

## AIDS

*Contents:* Activities and factsheets concerning AIDS, its causes, transmission and prevention.

*Time:* 1 to 2 periods, depending on number of activities used.

*Intended use:* GCSE Biology courses. It is assumed that students will already have some knowledge of the body's defences against disease.

*Aims:*

- To complement work on disease and the immune system
- To improve students' knowledge and awareness of the nature of AIDS and how it can be prevented
- To develop understanding of the problems faced by persons infected with the AIDS virus, and to help avoid ostracism
- To provide opportunities to practise communication skills.

*Author:* Christine Morris

The unit consists of three parts:

*Activity 1* A true/false test designed to assess students' knowledge and understanding of AIDS

*Activity 2* A discussion exercise involving hypothetical case studies of people infected with HIV

*Factsheets* giving information about HIV and AIDS

### Suggested use

#### Activity 1

Get students to complete the questionnaire individually at first, *before* reading the factsheets. They can then read the factsheets and change any answers they wish. Groups of students may then compare their answers and discuss any uncertainties. Finally, any remaining queries could be fed back to the teacher, perhaps during a plenary session.

Some of the questions that might be discussed:

- What are the students' main concerns about AIDS?
- How many of the things they have heard about AIDS are factually incorrect?
- How much of what people say about AIDS is influenced by their own attitudes?

*Answers to the true/false questions* The answers given below are those that applied when this unit was written in July 1987.

1 True	6 True	11 True	16 False	20b False	20g False	25 True
2 False	7 True	12 False	17 False	20c False	21 False	
3 True	8 False	13 True	18 True	20d True	22 False	
4 True	9 True	14 False	19 False	20e False	23 False	
5 False	10 True	15 True	20a True	20f False	24 True	

## Activity 2

This activity is intended to be used *after* Activity 1. It is intended to help students identify and examine any prejudices they may have concerning AIDS victims and carriers.

Working in groups, students should read the case studies and discuss the questions given on the worksheet.

## Notes on the factsheets

The information on the factsheets is brief and simplified so teachers may wish to back it up using some of the further resources identified below.

In particular, the information concerning white blood cells has been highly simplified. HIV, the virus responsible for AIDS, actually attacks one particular type of white blood cell, the T4 cell. These are the 'helper' cells which activate the defence system by switching on two other types of cell: the 'killer' cells which actually destroy pathogenic microorganisms, and the B cells which produce antibodies. With large numbers of T4 cells killed by HIV, the defence system cannot be properly activated.

Feedback from trial schools suggests that AIDS is often discussed in programmes of personal and social education as well as in the science curriculum so some coordination with other departments is likely to be needed.

Students may know someone who is HIV positive or is suffering from AIDS. Some caution is therefore needed before embarking on the topic. The Family Doctor guide, *AIDS*, includes simple, clear summaries of what it is like to have AIDS and how to support a person with AIDS.

## Further resources

### Books and leaflets

Carne, Dr C.A., *AIDS*. Family Doctor Publications, 1987.

(Family Doctor Publications, Tavistock Square, London WC1H 9JP) An illustrated guide.

Department of Education and Science, *AIDS — Some Questions and Answers*. DES, 1987

(Available free from Publications Despatch Department, DES, Honeypot Lane, Stanmore, Middlesex HA1 7AZ)

An information booklet for teachers. It includes a list of sources of further information.

Also from DES, *Children at School and Problems Relating to AIDS*. DES, 1986.

Harvey, Ian and Reiss, Michael, *AIDSFACTS*. Cambridge Science Books, 1987.

(Cambridge Science Books, Tracey Hall, Cockburn Street, Cambridge CB1 3NB)

Sketchley, John, *Teaching AIDS: Educational Materials about Acquired Immune Deficiency Syndrome for School Teachers*. BLAT Centre for Health and Medical Education, 1987.

(BLAT Centre for Health and Medical Education, BMA House, Tavistock Square, London WC1H 9JP)

A resource pack containing information sheets and suggested activities.

## Videos

Experience in trial schools suggests that it is very important for teachers to preview videos about AIDS.

### *AIDS*

Available by hire or purchase from Health Education Video Unit, Clinical Sciences Building, Leicester Royal Infirmary, PO Box 65, Leicester LE2 7LX (Tel: 0533 550461)

### *The AIDS Movie*

Available by hire or purchase from Educational Media International, 25 Boileau Road, London W5 3AL (Tel: 01 998 8657)

### *AIDS — a Programme for Students over 16*

Yorkshire Television, ITV Schools. The video is accompanied by helpful notes.

### *Facts for Life*

Granada, ITV Schools, will broadcast this series covering diseases including AIDS in the summer of 1988.

# AIDS

## Activity 1: True or False?

Here are some statements about AIDS. For each one, put a tick to show if you think it is true or false. If you are sure of your answer, put Y in the third column. If you are not sure your answer is right, leave the third column blank.

	<i>True</i>	<i>False</i>	<i>Are you sure?</i>
1 AIDS is caused by a virus called HIV			
2 There is a vaccine to prevent people getting AIDS			
3 AIDS is caused by a virus that destroys the immune system so that resistance to disease is lowered			
4 AIDS stands for Acquired Immune Deficiency Syndrome			
5 There is a cure for AIDS			
6 You can be tested to find out if you are infected with the AIDS virus			
7 People can carry the AIDS virus and pass it on without knowing they have it			
8 Everyone who has the AIDS virus get AIDS within 3 years			
9 Common symptoms caused by the virus HIV are fatigue, unexpected weight loss, persistent fevers and sweating			
10 People with AIDS often suffer from pneumonia, cancer and brain damage			
11 Most people who gets AIDS die within 2 years			
12 50 000 people have already died of AIDS in this country			
13 The AIDS virus cannot survive for long outside the human body			
14 The AIDS virus can be passed on by touching an infected person, sharing cutlery, sharing the same toilet seat or breathing in their germs			
15 The AIDS virus is passed from one infected person to another through blood or through body fluids such as semen (males) or vaginal fluid (females)			
16 It is very easy to catch the AIDS virus from an infected person by day-to-day contact			

	<i>True</i>	<i>False</i>	<i>Are you sure?</i>
17 You can only be infected with the AIDS virus during sexual intercourse if you draw blood inside the vagina or anus			
18 Drug users who inject their drugs can pass on the AIDS virus by sharing needles			
19 It is dangerous to have a blood transfusion in this country because the blood is likely to be infected with the AIDS virus			
20 The following are ways in which a person is at <b>high risk</b> of catching the AIDS virus from their infected partner			
(a) A man and a woman having vaginal intercourse			
(b) A couple having intercourse using a condom			
(c) A couple masturbating each other by hand			
(d) Two men having anal intercourse			
(e) Oral sex (caressing a partner's genitals with the tongue or mouth)			
(f) Kissing			
(g) Heavy petting (touching, caressing partner's genitals by hand)			
21 Only men can get AIDS			
22 All AIDS cases involve homosexual males			
23 You can develop AIDS by having regular sexual intercourse with a non-infected partner			
24 Pregnant women who have the AIDS virus can pass it on to their baby			
25 If someone in your class had AIDS no special precautions to prevent them passing on the virus would be needed			

When you have finished doing the questionnaire, read the AIDS factsheets. Then go back and change any answers you think you got wrong the first time. Compare your answers with other members of the group.

## Activity 2: Case studies

For each case, try to put yourself in the position of the infected AIDS victim, or of their relative or close friend.

Working in groups, discuss and answer these questions for each case.

- What problems do you think the AIDS victim will face?
- How would you suggest they cope with these problems?
- What do you think should be done to help them?

### **Case 1 Parent of a 5-year-old child, who is infected with HIV, the virus which causes AIDS**

You want your child to have a happy normal life. You know that there is a possibility of her developing AIDS but you hope that this will not happen. She is about to enter school in September and you have recently heard from the school that a parents' action group has been set up. This group threaten to withdraw their children from the school if your child is allowed to attend.

### **Case 2 Paul**

Paul is 17. He cannot understand why there is all this publicity about AIDS. He says that over a year there are many more road deaths than AIDS deaths — so why worry? He sees no reason to change his sexual behaviour and is certainly not prepared to use a condom: 'It's up to the girl to stop herself getting pregnant.'

A couple of years later however he meets a girl and wants to marry her and settle down. At about this time, he decides to give blood but the hospital finds his blood to be HIV antibody positive. He is told.

### **Case 3 Jane**

Jane is a 26-year-old woman. She is a drug abuser and injects heroin into her body. She sometimes finds difficulty in getting hold of needles, so she shares needles with other drug abusers. Jane catches HIV, the AIDS-causing virus, from sharing a needle, but is not aware of it until she becomes pregnant. She wants to have the child.

# Factsheets on AIDS

## What causes AIDS?

AIDS is caused by a virus. The virus is called the **Human Immunodeficiency virus**, or **HIV** for short. This virus attacks white blood cells, which help defend the body against disease.

There are several different types of white blood cell. They work together to fight disease-causing bacteria and viruses which have invaded your body.

HIV attacks one type of blood cell called the 'T Helper' cell. Figure 2 shows what happens.

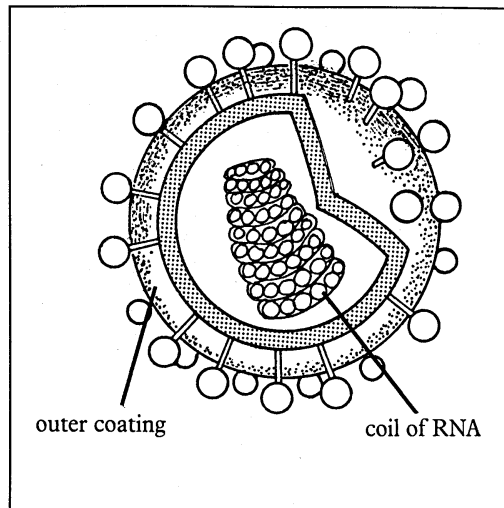


Figure 1 HIV, the virus which causes AIDS. The diameter of the virus is about 100 nanometres

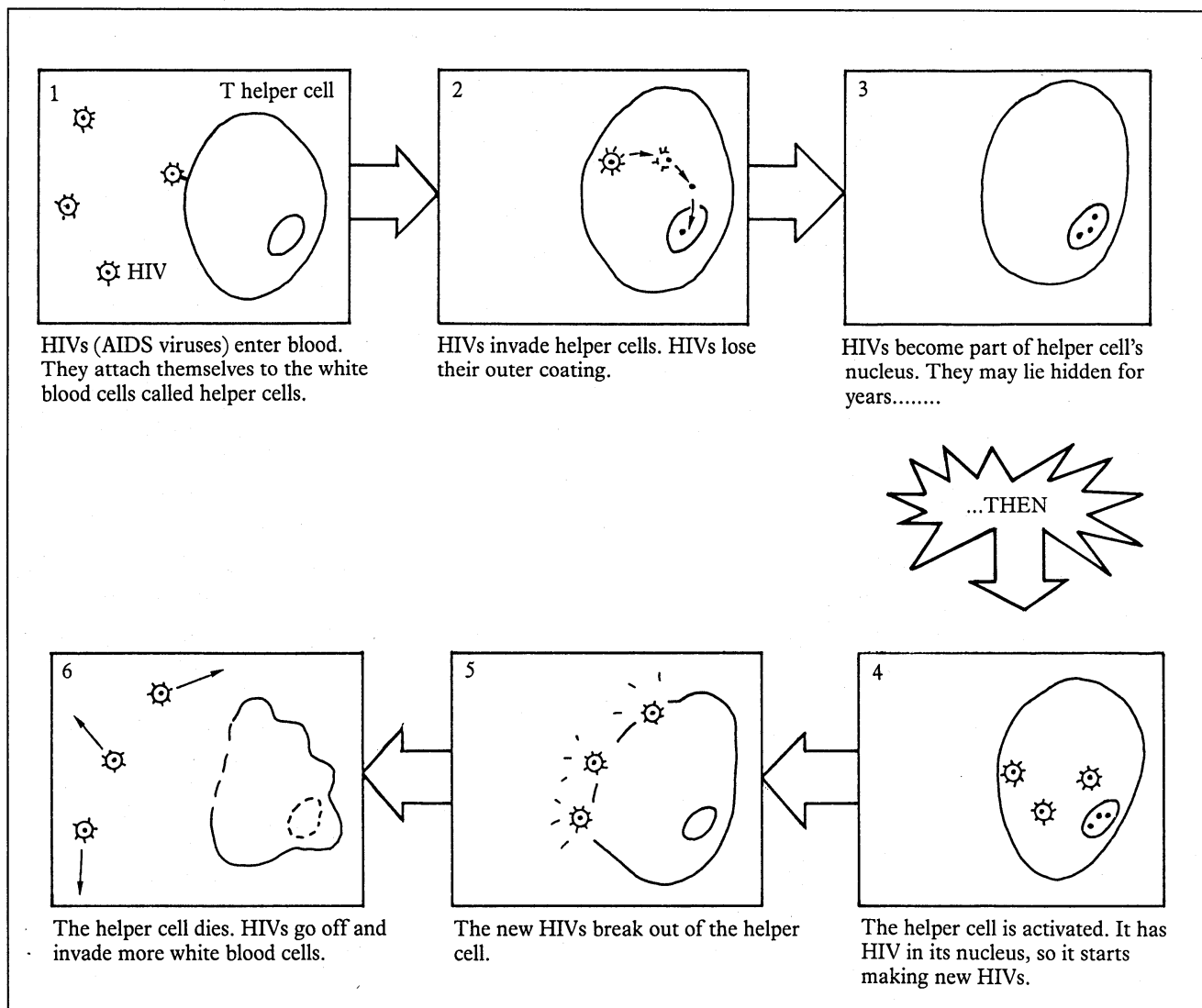


Figure 2 How HIV attacks white blood cells

You can see that HIV takes over the helper cell. It makes the cell produce lots of new HIVs. In the end it kills the cell.

In this way people who are infected with HIV lose lots of their helper cells. Eventually they don't have enough of these white cells left to defend themselves against diseases. Sooner or later they catch a serious disease, and they are defenceless against it. AIDS sufferers don't die of AIDS itself. They die of some other disease which their bodies cannot fight.

There is no vaccine to prevent HIV infection.

There is no cure for AIDS.

### Is there a test for AIDS?

Antibodies are produced by the body in response to HIV. Unfortunately these antibodies do not seem to affect the virus. The antibodies can be detected by blood tests. If they are found, they show that the person has been infected. However, the antibodies do not necessarily mean that the person will develop AIDS.

### What happens if someone is infected with the AIDS virus?

The effects of infection by the AIDS virus can be thought of as a number of stages.

#### Stage 1 The AIDS virus enters the body

The virus enters the body and hides in helper cells.

At this stage people seem healthy but they are infectious. They can pass on the virus to others.

#### Stage 2 Antibodies appear in the blood

Antibodies usually appear after about 2 to 3 months. Unlike most antibodies they do not affect HIV and so they do not destroy the virus which causes AIDS.

Special tests can find antibodies in the blood. The antibodies show that people have been infected with HIV.

Infected people can pass on the virus to others at this stage but they still seem healthy. The stage may last for about one to five or more years.

#### Stage 3 Early symptoms of HIV begin

The early symptoms include loss of weight, great tiredness, constant fevers, persistent diarrhoea and heavy night sweats.

Some of these symptoms are very common. There can be lots of reasons, other than AIDS, for developing them. It is only if a person has many of these symptoms together and has taken part in an 'at-risk' activity, that HIV may be the cause.

<b>Acquired</b>	something you have picked up, not inherited
<b>Immune Deficiency</b>	Your body cannot defend itself against illness
<b>Syndrome</b>	The set of illnesses you get as a result

Figure 3 How AIDS gets its name



## Stage 4 AIDS

At this stage the virus has done severe damage to the immune system by destroying the white cells called helper cells. Serious illnesses can take hold. The commoner illnesses are pneumonia, cancers and damage to the brain.

Some of the illnesses are rare except among AIDS sufferers. In particular:

- a type of pneumonia caused by an organism called *Pneumocystis carinii*
- a skin cancer called Kaposi's sarcoma

AIDS patients at this stage may die quickly, or may live for about two years.

Figure 4 shows the numbers of people in the UK with HIV in different conditions in December 1986. The number of people infected with HIV can only be estimated.

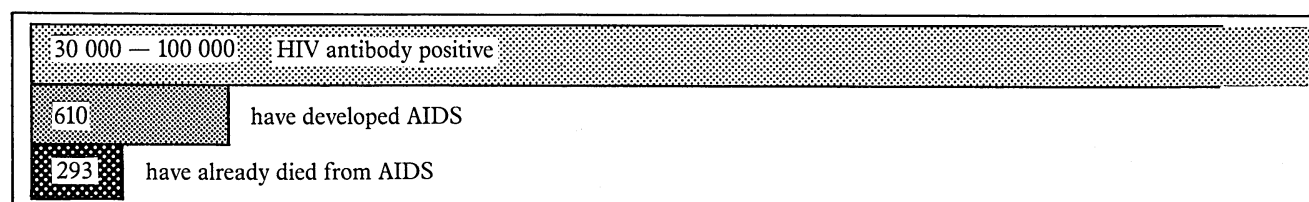


Figure 4

## How do people get AIDS?

HIV — the virus that causes AIDS — is delicate. It only survives in human body fluids, such as blood, sperm fluid (semen), vaginal fluid and breast milk. The virus has also been found in saliva and tears but no one is known to have caught HIV from saliva or tears.

HIV cannot live for long outside the human body.

In order to get into the human body it has to pass through the body's first line of defence. This is the skin and the membranes lining the mouth, urine passage, anus, vagina, etc. It can only get through if it is carried in infected body fluid such as blood or semen.

There are three main ways HIV can get through.

- **Passing directly into the blood system through cuts, or injections with infected needles.**

In the United Kingdom, all blood given in hospitals is tested. Blood products are heat treated to reduce the risk of infection. Blood transfusions can still be risky in developing countries which do not have the facilities to test all blood.

- **Being passed on through vaginal and anal sexual intercourse**

*Vaginal intercourse* — between man and woman, when the man's penis enters the woman's vagina.

*Anal intercourse* — either between man and woman, or between two men when the man's penis enters the rectum, or back passage, of his partner.

It is very easy to catch AIDS from an infected person by sexual intercourse with them. It is **not** necessary to draw blood in the vagina or anus to transmit AIDS. It is not the blood which carries HIV during intercourse, but the semen and no bleeding need occur for the virus to be transmitted.

- **Being passed on to a new-born baby** from the mother, before or during birth, and possibly from breast milk.

## Who is at risk of catching AIDS?

Anyone *could* become infected, but so far the infection has been found mainly in people who are involved in a number of at-risk activities (Table 1).

Table 1 At-risk activities. Figures are for the UK, January 1987

At-risk activities	Number of AIDS cases		Number of deaths
	male	female	
Homosexual sex	606	0	302
Sharing needles to inject drugs	7	0	4
Receiving a transfusion of a contaminated blood product (in the days <i>before</i> blood products were made safe from HIV)			
(a) haemophiliacs	26	0	19
(b) other people	3	1	4
Sexual intercourse with anyone who has been involved in the above activities	1	2	3
Birth — if your mother is infected with HIV	3	3	3

At present there are more *reported* AIDS cases in the USA than in any other country of the world (Figure 5). But in some parts of the world, particularly Africa, many AIDS cases do not get reported. Doctors believe that the population in Central Africa is worse affected than anywhere else in the world.

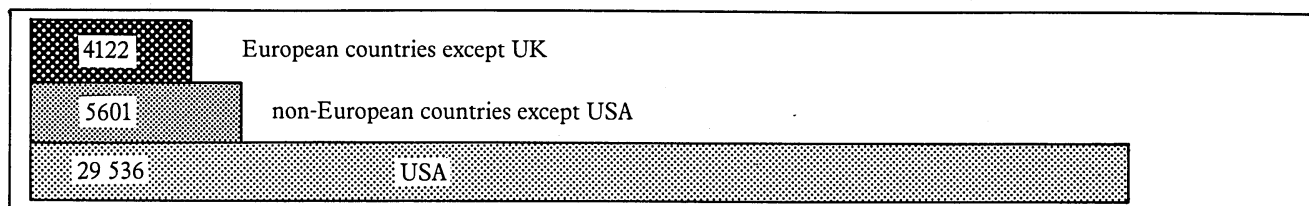


Figure 5 Reported AIDS cases around the world (February 1987)

## How can you avoid getting AIDS?

Remember — you can only receive HIV, the virus which causes AIDS, from body fluids. You cannot get it through ordinary contact with infected people.

The important rules are

- The less sexual partners you have, the less your chance of being infected.
- Wearing a condom during intercourse cuts down the risk of infection.
- People who use drugs should not inject. If they do inject, they should **never** share needles with other people.

AIDS is a new disease. We do not know how it will affect us over a long period of time. There is no cure yet, so prevention is all we have. People infected with HIV rely heavily on society's understanding of this disease to stem prejudices and scare-mongering. They need support and caring from us all.

## Disposable Nappies

*Contents:* Survey, decision-making and practical work concerning the science and technology of disposable nappies.

*Time:* Part 1 can be done at home. Part 2 needs 1 to 2 periods. Part 3 will probably need a minimum of 2 periods.

*Intended use:* GCSE Chemistry and Science. Links with work on polymers and materials.

*Aims:*

- To complement and illustrate work on polymers and the uses of materials
- To develop awareness of the involvement of science and technology in the design and manufacture of a familiar consumer product
- To illustrate the way in which the materials for a particular application are selected according to their properties
- To illustrate the way in which scientists and technologists can develop particular materials to suit particular needs
- To provide opportunities to practise a range of skills, including information-gathering, decision-making and experimental design

*Requirements:* Students' worksheets No.910. It would be useful to have one or two disposable nappies of different brands available, particularly if Part 1 is to be omitted.

*Authors:* John Holman and Andrew Hunt

The unit is in three parts

Parts 1 and 3 are optional, though Part 1, which can be done for homework, provides a good lead-in to Part 2. In addition there are optional information sheets (pages 5 and 6). Students should **not** be given the extra information until **after** they have done Part 2.

When they have studied this unit, students may be interested to discuss the wider environmental and resource implications of replacing a renewable, washable product with a non-renewable, disposable one.

### Part 1 What's the problem?

Finding out what makes a good nappy. A homework survey. Groups of students might be asked to present a report of their findings before tackling Part 2.

### Part 2 Choosing the right materials

A decision-making exercise in which students select suitable materials for a disposable nappy. Superabsorbent polymer can vary in its composition. It is usually a starch-polyacrylate copolymer.

### Part 3 Comparing nappies

Practical work in which students are asked to plan and carry out a method for comparing nappies.

Effective testing is the key to successful marketing of a product. The commercial procedure for testing absorbency is as follows:

Stamp out a disc of the absorbent material.

Weigh the dry sample.

Put the sample in a 'tea bag', seal it and drop it into a saline solution for a measured time.

Remove the sample from the solution and allow to drain for 10 minutes.

Re-weigh.

*Acknowledgements* Figure 1 supplied by Peaudouce; Figure 4 reproduced by permission of MODO Converting Machinery AB.

## DISPOSABLE NAPPIES

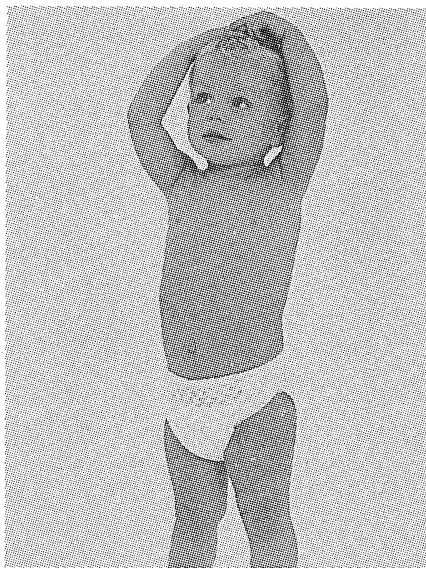


Figure 1

Millions of disposable nappies are used in Britain every day. In this unit you will ask what makes a good disposable nappy. You will look at the materials they are made from, and see that disposable nappies involve a lot of science and technology.

The unit is in three parts :

- Part 1* What's the problem? (Finding out what makes a good nappy)
- Part 2* Choosing the right materials
- Part 3* Comparing nappies.

### Part 1 What's the problem?

We all start life wearing nappies but we cannot remember what it felt like. The people who know about nappies are the parents of young children. To find out about nappies you will have to find out what the parents think.

- What are the advantages and disadvantages of washable nappies?
- What are the advantages and disadvantages of disposable nappies?
- What makes a good disposable nappy?

Try to answer these questions by collecting opinions from as many people as possible with recent experience of looking after babies. With the help of other members of your class, interview neighbours, friends and relations who may be able to help you.

While making your survey try to examine as many types of nappy as you can.

Answer question 1 to make sure that you understand some of the key words used in this unit.

#### Question

- 1 What do these words mean:
- disposable*
  - absorbent*
  - biodegradable*
  - flammable*
  - opaque?*
- (A dictionary will help you)

## Part 2 Choosing the right materials

If you have done Part 1, you'll know that a good disposable nappy needs some important properties. It needs to be:

- Absorbent — to soak up lots of liquid
- Leak-proof — so liquid cannot leak out at legs or waistband
- Comfortable — for the baby to wear
- Disposable — the nappy may be disposed of by burning or breakdown by bacteria.

Figure 2 shows a typical disposable nappy.

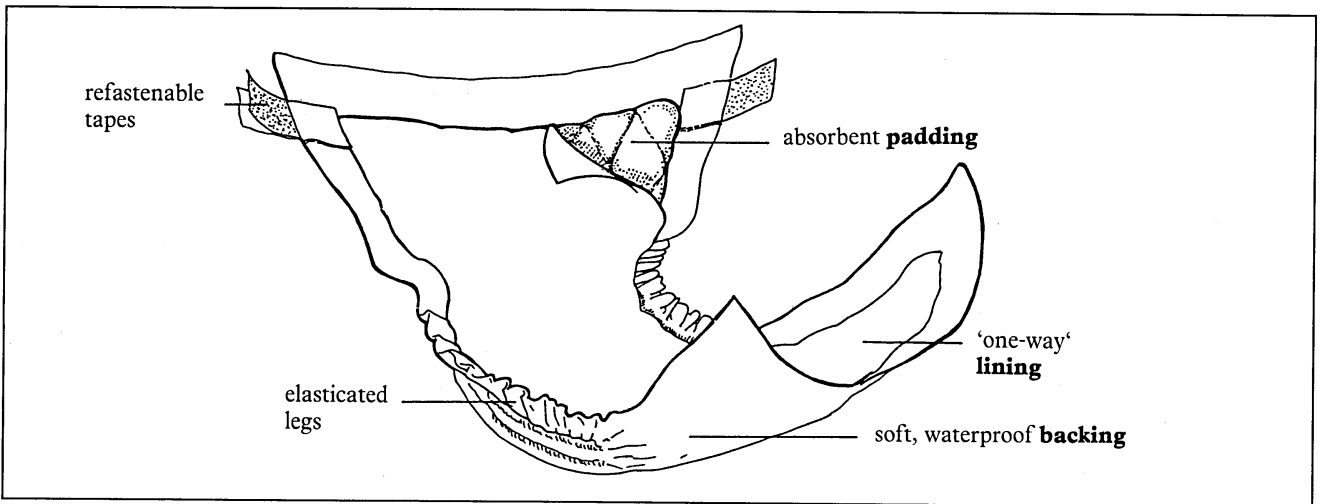


Figure 2 A typical disposable nappy

The **padding** has to be as water-absorbent as possible. The **backing** has to be completely waterproof, but soft. The **lining** has to let water pass through it to the padding. But the lining itself must stay as dry as possible so the baby's skin stays dry.

Table 1 (page 3) shows some materials that might be used in a disposable nappy. You can use the table to answer questions 2 to 7. The information in the 'box' below may help you. It explains why some materials absorb water better than others.

### Why do some materials absorb water better than others?

Water contains  $H_2O$  molecules.



The O-H group of atoms attracts other O-H groups. This is what holds water together as a liquid.

Other substances also contain O-H groups. Cellulose has long chains of atoms with many OH groups attached to the chain. These O-H groups attract water molecules. That is why cellulose can absorb a lot of water (Figure 3). Cotton and tissue paper consist of cellulose. Rayon is a form of cellulose which has been modified chemically.

'Superabsorbent polymer' was specially developed by scientists to absorb large amounts of water. It forms a kind of jelly which holds the water under pressure. It has lots of O-H groups to attract  $H_2O$  molecules, and also has other groups of atoms which attract water. Polythene, on the other hand, has no O-H groups. It has no attraction at all for water — it is waterproof.

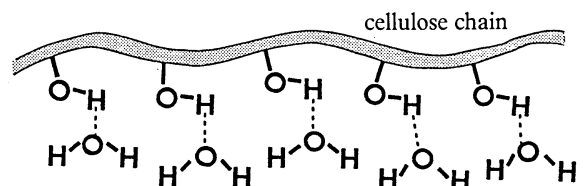


Figure 3

Table 1 Materials that might be used to make disposable nappies

Material	Description	Price	Bio-degradable?	Flammable?	Water-proof?	Water absorbent?	Strength	Sofiness
Non-woven poly-propylene fabric	see box below table	low	no	yes	no	no	strong	soft
Non-woven rayon fabric	see box below table	low	yes	yes	no	yes	strong	soft
Woven cotton cloth	white cloth like sheets	high	yes	yes	no	yes	strong	soft
Aluminium foil	shiny foil	medium	no	no	yes	no	strong	hard
Clear polythene sheeting	clear plastic sheet	low	no	yes	yes	no	strong	soft
Whitened poly-thene sheeting	opaque, white plastic sheet	low	no	yes	yes	no	strong	soft
Fluffed cellulose pulp (made from wood)	like cotton wool	low	yes	yes	no	yes	weak	soft
Superabsorbent polymer	like cotton wool	high	yes, but slowly	yes	no	very	weak	soft
Tissue paper	creped cellulose	low	yes	yes	no	yes	weak	soft

### Questions

- 2 *Imagine you are a disposable nappy manufacturer. Which material or materials would you choose for the backing? Give reasons for your choice.*
- 3 *Which material or materials would you choose for the padding? Give reasons for your choice.*
- 4 *Which material or materials would you choose for the lining? Give reasons for your choice.*
- 5 *Are there any materials you would like to use but which are not in the table?*
- 6 *Now draw a cross-sectional diagram through the middle of the nappy to show how the different materials would be fitted together. (Your diagram should show the nappy as if it had been cut in half across the middle.)*
- 7 *Having designed your nappy, you now have to market it. Design a poster advertising your nappy. The poster should show clearly what you think are the nappy's strong selling points.*

### What are non-woven fabrics?

Traditional fabrics are made by weaving long fibres. Non-woven fabrics are produced by pressing and bonding much shorter fibres.

Non-woven fabrics are now common. They are used to make cloths for wiping up kitchen spills, as well as disposable towels, aprons and nappies.

Toilet paper and kitchen rolls are also examples of non-woven materials made from short fibres.



### Part 3 Comparing nappies

Try comparing the effectiveness of different brands of disposable nappy.

- You might test the absorbent padding to see how much water it will soak up.
- Some manufacturers claim that their nappies have 'one-way' linings. You could test the linings to see if the claims are true.
- You could test the sticky tapes used to fasten the nappy. Are the tapes strong enough to hold the nappy on an active baby? Does the adhesive hold fast even when the nappy gets wet?

Plan a method to help you make the comparison before you start. Bear in mind these points:

- Your comparisons must be **fair**. How will you make sure each brand is tested in the same way?
- Your comparisons must be **reliable**. Will you be able to defend your method if a nappy manufacturer says your results are inaccurate?

## Further information

Disposable nappies are very big business. In 1987, £200 million was spent on disposable nappies sold in the UK.

### The structure of a disposable nappy

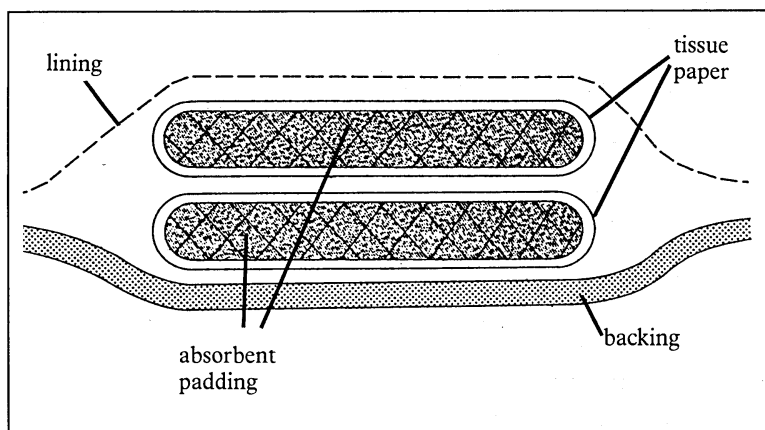


Figure 3 A cross-section showing the construction of a typical disposable nappy

The **backing** is polythene sheeting. The polythene is whitened so that you cannot see through it.

The **absorbent padding** is usually cellulose fluff pulp. It is made from wood pulp and fluffed up to give a high surface area. The fluff pulp is usually wrapped around with tissue paper. The best quality nappies have 'superabsorbent polymer' mixed with the cellulose pulp. 'Superabsorbent polymer' has the advantage of absorbing a large amount of water into a small volume. It forms a gel which traps the water and holds it under pressure.

The **lining** is a non-woven material, usually polypropylene. Polyester or rayon are sometimes used. The advantage of rayon is that it is biodegradable.

### Disposal

Disposable nappies cannot be flushed down the toilet whole. One possibility is to tear the padding and lining away from the backing in strips before flushing it away. The backing can then be disposed of separately. As much of the nappy as possible should be biodegradable with this type of disposal.

Another disposal method is to put the whole nappy in the dustbin. There may be hygiene problems if the nappy is very dirty.

#### Investigation

Try removing some filling from a nappy.

Look at a little of the filling with the help of a hand lens or microscope.

Add some water and leave it for a few seconds. Small lumps of gel can be seen among the cellulose fibres if the filling includes superabsorbent polymer.

## Manufacturing nappies

Once the materials for a nappy are decided, the nappies must be manufactured in huge quantities (see question 8). Figure 4 shows a typical machine used to make disposable nappies.

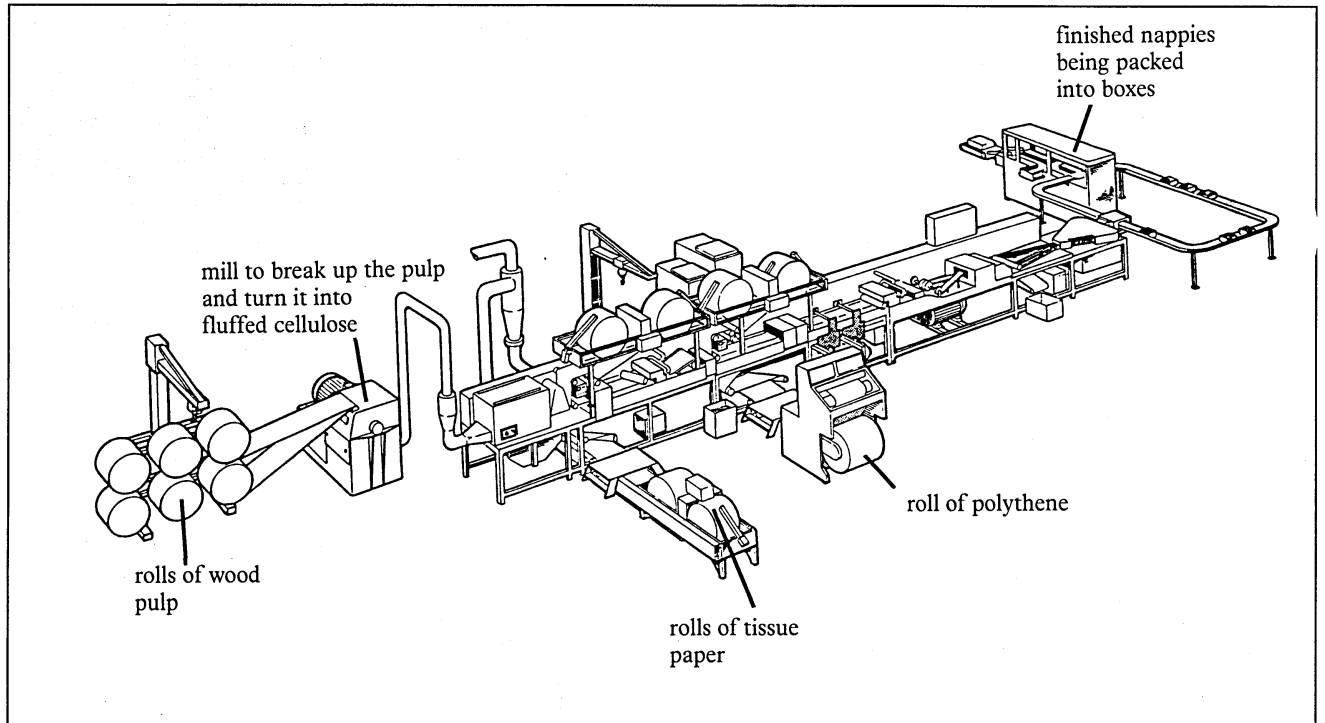


Figure 4

The machine shown in Figure 4 can produce up to 500 disposable nappies each minute. One operator, two packers and a part-time supervisor are the only people needed to run the machine.

Now answer question 8.

### Question

- 8 There are about 2 million babies in Britain. About half of them wear disposable nappies. Suppose a baby uses an average of 5 nappies a day. How many nappies must be manufactured each day to meet Britain's needs?

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## Some of the schools involved in trialling the units in this book

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Cheadle Hulme School, Cheshire  
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The Deanery High School, Wigan  
Emerson Park Comprehensive School, Essex  
Norwich High School  
Park House School, Newbury  
Parmiter's School, Watford  
Portslade Community College, East Sussex  
Rainham Mark Grammar School, Kent  
Rickstones School, Essex  
Royal Grammar School, Guildford  
St Albans Girls' School  
St Clement Danes School, Hertfordshire  
St Vincent's School, Gosport  
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## SATIS central team

The SATIS central team determines overall policy for the project, and individual members contribute to the project in many ways, including writing, reviewing and revising units.

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## **SATIS 9**

List of units in this book

### **901 THE CHINESE CANCER DETECTIVES**

Reading, questions, role-play and practical work related to the story of the identification of the cause of oesophageal cancer in Lin Xian, China.

### **902 ACID RAIN**

A structured discussion about the problems of acid rain.

### **903 WHAT ARE THE SOUNDS OF MUSIC?**

Reading and questions about sound and music, together with suggested teacher demonstrations and class investigations.

### **904 WHICH BLEACH?**

Survey, practical work and questions about the consumer testing of bleaches.

### **905 THE IMPACT OF INFORMATION TECHNOLOGY**

Reading, questions and discussion activities about the impact of information technology on our lives.

### **906 IT IN GREENHOUSES**

Reading and questions about the use of information technology to control the environment in greenhouses.

### **907 YOUR STARS — REVELATION OR REASSURANCE?**

A practical investigation of the validity of astrology.

### **908 WHY NOT COMBINED HEAT AND POWER?**

Reading, questions and data analysis concerning the use of hot water and steam from power stations to run industrial processes and to heat homes.

### **909 AIDS**

Activities and factsheets concerning AIDS, its causes, transmission and prevention.

### **910 DISPOSABLE NAPPIES**

Survey, decision-making and practical work concerning the science and technology of disposable nappies.

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