Suggested teaching program

**Chapter 8: Reproducing**

Time allocation: 3 weeks

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| **Context and overview** |
| In year 8, analyse the relationship between structure and function at cell, organ and body system levels. Students use experimentation to isolate relationships between components in systems and explain these relationships through increasingly complex representations. They make predictions and propose explanations, drawing on evidence to support their views. |
| **Syllabus outcomes addressed** |
| • Multi-cellular organisms contain systems of organs carrying out specialised functions that enable them to survive and reproduce ACSSU150  • Scientific knowledge has changed peoples’ understanding of the world and is refined as new [evidence](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/evidence) becomes available ACSHE134  • People use science understanding and skills in their occupations and these have influenced the development of practices in areas of human activity ACSHE136  • Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge ACSIS139  • Collaboratively and individually plan and conduct a range of [investigation](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/investigation) types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed ACSIS140  • Measure and control variables, select equipment appropriate to the task and collect [data](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/data) with accuracy ACSIS141  • Construct and use a range of representations, including graphs, keys and models to represent and [analyse](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/analyse) patterns or relationships in [data](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/data) using [digital technologies](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/digital-technologies) as appropriate ACSIS144  • Summarise [data](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/data), from students’ own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions based on [evidence](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/evidence) ACSIS145  • Communicate ideas, findings and [evidence](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/evidence) based solutions to problems using [scientific language](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/scientific-language), and representations, using [digital technologies](http://k10outline.scsa.wa.edu.au/home/p-10-curriculum/curriculum-browser/science-v9/overview/glossary/digital-technologies) as appropriate ACSIS148 |
| **Achievement standards** |
| Students analyse the relationship between structure and function at cell, organ and body system levels. Students examine the different science knowledge used in occupations. They explain how evidence has led to an improved understanding of a scientific idea and describe situations in which scientists collaborated to generate solutions to contemporary problems.  Students identify and construct questions and problems that they can investigate scientifically. They consider safety and ethics when planning investigations, including designing field or experimental methods. They identify variables to be changed, measured and controlled. Students construct representations of their data to reveal and analyse patterns and trends, and use these when justifying their conclusions. They explain how modifications to methods could improve the quality of their data and apply their own scientific knowledge and investigation findings to evaluate claims made by others. They use appropriate language and representations to communicate science ideas, methods and findings in a range of text types. |

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| **Student book section** | **WA Syllabus links** | **Suggested indicators of learning and understanding** | **Suggested teaching and learning activities** | **Resources** |
| **8.1 There are different ways of reproducing**  **(pages 140–141)** | *Science Understanding*  ACSSU150  *Science as a Human Endeavour*  ACSHE134  ACSHE136  *Science Inquiry Skills*  ACSIS140  ACSIS141  ACSIS144  ACSIS145  ACSIS148 | By the end of this unit, students should be able to:  • define asexual reproduction, sexual reproduction, binary fission, parthenogenesis, fragmentation, vegetative reproduction, gamete, offspring and hermaphrodite  • describe asexual reproduction in terms of genetic similarities between parent and offspring  • describe sexual reproduction in terms of genetic similarities between parent and offspring  • provide examples of organisms that reproduce asexually  • provide examples of organisms that reproduce sexually  • explain some advantages of hermaphroditism  • relate types of gametes to the sex of the parent  • describe the influences of nature and nurture on the development of an individual. | **What if?**  Students brainstorm features and characteristics of selectively bred organisms.  **Experiment 8.1**  *Vegetative propagation*  Students apply horticultural skills to propagate a plant and investigate the concept of vegetative cloning. | **Oxford Science 8 Western Australian Curriculum resources**  • What if? Page 139  • Check your learning, page 141  • Experiment 8.1, page 211 |

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| **8.2 The female reproductive system produces eggs in the ovaries**  **(pages 142–143)** | *Science Understanding*  ACSSU150  *Science Inquiry Skills*  ACSIS148 | By the end of this unit, students should be able to:  • define ova, oestrogen, ovulation, zygote, foetus, menstruation and gestation  • describe the female reproductive system including vagina, uterus, fallopian tubes, ovaries, endometrium and placenta  • explain the main processes involved in the menstruation cycle. | **Female reproductive system**  Students can find out more about the female reproductive system and the processes of the ovarian cycle by watching the narration animations at the Sumanas website. | **Oxford Science 8 Western Australian Curriculum resources**  • Check your learning, page 143 |
| **Additional resources**  Sumanas ovarian and uterine cycles:  <http://www.sumanasinc.com/webcontent/animations/content/ovarianuterine.html> |
| **8.3 The male reproductive system produces sperm in the testes**  **(pages 144–145)** | *Science Understanding*  ACSSU150  *Science Inquiry Skills*  ACSIS148 | By the end of this unit, students should be able to:  • define sexually dimorphic, fertilisation, internal fertilisation, external fertilisation, testosterone and oviduct  • describe the main structures and functions of the male reproductive system including: testes, penis, scrotum, epididymis, vas deferens, seminal vesicles and prostate gland  • provide examples of animals that use internal fertilisation  • provide examples of animals that use external fertilisation  • explain the difference between internal and external fertilisation. | **Sperm production**  Students can learn more about the production of sperm in the male reproductive system by watching the narrated DNA Tube video.  **Bitesize reproduction**  Students can consolidate their understanding of the male and female reproductive systems by completing the Bitesize tutorial, activity and quiz. | **Oxford Science 8 Western Australian Curriculum resources**  • Check your learning, page 145 |
| **Additional resources**  DNA Tube spermatogenesis animation:  <http://www.dnatube.com/video/460/Spermatogenesis-The-Production-of-Sperm-Cells>  BBC Bitesize reproduction tutorial:  <http://www.bbc.co.uk/education/guides/z7mbkqt/activity> |

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| **8.4 Thing sometimes go wrong in reproduction**  **(pages 146–147)** | *Science Understanding*  ACSSU150  *Science as a Human Endeavour*  ACSHE134  ACSHE136  *Science Inquiry Skills*  ACSIS139  ACSIS144  ACSIS145  ACSIS148 | By the end of this unit, students should be able to:  • define contraception, inbreeding and desexing  • describe some common problems of the human reproductive systems. | **Challenge 8.4**  *Working with the RSPCA*  Students develop a mathematical model to demonstrate the exponential nature of reproduction in cats.  **IVF in action**  Students can watch a video clip of IVF to learn more about the process. | **Oxford Science 8 Western Australian Curriculum resources**  • Extend your understanding, page 147  • Challenge 8.4, page 211 |
| **Additional resources**  National Geographic clip of IVF:  <http://video.nationalgeographic.com/video/ivf-sci> |
| **8.5 Plant sexual reproduction produces seeds**  **(pages 148–149)** | *Science Understanding*  ACSSU150  *Science Inquiry Skills*  ACSIS139  ACSIS140  ACSIS144  ACSIS148 | By the end of this unit, students should be able to:  • define pollination, self-pollination, cross-pollination and spores  • describe the main functions of the reproductive structure of flowers including: anther, stigma, petals, stamen, filament, sepals, ovum, ovary, carpel and style  • classify the parts of a flower as being male or female or both  • explain the process of pollination and fertilisation in plants  • relate the type of flower attractant to the pollinators. | **Experiment 8.5**  *Flower dissection*  Students use their dissection skills to investigate the main structures of a flower.  **Flower structure and function**  Student can learn more about the structure and function of flowers with the interactive diagram from the University of Nebraska-Lincoln. | **Oxford Science 8 Western Australian Curriculum resources**  • Check your learning, page 149  • Experiment 8.5, page 212 |
| **Additional resources**  University of Nebraska-Lincoln interactive flower diagram:  <http://passel.unl.edu/pages/animation.php?a=flowerbreeding.swf> |

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| **8.6 Reproduction techniques have an impact in agriculture**  **(pages 150–151)** | *Science Understanding*  ACSSU150  *Science as a Human Endeavour*  ACSHE134  ACSHE136  *Science Inquiry Skills*  ACSIS148 | By the end of this unit, students should be able to:  • define selective breeding  • describe the purpose of selective breeding  • provide examples of organisms that have been selective bred  • relate selective breeding to a loss of diversity. | **Australia’s farming future**  Students can read an article about ‘Agriculture in Australia: growing more than our farming future’ about how science will contribute to Australia now and in the future. | **Oxford Science 8 Western Australian Curriculum resources**  • Extend your understanding, page 151 |
| **Additional resources**  The Conversation article on agriculture in Australia:  <http://theconversation.com/agriculture-in-australia-growing-more-than-our-farming-future-22843> |
| **8 Review**  **(pages 152–154)** | *Science Understanding*  ACSSU150  *Science Inquiry Skills*  ACSIS148 | By the end of this unit, students should be able to:  • define all Key Words listed on page 154  • explain that multicellular organisms can survive and reproduce because they contain organ systems with specific functions  • identify areas of personal strengths and weaknesses in their knowledge and understanding of the topic. | **Revision activities**  • Students could play celebrity heads with the Key Words list  • Students can make dominoes with Key Words on one end and definitions/diagrams/examples on the other end  • Students can create mind maps, Venn diagrams or other graphic organisers to summarise the key concepts of this chapter  • Peer teaching: students can work in groups to reteach the content of the unit to the class for the purpose of revision. Each group could be allocated a double-page to summarise | **Oxford Science 8 Western Australian Curriculum resources**  • Review questions, page 152  • Research topics, page 153  • Key Words list, page 154 |