Animal studies – sheep and wool science

Option S4 – wool harvesting

Contents

[Option S4 – wool harvesting 2](#_Toc153281072)

[Duration of learning 2](#_Toc153281073)

[Outcomes 3](#_Toc153281074)

[Rationale 4](#_Toc153281075)

[Aim 4](#_Toc153281076)

[Purpose and audience 5](#_Toc153281077)

[When and how to use this document 5](#_Toc153281078)

[Learning sequences 6](#_Toc153281079)

[Week 1 7](#_Toc153281080)

[Week 2 8](#_Toc153281081)

[Week 3 10](#_Toc153281082)

[Week 4 12](#_Toc153281083)

[Week 5 15](#_Toc153281084)

[Week 6 17](#_Toc153281085)

[Weeks 7 and 8 20](#_Toc153281086)

[Additional information 24](#_Toc153281087)

[References 27](#_Toc153281088)

# Option S4 – wool harvesting

Students crutch a sheep, participate in shearing and identify ways to avoid contamination of the wool clip, learn the importance of correctly picking up and throwing a fleece and how to skirt a fleece and present it to a wool classer. Students will learn to identify a wide range of wool faults that can occur in a sheep fleece.

## 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 20 hours and can be adapted to suit each school context.

It is suitable to be integrated with:

* Core 1 – the industry
* Core 2 – nutrition
* Core 3 – animal health and disease.

This unit was written to be delivered concurrently with each of the core units of learning to meet indicative delivery hours.

## Outcomes

A student:

* **AS-4** explains and applies methods of managing health requirements
* **AS-7** selects and demonstrates safe work practices
* **AS-9 appreciates the importance of working collaboratively to achieve selected goals**
* **AS-S-14 explains and engages in the harvesting of wool**
* **AS-S-15 researches the different methods of marketing and steps involved in wool processing**

[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 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.

## Week 1

Table 1 – sheep and wool science – Option S4 – wool harvesting week 1 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-S-15**  **Content**  Students:   * consider contamination in yards and shearing sheds, including * identifying contamination * ways to avoid contamination. | **Teacher**  Guide students through types of contamination including soft, hard and polypropylene contaminants.  **Student**  Collect various samples of contamination from in and around the school shearing shed.  Sort contaminants into soft, hard and polypropylene.  Research strategies on how to eliminate contaminants from the wool clip. | Students successfully identify different types of contamination.  Students formulate effective strategies for eliminating contamination from the wool clip. |  |

## Week 2

Table 2 – sheep and wool science – Option S4 – wool harvesting week 2 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-7, AS-S-14**  **Content**  Students:   * demonstrate correct technique for picking up and throwing a fleece onto a wool table. | **Teacher**  Access the instructional video, [AWI Wool Handling – Wool Preparation – Picking up a Fleece with Jim Murray (1:18)](https://www.youtube.com/watch?v=X2qrdamURnE) and perform a demonstration of correct technique to pick up a fleece using WHS practices.  **Student**  Practise the correct technique of picking up a fleece and throwing onto a table using a blanket to minimise damage to fleece until the correct technique is mastered.  Work in groups and provide peer feedback to each other, verbally or using [Peer feedback](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/549?clearCache=a28f94d2-325e-3f37-45f0-4fec1a3fb058) forms.  When confident, pick up and throw a fleece under direct teacher supervision.  During shearing, demonstrate picking up and throwing fleece onto a wool table using correct WHS practices. | Students successfully pick up and thrown a fleece from the floor to the table. Fleece is adequately presented to the wool handlers for skirting. |  |

## Week 3

Table 3 – sheep and wool science – Option S4 – wool harvesting week 3 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-S-14, AS-S-15**  **Content**  Students:   * identify parts of a fleece and correctly skirt a fleece to improve its market value. | **Teacher**  Guide students through the different parts of a fleece.  **Student**  Sketch and label a diagram of a fleece with the different parts including the wig, neck, skirt, shank and legs.  **Teacher**  Outline cast lines of the fleece including locks, bellies, stain, broken, backs, necks, cotted, water stain, fleece rot, dermatitis, skin pieces, brand and gare.  **Student**  Participate in practical exam identifying different fleece samples including the above cast lines. | Students accurately identify:   * different parts of the fleece * different samples of cast lines. |  |

## Week 4

Table 4 – sheep and wool science – Option S4 – wool harvesting week 4 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-7,** **AS-9, AS-S-14**  **Content**  Students:   * **correctly press wool into bales,** including * identifying risks * applying safe work methods. | **Teacher**  **Guide students through the parts of a wool press and their function.**  **Student**  **Label a diagram of a wool press with each part.**  **Teacher**  **Present safety operation protocols of a hydraulic wool press (refer to user manual of specific wool press in use).**  **Student**  **Identify potential hazards and conduct a risk assessment for using a hydraulic wool press. Refer to the** [WHS Risk Management Procedure](https://education.nsw.gov.au/inside-the-department/health-and-safety/risk-management/whs-risk-management-procedure/risk-management-procedures1)and complete a risk assessment using the [Risk assessment template](https://education.nsw.gov.au/inside-the-department/health-and-safety/risk-management/whs-risk-management-procedure/risk-management-procedures1).  **Teacher**  **Demonstrate how to safely and correctly fit a wool pack into the press, how to safely load wool into the press and the correct and safe operation of the press.**  **Student**  **Safely and correctly operate press as part of shearing.**  **After viewing** [AWI Wool Handling – Pressing – Recording and Branding (3:07)](https://www.youtube.com/watch?v=0IttdxAAfjw), l**abel a diagram on how to brand a wool bale on the top and face of the bale. The diagram should include: farm brand, wool description, bin code, bale number and quality assurance scheme and broker stencils. Utilise the standard** [Wool Pack labelling.](https://www.awex.com.au/standards/wool-packs/wool-pack-labels/)  **Teacher**  **Explain the correct weight range for a wool bale and the correct way to fasten a bale.**  **Students**  Students work in groups to fasten a bale and provide peer feedback to each other, verbally or using [Peer feedback](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/549?clearCache=a28f94d2-325e-3f37-45f0-4fec1a3fb058) forms. | Students successfully pack a wool press, fill with wool, press bale and fasten, and then label a bale as a group. |  |

## Week 5

Table 5 – sheep and wool science – Option S4 – wool harvesting week 5 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-4, AS-S-15**  **Content**  **Students:**   * **recognise wool faults and how they impact wool processing.** | **Student**  **Identify different wool faults in the samples previously collected by students. Faults may include: tender, doggy, cotted, discoloured/canary yellow, overgrown, dermatitis, black, kemp/gare or parasite affected.**  **Select different types of wool faults and use research skills to develop an** [informative writing piece](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/625?clearCache=4e8ec5c1-29aa-8c01-fa45-c572b10c8f8b)**. Use the following to guide the research and writing piece:**   * **A description of the wool fault** * **What causes the wool fault** * **The effect of the wool fault on the processing of the wool product.** * The economic value of the wool, and how this may change | Students can identify faults and describe how they affect processing of the wool product. |  |

## Week 6

Table 6 – sheep and wool science – Option S4 – wool harvesting week 6 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-7, AS-9, AS-S-14**  **Content**  **Students:**   * **safely crutch a sheep to minimise the stress on the animal.** | **Teacher**  **Introduce students to the overhead gear and handpiece. Identify each part and describe its function.**  **Student**  **Label a diagram of overhead gear and handpiece.**  **Teacher**  **Demonstrate how to safely wash and correctly load a comb and cutter.**  **Student**  **Identify potential hazards and conduct a risk assessment for using a hydraulic wool press. Refer to** [Managing risks](https://www.safework.nsw.gov.au/easywhs-beta/managing-risks/learn-more)and complete a risk assessment using the [Sample Risk Assessment Template [PDF 101 KB]](https://www.safework.nsw.gov.au/__data/assets/pdf_file/0012/969996/risk-assessment-checklist-for-a-general-workplace-environment.pdf).  **Student**  **Practise washing and loading a comb and cutter before crutching using safe and hygienic practices.**  **Teacher**  **Provide students with best practice,** using the instructional video from (0:00–0:25) only: [AWI Improver – Catch and Drag (1:21)](https://www.youtube.com/watch?v=ZY-QI87fJ6E) **of catching and throwing a sheep safely and ethically to adhere to animal welfare guidelines. Use** [Sheep – handling](https://education.nsw.gov.au/teaching-and-learning/animals-in-schools/animals-in-schools-species/sheep/sheep-handling) for animal welfare guidelines.  **Student**  **In groups, practise catching and throwing sheep in the catching pen of the school shearing shed using safe and ethical practices and adhering to animal welfare guidelines.**  **Teacher**  **Demonstrate best practice of how to crutch, remove stain from pizzle area and wig sheep.**  **Student**  **Under teacher supervision, students take turns to crutch, remove stain from pizzle area and wig sheep.** | Students can independently wash and load a comb and cutter.  Students can crutch, remove stain and wig sheep under supervision from the teacher. |  |

## Weeks 7 and 8

Table 7 – sheep and wool science – Option S4 – wool harvesting weeks 7 and 8 learning sequence

|  |  |  |  |
| --- | --- | --- | --- |
| Outcomes and content | Teaching and learning | Evidence of learning | Adjustments and registration |
| **Outcomes**  **AS-7, AS-9, AS-S-14**  **Content**  **Students:**   * **work collaboratively to participate in shearing using safe work practices.** | **Teacher**  **Demonstrate how to safely and ethically shear a sheep in stages including the belly, the head and neck, the long blow and the last side.**  **Student**  **Work in groups to safely and ethically shear the sheep in sections, with each group member shearing a different section under teacher supervision.**  **Apply fleece throwing and wool handling skills during this process – including skirting, roustabout and wool pressing.**  **Teacher**  **Discuss with students what they now know about the wool industry after completing the unit. Draw student’s attention to the following concepts that they have covered: contamination, fleece handling, fleece identification, the wool press, wool processing and sheep shearing.**  **Students**  **In small groups students use their class notes and knowledge gained from practical experiences to develop a** [concept map](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/577?clearCache=66bf8183-4363-f4cc-3aa3-3480342b532f) **including the following concepts they have covered: contamination, fleece handling, fleece identification, the wool press, wool processing and sheep shearing. This can be done using a large piece of paper or through digital platforms such as Canva, the smart chart tool in Microsoft word and PowerPoint or a Google Jamboard.**  **Teacher**  **Facilitate a** [gallery walk](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/555?clearCache=7697e7fc-f91f-e0f8-3357-3225556c77a) **of all student concept maps, allowing students to participate through observation and discussion of the different concepts covered throughout the unit.**  **Students**  **Participate in a** [gallery walk](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/555?clearCache=7697e7fc-f91f-e0f8-3357-3225556c77a)**, adding to their own knowledge and discussing with peers each of the concepts covered in their maps.**  **Teacher**  **Facilitate a class discussion around what was evident in the concept maps produced by the class. Draw students’ attention to how the different concepts are interrelated and the importance of each in wool harvesting.**  **Students**  **Individually reflect on the above activity and what they have learnt throughout the unit. Students produce a paragraph summarising their knowledge and skills in wool harvesting.** | Students can work together as a team to shear an entire sheep. |  |

# 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 13 December 2022.

Australian Wool Innovation Ltd (3 November 2015) ['AWI Wool Handling – Wool Preparation – Picking up a Fleece with Jim Murray' [video]](https://www.youtube.com/watch?v=X2qrdamURnE), *Australian Wool Innovation Ltd*, YouTube, accessed 30 January 2023.

Australian Wool Innovation Ltd (4 November 2015) ['AWI Improver – Catch and Drag' [video]](https://www.youtube.com/watch?v=ZY-QI87fJ6E), *Australian Wool Innovation Ltd*, YouTube, accessed 30 January 2023.

CESE (Centre for Education Statistics and Evaluation) (2020a) [*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) (2020b) [*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.

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.

State of New South Wales (Department of Education) (2023) ‘[Concept maps](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/577?clearCache=66bf8183-4363-f4cc-3aa3-3480342b532f)’, *Digital Learning Selector:* *Learning activities,* NSW Department of Education website, accessed 27 July 2023.

State of New South Wales (Department of Education) (2023*)* ‘[Gallery walks](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/555?clearCache=7697e7fc-f91f-e0f8-3357-3225556c77a)’, *Digital Learning Selector:* *Learning activities,* NSW Department of Education website, accessed 27 July 2023.

State of New South Wales (Department of Education) (2023) ‘[Peer Feedback](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/549?clearCache=a28f94d2-325e-3f37-45f0-4fec1a3fb058)’, *Digital Learning Selector:* *Learning activities*, NSW Department of Education website, accessed 27 July 2023.

State of New South Wales (Department of Education) (2023) ['Sheep – handling'](https://education.nsw.gov.au/teaching-and-learning/animals-in-schools/animals-in-schools-species/sheep/sheep-handling), *Animals in schools*, NSW Department of Education website, accessed 30 January 2023.

State of New South Wales (SafeWork NSW) (2023), ‘[Identify health and safety risks](https://www.safework.nsw.gov.au/easywhs-beta/managing-risks/learn-more)’, *Managing risks*, SafeWork website, accessed 27 July 2023.

State of New South Wales (SafeWork NSW) (2023), ‘[Sample risk assessment – general workplace environment’](https://www.safework.nsw.gov.au/easywhs-beta/managing-risks/learn-more), *Managing risks*, SafeWork 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.