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 to 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 (ACSIS071)
- Living things depend on each other and the environment to survive (ACSSU073)