

### Lesson 6: New medicines

#### Task 4: Animal testing - What Are The Alternatives?

Students work in groups of three or four. There is enough information for 9 groups although by giving a group more than one card of information, the task can be matched to whatever number of groups are in the class. The information sheets should be copied and laminated beforehand.

The students work in their group (let's say of four). Then:

- (i) read over their information sheet (2-5 min)
- (ii) Summarise the information (on A3 sheet) using diagrams, symbols BUT only 20 words (10 min)
- (iii) Three members of their group move to three other groups to be taught about another part of the alternatives to animal testing - they record notes on Worksheet 2. The fourth member stays to teach three members from other groups (5 min)
- (iv) The students continue to move around the room until all of the other groups have been visited (10-15 min).
- (v) Students return to their original group to teach each other about what they've learnt. All should have completed worksheets.

### Lesson 6: New medicines

#### Information sheet A - Key Points

More than 2.7 million live animal experiments were authorised in Great Britain in 2002. This number has halved in the last 30 years. In the world, animals are used to test products ranging from shampoo to new cancer drugs. British law requires that any new drug must be tested on at least two different species of live mammal, one of which must be a large non-rodent. UK regulations are considered some of the most rigorous in the world - the Animals Act of 1986 insists that no animal experiments be conducted if there is a realistic alternative. Almost every medical treatment you use has been tested on animals. Animals were also used to develop anaesthetics to prevent human pain and suffering during surgery.

Task 4

#### Information sheet B - The 'Three Rs'

In 1959, British zoologist William M. S. Russell and microbiologist Rex L. Burch published "The Principles of Humane Experimental Technique", in which they put forth the 'three Rs of animal research':

**Replacement** - use alternative methods, e.g. testing on cell cultures (*in vitro*)

**Reduction** - use statistics to reduce the number of animals that must be used for each experiment

**Refinement** - improve the experiment to reduce animal suffering

#### **In the future**

Animal researchers say that it will be impossible to eliminate all animal tests. But most scientists accept that it is extremely important to minimise the suffering of laboratory animals, and to use as few animals as possible.

Task 4

#### Information sheet C - Paying for alternatives

Humanitarian organisations and governments have funded studies into alternative methods since the 1960s. For the past 15 years, Germany has given £4.2 million a year in research grants, while the Netherlands spends £1.4 million a year. It is estimated that the total spent by the UK government is in the region of £2 million a year. The European Centre for the Validation of Alternative Methods was set up in 1992 by the European Commission, and contributes £6.3 million annually. EU regulations state that researchers must assess the pain that an animal may feel during an experiment, and justify its suffering by what the research can achieve.

Task 4

### Lesson 6: New medicines

#### **Information sheet D - Reducing deaths**

In the past, the toxicity of a new substance was measured by an 'LD50' (lethal dose 50%) test. This test required up to 200 rats, dogs or other animals to be force-fed different amounts of the substance, to determine the dose that would kill exactly half that group of animals.

Recent changes in protocol have put a ban on the LD50 test, except in exceptional circumstances. In addition, the Organisation for Economic Co-operation and Development says that if a substance kills the first three animals it is tested on, further trials are unnecessary.

Task 4

#### **Information sheet E - Reducing deaths by using statistics**

A vaccine is only considered effective if at least 80% of the vaccinated animals survive after being exposed to a particular disease. However, the disease must also kill 80% of a control group not protected by the vaccine. Using statistical methods, Coenraad Hendriksen of the National Institute of Public Health and the Environment in the Netherlands has developed a method to test diphtheria and tetanus vaccines that only requires measuring the level of antibodies in an animal.

Apart from greatly reducing their suffering, it also uses half the number of animals. Other statistical techniques can use patient data to understand how a disease spreads, without testing it on animals.

Task 4

#### **Information sheet F - Reducing deaths by using cell cultures**

In the 1970s, the Netherlands used 5,000 monkeys a year to make polio vaccines. Now kidney cell cultures from just 10 monkeys provide enough vaccine for everyone in the country. Hormones or vaccines manufactured in cell cultures are also purer than those made within the animals themselves. This further reduces the need for animal tests to check the safety of the vaccines.

Task 4

### Lesson 6: New medicines

#### **Information sheet G - Reducing deaths by using fewer mammals**

Horst Spielmann of ZEBET, the German centre for animal testing alternatives, has surveyed decades of industry data on pesticides. He concluded that if mice and rats prove sensitive to a chemical, it does not have to undergo further tests on dogs. Spielmann anticipates that 70% of dog tests can now be dispensed with.

There is a general effort by researchers to use lab animals that are less likely to suffer the sensations of pain or discomfort. In Canada, many studies have replaced mammals with fish, and now researchers are even trying to use bacteria in tests instead of rats.

Task 4

#### **Information sheet H - Reducing deaths by using synthetic membranes**

The Department of Transportation became the first US agency to accept tests for skin corrosivity conducted on artificially-grown cells in 1993. The traditional test simply measured how far a corrosive substance ate into an anaesthetised rabbit's shaved back. Instead, the replacement uses reconstructed human skin, or a synthetic material called 'Corrositex'. Similar solutions are being developed for many other types of experiments which currently use animals.

Task 4

#### **Information sheet I - Reducing deaths by using new technologies**

New scanning technologies (such as Magnetic Resonance Imaging) can help doctors learn about disease from human patients without the need for invasive surgery, or animal testing.

Similarly, autopsies and cell culture studies can reveal a great deal of information without having to simulate the disease in a lab animal. Computer models have also been developed that simulate an animal's response, removing the need for live animal tests.

Task 4