Animal studies – sheep and wool science

Core 3 – animal health and disease

Contents

[Core 3 – animal health and disease 2](#_Toc152664885)

[Duration of learning 2](#_Toc152664886)

[Outcomes 3](#_Toc152664887)

[Rationale 4](#_Toc152664888)

[Aim 4](#_Toc152664889)

[Purpose and audience 5](#_Toc152664890)

[When and how to use this document 5](#_Toc152664891)

[Learning sequences 6](#_Toc152664892)

[Weeks 1 and 2 7](#_Toc152664893)

[Week 3 10](#_Toc152664894)

[Weeks 4–6 13](#_Toc152664895)

[Additional information 17](#_Toc152664896)

[References 20](#_Toc152664897)

# Core 3 – animal health and disease

This learning sequence addresses how to prevent disease through good management practices. Students will understand the importance of undertaking an integrated approach to prevention and control for selected diseases. The lesson sequence is designed to allow students to investigate sheep-related health and disease issues. It provides critical thinking opportunities as students pose questions, solve health problems and make evidence-based decisions on how to treat the disease issues as part of a holistic animal health management approach.

## Duration of learning

The practical nature of Animal studies requires the concepts students learn throughout the learning sequence to be supported by repeated opportunities to apply the skills under supervised conditions.

This learning sequence is designed to be completed over a period of 15 hours and can be adapted to suit each school context.

It is suitable to be integrated with:

* Option S1 – sheep genetics and reproduction
* Option S4 – wool harvesting.

This unit was written to be delivered concurrently with Sheep and wool science Option S4 – wool harvesting to meet indicative delivery hours.

## Outcomes

A student:

* **AS-3** develops appropriate feeding and nutrition programs to meet industry requirements
* **AS-4** explains and applies methods of managing health requirements
* **AS-6** effectively communicates using a variety of techniques
* **AS-7** selects and demonstrates safe work practices
* **AS-8** demonstrates appropriate care and empathy for animals

[Animal studies course document](https://education.nsw.gov.au/teaching-and-learning/curriculum/department-approved-courses/animal-studies) © NSW Department of Education for and on behalf of the Crown in the State of New South Wales, 2021.

## Rationale

This course is intended for students seeking to further their knowledge and skills in particular animal industries that are relevant to their local context or interest.

The Animal studies course provides the opportunity to extend and develop student interest beyond the scope of curriculum options from the NSW Education Standards Authority (NESA).

This will consequently allow specialisation, which will promote the safe participation of students in the industry, add deep knowledge and understanding and develop advanced skills in the management and handling of the selected species.

Provision of courses for Stage 5 must meet the needs of a diverse range of student needs including students with disability, high potential and gifted students, and students from diverse cultural backgrounds, to maximise their post-school opportunities.

## Aim

The course aims to develop:

* an understanding and knowledge of the specific animal industry
* skills and knowledge in the management of a species to meet industry goals
* an appreciation and awareness of safe work practices and management when using animals
* an empathy and appreciation for the animal’s wellbeing.

## Purpose and audience

This teaching resource is for teachers delivering or planning to deliver the course. The learning sequence demonstrates how a combination of outcomes can be used to develop teaching and learning activities. It also suggests a range of resources to support teachers when planning and teaching the course.

## When and how to use this document

Use this resource when designing learning activities that align with the course outcomes and content. The activities and resources can be used directly or may be adapted based on teacher judgment and knowledge of their students. Core and options topics may be taught concurrently or consecutively. Consult the [Animal studies course document](https://education.nsw.gov.au/teaching-and-learning/curriculum/department-approved-courses/animal-studies) for further details on the timing of core and options.

Schools in NSW that use animals for educational purposes must satisfy the requirements of the *Animal Research Act 1985* (NSW) and the Australian code for the care and use of animals for scientific purposes. The legislation is interpreted for schools on the [Animals in Schools website](https://education.nsw.gov.au/teaching-and-learning/animals-in-schools) and applies to all vertebrate animals.

# Learning sequences

This sample learning sequence has been prepared by the NSW Department of Education. It has been developed as a guide for teachers to assist in the development of a teaching and learning program contextualised to an individual school's needs. The scope and depth of the content covered should relate to the school's context, expertise of the teachers delivering the course and the prior knowledge of the students. Plan learning activities that are inclusive and accommodate the needs of all students, in your classroom from the beginning. Some students may require more specific adjustments to allow them to participate on the same basis. Space is provided for adjustments and enhancements that are made to the learning sequence during its implementation, in order to meet the individual needs of students and to allow for differentiation of the Animal studies course. For further advice, see [Additional information](#_Additional_information_1) later in this document.

When working with chemicals and equipment, it is essential to model and provide direction on safe practice. This learning sequence involves the use of drenches, vaccines, pesticides and other chemicals, as well as other equipment such as shears and wool press.

Using information from the [Compliance](https://education.nsw.gov.au/teaching-and-learning/curriculum/compliance) webpage, communicate the following information and guidelines to staff and students who work with chemicals and equipment:

* [Chemical Safety in Schools](https://education.nsw.gov.au/teaching-and-learning/curriculum/compliance#:~:text=Chemical%20safety%20in%20schools%20outlines,hazardous%20substances%20and%20dangerous%20goods) for things like storage, handling and PPE
* [Equipment Safety in Schools](https://education.nsw.gov.au/inside-the-department/facilities-assets-and-equipment/school-infrastructure-nsw/knowledge/directorates/operations/technical-services/compliance-and-environment/equipment-safety-in-schools) for equipment usage controls.

## Weeks 1 and 2

Table 1 – sheep and wool science – Core 3 – animal health and disease weeks 1 and 2 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-3, AS-4**  **Content**  Students:   * adopt management methods that reduce incidence of disease including * identifying signs of disease, injury or poor health. * knowledge of diseases prevalent in their local area * understanding the importance of whole management in the controlling of disease * understanding and following biosecurity procedures including notifications, quarantining, and treatment. | **Teacher**  Explicitly teach the specific terminology associated with the signs and symptoms of a sick or injured sheep.  Use images and resources on [Sheep – health](https://education.nsw.gov.au/teaching-and-learning/animals-in-schools/animals-in-schools-species/sheep/sheep-health) to demonstrate what barber’s pole worm, fly strike or scours looks like in sheep and explain how to treat each one.  **Discuss diseases that are prevalent or have been prevalent in the past in the local area.**  **Refer to** [Sheep diseases – the farmers’ guide [PDF 6.23 MB]](https://pir.sa.gov.au/__data/assets/pdf_file/0005/289265/sheep-diseases-farmers-guide.pdf)  **Student**  Observe sheep and inspect for disease or injury including, but not limited to, barber’s pole worm, fly strike or scours.  Treat sick or injured sheep with teacher guidance. Follow up treatment in a holistic manner – looking at the health, nutrition and environment of the animals to minimise risk of future health issues and allow the animal appropriate recovery.  **Teacher**  Introduce the [NSW biosecurity legislation and regulations [PDF 700 KB]](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/722894/Sheep.pdf) and the list of diseases that require mandatory reporting and quarantining.  Model best practice while guiding students through a biosecurity assessment of sheep enterprises for ovine brucellosis, lice, footrot, Ovine Johnes disease and resistance to worms. Information and advice for the assessment can be located in [The general biosecurity duty and sheep producers [PDF 248 KB]](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/724008/The-general-biosecurity-duty-and-sheep-producers.pdf).  **Student**  Use research strategies to investigate a sheep clostridial disease and another disease of their choice (preferably prevalent in their local area) and devise an appropriate treatment and prevention plan for each disease. | Students successfully create and submit a treatment and prevention plan for 2 common diseases for sheep in the local area. The plan should reflect the recommended schedule for specific diseases. |  |

## Week 3

Table 2 – sheep and wool science – Core 3 – animal health and disease week 3 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-7**, **AS-8**  **Content**  Students:   * appreciate and engage in routine procedures that prevent disease, including * following and participating in procedures for the control of internal and external parasites, pathogens and metabolic diseases * safely following animal husbandry procedures * generating and maintaining accurate records of treatments that meet legislative and industry requirements. * adopt management methods that reduce incidence of disease, including * understanding risks associated with animal relocation, and observing all recording requirements. | **Teacher**  **Discuss term *vaccination* with students and give definition. List the different vaccinations received by sheep.**  **Organise students into small groups to complete a jigsaw activity on the vaccinations of sheep.**  **Student**  **Complete** [jigsaw activity](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/546?clearCache=8c951bf-70a2-6e5a-8ebb-8db2526a5bda)**.**  **In small groups, complete research on 1**–**2 vaccinations including: name, ingredients, frequency given, dosage required, additional information.**  **Students come back together as a class and present their research as part of the jigsaw.**  **Teacher**  Explain the sections of a [Livestock treatment record [PDF 596 KB]](https://www.integritysystems.com.au/globalassets/isc/pdf-files/lpa-documents/lpa-records-templates/lpa-02-livestock-treatment-record-form.pdf) and how they need to be filled out.  **Student**  Treat animals and record treatment accurately and according to industry standard using a [Livestock treatment record [PDF 596 KB]](https://www.integritysystems.com.au/globalassets/isc/pdf-files/lpa-documents/lpa-records-templates/lpa-02-livestock-treatment-record-form.pdf).  **Teacher**  Explain the different sections of a [National Vendor Declaration (NVD)](https://www.integritysystems.com.au/on-farm-assurance/national-vendor-declaration-nvd/) form and how it must be filled out to meet legislation requirements. Demonstrates the correct way to complete a NVD form. | Students participate in jigsaw activity and report their research back to the class.  Students correctly complete treatment records for 10 animals. |  |

## Weeks 4–6

Table 3 – sheep and wool science – Core 3 – animal health and disease weeks 4–6 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-4, AS-7, AS-8**  **Content**  Students:   * select appropriate management techniques to control parasites and pests. | **Teacher**  Guide students through the definition and components of [Integrated Pest Management (IPM).](https://www.epa.nsw.gov.au/your-environment/pesticides/integrated-pest-management#:~:text=Integrated%20pest%20management%20%28IPM%29%20is%20an%20environmentally%20sensitive,for%20pesticide%20intensive%20activities%20such%20as%20broadacre%20spraying.)  Demonstrate the correct way to develop an IPM program Including: forward planning, regular monitoring and timely decision making.  Refer to [Wormboss](http://wormboss.com.au/) for advice relating to worm control in sheep.  **Student**  Complete notes and construct an IPM program for intestinal worms consulting [Managing worms in sheep in NSW [PDF 359 KB]](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/749540/Managing-worms-in-sheep-in-NSW.pdf).  **Teacher**  Demonstrate the correct, safe and hygienic way to undertake faeces collection for worm testing.  **Student**  Use safe and hygienic practices to collect 10 faeces samples for worm testing.  **Teacher**  Demonstrate how to conduct a faecal egg count using safe and hygienic practice.  Demonstrate how to calibrate a drench gun and safely drench sheep using best practice.  **Student**  Use safe and hygienic practices to drench sheep under teacher supervision.  **Teacher**  Demonstrate the safe and correct techniques to calibrate a vaccine gun and how to safely vaccinate sheep using best practice.  Explain and demonstrate to students the correct record keeping practices and safe storage and handling procedures of the school to meet [Livestock Production Assurance (LPA) [PDF 596 KB]](https://www.integritysystems.com.au/globalassets/isc/pdf-files/lpa-documents/lpa-records-templates/lpa-02-livestock-treatment-record-form.pdf).  **Student**  Vaccinate sheep under teacher supervision using safe practices.  Complete an unofficial animal care record to maintain a record of activities performed. | Students correctly select the most appropriate control method for a sheep under worm burden from an IPM program.  Students accurately calibrate a drench gun and a vaccine gun.  Students successfully drench and vaccinate a sheep under teacher supervision. |  |

# Additional information

This resource has been designed to support schools with successful implementation of new curriculum, specifically the NSW Department of Education approved elective course, Animal Studies © NSW Department of Education for and on behalf of the Crown in right of the State of New South Wales, 2021.

The resource is produced to assist schools with promoting and implementing the course for the first time. As the course may be taught by teachers from a range of key learning areas, the resource is designed to support teachers from a variety of KLA expertise.

**Resource evaluation and support**: all curriculum resources are prepared through a rigorous process. Resources are periodically reviewed as part of our ongoing evaluation plan to ensure currency, relevance and effectiveness. For additional support or advice contact the Teaching and Learning Curriculum team by emailing [secondaryteachingandlearning@det.nsw.edu.au](mailto:secondaryteachingandlearning@det.nsw.edu.au).

**Differentiation:** Further advice to support Aboriginal and Torres Strait Islander students, EALD students, students with a disability and/or additional needs and High Potential and gifted students can be found on the [Planning, programming and assessing 7–12](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12) webpage. This includes the [Inclusion and differentiation advice 7–10](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12/inclusion-and-differentiation-advice-7-10) webpage.

**Assessment**: further advice to support formative assessment is available on the [Planning, programming and assessing 7–12](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12) webpage. This includes the [Classroom assessment advice 7–10](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12/classroom-assessment-advice-7-10-). For summative assessment tasks, the [Assessment task advice 7–10](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12/assessment-task-advice-7-10) webpage is available.

**Consulted with**: Curriculum and Reform, Inclusive Education, Multicultural Education, Aboriginal Outcomes and Partnerships, Animal Welfare Coordinator, and subject matter experts.

**Alignment to system priorities and/or needs**: [School Excellence Policy](https://education.nsw.gov.au/policy-library/policies/pd-2016-0468), [School Success Model](https://education.nsw.gov.au/public-schools/school-success-model/school-success-model-explained).

**Alignment to the School Excellence Framework**: this resource supports the [School Excellence Framework](https://education.nsw.gov.au/policy-library/policies/pd-2016-0468) elements of curriculum (curriculum provision) and effective classroom practice (lesson planning, explicit teaching).

**Alignment to Australian Professional Teaching Standards**: this resource supports teachers to address [Australian Professional Teaching Standards](https://educationstandards.nsw.edu.au/wps/portal/nesa/teacher-accreditation/meeting-requirements/the-standards/proficient-teacher) 2.1.2, 2.3.2, 3.2.2, 7.2.2.

**Creation date**: 16 December 2022

**Rights**: © State of New South Wales, Department of Education

**Evidence base**:

‘The long-term vision is for a curriculum that supports teachers to nurture wonder, ignite passion and provide every young person with knowledge, skills and attributes that will help prepare them for a lifetime of learning, meaningful adult employment and effective future citizenship’ (NESA 2020:xi).

The development of the course and the course document as part of department approved electives aims to respond to the goals articulated in NESA’s curriculum review. Consistent messages from the review include:

* ‘flexibility’ was the word most used by teachers to describe the systemic change they want
* teachers need more time to teach important knowledge and skills
* students want authentic learning with real-world application.

This teaching resource provides teachers with some examples of explicit and authentic learning experiences. The option to adjust these learning sequences leads to ‘increased local decision making in relation to the curriculum’ as this ‘is associated with higher levels of student performance’ (NESA 2020:52).

The suggested strategies for teaching and learning align with the principles of explicit teaching. ‘The evidence shows that students who experience explicit teaching practices perform better than students who do not. Explicit teaching reduces the cognitive burden of learning new and complex concepts and skills, and helps students develop deep understanding’ (CESE 2020a:11).

# References

[Animal studies course document](https://education.nsw.gov.au/teaching-and-learning/curriculum/department-approved-courses/animal-studies) © NSW Department of Education for and on behalf of the Crown in the State of New South Wales, 2021.

AITSL (Australian Institute for Teaching and School Leadership (2017) ‘[Feedback Factsheet](https://www.aitsl.edu.au/teach/improve-practice/feedback#:~:text=FEEDBACK-,Factsheet,-A%20quick%20guide)’, AITSL, accessed 14 December 2022.

CESE (Centre for Education Statistics and Evaluation) (2020) [*What works best: 2020 update*](https://education.nsw.gov.au/about-us/educational-data/cese/publications/research-reports/what-works-best-2020-update), NSW Department of Education, accessed 13 December 2022.

CESE (Centre for Education Statistics and Evaluation) (2020) [*What works best in practice*](https://education.nsw.gov.au/about-us/educational-data/cese/publications/practical-guides-for-educators-/what-works-best-in-practice), NSW Department of Education, accessed 13 December 2022.

Department of Primary Industries and Regions (PIR) (2022) [*Sheep diseases: The Farmers’ Guide 4th edn* [PDF 6.23 MB]](https://pir.sa.gov.au/__data/assets/pdf_file/0005/289265/sheep-diseases-farmers-guide.pdf), PIR, accessed 27 July 2023.

Integrity Systems Company (2023) [*National Vendor Declaration*](https://www.integritysystems.com.au/on-farm-assurance/national-vendor-declaration-nvd/), Integrity Systems website, accessed 27 July 2023.

Integrated Systems (2023) [*Livestock treatment record* [PDF 596 KB]](https://www.integritysystems.com.au/globalassets/isc/pdf-files/lpa-documents/lpa-records-templates/lpa-02-livestock-treatment-record-form.pdf) LPA Requirement 3, accessed 27 July 2023.

NESA (NSW Education Standards Authority) (2020) [*Nurturing Wonder and Igniting Passion, designs for a new school curriculum: NSW Curriculum Review* [PDF 1.12MB]](https://www.nsw.gov.au/sites/default/files/2023-04/NSW-Curriculum-Review-Final-Report.pdf), NESA, accessed 13 December 2022.

ParaBoss (2022) [*wormboss*](https://wormboss.com.au/) [website], accessed 27 July 2023.

State of New South Wales (Department of Education) (2023) ‘[Jigsaw](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/546?clearCache=8c951bf-70a2-6e5a-8ebb-8db2526a5bda)’, *Learning activities,* Digital Learning Selector website, accessed 27 July 2023.

State of New South Wales (Department of Education) (2023) ‘[Sheep](https://education.nsw.gov.au/teaching-and-learning/animals-in-schools/animals-in-schools-species/sheep)’, *Animals in schools – species*, NSW Department of Education website, accessed 1 February 2023.

State of New South Wales (Department of Primary Industries) (2017) [*Biosecurity Regulation 2017 – Sheep* [PDF 700 KB]](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/722894/Sheep.pdf), NSWDPI, accessed 27 July 2023.

State of New South Wales (Department of Primary Industries) (2017) [*Managing worms in sheep in NSW* [PDF 359 KB]](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/749540/Managing-worms-in-sheep-in-NSW.pdf), NSWDPI, accessed 27 July 2023.

State of New South Wales (Department of Primary Industries) (2017) [*The general biosecurity duty and sheep producers* [PDF 248 KB]](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/724008/The-general-biosecurity-duty-and-sheep-producers.pdf), NSWDPI, accessed 27 July 2023.

State of New South Wales through the Environment Protection Authority (2023) ‘[Integrated pest management](https://www.epa.nsw.gov.au/your-environment/pesticides/integrated-pest-management#:~:text=Integrated%20pest%20management%20%28IPM%29%20is%20an%20environmentally%20sensitive,for%20pesticide%20intensive%20activities%20such%20as%20broadacre%20spraying.)’, *Pesticides*, NSWEPA website, accessed 27 July 2023.

**© State of New South Wales (Department of Education), 2023**

The copyright material published in this resource is subject to the *Copyright Act 1968* (Cth) and is owned by the NSW Department of Education or, where indicated, by a party other than the NSW Department of Education (third-party material).

Copyright material available in this resource and owned by the NSW Department of Education is licensed under a [Creative Commons Attribution 4.0 International (CC BY 4.0) license](https://creativecommons.org/licenses/by/4.0/).

[](https://creativecommons.org/licenses/by/4.0/)

This license allows you to share and adapt the material for any purpose, even commercially.

Attribution should be given to © State of New South Wales (Department of Education), 2023.

Material in this resource not available under a Creative Commons license:

* the NSW Department of Education logo, other logos and trademark-protected material
* material owned by a third party that has been reproduced with permission. You will need to obtain permission from the third party to reuse its material.

**Links to third-party material and websites**

Please note that the provided (reading/viewing material/list/links/texts) are a suggestion only and implies no endorsement, by the New South Wales Department of Education, of any author, publisher, or book title. School principals and teachers are best placed to assess the suitability of resources that would complement the curriculum and reflect the needs and interests of their students.

If you use the links provided in this document to access a third-party's website, you acknowledge that the terms of use, including licence terms set out on the third-party's website apply to the use which may be made of the materials on that third-party website or where permitted by the *Copyright Act 1968* (Cth). The department accepts no responsibility for content on third-party websites.