**Animal Research and the Alternatives**

Approximate timing: 1 hour

Required resources: PowerPoint presentation (supplied), internet connection

This lesson will introduce students to the reason why animals are used in medical research. It will also look at the 3Rs – refinement, reduction and replacement – which govern the use of animals.

The lesson supports:

* AQA: GCSE 4.3.1.9 Discovery and development of drugs
* OCR: GCSE Gateway Science Biology A B6.3q
* OCR GCSE Twenty First Century Science Biology B B2.5 and B2.6

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| **Learning outcomes** |
| All students will: | Know basic facts of animal research |
| Most students will: | Explain why animal models are used |
| Some students will: | Assess whether the 3Rs are moral  |
| Key word/s | Animal research, alternatives, 3Rs, refinement, replacement, reduction, model |

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| **Teaching notes** | **Student learning activities**  |
| **Starter** ( 5mins )Animal research is the correct term for all use of animals in research. Animal testing tends to mean safety testing drugs, which is only a small proportion of all animal use in bioscience. | Slide 1Students copy down lesson objectivesStudents write down 3 things that come to mind when they hear about “animal research” or “animal testing”. |
| **Development** ( 10-15mins) Can get everybody to stand up – ask those with diabetes to sit down, then those with asthma, then who have taken antibiotics, then vaccines – most people will have taken animal research developed products.Can print off pie chart. Answers on slide 4. Other facts. Dogs and cats together account for 0.5%, monkeys account for less than 0.1%A quiz with answers on slide 10. More procedures than animals because some animals used twice | Slide 2-3. Students copy or read the facts about animal research. Includes some technical words. Slide 4-5. Students guess / write down which percentages apply to which animalsSlides 6-11Students participate in five question pop quiz, preferably noting down their answers. |

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| **Main** (30-35 mins)Can discuss the needs of different animals with students. Note that the animal welfare act does not cover invertebrates (e.g. fruit flies / nematode worms). Research on monkeys, cats and dogs is more strictly regulated.Researchers must explain how they have addressed the 3Rs in their application licenses to the Home Office.Refinement covers anything aimed at making the lives of animals within labs better e.g. training a monkey to stand and calmly take an injection so it doesn’t need to be restrained.Generally non-animal methods complement rather than replace animal research. So computer models use animal data and cell cultures may be taken from animals. Use two YouTube videos (internet required) and discuss ways in which 3Rs exist. E.g. dog treats (refinement), noninvasive scanning techniques (replacement), clicker training (refinement), lab techs playing with dogs (refinement), using rats rather than monkeys (reduction if overall suffering goes down), social housing of animals (refinement) etc. | Slide 12Students try to offer ways in which animals must be treated differently – comparing two animals and using hints on the board.Slides 13-15Students can discuss the 3RsSlide 16Students watch video of animal research facilities and outline way in which the 3Rs are used as they watch the two videos. They should categorize each thing as replacement, reduction and refinement. |
| Plenary (5 mins)Plenary questions are linked to initial learning objectives.  | Slide 17Students fill out answers to 3 questions. |
| Homework | Write two short letters to an MP, one explaining why animal research should be banned, and one explaining why it should continue.AlternativelyDevelop your own enrichment product, such as a better cage design, or toy for a particular animal. |