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 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 (ACSIS071)
- Compare results with predictions, suggesting possible reasons for findings (ACSIS216)
- Science knowledge helps people to understand the effect of their actions (ACSHE062)