**Fabric to Yarn Activity**

**Objectives**
1. Students undertake an appraisal and comparison of a range of fabrics on the basis of:
   a) touch, and
   b) appearance.
2. Students consider wool compared with other fabrics and learn about wool properties.

**Curriculum Links**
- Level 5, 6: Science
- Level 5, 6: Intrapersonal development
- Extension A links:
  - Level 5, 6: Design, Creativity and Technology
- Extension B links:
  - Level 5, 6: Mathematics

**Materials**
A range of fabric samples for each group of participants- available through LandLearn.

**Method**
1. Start by tuning in- discuss the wool industry in Victoria.
   - Worth $1 billion in exports to Victoria. Most goes to China and Italy. 6500 wool growers in Victoria.
   - Uses of wool: mainly clothes (including specialist clothing), also used for carpet, insulation, bedding and fashion accessories.
   - Wool is grown in Australia and then shipped out- for the majority of our wool, cleaning and processing happens overseas.
   - Prompt questions might include: How much of what we wear is wool? What percentage of your wardrobe is wool? Ask students to check tags on blazers/jumpers.

2. Divide into a maximum of five groups and hand out worksheet 1. The fabric samples are made up of the following textile fibres: wool, cotton, acetate, microfibre, polyester, nylon, nylon/acrylic blend and silk.

3. Begin by handing out a sample of colour ID- White (1) to each group. Encourage the students to open the material and feel it. They should assess the fibre on a scale of 1 – 7 (poor to good) for comfort and appearance which takes into account softness, drape, handle, finish, texture and colour (see glossary for definitions). In the ‘prickle’ column students can note whether they felt any prickle fibres by tapping one layer of the fibre on the underside of their forearm. They can start guessing what type of fibre it is and its uses, or this step can be saved for the class discussion in step 5.

4. Repeat step 3 for each colour ID, in the order of the worksheet is easiest.
5. When the comfort and appearance appraisal is completed, go through each colour ID one by one as a class and compare ratings (no wrong answer as everyone interprets touch differently)- write the range of responses in a table on the board. Then make an assessment of the end use of the fabric in column 3, then guess the fibre type and write the answer in column 4.

6. Did you correctly name each fabric? How did the woollen fabrics compare to the others? Are you surprised by this, or was it expected?

**Extension:**
A. Design an outfit made entirely of wool. Consider that some types may need to be higher micron wool for stiffness, and others finer wool. Outline properties on your design sheet including softness, drape, handle, finish, texture and colour.

B. Using the diameter distributions for fabric samples Figures 1-11 reflect on the prickle feel of each fabric, what rule of thumb can be made for prickle? (teachers: prickle is affected by the proportion of fibres over 30um).

**Conclusion:**
The quality of a fabric is influenced by a number of properties. While some of these can be measured and specified, other qualities depend on personal preferences. When marketing fabric, quality specifications and consumer preferences must be known, so that effective marketing strategies are implemented.

This session has allowed you to appreciate that there are a range of fabrics made from different fibres, and each with their own qualities. Among these, there is a definite place for wool as a comfortable, “everyday” apparel fibre, as well as for more elegant and stylish uses.

Farmers can influence many of wools properties including prickle and softness due to the way they select sheep for breeding. Sheep can be bred and/or managed to have a lower micron, a lower frequency of waves in the wool (crimp frequency), less short fibres and less variation in a flock’s wool quality.
Glossary:

**Appearance:**
Includes colour, drape, finish and texture properties.

**Colour:**
This is often described as depth of colour. Wool is often said to have good depth of colour, whereas most artificial fibres do not. One way to assess this is to compare the colour in well-lighted conditions, then in poorer light. If the colour stays relatively the same, the depth of colour is better.

**Comfort:**
Measured by the wearer and is impacted by finish, handle, softness and texture.

**Drape:**
This is the way the fabric hangs or falls from an object or person. A fabric with good drape would hang limply in graceful folds.

**Finish:**
A process after manufacture which creates specific surface properties. This could include visual, tactile and/or performance qualities. Eg a silken finish.

**Handle:**
The feeling of the touch of the fabric eg. "rough", "smooth", "harsh", or "pliable".

**Micron:**
The thickness of a single strand of a fabric (1000\(^{th}\) of a millimetre). Relates to softness.

**Prickle:**
Prickle can be tested for by tapping one layer of the fibre on the underside of the forearm- a prickly feeling indicates prickle fibres are present. Prickle factor depends where the fibre is worn on the skin and the sensitivity of the person. The prickle sensation is caused by the ends of fibres ‘poking’ out from the fabric or yarn, and pressing against the skin. It is more likely to prickle if it is a short fibre held tightly in place and is a thicker micron. When a fabric has more than 5% of fibres over 30 microns then it is likely to produce a prickle sensation in most wearers. Other fibres can cause prickle (not just wool).

**Softness:**
A soft fabric is described as yielding to pressure put upon it. In the hand, soft fabrics will easily "scrunch up", providing little resistance to compression.

**Texture:**
Patterns formed physically, compared with through colour.
Diameter Distributions for the Fabric Samples (Figures 1-11)

**WHITE 1**
- Fabric Weight: 210 g/m²
- Mean Fibre Diameter: 20.55 μm
- CV of Fibre Diameter: 22.9%

**LIGHT BLUE**
- Fabric Weight: 95 g/m²
- Mean Fibre Diameter: 22.31 μm
- CV of Fibre Diameter: 19.9%

**CREAM**
- Fabric Weight: 90 g/m²
- Mean Fibre Diameter: 10.29 μm
- CV of Fibre Diameter: 25.5%
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**BROWN**
- Fibre Weight: 150 g
- Mean Fibre Diameter: 13.66 µm
- CV of Fibre Diameter: 20.2%

**RUST**
- Fabric Weight: 360 g/m²
- Mean Fibre Diameter: 27.1 µm
- CV of Fibre Diameter: 26.3%

**GREEN**
- Fabric Weight: 75 g/m²
- Mean Fibre Diameter: 20.35 µm
- CV of Fibre Diameter: 14.5%

**WHITE 2**
- Fibre Weight: 140 g/m²
- Mean Fibre Diameter: 12.78 µm
- CV of Fibre Diameter: 28.3%
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**WHITE 3**
- Fabric Weight: 189.4 g/m²
- Mean Fibre Diameter: 21.74 µm
- CV of Fibre Diameter: 20.9%

**DUSTY PINK**
- Fabric Weight: 230 g/m²
- Mean Fibre Diameter: 17.5 µm
- CV of Fibre Diameter: 40.1%

**Aqua**
- Fabric Weight: 335 g/m²
- Mean Fibre Diameter: 23.29 µm
- CV of Fibre Diameter: 26.7%

**Navy Blue**
- Fabric Weight: 220 g/m²
- Mean Fibre Diameter: 19 µm
- CV of Fibre Diameter: 22.1%
# Worksheet 1

<table>
<thead>
<tr>
<th>ID colour</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>White (1)</td>
<td>[1]</td>
<td>[2]</td>
<td>[3]</td>
<td>[4]</td>
<td>[5]</td>
</tr>
<tr>
<td>White (2)</td>
<td>[1]</td>
<td>[2]</td>
<td>[3]</td>
<td>[4]</td>
<td>[5]</td>
</tr>
<tr>
<td>White (3)</td>
<td>[1]</td>
<td>[2]</td>
<td>[3]</td>
<td>[4]</td>
<td>[5]</td>
</tr>
<tr>
<td>ID colour</td>
<td>FIBRE TYPE</td>
<td>FIBRE USES</td>
<td>MICRON</td>
<td>% fibres &gt;30um</td>
<td>WEIGHT</td>
</tr>
<tr>
<td>------------</td>
<td>------------------</td>
<td>------------------------</td>
<td>--------</td>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>White (1)</td>
<td>Pure wool</td>
<td>Trousers Slacks Suits</td>
<td>20.6um</td>
<td>3.8%</td>
<td>210 g/m²</td>
</tr>
<tr>
<td>Light Blue</td>
<td>Acetate</td>
<td>Nightwear Lining garments</td>
<td>22.3um</td>
<td>6.8%</td>
<td>95</td>
</tr>
<tr>
<td>Cream</td>
<td>Raw silk</td>
<td>High fashion garments eg wedding dresses</td>
<td>10um</td>
<td>0%</td>
<td>90</td>
</tr>
<tr>
<td>Brown</td>
<td>Microfibre/ polyester</td>
<td>Dress pants Suits</td>
<td>13.7um</td>
<td>0.1%</td>
<td>150</td>
</tr>
<tr>
<td>Rust</td>
<td>Pure wool</td>
<td>Upholstery</td>
<td>27.1um</td>
<td>32%</td>
<td>360</td>
</tr>
<tr>
<td>Green</td>
<td>Ripstop nylon</td>
<td>Outer wear Raincoats Tents</td>
<td>20.4um</td>
<td>1%</td>
<td>75</td>
</tr>
<tr>
<td>White (2)</td>
<td>Homespun cotton</td>
<td>Craft work Quilting</td>
<td>12.8um</td>
<td>0%</td>
<td>140</td>
</tr>
<tr>
<td>White (3)</td>
<td>Pure wool</td>
<td>Dresses Undergarments</td>
<td>21.7um</td>
<td>5.3%</td>
<td>184</td>
</tr>
<tr>
<td>Pink</td>
<td>80% nylon 20% acrylic</td>
<td>Cardigans Jumpers Dresses</td>
<td>17.5um</td>
<td>3.5%</td>
<td>230</td>
</tr>
<tr>
<td>Aqua</td>
<td>Pure wool</td>
<td>Overcoats School blazers</td>
<td>23.3um</td>
<td>14%</td>
<td>335</td>
</tr>
<tr>
<td>Navy Blue</td>
<td>Pure wool</td>
<td>Fine suits &amp; trousers</td>
<td>19.0um</td>
<td>1.4%</td>
<td>220</td>
</tr>
</tbody>
</table>