00 a.m. – 5.30 p.m. 6 day week
every other Saturday off

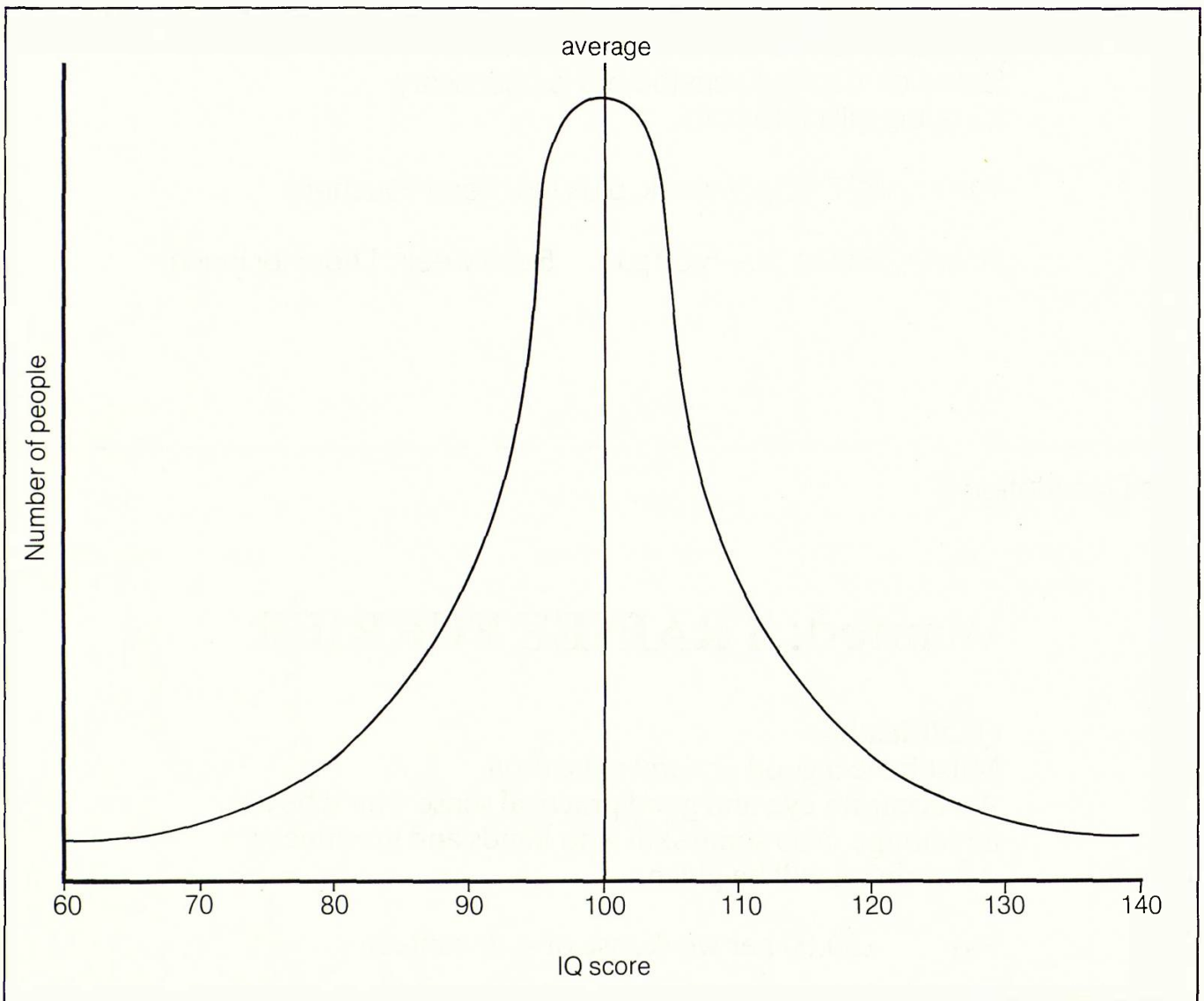
What kind of person are you?

Information: Intelligence

Sometimes a person is described as 'intelligent' or 'bright'. What is intelligence? It is a way of adapting to the world. It includes many things, such as the ability to work out the answers to problems.

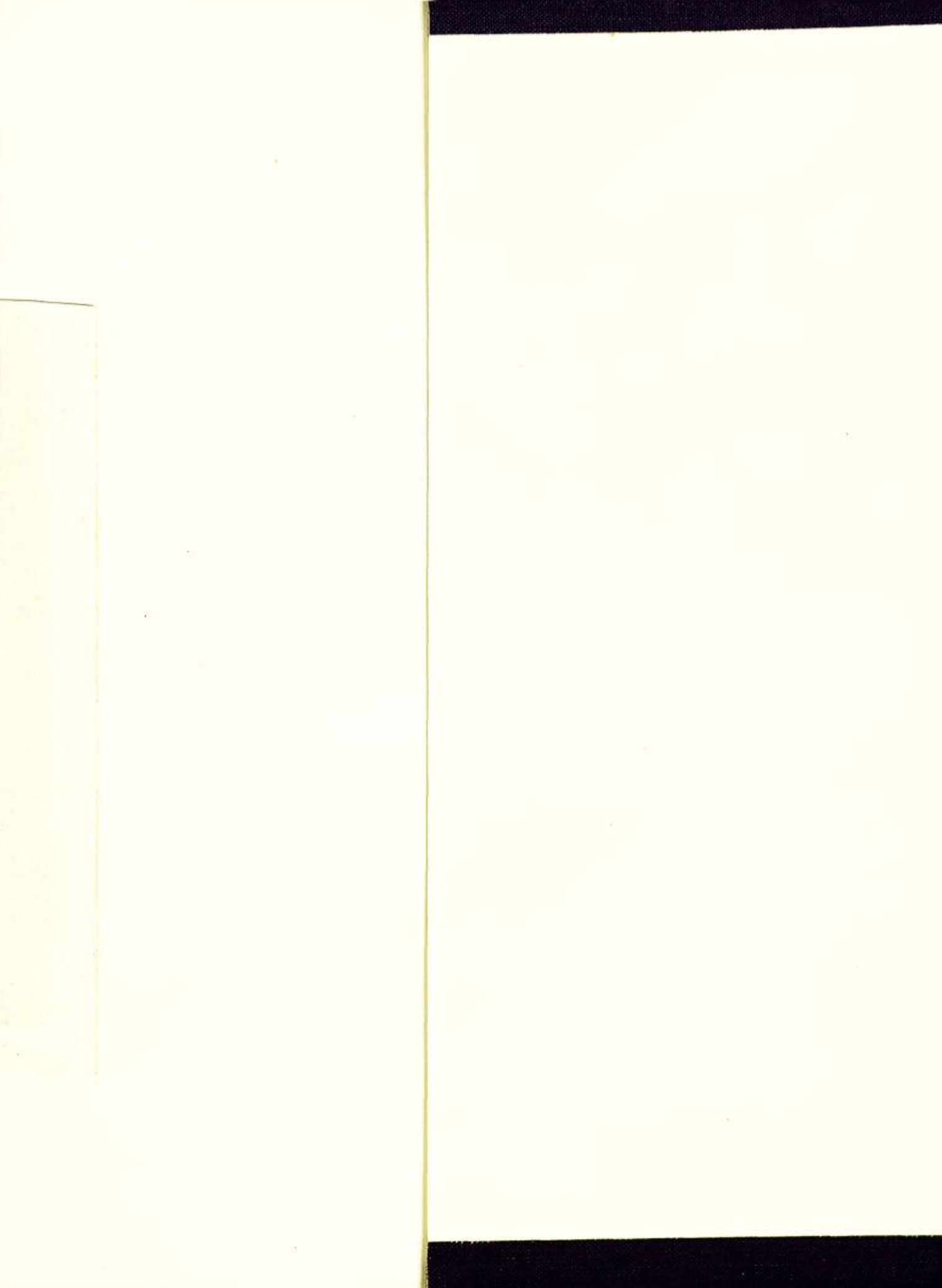
People try to measure our intelligence by tests. The result is a number called an **intelligence quotient** or **IQ**.

A graph of the IQ's of a large number of people would look something like this.

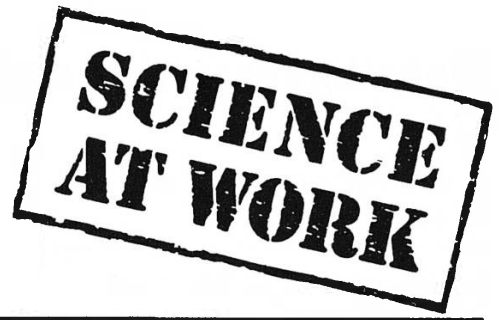


Most would have an IQ of about 100.

Intelligence tests are hard to set up. If we gave an English IQ test to a Chinese farmer the result would be worthless. This is because the questions are based on the English language and an English way of life. The result would not tell us how intelligent the man was, only that he knows very little about the English language and England.



Teachers' Guide to You and Your Mind



Introduction

The units

The background and aims of the *Science at Work* series as a whole can be found in the guides to the other units. For reasons of space they are not repeated here.

Objectives of the You and Your Mind unit

When they have completed this unit, the pupils should:

- know and understand the words and terminology connected with the unit
- have an understanding of their different senses and how they work
- know what perception is and how it can be distorted
- understand what is meant by reflex actions
- have an elementary knowledge of the structure of the eye and brain
- know the basic ways (conditioning, trial and error and

- problem solving) in which learning takes place
- understand what is meant by instinct
- be able to perform a simple rating study of attitudes, and recognise this as such if presented with it
- understand some of the ways that attitudes can be influenced
- understand how advertisers try to change attitudes
- be able to draw up a simple trait profile
- know what body language is and how it conveys information about moods and feelings
- be able to complete a simple application form

Teaching the You and Your Mind unit

Introducing the unit

The unit may be introduced in several ways:

1. Collecting cut-outs from magazines of questionnaires, articles on shyness etc. to show how psychology finds its way into our everyday lives.
2. Looking at advertisements and the actual products to see how accurate their claims are.
3. Conducting an opinion poll in school on a school related topic to see if and how we are influenced by the opinions of other people.
4. Using a geiger counter to show that there are things that our senses cannot detect. How do we know that radiation makes a geiger counter click? Do we just believe it? What is the difference between knowing and believing?

Teaching the unit

The pupils' book contains 6 chapters.

Each chapter has practical and information sections. There are sequential questions within each chapter: these indicate when a student has to write in a notebook. For slow readers and writers, there are record sheets to each chapter. The record sheets are copyright free and are contained within this teachers' guide (pages 9–16).

In the pages which follow, each chapter is discussed with reference to: apparatus per working group; new scientific words; safety and teaching hints; answers to practical questions (where necessary); resources.

Detailed teaching notes

1 MAKING SENSE OF THE WORLD

USING DIFFERENT SENSES

(pupils' book page 1)

Apparatus: sets of 9 pairs of objects:
2 sealed cloth bags, same size – one empty, one with a coin in; 2 tuning forks of different pitch; 2 bottles with caps – one filled with water, one with turps; 2 pieces of cloth, same size – one velvet, one hessian; 2 pieces of card – one triangular, one hexagonal; 2 pieces of paper – one sandpaper, one blotting paper; 2 identical bottles containing water of different temperatures; 2 sealed matchboxes – one empty, one with a ball bearing in; 2 balls, same size – different materials; blindfold

New Words: stimuli, transparent, lens, optic nerve, image, retina, cornea

TRICKING OUR SENSES (1)

(pupils' book page 3)

Apparatus: stop clock

New Word: after-image

TRICKING OUR SENSES (2)

(pupils' book pages 4 and 5)

Apparatus: ruler; pencil; paper

TRICKING OUR SENSES (3)

(pupils' book page 6)

Apparatus: one box 35 cm x 15 cm x 25 cm; one box 20 cm x 20 cm x 15 cm;
2

The blindfold prevents light entry, removing stimuli of colour, brightness and size.

Q2 The senses used are touch, smell, hearing and proprioception (weight).

Q3 Stimuli sensed are weight, pitch, scent, texture, shape, heat quantity.

Q4 Colour, brightness and size.

The pupils should see after-images of the original colours when they look at the grey square. Explain that negative after-images are seen because the eye becomes adapted to, and saturated by, a certain stimulus if exposed to it for a long time. The purple colour should appear to be of different intensity depending on the different contrasting colours. An after-image of touch is the sensation that a limb is still there after amputation – the Phantom Limb Phenomenon.

Q9 No.

Q10 Colours seen when eyes closed after staring at a bright light. Shapes superimposed on a page after looking at a light bulb for some time.

The pupils look at the drawings on page 4 and try to work out the reason for the illusions. The illusions are caused because the brain becomes fixed on one aspect of the drawing, such as length or distance, and as a result all the other aspects are distorted. On page 5 the proportion created by the side lines at the edges of line A draws the eye inwards. By the time the lines cross at B they bisect it into thirds, and the brain believes that B must be longer than A.

Q11 No.

Q12 Gives perspective to drawings.

Q13 Yes.

Q14 Line B looks longer than A because of the way in which it is cut by the two sets of lines.

The boxes must weight exactly the same but be different sizes. They should both be sealed. The smaller box is *expected* to be lighter and this leads to the

weights stuck inside the bottom of each box so that the exact weight of each is 300 g; balance
New Words: compare, selects

illusion that it is heavier by comparison. This persists even after weighing both boxes, proving that knowledge is not always enough to overcome the illusion.
Q15 Heavier.
Q16 300 g.
Q17 Its size.

2 HOW WE PERCEIVE THE WORLD

INTERPRETING WHAT IS SEEN (pupils' books pages 8 and 9)

Apparatus: stop clock; flash card; 2 word clue cards
Flash card



Clue card A: curtains in a window, bottle, crescent moon, beehive, spectacles, ship's wheel, seven, hour glass, kidney bean
Clue card B: diamond in a rectangle, stirrup, letter C, hat, dumb-bells, sun, four, table, canoe
New Words: believe, perceive, interprets, optical illusion

Show the flash card to the pupils for 10 seconds. They will miss out the double 'in'. Show the card again and read it out. Explain that they see what they expect to see and not exactly what is there. The mind makes sense of what the eyes see.

In steps C and D two different word clue lists are given to the class. Do not tell them this, and be careful how you distribute them so that they do not guess. The eyes perceive fairly ambiguous shapes which may in fact be remembered accurately. When presented with written clues which are very similar to the shapes the brain re-interprets the shape it first saw to fit the clue. The brain believes the clue is there to help it remember.

- Q4 No.
Q5 The mind tries to make sense of what you see.
Q6 Yes.
Q7 Perception depends on the last information received.

3 HOW WE BEHAVE

THE IRIS REFLEX (pupils' book page 11)

Apparatus: torch, blindfold, stop clock
New Words: iris, pupil, reflex, nervous system, instinct, survive, suckling, grooming

Several torches are needed. Make sure there is a dark corner of the room for step C. Tell pupils that doctors use this reflex as a sign that the body is working properly, particularly after a blow to the head or if there is suspected brain damage.

- Q6 Pupil gets smaller.
Q7 Pupil gets bigger.
Q8 Pupils react to the strength of the light.

4 WAYS OF LEARNING

CONDITIONING IN HUMANS (pupils' book page 14)

Apparatus: bell; puffer bottle
New Words: conditioning, anorexia, reward, punishment, cerebral cortex, approval, disapproval

'Conditioning' of the eye reflex should occur within 20 trials when the bell is rung. This is not really conditioning, but is in fact anticipation, but suffices to show the principles involved.

- Q4 Nothing. Q5 No.
Q6 Blinked right eye. Q7 Reflex.
Q8 Blinked right eye. Q9 Yes.

LEARNING WORDS (pupils' book page 16)

Apparatus: stop clock; 2 pieces of card

The pupils should be told to choose words in the form – consonant, vowel, consonant. In multi-cultural schools check that the nonsense words are nonsense in *all* languages. Fewer trials should be needed for the 'real' words. Some nonsense words will be remembered when the previous word acts as a

cue. It may take longer than 10 trials for the list to be recalled correctly twice, in which case they should be told to stop after 10 trials and count the number of words remembered.

Q17 Easier to remember sense.

Q19 Need to learn more than once.

LEARNING: READING OR WRITING?

(pupils' book page 17)

Apparatus: 2 word lists e.g.:
small, where, their, agree, mouth, drive,
which, table, clamp, train
brush, stair, sight, heart, adapt, rules,
sleep, abort, there, affect

The words should not be more than 5 letters long. More words should be spelt correctly after writing them down.

Q20 Test B.

Q21 Easier to remember the words written down.

Q22 You remember more facts if you write them down.

LEARNING TO SOLVE PROBLEMS (1)

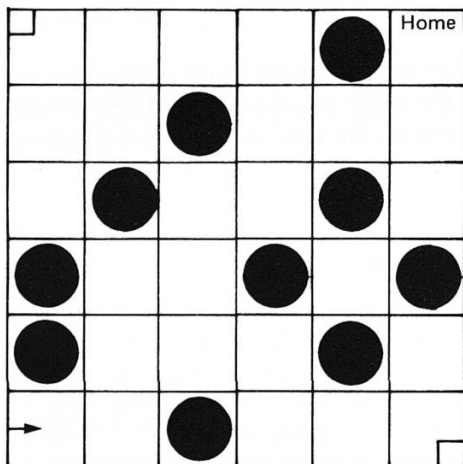
(pupils' book page 18)

Apparatus: Maze X — piece of thick card 6 cm x 6 cm divided into 1 cm² squares. Holes dowedled out as shown. Reference lines cut out of corners as shown. 2 pieces of paper 6 cm x 6 cm, divided into 1 cm² squares. Pencil dot in centre of each square. Reference lines as on maze X; 2 paperclips

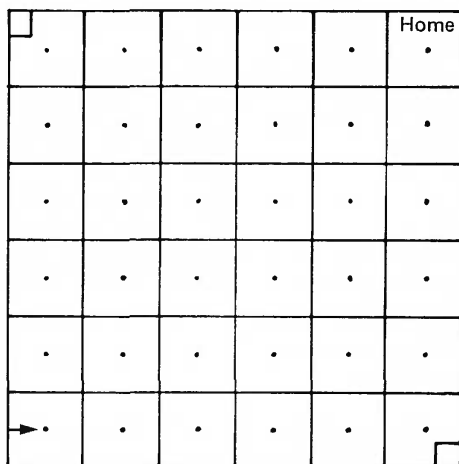
When the pupils attach the blanks to the maze, make sure the reference lines in the corner are aligned, so that the holes in the maze are accurately under the squares.

Q25 Yes.

Q26 It is called trial and error because you learn from your mistakes.



Maze X reference line



Maze blank

New Words: trial and error

LEARNING TO SOLVE PROBLEMS (2)

(pupils' book page 19)

Apparatus: piece of string 30 cm long; wooden trolley; wooden block with a hook in it; wooden wedge with pulley screwed in; two 250 cm³ beakers
New Words: skill, results, relearning

The wooden trolley and wooden block must be about the same weight. The string should be taut.

Pupils need to know that wood floats in water. If they pour water into the beaker the wood will float up and the trolley move down the slope. They are deliberately *not* told what to do with the other beaker.

Q29 Wood floats in water.

5 HOW WE THINK AND FEEL

TESTING ATTITUDES

(pupils' book page 23)

Apparatus: Attitude Score Card (page 6 of this Teachers' Guide)

New Words: conforming, trends, survey, opinion poll, cue

This score card is designed to test pupils' attitudes to sport on TV. As extension work they could try it out at home, or even in a street survey. The card has 5 positive attitudes to sport on TV, so a high score means a positive attitude. You should do an attitude score on yourself to create a contrast for discussion.

Q6 No.

Q7 TV companies, consumer research groups etc.

Q8 No.

Q9 To make sure a representative sample is taken.

PACKETS THAT PERSUADE

(pupils' book page 26)

Apparatus: Attitude Score Card (page 6 of this Teachers' Guide)

Again, 5 positive statements to packaging soap powder, favouring the more attractive package. A high score means the subject is likely to buy a packet because of its packaging. Emphasise to the pupils that all other factors are the same, including price. Ask how things can be made more saleable by free offers, competitions etc.

Q15 Soap powder packet Y.

Q16 It looks better.

Q17 The packaging.

Q18 No.

6 WHAT KIND OF PERSON ARE YOU?

TESTING PERSONALITY

(pupils' book page 29)

Apparatus: table in Pupils' Book page 29

New Words: personality, observing, assessment, first impression, communicate, body language, personality traits, interpret, Rorschach Inkblot Test, characteristics

This is a simple trait inventory to build up a personal characteristics profile. First read through the table with the pupils to check they understand all the words. An interesting extension is to give pupils thumbnail sketches of people and ask them to build profiles. It is in this lesson that questions about the common psychiatric illnesses tend to be asked, so familiarise yourself with the symptoms of a few of them. For example: psychosis, neurosis, schizophrenia, paranoia, psychotic, megalomania, kleptomania, agoraphobia.

INTERVIEW TECHNIQUES

(pupils' book pages 30 and 31)

Apparatus: Application Form and Interviewer's Card (pages 7 and 8 of this Teachers' Guide)

New Words: Intelligence Quotient (IQ)

The interviewer has to assess the presentation of the application form; the applicant's speech habits — clear sentences, no long pauses; body language — facial expression, nail biting, the way the applicant sits. (N.B. Do not include stuttering or any speech defects.) A chat from the Careers Officer is a good way to end this lesson.

Penguin Modern Psychology Readings (various books in this series)

Social Psychology Units 5, 6, 7, 8, 9, 10, 12 (course D305)

The Open University

Attitudes (ed. Jahunda & Warren), Penguin 1976

I. Hunter *Memory*, Penguin 1978

R. Thomson *The Psychology of Thinking*, Penguin 1964

H. J. Eysenk *Structures of Human Personality*, Methuen & Wiley 1953

L. S. Cronbach *Essentials of Psychological Testing*, Harper & Row 1961

ATTITUDE SCORE CARD

Questionnaires

Each questionnaire has 5 questions and 5 possible answers to each question. Ask each person you are interviewing to choose one answer. The score for each answer is shown at the foot of the page.

Attitude to sport on television

Question 1 There is not enough sport shown on television.

Answers strongly agree agree, undecided, disagree, strongly disagree.

Question 2 There should be a greater variety of sport shown on television.

Answers strongly agree, agree, undecided, disagree, strongly disagree.

Question 3 It is much better to watch sport on television than to watch it outside.

Answers strongly agree, agree, undecided, disagree, strongly disagree.

Question 4 Seeing experts 'in your own home' helps to encourage a lively interest in sport.

Answers strongly agree, agree, undecided, disagree, strongly disagree.

Question 5 Putting sport on television means that many people get to see sports they would not normally watch.

Answers strongly agree, agree, undecided, disagree, strongly disagree.

Attitude to soap powder packets

Washing is a boring job. I like to look at a pretty packet while I'm doing the washing.

People are attracted to bright, coloured packets.

Manufacturers ought to make their products more interesting to look at.

Making attractive packaging keeps artists in employment.

I always buy the packet that catches my eye in the supermarket.

Attitude to sport on television	
Score	Attitude
5-13	You think there is far too much sport on television.
14-19	You think there is the right amount of sport on television.
20-25	You would like to see more sport on television.

Attitude to soap powder packaging	
Score	Attitude
5-12	The colour of a packet is not very important to you when you buy things. You think what is inside is much more important.
13-19	You think there are other things that are just as important as the design of a packet and you look for these as well when buying.
20-25	You think packaging is important when you buy a product. It influences your choice of what you buy.

Scoring for each questionnaire

Answer	Points
strongly agree	5
agree	4
undecided	3
disagree	2
strongly disagree	1

APPLICATION FORM (for use with Interview techniques – page 30)

Complete this form.

NameSex

Age

Address

Secondary School attended

Subjects taken at 4th and 5th year level

Job being applied for

Why do you want this particular job?

Which part of your school experience do you think qualifies you for this job?

Has your school attendance been a) regular?
b) punctual?

What interests do you have outside school?

Write a few short sentences saying why you think you would be the best candidate for the job.

INTERVIEWER'S CARD (for use with Interview techniques – page 30)

1 Look at the application form. Give it a mark out of 3 for neatness and presentation.

2 Name of candidate

3 Job being applied for

4 Has the candidate's attendance at school been

a) regular? (If yes, give 1 mark)

b) punctual? (If yes, give 1 mark)

Ask the candidate the following questions.

1 Why do you think you can do this job well?

If the answer is clear, short, confident, well thought out and mentions all the things in the job description give 3 marks.

If the answer is hesitant, or over confident, and does not mention the things in the job description, give 2 marks.

If the answer is very poor, and tells you nothing about the person, give 1 mark.

2 Tell me about the school you went to, and your interests outside school.

Listen to the voice. If it is clear and the answer is interesting, give 3 marks.

If the voice is low and you have difficulty hearing, and they seem to have few interests and be bored by school, give 2 marks.

If the answer is very short, or very long and rambling so you can't understand it, and they have no hobbies and dislike school, give 1 mark.

Look at the way they are sitting.

a) If sitting with legs crossed tightly and seeming very nervous, give 1 mark.

b) If bolt upright and looking tense and worried, give 2 marks.

c) If relaxed without being sloppy, sitting straight, give 3 marks.

Total

Score: 10-14 points – employ them. 6-9 points – employ them if no-one better turns up. 5 or below – try harder for your next interview.

1 Making sense of the world

USING DIFFERENT SENSES (page 1)

Q1

Pair	What the objects looked like to me	Differences between the 2 objects found by partner	Sense(s) partner used to find the differences
1			
2			
3			
4			
5			
6			
7			
8			
9			

Q2 The senses used to find the differences between the objects were

.....

Q3 The stimuli sensed were

Q4 When your eyes are covered the stimuli you cannot sense are

.....

INFORMATION: EYES (page 2)

Q5 Braille is

Q6 A Talking Page is

Q7 The retina is

Q8 Messages are sent from the eyes to the brain along the

TRICKING OUR SENSES (1) (page 3)

Q9 The purple colour looks

Q10 An after-image you can see in everyday life is

1 MAKING SENSE OF THE WORLD (Continued)

TRICKING OUR SENSES (2) (pages 4 and 5)

Q11 By just looking at the drawings

Q12 Drawings like 6 are used in art to give

Q13 My partner's sense of sight *was/was not* tricked by the drawing.

Q14 The sense of sight was tricked because

TRICKING OUR SENSES (3) (page 6)

Q15 I guessed that the smaller box was

Q16 Each box weighed on the balance.

Q17 The clues I used about box Y were

2 How we perceive the world

INFORMATION: PERCEPTION (page 7)

Q1 Perception is

Q2 An optical illusion is

Q3 (Various answers)

INTERPRETING WHAT IS SEEN (pages 8 and 9)

Q4 I wrote down

Q5 Most people did not notice one of the words because

.....

Q6 Everyone *could/could not* draw a picture to match the clue words they were given.

Q7 The answer to Q6 shows that the brain

3 How we behave

INFORMATION: REFLEXES (page 10)

- Q1 A reflex action is
- Q2 The iris reflex is
- Q3 Doctors use reflex actions to
- Q4 Some other reflex actions are and

THE IRIS REFLEX (page 11)

Q5

Light	Size of right eye pupil	Size of left eye pupil
Daylight		
Torchlight		
Dim light		

- Q6 In bright light the pupil is
- Q7 In dim light the pupil becomes
- Q8 The pupils change size because

INFORMATION: INSTINCT (page 12)

- Q9 The gripping instinct is important to young monkeys because
- Q10 Instinct is
- Q11 The advantage of the suckling instinct is

4 Ways of learning

INFORMATION: CONDITIONING (page 13)

- Q1 A mammal is
- Q2 If a conditioned dog does not get food when the bell is rung it will
- Q3 Anorexia is

4 WAYS OF LEARNING (Continued)

CONDITIONING IN HUMANS (page 14)

- Q4 When the bell was rung in step A my partner
- Q5 People *do/do not* usually blink when they hear a bell ring.
- Q6 When air was puffed into the eye (in step B) my partner *did/did not* blink.
- Q7 This is a action.
- Q8 In step E my partner
- Q9 My partner *has/has not* been conditioned.

INFORMATION: LEARNING IN HUMANS (page 15)

- Q10 The cerebral cortex is
- Q11 A reward is
- Q12 A punishment is
- Q13 The athletes have been rewarded by

LEARNING WORDS (page 16)

Q14

Word	1	2	3	Tries		6	7	8	9	10
				4	5					
get										
sit										

Nonsense word	1	2	3	4	Tries		7	8	9	10
					5	6				
zok										

- Q15 My partner took tries to remember all the 'real' words.
- Q16 My partner took tries to remember all the nonsense words.
- Q17 It *is/is not* easier to remember sense than nonsense.
- Q18 The nonsense words my partner remembered easily were
- Q19 School work should be learned

RECORD SHEET
4 WAYS OF LEARNING (Continued)

LEARNING: READING OR WRITING? (page 17)

Q20 I got a better mark in test *A/B*.

Q21 It was easier to remember the words in test *A/B*.

Q22 School work should be learned by

LEARNING TO SOLVE PROBLEMS (1) (page 18)

Q23 I made errors on my first try.

Q24 I made errors on my second try.

Q25 I by making mistakes.

Q26 This kind of learning is called trial and error because

.....

LEARNING TO SOLVE PROBLEMS (2) (page 19)

Q27 I solved the problem by

Q28 I worked out the problem by

Q29 To solve the problem I needed to know that

INFORMATION: LEARNING AND REMEMBERING (pages 20 and 21)

Q30 When a person does not know his results, the way in which he does a task

.....

Q31 When a person knows his results, the way in which he does a task

Q32 The best way to learn facts is

5 How we think and feel

INFORMATION: TRENDS AND OPINIONS (page 22)

- Q1 Some of the trends that have taken place since 1950 are and
- Q2 Conform means
- Q3 Four influences that help us form attitudes are
- Q4 An opinion poll is

TESTING ATTITUDES (page 23)

Q5

Attitude to sport on television			
Name	Question number and score	Total score	Attitude
	Q1		
	Q2		
	Q3		
	Q4		
	Q5		
	Q1		
	Q2		
	Q3		
	Q4		
	Q5		
	Q1		
	Q2		
	Q3		
	Q4		
	Q5		
	Q1		
	Q2		
	Q3		
	Q4		
	Q5		

- Q6 Everyone *did/did not* have the same attitude to sport on television.
- Q7 This kind of survey could be used by
- Q8 I think my findings *are/are not* reliable.
- Q9 Opinion polls ask large numbers of people

5 HOW WE THINK AND FEEL (Continued)

INFORMATION: ATTITUDES TO ADVERTISING (pages 24 and 25)

Q10 Three things used by an advertiser to help us remember his product are
 and

Q11 Advertisers would be *less/more/as* successful.

Q12 Two TV advertisements I remember are and

Q13 I remember them because
 I *would/would not* buy their product.

PACKETS THAT PERSUADE (page 26)

Q14

Attitude to soap powder packets			
Name	Question number and score	Total score	Attitude
	Q1		
	Q2		
	Q3		
	Q4		
	Q5		
	Q1		
	Q2		
	Q3		
	Q4		
	Q5		
	Q1		
	Q2		
	Q3		
	Q4		
	Q5		
	Q1		
	Q2		
	Q3		
	Q4		
	Q5		

5 HOW WE THINK AND FEEL (Continued)

PACKETS THAT PERSUADE (page 26 continued)

- Q15 People would be more likely to buy packet
- Q16 They would buy this packet because
- Q17 Their choice was influenced by
- Q18 The quality of the soap powder had to do with their choice.

6 What kind of person are you?

INFORMATION: PERSONALITY (pages 27 and 28)

- Q1 The words that best describe the person in each drawing are:
 - Drawing A
 - Drawing B
 - Drawing C
 - Drawing D
- Q2 A first impression is
- Q3 Body language is
- Q4 A personality trait is
- Q5 The Rorschach Test is

TESTING PERSONALITY (page 29)

- Q6 My partner and I *did/did not* agree on my characteristics.

INTERVIEW TECHNIQUES (pages 30 and 31)

- Q7 My marks *were/were not* affected by my body movements.
- Q8 My body language told the interviewer that I was
- Q9 I scored low marks on
- Q10 I could improve these things by

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