

## Unit overview

In this seven-lesson unit students explore the properties of Australia's most iconic natural fibre — wool — and determine what makes wool the ideal fibre for a wide range of everyday products.

Some students may have experience with wool through clothing or home furnishings, such as blankets. However, many Year 4 students may not be aware of the source of wool textiles (sheep), the range of uses and the unique properties of wool, which make it an ideal textile for a wide range of uses.

Through an in-depth investigation of wool, students will discover how the properties of materials influence their end use. Students will have the opportunity to develop skills in sorting and grouping materials on the basis of observable properties, such as texture and feel, biodegradability, thermoregulation, flammability and water absorption.

Having expanded their understanding of, and appreciation for, the properties of wool, students will apply their learning through a role play activity that challenges them to demonstrate how wool can successfully be incorporated into a wide range of clothing types and applications.

The unit helps students to recognise that observation is an important part of exploring and investigating materials, while allowing them to share observations with others and communicating their experiences. They follow instructions

to identify investigable questions about familiar contexts and make predictions based on prior knowledge. Students describe ways to conduct investigations and safely use equipment to make and record observations with accuracy.

Students will record their learning in a science journal, which provides for meaningful literacy development. It is used to review and organise observations and ideas and can include images, worksheets and student contributions.

Hands-on experiences and sharing observations with others are key ways to create shared understandings, while individually, students record their observations, suggesting explanations for these and comparing their findings with their predictions.

**NOTE:** *The practical activity in Lesson 6: Wool – where does it go? needs to be set up six weeks before the lesson is run. Download the full unit of work for more details.*

## Cross-curriculum priority:

### Sustainability

Lessons about the interdependence of animals, plants and people.

## Links with the Australian Curriculum

This *Properties of wool* unit links to all three strands of the Australian Science Curriculum: Science understanding, Science as a human endeavour and Science inquiry skills as outlined below.

The table below outlines the sub-strands covered in this unit of work.

Strand	Sub-strand	Code	Content descriptions
Science understanding	Chemical sciences	<a href="#">ACSSU074</a>	Natural and processed materials have a range of physical properties that can influence their use
	Biological sciences	<a href="#">ACSSU073</a>	Living things depend on each other and the environment to survive
Science inquiry skills	Questioning and predicting	<a href="#">AC SIS064</a>	With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge
	Planning and conducting	<a href="#">AC SIS065</a>	With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment
		<a href="#">AC SIS066</a>	Consider the elements of fair tests and use formal measurements and digital technologies as appropriate, to make and record observations accurately
	Processing and analysing	<a href="#">AC SIS068</a>	Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends
		<a href="#">AC SIS216</a>	Compare results with predictions, suggesting possible reasons for findings
	Evaluating	<a href="#">AC SIS069</a>	Reflect on investigations, including whether a test was fair or not
	Communicating	<a href="#">AC SIS071</a>	Represent and communicate observations, ideas and findings using formal and informal representations
Science as a human endeavour	Nature and development of science	<a href="#">AC SHE061</a>	Science involves making predictions and describing patterns and relationships
	Use and influence of science	<a href="#">AC SHE062</a>	Science knowledge helps people to understand the effect of their actions

## Achievement standard

The sequence of the lessons in this unit of work provides opportunities to gather information about students' understanding related to the sections in bold in the achievement statement below:

By the end of Year 4, students apply the **observable properties of materials to explain how objects and materials can be used**. They identify when science is used to understand the effect of their actions.

Students **follow instructions to identify investigable questions about familiar contexts and make predictions based on prior knowledge**. They **describe ways to conduct investigations and safely use equipment to make and record observations with accuracy**. They use provided tables and column graphs to **organise data and identify patterns**. Students suggest **explanations for observations and compare their findings with their predictions**. They suggest reasons why a test was fair or not. They use **formal and informal ways to communicate their observations and findings**.

Source: [Australian Curriculum, Assessment and Reporting Authority \[ACARA\]](#)

## Background information

People have been using wool for thousands of years to make clothing and textiles, furnishings and insulation. Australia produces 90% of the world's fine apparel wool.

Wool is a natural and renewable fibre produced by sheep. As wool grows out from the sheep's skin, it forms groups of wavy fibres called staples. This natural crimp (wave) gives wool its elasticity (springiness). Wool feels soft and slightly greasy before it is washed or processed. The natural oil in wool (lanolin) coats each fibre. Wool can keep things cool and it can keep things warm. Wool is soft, strong, lightweight, stain repellent, fire resistant and biodegradable.

The natural properties of wool make it an ideal fibre for a wide range of everyday uses. Depending on the length and fibre diameter (fineness) of a wool fleece, it can be processed through either the woollen or worsted processing system.

Woollen-spun woven fabrics are generally thick and heavy. They are ideal for warm winter jackets and coats. These fabrics are generally wind-proof and can repel light rain, so are good to wear when playing outside in winter.

Knitted fabrics made from woollen-spun yarn are generally heavier and bulkier than worsted-spun knitted fabrics. They make soft, warm jumpers, scarves, beanies, socks and cardigans.

Worsted processing produces fine yarns, which can be woven to produce smooth, light-weight fabrics. These fabrics are used for clothes such as business suits, trousers and skirts.

Worsted-spun woven fabrics are ideal to wear in warm weather or inside, where they keep you cool and comfortable.

Fine worsted-spun yarns produce super-soft knitted fabrics that feel great next to your skin. These fabrics are incredibly versatile — they are used for baby clothes, underwear, t-shirts and sportswear, leggings, dresses and other lightweight knitwear.

Worsted-spun knitted fabrics are ideal for wearing every day — they are ideal for travelling as they are soft, cool, comfortable, lightweight and don't need ironing.

More background information on the external features of sheep and how they help sheep survive can be found in the LEARN ABOUT WOOL [The external features of living things](#) resource package.

## Student science journal

During this unit of work students are encouraged to record their observations and the results of investigations in a science journal.

A science journal is used for a number of purposes.

- to record student ideas including prior knowledge, observations and statements of learning
- to record scientific text types, such as labelled diagrams, lists, drawings, simple tables and graphs, mind maps and

other appropriate graphic organisers

- to record their learning journey, including photos and printed worksheets
- to showcase to others the learning that has been undertaken during the unit.

A scrapbook makes an ideal student science journal.

## Classroom preparation and resources

This unit of work has been developed to be used in conjunction with the freely available online LEARN ABOUT WOOL resource library, which contains a range of relevant factsheets, posters, publications, engaging short videos and links to useful websites.

A hardcopy version of the LEARN ABOUT WOOL kit is freely available by emailing [teacherskit@wool.com](mailto:teacherskit@wool.com). The kit contains samples of wool from the raw fibre through various stages of processing to yarn and fabric samples. These samples are integral to the tactile explorations outlined in this unit of work.

Throughout this unit of work you could:

- display the LEARN ABOUT WOOL *Wool processing* poster, showing the journey from farm to fashion.
- display the LEARN ABOUT WOOL kit fibre, yarn and fabric samples in a basket
- allow students to explore the LEARN ABOUT WOOL primary factsheets
- encourage students to read *The story of wool* (Kondinin group)
- encourage students to use vocabulary associated with wool production found in the resources.
- encourage students to explore [The Woolmark Company](#) website
- show relevant videos from [The Woolmark Company YouTube channel](#)

## Additional resources

In addition to the samples provided in the LEARN ABOUT WOOL kit, collect and display a basket of wool clothes and furnishings alongside samples of wool fabric and yarn.

Try to ensure a representative sample of items from each type of processing system (read the [Different types of wool](#) fabrics factsheet for some ideas).

To complement your classroom display and enhance this lesson, you may like to ask students to bring in one or two of their favourite items of woollen clothing or furnishings/bedlinen. Make sure all students' items are clearly labelled.

The activities in this unit of work require a range of equipment. Each lesson plan will identify the particular items required to successfully carry out the lesson.

## Unit snapshot

Lesson	At a glance
Lesson 1: What is wool?	<ul style="list-style-type: none"><li>• Provides a hands-on shared experience about what different materials feel like.</li><li>• Explores what students already know about wool, where it comes from and how it is used in everyday products.</li><li>• Draws out questions students may have about wool.</li><li>• Introduces the concept of natural and synthetic fibres.</li></ul>
Lesson 2: Wool — taking a closer look	<ul style="list-style-type: none"><li>• Allows students to investigate the observable features of the wool fibre in more detail.</li><li>• Discusses how these features make wool a useful fibre for everyday products.</li></ul>
Lesson 3: Does wool burn?	<ul style="list-style-type: none"><li>• Allows students to observe and compare the flammability of a range of common fabrics and draw conclusions about the suitability of these fabrics for a range of everyday uses.</li></ul>
Lesson 4: Is wool stain resistant?	<ul style="list-style-type: none"><li>• Allows students to investigate the capacity of wool and cotton to resist stains and draw conclusions about the suitability of these textiles for a range of everyday uses.</li></ul>
Lesson 5: Wool — keeping us warm and cool	<ul style="list-style-type: none"><li>• Allows students to reflect on their observations regarding the thermoregulatory properties of wool and draw conclusions about the suitability of wool for a range of everyday uses and activities.</li></ul>
Lesson 6: Wool — where does it go?	<ul style="list-style-type: none"><li>• Allows students to investigate the capacity of wool and synthetic fabrics to resist biodegradation and draw conclusions about the impact of the different types of textiles on the environment at the end of their useful life.</li></ul>
Lesson 7: Where can we use wool?	<ul style="list-style-type: none"><li>• Allows students to reflect on their observations regarding the range of properties of wool and draw conclusions about the suitability of wool for a range of everyday uses and activities.</li></ul>

## Pre-lesson preparation, materials and equipment

The LEARN ABOUT WOOL factsheets and links below provide ample background information to carry out this lesson and answer a range of questions posed by students.

A range of additional resources is available in the LEARN ABOUT WOOL online resource library.

### Useful resources:

LEARN ABOUT WOOL primary factsheets

- [What is wool?](#)
- [How wool grows](#)
- [Inside a wool fibre](#)
- [Properties of wool](#)
- [Wool—the natural fibre](#)
- [Different types of wool fabrics](#)

### Videos

- [Sam the Lamb — what is wool?](#)
- [The innovator](#)
- [Merino, the baby wool](#)
- [How my sweater came to be](#)

### Useful links

- [Enviro-stories library](#)
- [Wool fibre facts and benefits](#)

### Useful books

- The Workboot Series - *The story of wool* (Kondinin Group)

## Materials and equipment

- LEARN ABOUT WOOL kit fabric and fibre samples
- A range of objects made from various materials (e.g. wood, metal, polystyrene, plastic, glass, rubber, cotton, wool, Lycra)
- Cardboard boxes to hold objects so students cannot see the objects while they feel them.
- A range of clothing and furnishings made from wool, cotton and other fibres (socks, blankets, jumpers, t-shirts, pyjamas, sportswear, baby clothes etc.)
- Try to include a range of wool items ranging from worsted-spun woven and knitted (e.g. T-shirts and tailored pants or skirts) through to woollen-spun woven and knitted fabrics (e.g. heavy winter coats and jumpers — see the *Different types of wool fabrics* factsheet for ideas).
- Student science journal
- Student worksheet — Properties of materials

### Lesson objective:

- To capture students' interest and introduce them to the language used to describe the properties of everyday materials.
- To explore what students know about the origins of everyday fabrics they are familiar with.
- To introduce students to the concepts of 'natural' and 'synthetic' fibres.
- To draw out questions from students about where wool comes from and what it is used for.

### Students will have the opportunity to:

- explore and make observations about a range of materials
- discuss the different uses for fabric/textiles (e.g. clothing, bedding and furnishings) and investigate the sources of the textiles used in a range of everyday products (e.g. animals, plants and petrochemicals).
- explore the difference between natural and synthetic fibres
- identify the source of wool.

### Setting the context

Many students will have little knowledge about or experience with the origin of the textiles (fabrics) used in everyday items of clothing and furnishing. They may not clearly understand the difference between 'natural fibres' and 'synthetic fibres' or appreciate the different properties of a wide range of fibres. This lesson allows students to explore a range of textiles and fibres and their observable properties, such as texture, strength, elasticity.

### Lesson focus

The focus of this lesson is to spark students' interest, stimulate their curiosity, raise questions for inquiry and gain an understanding of their existing beliefs about the textiles and fibres they come into contact with every day. These existing ideas can then be taken into account during future lessons.

### Introduction

Divide students into small groups and encourage them to explore the range of objects in the 'touch and feel' boxes (where the items are hidden from view and the students can feel, but not see, the contents of the box). Ask students to share their observations as they explore the items. Encourage them to describe the way the items feel. When each group has had the opportunity to feel the items, ask students to return to their seats and share their observations and write their descriptions in their science journal. Ask students if they can guess what the items are and encourage them to explain how they are drawing their conclusions.

### Body of lesson

1. Explain to students that different objects are made from different materials, which have different 'properties'. Ask students to write the word 'properties' in their science journal. Explain that the word properties can be defined as 'the way an object looks, feels, smells, tastes or behaves in certain situations'. Ensure students also record this definition in their science journals.
2. Direct students to complete the worksheet *Properties of materials*. Ask students why they think each of the items in the worksheet has been made using the materials they have listed. Guide the discussion with questions such as:
  - "What would happen if the jumper was made of paper instead of wool?"
  - "Why do you think bottles are made of glass or plastic and not paper?"
  - "What would it feel like wearing thongs made of wood or metal?"
  - "What would happen if coins were made of chocolate instead of metal?"

## Conclusion

Explain to students that during this unit of work you are going to investigate the properties of one of Australia's most important natural fibres — wool — and how these properties influence the way we use wool in a range of everyday products.

Ask students if they can guess which items in the 'touch and feel' boxes were made from wool. Ask students to identify the properties that suggested the items were woollen. Identify the woollen items in the collection of objects the students have been exploring and review their descriptions of these items, asking when they might wear or use these items and why. Ask students to record their findings in their science journal.

Ask students if they know where wool comes from and if necessary, explain that wool comes from sheep. You could ask students to read the information on the *LEARN ABOUT WOOL* factsheets [What is wool?](#) and [How wool grows](#). In particular, students may be interested in the *Did you know?* facts about wool on each factsheet. Allow students time at the end of the lesson to explore the LEARN ABOUT WOOL factsheets, videos and useful links.

## Extension activity

Explain to students that wool is a 'natural' fibre. Ask students to guess what that might mean and ask them to write their predictions in their science journal under the heading *Natural fibres*. Using the factsheet [Wool the natural fibre](#), as a reference, explain to students that the clothes they wear each day can be grouped into 'natural' and 'synthetic' fibres. Talk about other 'natural' fibres, such as cotton and silk and 'synthetic' fibres such as polyester and Lycra using samples from the earlier investigation as examples.

You might like to allow students to explore some of the stories in the Enviro-stories online library — [Our Farms are Our Future](#), such as [Fluffy's getting shorn](#) and [My life on a sheep farm](#) — or the videos as listed at the beginning of this lesson plan. Students can also explore [The Woolmark Company](#) website for further information about how wool is produced and processed.

Students might like to investigate whether the clothes they are wearing are made from natural or synthetic fibres and record their findings in their science journal.

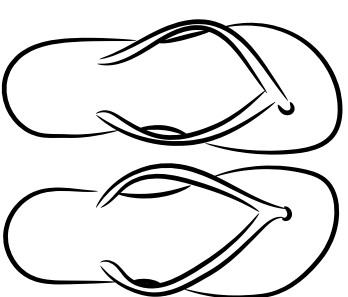
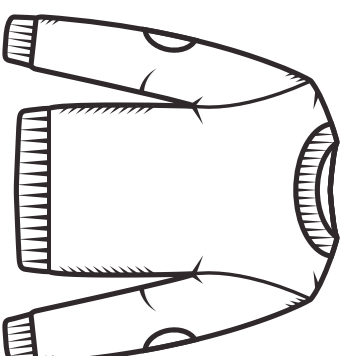
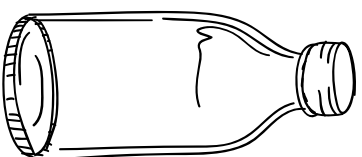
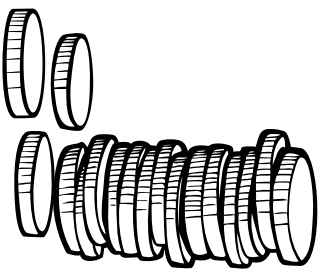
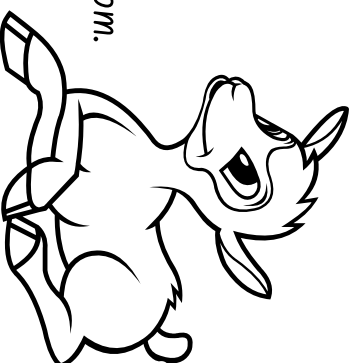
## Links to the Australian Curriculum:

- Natural and processed materials have a range of physical properties that can influence their use ([ACSSU074](#))
- Represent and communicate observations, ideas and findings using formal and informal representations ([ACSI071](#))
- Science involves making predictions and describing patterns and relationships ([ACSHE061](#))



# PROPERTIES OF MATERIALS

Help Sam the Lamb by writing words about  
each object that describe how it might look or feel.  
Below each object write what you think it is made from.



Name: .....

## Pre-lesson preparation, materials and equipment

The LEARN ABOUT WOOL resources and links below provide ample background information to carry out this lesson and answer a range of questions posed by students.

A range of additional resources is available in the LEARN ABOUT WOOL online resource library.

To allow students to see the wool fibre more closely you will need to provide access to magnifying glasses and/ or a microscope. If using a microscope you will need to set up a sample slide before the lesson so students can see the fibre without needing to adjust the microscope or set up the microscope so the slide can be seen on through an image projector onto a screen at the front of the classroom.

Students will not be able to observe the microscopic scales on the wool fibre, which are only visible under an electron microscope, but these can be seen on the front of the LEARN ABOUT WOOL kit *Inside a wool fibre* factsheet and *Structure of a wool fibre* poster.

## Useful resources:

*LEARN ABOUT WOOL* primary factsheets

- [What is wool?](#)
- [How wool grows](#)
- [Inside a wool fibre](#)
- [Properties of wool](#)
- [Wool—the natural fibre](#)
- [Different types of wool fabrics](#)

## Videos

- [Sam the Lamb — what is wool?](#)
- [Tested by nature — tested by us](#)
- [Discover wool](#)
- [The innovator](#)

## Posters

- [Structure of a wool fibre](#)

## Useful links

- [Wool fibre facts and benefits](#)

## Materials and equipment

- LEARN ABOUT WOOL kit greasy (raw) wool fibre sample.  
If possible, access an entire fleece for display in the classroom and for students to explore (touch and feel).
- Student science journal to record student reflections
- LEARN ABOUT WOOL student worksheet:  
*Looking at wool more closely*
- Magnifying glasses and /or microscopes

#### Lesson objective:

- To allow students to investigate the raw wool fibre more closely.
- To draw out questions from students about how the physical (observable) features of greasy (raw) wool make it useful for a range of everyday products.

#### Students will have the opportunity to:

- explore and make shared observations about the wool fibre
- gain an appreciation of how the physical properties of the wool fibre contribute to the final properties of the woollen product.

#### Setting the context

The wool fibre has a number of structural features that give wool its unique properties as a fibre and textile. The diameter (micron) of the wool determines how fine the final yarn and fabric will be, the crimp (wave) gives wool its natural insulation properties.

The grease that surrounds each wool fibre (lanolin) is removed during processing and used in a range of beauty products.

Each wool fibre is covered in tiny scales, which are important in making felts and traditional wool cloth.

#### Lesson focus

The focus of this lesson is to spark students' interest, stimulate their curiosity, raise questions for inquiry and gain an understanding of their existing beliefs about wool. These existing ideas can then be taken account of in future lessons.

#### Introduction

Review the students' journal descriptions from Lesson 1 and discuss the observations students made about the wool products they explored during this lesson. Ask students to share what they recorded about wool from the previous lesson (e.g. "Where does wool comes from?"). After collecting responses on a smartboard or screen for all students to see ask students to record others' observations in their science journals under the heading *What we know about wool*.

#### Body of lesson

1. Explain to students that wool has some unique features, called 'properties', which help protect sheep in all kinds of weather (review from Lesson 1 the meaning of 'properties'). Play the video [Sam the Lamb — What is wool?](#). Discuss with students what kinds of properties they think wool might have. Play the video [Tested by nature, tested by us](#).

Ask students if they can identify any additional properties. Encourage discussion by asking questions like:

- How does wool protect sheep from cold weather?
- How does wool protect sheep from wet weather?

2. Show students the map on the front of the [Wool production](#) in Australia factsheet and explain that the red and green areas are where most of the sheep in Australia are kept for wool production. Discuss with students the type of weather common in these areas during different seasons: for example, Tasmania is very cold in winter, central NSW is very hot in summer. Ask students what sort of conditions sheep might need protection from during the seasons (e.g. sun, wind, rain, snow). Explain that their wool fleece has properties that help protect sheep from all these weather conditions. Explain to students they are going to have a closer look at samples of raw (greasy) wool, share their observations with the class and record them using drawings and words.
3. Distribute to students the *Looking at wool more closely* worksheet. Ask students to predict what they think wool looks like up close and write their predictions in the table on the worksheet under the heading *Before a close look*.
4. Allow students to explore the raw (greasy wool) fibre sample provided in the hard copy LEARN ABOUT WOOL kit, or a wool fleece if you have been able to access one.

Encourage students to try and stretch a section of the wool staple and feel how strong the fibre is. Ask if they can see the wrinkles (crimp) in the wool staples or whether the wool feels greasy. Ask students to share their observations as they explore the raw fibre. Encourage them to describe the way the items look, feel, and smell. Ask students to add their descriptions to their science journals under the heading *Looking at wool more closely*.

5. Using the information on the [How wool grows](#) and [Inside a wool](#) fibre factsheets or the [Structure of a wool fibre](#) poster, as a reference, explain to students the how physical properties of wool they have just been exploring including: the crimp (waves), the staple (it's length and strength) and the lanolin (grease) all help protect the sheep from the weather.
6. Ask students to compare and describe the differences between their own hair and the samples of raw wool they have been investigating. Draw students' attention to the *Did you know?* and *Fun facts* on the [How wool grows](#) and [Inside a wool](#) fibre factsheets, which make comparisons between human hair and wool. If possible, display these factsheets on a smartboard or screen for the whole class to see.

7. Allow students to further explore the wool fibre using a magnifying glass or microscope and ask them to draw what they see on their worksheets under the heading After a close look. Ask students to apply labels to their diagrams including: wool staple (as a heading) and crimp (to indicate the waves).
8. Show students the [Discover wool](#) animation and discuss how the features of wool investigated in this lesson might relate to the wool items they investigated in Lesson 1 (for example, if wool helps to keep sheep warm when it is cold and cool when it is hot, wool clothing can do the same for people).

### Conclusion

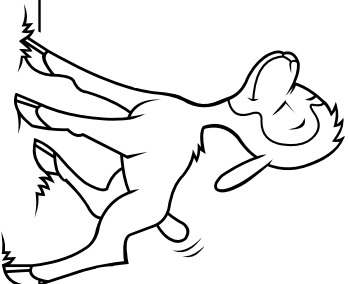
Play the video [The innovator](#). Ask students to think about the types of weather conditions and activities in which they might choose to wear wool. Encourage students to explain their choices. Students are encouraged to note their responses in their science journals.

Explain that during the next few lessons you will be further investigating the unique properties of wool and how these properties influence the way we use wool in a range of everyday products.

### Links to the Australian Curriculum:

- Natural and processed materials have a range of physical properties that can influence their use. ([ACSSU074](#))
- Represent and communicate observations, ideas and findings using formal and informal representations ([ACSI071](#))
- Living things depend on each other and the environment to survive ([ACSSU073](#))

# LOOKING AT WOOL MORE CLOSELY

<i>Before a close look</i>	<i>After a close look</i>
	

*Name:* .....

### **Pre-lesson preparation, materials and equipment**

The LEARN ABOUT WOOL factsheet *Properties of wool*, combined with the suggested resources below will give you ample background information to carry out this lesson and answer a range of questions posed by students.

A student worksheet *Does wool burn?* has been provided for you to distribute to students for recording their predictions and their observations from this lesson.

### **Useful resources:**

LEARN ABOUT WOOL factsheets

- [Properties of wool](#)

Videos

- [Sam the Lamb – what is wool?](#)

Useful links

- IWTO: [Wool and flame resistance](#)
- IWTO: [Wool and fire](#) factsheet
- [Wool fibre facts and benefits](#)

### **Materials and equipment**

- Science journal to record student reflections

### Lesson objective:

- To allow students to observe and compare the flammability of a range of common textiles and draw conclusions about the suitability of these textiles for a range of everyday uses.

### Students will have the opportunity to:

- observe the flammability of wool compared with a range of other fibres
- consider the implications of flammable fibres in a range of everyday uses.

### Setting the context

Wool's chemical structure makes it naturally flame resistant. It is a highly-trusted natural fibre in public areas, such as hotels, aircraft, hospitals and theatres.

Wool is harder to ignite than many common textile fibres. While cotton catches alight at 255°C, the temperature must reach 570–600°C before wool will ignite; while polyester melts at 252–292°C and nylon succumbs at an even lower 160–260°C, wool never melts so it can't stick to the skin like many common synthetics.

### Lesson focus

The focus of this lesson is to encourage students to think about the link between the flame-resistance properties of a fibre and the implications for its end use, in particular why wool is a safe fibre to wear or use in home furnishings.

### Introduction

Ask students to review their science journals and discuss the observations students have so far made about wool including the physical features that help wool protect sheep under a range of weather conditions.

Explain to students that wool has some unique features that we can't immediately see, but can test for, such as flammability. Ensure students understand that flammability describes whether or not a material will burn easily or not. Explain to students that they will be watching a video about the flammability of a range of fabrics.

### Body of lesson

1. Distribute the student worksheet *Does wool burn?* to students and explain that as a class you will watch the video about the flammability of different fabrics (textiles) and they will to predict what will happen when each of the textiles is exposed to a flame. They will need to record their predictions before the textile is exposed to the flame and observations after the textile has been exposed to the flame.
2. Start the video [Sam the Lamb — Does wool burn?](#) stopping before each fabric is exposed to the flame. Ask students to predict what will happen and record the corresponding option on their worksheet (circle the appropriate word in the *My prediction* column).
3. Following each demonstration, stop the video and ask students to describe what they observed during the demonstration. Discuss whether what happened matched their predictions. Ask students to record what happened on their worksheet in the *My observations* column.
4. Repeat this process for each fabric type.
5. In light of the results of this activity, discuss the relative safety of each of the sample clothing items in the event of a fire. Ask students to complete their worksheet by identifying the safest (least flammable) option shown at the bottom of the sheet. Discuss the implications of this experiment with regards to the safety of furnishings and clothing, such as children's pyjamas, drying clothes on a heater or near a campfire, or furnishings such as curtains, floor coverings and bedding.

## Conclusion

Ask students to write a paragraph to describe the fire-resistant properties of wool in their science journal under the heading *Is wool flammable?*

Explain that during the next few lessons you will be further investigating the unique properties of wool and how these properties influence the way we use wool in a range of everyday products.

## Links to the Australian Curriculum:

- Natural and processed materials have a range of physical properties that can influence their use. ([ACSSU074](#))
- Science involves making predictions and describing patterns and relationships ([ACSHE061](#))
- Represent and communicate observations, ideas and findings using formal and informal representations ([ACSI071](#))
- Compare results with predictions, suggesting possible reasons for findings ([ACSI0216](#))
- Science knowledge helps people to understand the effect of their actions ([ACSHE062](#))

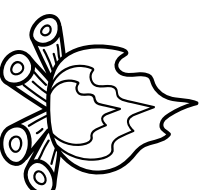


# DOES WOOL BURN?

<i>Fabric type</i>	<i>My predictions</i>	<i>My observations</i>
<i>polar fleece</i>	<i>crumble</i> <i>burn slowly</i> <i>burn quickly</i> <i>melt</i>	
<i>cotton</i>	<i>crumble</i> <i>burn slowly</i> <i>burn quickly</i> <i>melt</i>	
<i>wool</i>	<i>crumble</i> <i>burn slowly</i> <i>burn quickly</i> <i>melt</i>	

*Draw a circle around the name of the fabric you think is the safest if there is a fire and explain your choice below.*

*polar fleece*      *wool*  
*cotton*



*Name:*

### **Pre-lesson preparation, materials and equipment**

The LEARN ABOUT WOOL factsheet *Properties of wool* will give you ample background information to carry out this lesson and answer a range of questions posed by students.

This activity will involve applying droplets of coloured water onto cotton and wool socks. Demonstrate this activity before allowing students to investigate for themselves. Before carrying out the demonstration clearly explain to students they must remain seated during the demonstration and listen to all instructions.

A student worksheet *Resist that stain* has been provided for you to distribute to students for recording their predictions and observations from this lesson.

### **Useful resources:**

LEARN ABOUT WOOL factsheets

- [Properties of wool](#)

Useful links

- [Wool fibre facts and benefits](#)

### **Materials and equipment**

- Enough white cotton and wool socks to share among small groups of students.
- Eye droppers
- Food colouring
- Water and jugs
- Newspaper or cotton tea towels to place on tables to soak up any spilt water
- LEARN ABOUT WOOL student worksheet *Resist that stain*
- Science journal to record student observations

### Lesson objective:

- To allow students to investigate and compare the stain-resistant (moisture-repellent) capacity of wool compared with cotton and draw conclusions about the suitability of these textiles for a range of everyday uses.

### Students will have the opportunity to:

- test the stain-resistant capacities of wool compared with cotton
- consider the implications of wool's ability to repel water in a range of everyday uses.

### Setting the context

While the core of the wool fibre can absorb up to a third of its dry weight in moisture, the surface of the fibre has a waxy coating that repels liquids. This surface layer is not easily removed by washing or processing. Water droplets on the surface of wool clothing will bead and roll off instead of being absorbed into the fabric, as occurs with cotton, allowing it to resist many common everyday stains.

### Lesson focus

The focus of this lesson is to encourage students to think about the link between the stain resistance property of a fibre and the implications for its end use.

### Introduction

As a class, review the student's science journals and discuss the observations students have made so far about wool including the physical features that help wool protect sheep under a range of weather conditions and the features we can't see or feel, such as fire resistance.

Explain to students that wool has some other unique features we can't see, but we can test for, such as water repellence and stain resistance. Ask students why this property might be useful. Encourage discussion with questions such as:

- "Has an ice-block ever dripped while you were eating it?"
- "What happened?"
- "Have you ever trodden in water when you were wearing socks?"
- "What happened to your feet?"

### Body of lesson

1. Distribute the student worksheet *Resist that stain* to students and explain that you will ask them to predict what will happen when you drop coloured water using an eye dropper onto the cotton socks then the wool socks. Ask them to record their predictions before and after they have observed the demonstration.
2. Lay each of the socks on some newspaper or a tea towel on the table. Ask students to predict what will happen when the water is placed on the socks and get them to record their prediction in the *My predictions* column on their worksheets.
3. Ask a volunteer student to use the eye dropper, draw up water from the jug and slowly place a droplet on the cotton sock. The sock will absorb the water immediately. Ask the students to observe what happens to the water and record their observations in the *My observations* column on their worksheet.
4. Repeat the process with the wool sock. The droplet of water will sit on the surface of the wool sock and not be absorbed. You can then use the cotton sock to absorb the water droplet from the wool sock.
5. Ask a student to come forward and feel both socks and describe how they feel. The wool sock will still feel dry, while the cotton sock will be wet where it has absorbed the water.
6. Ask students to describe what happened during the demonstration. Discuss whether what happened matched their predictions.
7. Organise students into small groups of three or four students and allow them to replicate the activity in their groups.
8. As you go around each group ask students to describe again what is happening. Encourage them to think about what might happen if they spilt a drink while wearing a wool t-shirt and what would happen if they were wearing a cotton t-shirt. Encourage students to think about other items of clothing that might be made of cotton or wool, such as jumpers and hoodies (sweaters). Ask students to imagine what might happen if they were wearing these clothes on a bushwalk in foggy or misty weather. Encourage students to discuss in small groups and report their findings back to the class.

**NOTE:** Wool is the preferred fibre for many outdoor activities for its water-repellent qualities as well as its ability to wick sweat away from the skin and help regulate body temperature.

## Conclusion

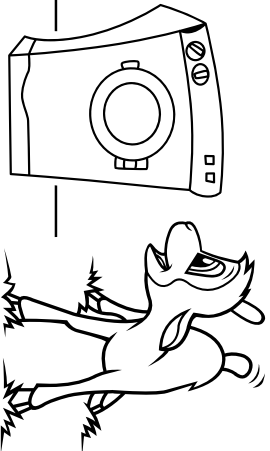
Ask students to develop a paragraph to describe the water and stain-repellent properties of wool and record this in their science journals under the heading *Is wool stain resistant?*

Explain that during the next lesson you will be considering how the properties you have been investigating influence the way we use wool in a range of everyday products.

## Links to the Australian Curriculum:

- Natural and processed materials have a range of physical properties that can influence their use. ([ACSSU074](#))
- Science involves making predictions and describing patterns and relationships ([ACSHE061](#))
- Represent and communicate observations, ideas and findings using formal and informal representations ([AC SIS071](#))
- Compare results with predictions, suggesting possible reasons for findings ([AC SIS216](#))

# RESIST THAT STAIN

<i>Fabric type</i>	<i>My predictions</i> <i>(Write the answer below that indicates your prediction)</i>	<i>My observations</i> <i>(Record your observations when coloured water was dropped onto the fabric)</i>
<i>wool</i>		
<i>cotton</i>		

Name: .....

### Pre-lesson preparation, materials and equipment

The LEARN ABOUT WOOL resources below will give you ample background information to carry out this lesson and answer a range of questions posed by students. This lesson focuses on the thermoregulatory properties of wool and its ability to insulate.

This activity will involve comparing the change in temperature over time of refrigerator-cold cans of drink when covered with a wool sock and a cotton sock.

Demonstrate this activity before allowing students to investigate for themselves. Before carrying out the demonstration clearly explain to students they must listen carefully to all instructions and take care when using laboratory thermometers.

A student data recording sheet *Temperature of the cans* has been provided for you to distribute to students for recording their predictions and their observations from this lesson.

### Useful resources:

LEARN ABOUT WOOL factsheets

- [Properties of wool](#)
- [Different types of wool fabrics](#)

Videos

- [Sam the Lamb — Properties of wool](#)
- [Wool regulates body temperature](#)
- [The innovator](#)
- [Merino Activewear](#)
- [Merino wool in sports and activewear](#)

### Materials and equipment

Per group of four students:

- LEARN ABOUT WOOL data recording sheet:  
*Temperature of the cans*
- Two refrigerator-cold cans of drink per group of four students
- Two laboratory thermometers
- One woollen sock
- One cotton sock
- Science journal to record student observations

### Lesson objective:

- To allow students to investigate and compare the thermoregulatory (temperature regulation) capacity of wool compared with cotton and draw conclusions about the suitability of these textiles for a range of everyday uses.

### Students will have the opportunity to:

- test the thermoregulatory capacities of wool compared with cotton
- consider the implications of wool's ability to influence the temperature of the user in a range of everyday uses.

### Setting the context

In contrast to synthetics, wool is an active fibre that reacts to changes in body temperature. It helps you stay warm when the weather is cold, and cool when the weather is hot. Wool is the preferred fibre for many outdoor activities for its water-repellent qualities, as well as its ability wick sweat away from the skin and help regulate body temperature. Wool's insulation properties, trapping air in the natural crimp of the fibres, help keep you warm when it's cold.

In terms of thermal conductivity, wool is not really that different from other fabrics, such as cotton or polyester. The main reason why wool is better at controlling temperature is how it manages moisture. When it is hot, wool manages moisture to keep you cooler. Water is transported through the fabric and away from the skin into the drier air. When you exercise and start to sweat, the wool next to your skin automatically absorbs the vapour transporting it, and the heat associated with it, away from your skin, keeping you dry and comfortable. This movement of moisture away from your skin not only helps to keep you dry, it also helps keep you cool.

### Lesson focus

The focus of this lesson is to encourage students to think about the link between the thermoregulatory properties of a fibre and the implications for its end use.

### Introduction

Using their science journals, reflect with students what they now know about wool — where it comes from, how it feels and some of its hidden properties (fire and stain resistance).

Explain to students that during this lesson they are going to think about some of the ways wool can be used in domestic applications, such as insulation and bedding, and how these items assist with temperature regulation of the user. The LEARN ABOUT WOOL factsheets *Properties of wool* and *Different types of wool fabrics* can be used to stimulate discussion.

To assist with their understanding, students will carry out an

activity designed to test the difference between two fabrics using the concept of a 'fair test'. This means all parts of the test will be kept the same, apart from the one variable they are testing; in this case, the sock material.

### Body of lesson

1. Distribute the data recording sheet *Temperature of the cans* to students and explain that you will ask them to predict what will happen to the temperature of the can over time when you cover a cold can of drink with a wool sock or a cotton sock. They can record their predictions on their data recording sheets before they carry out the experiment.
2. In groups of four students, ask students to put each of the socks on two identical cold cans of drink. Carefully place a laboratory thermometer down the side of the can underneath the sock. Ensure the cans are placed in the same location.
3. Ask students to predict what will happen to the temperature of the can when the sock is placed on the cans and ask them to record their predictions on their recording sheets.
4. Record the starting temperature of the two cans and record the temperature of each can every two minutes for 10 minutes. Ask students to calculate the total change in temperature after 10 minutes and record this on their data sheets in the space provided at the end of the table. Ask students to complete the statement on their data recording sheet as to which sock kept the can the coolest.
5. Group by group, ask the students share their observations of what happened to the temperature over time and encourage them to explain their results.
6. Ask the students to use the data recorded in the table on their data recording sheets to construct a simple column graph (temperature vs time) showing the change in temperature of the two cans during the 10 minutes. Explain that they will need a separate column for each sock type at each two-minute increment (perhaps blue for cotton and yellow for wool, for example).
7. Play the animation [Wool regulates body temperature](#). Ask students to reflect on the experiment and the animation as they describe what happened during the experiment in their science journals. Discuss whether what happened matched their predictions.
8. Play [The innovator](#) animation shown during Lesson 2 *Wool — taking a closer look* and ask each student group if they can now describe why the animations' hero is comfortable in wool both indoors and outdoors. Encourage students to think about how they would feel if they went hiking on a cold day wearing a woollen jumper. What would happen if they were wearing a cotton hoodie? Encourage students to think about other items of clothing e.g. woollen hats compared with cotton caps.

## Conclusion

Ask students to develop a paragraph to describe the thermoregulatory (temperature regulation) properties of wool and record this in their science journals. Ask them questions such as:

- “What sort of clothing would help keep you cooler in summer and warmer in winter?”
- “How could wool be used to help keep our houses cooler in summer and warmer in winter?”

Explain that during the next lesson you will be considering how the properties you have been investigating influence the way we use wool in a range of everyday products and how we dispose of unwanted clothing.

## Extension activity

Using the design of the class activity, modify and design a fair test to demonstrate how wool can help keep objects warmer for longer e.g. a hot drink.

Alternatively, investigate the domestic uses of wool, including roof and wall insulation, wool furnishings and carpet in the home. How does the use of wool help keep the user warmer in winter and cooler in summer in their home? Students could present their findings as a poster or infographic, using this question as the title.

## Links to the Australian Curriculum:

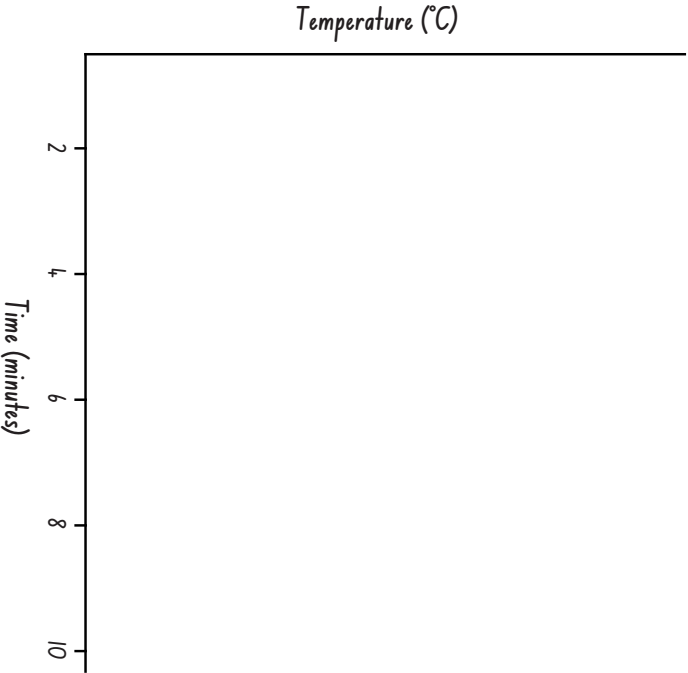
- Natural and processed materials have a range of physical properties that can influence their use. ([ACSSU074](#))
- Science involves making predictions and describing patterns and relationships ([ACSE061](#))
- With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge ([ACSI064](#))
- Represent and communicate observations, ideas and findings using formal and informal representations ([ACSI071](#))
- Compare results with predictions, suggesting possible reasons for findings ([ACSI216](#))
- Consider the elements of fair tests and use formal measurements and digital technologies as appropriate, to make and record observations accurately ([ACSI066](#))
- Reflect on investigations, including whether a test was fair or not ([ACSI069](#))
- Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends ([ACSI068](#))



# TEMPERATURE OF THE CANS

Record the temperature of the cans using a laboratory thermometer in the table below.  
 My prediction: The can covered in the ..... sock will keep the can the coolest.

	0 mins (°C)	2 mins (°C)	4 mins (°C)	6 mins (°C)	8 mins (°C)	10 mins (°C)	Change in temperature (°C)
Temperature of can covered in wool sock							
Temperature of can covered in cotton sock							



The result: The can covered in the .....sock kept the can the coolest.

Name: .....



## Pre-lesson preparation, materials and equipment

This lesson focuses on the biodegradable properties of wool.

This activity will involve comparing the change in biodegradation over time between wool and synthetic fabric.

**Note to teacher:** The practical activity in Lesson 6 *Wool – where does it go?* will need to be set up six weeks prior to the lesson being run. (See **Body of lesson** Steps 1-6) This will ensure students can observe distinct differences in the fabrics being tested. They will be able to draw valid conclusions about the performance of wool versus synthetic fabric when exposed to environmental degradation using warm, moist soil as the substrate.

Demonstrate the set-up of this activity before allowing students to investigate for themselves. Before carrying out the demonstration clearly explain to students they must listen carefully to all instructions and ensure they maintain temperature and moisture-controlled conditions in their jars, as far as practicable.

The LEARN ABOUT WOOL factsheets [Properties of wool](#), [Different types of wool fabrics](#) and [Wool is 100% biodegradable](#) combined with the suggested resources listed below provide ample background information to carry out this lesson and answer a range of questions posed by students.

## Useful resources:

LEARN ABOUT WOOL factsheets

- [Properties of wool](#)
- [Different types of wool fabrics](#)
- [Wool is 100% biodegradable](#)

Videos

- [Sam the Lamb — Properties of wool](#)

Useful links

- [War on waste digibook](#)
- [ABC Education](#)
- [Woolmark Company website](#)
- [Wool fibre facts and benefits](#)
- [Wool is 100% biodegradable](#)
- [Measuring wool's environmental footprint](#)

## Materials and equipment

Per pair of students:

- two glass jars (same size)
- 10 x 10cm piece of 100% wool fabric
- 10 x 10cm piece of synthetic fabric
- plastic mesh onion bag or orange bag
- scissors
- two sticky labels
- hand lens /magnifying glass
- tweezers
- soil (high organic matter content)
- one sheet of A4 white paper
- marker pens
- science journal to record student observations

### Lesson objective:

- To allow students to investigate and compare the biodegradability capacity of wool fabric compared with synthetic fabric and draw conclusions about the suitability of these textiles for a range of everyday uses and the environmental impacts of these textiles at the end of their useful life.

### Students will have the opportunity to:

- test the biodegradability capacities of wool fabric compared with synthetic fabric
- consider the implications of wool's ability to influence sustainable fashion choices of the user in a range of everyday settings.

### Setting the context

The world's landfill facilities are overflowing and a major contributor to this problem is the disposal of unwanted clothing, including wool garments. Wool is composed of protein so microbes within the soil can digest the fibre and return nutrients to the soil. Synthetic fibres, on the other hand, can be extremely slow to break down and significantly contribute to the world's overflowing landfills. In landfills wool degrades rapidly with no long-term damage to the environment.

If wool is kept warm and moist or buried in soil, bacteria and fungal growths develop, which produce enzymes that digest wool.

On the other hand, thanks to the unique chemical structure of keratin and wool's tough, water-repellent outer layer, clean and dry wool fibres do not readily degrade in normal use and storage. This allows wool products to be resilient and long-lasting in normal conditions.

Wool can be composted with other organic material to create a type of fertiliser, rich in nutrients, which can be used to improve pasture for animals.

### Lesson focus

The focus of this lesson is to encourage students to think about the link between the biodegradable properties of a fibre and the implications for its end use.

### Introduction

Let students know you are going to investigate properties of wool and other textiles that have an impact on the environment. Ask students to suggest ways that textiles, like those they have been investigating in previous lessons might affect the environment.

Encourage students to think about the clothing in their wardrobe. Ask them the following questions:

- What are most of your clothes made of?
- What happens to your old clothes when you grow out of them?
- If they are thrown out, where do they go?
- What do you think happens to them then?

Allow students to explore Chapter 2 of the *War on waste* digibook. Have a short class discussion about the impacts of fast fashion.

Explain that when wool is disposed of, it will naturally break down (biodegrade) in soil in a matter of months to years, releasing valuable nutrients back into the earth. This is because wool is made of protein (keratin, also hair and fingernails) and is a naturally occurring substance. Alternatively, synthetic fibres are very slow to break down and contribute significantly to landfill, many of which are overflowing in Australia.

Explain that soil contains microorganisms, which speed up the breakdown of naturally occurring substances when environmental conditions are suitable. When soil is damp and warm, the rate of breakdown by microorganisms will be optimised.

Let students know that you will be investigating this theory by burying two fabric samples: one wool fabric and one synthetic fabric.

## Body of lesson

1. Arrange students into pairs.
2. Provide each pair with two glass jars, two 10 x 10cm samples of fabric (one synthetic e.g. Lycra and one 100% wool fabric), two sticky labels, one marker pen, sufficient plastic mesh to encase each fabric sample.
3. Students can draw or photograph their fabric samples before burial and record their 'before' image in their science journal under the activity heading *Wool — where does it go?*.
4. Ask students to half fill each jar with soil (high organic matter, not sand) and place a piece of mesh, followed by the fabric sample and a covering layer of mesh before filling the jar with the remaining soil. Sandwiching each fabric sample between two pieces of plastic onion or orange bag mesh will allow ease of removal from the jar at the end of the activity.
5. Each pair will need to clearly label their jars with their names and the type of sample contained within the jar (i.e. 'wool' and 'synthetic').
6. Place the uncovered jars in a warm position for six weeks.
7. Ask students to record their prediction of what they expect to observe in six weeks' time in their science journal.
8. Leave the samples undisturbed for six weeks.  
*NOTE: Water may need to be added to the jars to keep the soil moist, but not saturated. To ensure a fair test, ensure the two jars are kept under identical conditions (including the amount of water added to each jar).*
9. After six weeks, ask students to carefully remove the samples from their jars using tweezers and place them side by side on an A4 piece of white paper.
10. Ask students to observe the fabric samples using hand lenses or magnifying glasses.
11. Students draw or photograph the samples and compare the 'before' and 'after' images.
12. Students record their observations in their science journal and review their observations against their prediction at the outset of the investigation.

## Conclusion

Ask each pair of students to share their results with another pair.

Support the students' discussion with the following questions:

- Was your prediction correct?
- How did we keep the test between the two samples fair?
- Which fabric showed the most breakdown?
- Why do you think this happened?
- If your old clothes are buried in landfill, what do you think will happen to them:
  - in a week
  - in six weeks
  - in a year?
- Which type of clothing would spend the longest time in landfill?
- Which type of clothing will break down the fastest in landfill?

## Extension activity

Students can research other methods of reducing the amount of landfill by recycling used garments, rather than disposing of them. Encourage them to discover how easily wool can be recycled by comparing this process with synthetic fibres using the resources listed at the start of this lesson plan or encourage them to design a fair test to compare other fibres and how quickly they biodegrade when buried in soil.

## Links to the Australian Curriculum:

- Natural and processed materials have a range of physical properties that can influence their use. ([ACSSU074](#))
- Science involves making predictions and describing patterns and relationships ([ACSHE061](#))
- Represent and communicate observations, ideas and findings using formal and informal representations ([AC SIS071](#))
- Compare results with predictions, suggesting possible reasons for findings ([AC SIS216](#))
- Reflect on investigations, including whether a test was fair or not ([AC SIS069](#))
- With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate ([AC SIS065](#))
- Consider the elements of fair tests and use formal measurements and digital technologies as appropriate, to make and record observations accurately ([AC SIS066](#))
- Science knowledge helps people to understand the effect of their actions ([AC SHE062](#))

### **Pre-lesson preparation, materials and equipment**

The LEARN ABOUT WOOL factsheets *Properties of wool* and *Different types of wool fabrics* combined with the suggested teacher reference resources listed below provide ample background information to carry out this lesson and answer a range of questions posed by students.

This activity will involve asking students to reflect on what they have learnt about the properties of wool during the past few lessons and encouraging them to think about how these properties influence the suitable end uses for wool.

### **Useful resources:**

LEARN ABOUT WOOL factsheets

- [\*Properties of wool\*](#)
- [\*Different types of wool fabrics\*](#)

Videos

- [\*Sam the Lamb – Properties of wool\*](#)
- [\*Sam the Lamb – What is wool?\*](#)
- [\*Tested by nature – tested by us\*](#)
- [\*Discover wool\*](#)
- [\*The innovator\*](#)

### **Materials and equipment**

- A range of woollen clothing items suitable for active/sporting activities
- Woollen bedding e.g. blankets, quilts
- Science journal to record student observations

#### Lesson objective:

- To allow students to reflect on their observations regarding the properties of wool and draw conclusions about the suitability of wool for a range of everyday uses and activities.

#### Students will have the opportunity to:

- consider the implications of wool's unique properties and draw conclusions about its suitability in a range of everyday uses.
- take part in informal and guided discussions relating to their observations
- use science journals to record observations and ideas and discuss their representations with others
- communicate ideas through role play.

#### Setting the context

Wool's range of unique properties make it an ideal fibre for many everyday applications. Wool is soft, comfortable, safe and environmentally sound.

During this lesson and possibly through their own experience, students will see wool used in a range of contexts; for babies' clothing and bedding, for sportswear, business and luxury wear and activewear.

#### Lesson focus

The focus of this lesson is to encourage students to think about the link between the varied properties of wool fibre and the implications for its end use.

#### Introduction

Using their science journals, reflect with students what they now know about wool — where it comes from, how it feels, some of its hidden properties (fire and stain resistance, biodegradability and thermoregulation).

Explain to students that during this lesson they are going to think about some of the ways wool can be used in everyday items of clothing and furnishings, such as curtains and bedding.

#### Body of lesson

1. Using the [Properties of wool](#) and [Different types of wool fabrics](#) factsheets as reference guides, review with students the different properties of wool they have investigated (e.g. softness, fire resistance, biodegradability, stain resistance, thermoregulation) and some they may not yet be aware of (e.g. breathable, renewable etc.).
2. Draw students' attention to the *Did you know?* and *Fun facts* on the factsheets, which expand upon how these properties are applied in end products (such as sportswear).
3. Show students the [Sam the Lamb — Properties of wool](#) video and discuss the concepts shown in the video with students. Ask questions such as:
  - Why is wool clothing good for sportswear?
  - What makes wool safe to wear?
  - What makes wool comfortable to wear?
4. Using their science journals as a prompt, ask students what they have learnt about the properties of wool during the past few lessons. Encourage them to think about how wool feels, whether wool is a 'safe' fibre in the case of a fire and what happens when wool is exposed to water. Ask students if they have any wool clothing at home and when they might wear wool clothing.
5. Explain to students they are going to explore how wool might be used in a range of everyday situations through a role-play activity. Divide the class into small groups (3 – 4 students) and provide each group with one of the following scenarios — a trip to the snow | bushwalking or going to the park on a cold day | going to a bonfire night | playing football or riding a bike in summer | buying clothes and bedding for a newborn baby.
6. Ask students to sort through the range of items provided and pack a suitcase or bag with items that will be suitable for their given situation. Tell them they will need to explain to the rest of the class the situation they are in and why they have chosen those particular items. For example, the group going skiing might select layers of wool items such as t-shirts, long-sleeved pull-overs and a wool jacket and the group playing football or riding a bike in summer might choose a wool t-shirt to protect them from the sun and keep them cool while they are active. If you do not have access to a wide range of wool items students could investigate wool products available online that would suit their scenario and describe them and how they would be used.
7. When students are ready, ask each group to present to the class. Encourage them to explain their situation, describe the items they have chosen and why they have chosen these items. Draw out from the students the particular properties of wool that have led them to make these choices during their presentation. Record these on a whiteboard or equivalent as a mind map.

## Conclusion

Regroup in front of the class mind map. On the board write the heading, *Properties of wool*. Ask students to name one property of wool they have investigated during this unit.

Ask the students the following questions:

- Where does wool come from?
- Is wool a natural or synthetic fibre?
- How does wool protect sheep?
- What does wool feel like?
- Is wool flammable?
- Could you wear wool on a rainy day?
- Why is wool good to wear in summer and winter?
- How can wool be used in your home to keep you warm and cool?
- How does wool help reduce landfill?

Make the links on the mind map following the student's suggestions.

## Extension activity

Ask students to select one of the properties of wool studied in this unit of work and consider how wool can be used to improve the lives of the user or the environment.

Students are to link their chosen property (e.g. fire resistance, biodegradability, stain resistance etc.) with the performance of the fibre in a chosen setting selected (e.g. the home, sporting arena, leisure activity or in the case of the environment, at the end of a product's useful life). A comparison between wool and cotton or synthetic fibres is to be included.

Students can be present their findings as a digital infographic (no larger than A3) or hand-drawn poster.

If the student chooses to present their work as an infographic, ask them to create a hand-drawn draft indicating the key messages they wish to convey, before generating the digital infographic.

As a reminder, infographics are a visual representation of data. When students create infographics, they are using information, visual, and technology literacies.

Some questions to ask students to help them reflect on specific infographics:

- Why is this infographic useful to me?
- What is the purpose of the visuals (charts, maps, drawings, etc) in this document?
- Is the text important for me to understand this infographic? Why?
- How can I evaluate this infographic? What does it do well? Where could it be improved?
- What information am I learning thanks to this infographic?
- Is this infographic helping me learn? How? Why?

Allow your students to spend some time investigating different forms of infographics. [The Daily Infographic](#) is a site dedicated to curating the most interesting infographics available on the web.

There is a variety of freely available tools to create infographics online, such as Canva. Most online infographic tools provide templates students can use for their own purposes. Students can adapt available infographic templates and add their own content, images, designs, etc.

The following article from EducationHQ Australia provides more information on using infographics in the classroom: <http://au.educationhq.com/news/33589/using-infographics-in-class/> (Accessed 11 May 2020)

## Links to the Australian Curriculum:

- Natural and processed materials have a range of physical properties that can influence their use. ([ACSSU074](#))
- Science involves making predictions and describing patterns and relationships ([ACSHE061](#))
- Represent and communicate observations, ideas and findings using formal and informal representations ([ACIS071](#))
- Science knowledge helps people to understand the effect of their actions ([ACSHE062](#))