

# WOOL THE WONDER FABRIC

## ROYAL DESIGN TECHNOLOGY CHALLENGE



According to HM King Charles, wool is a wonder fabric that is "versatile, sustainable, renewable and natural" and the new king likes wool so much that it was used in virtually every part of his Coronation, from beginning to end. For example, the 6,000 military, naval and air force personnel from the UK and Commonwealth all wore uniforms made from 15 miles of wool uniform fabric!

Products that are made from synthetic materials such as polyester require fossil fuels to produce whereas wool is grown naturally on a sheep's back in the same way that hair grows on our heads and the so the only things that we need to produce it are grass and water! Did you know that shearing a sheep is just like us having a haircut and it doesn't hurt the sheep? It's actually a very important process that is needed to keep sheep healthy. We will learn more about this in our live lesson but there's even more to explore!

In this activity, you will be challenged to use your designing and making skills to invent a brand new wool product that is worthy of royal approval!

### LEARNING OBJECTIVES:

- To draw inspiration to design from historical, cultural and other sources.
- To apply knowledge and skills when making design decisions in order to produce specific outcomes.
- To consider how design proposals will solve problems and how this may affect the environment.
- To use design communication methods to develop and present ideas, and respond to feedback.



### STEP 1: RESEARCHING

Use a range of sources to research all the ways that wool was used during King Charles's coronation. If you have completed the Wool the wonder fabric Science investigations, use what you found out about the properties of wool to think about why wool made such a good material for each of the uses.

### STEP 2: DESIGNING

Your challenge is to design a new product that is made from wool. Fill in the design template to help you plan your ideas.

Think about the following:

- What product are you going to make?
- Who is your product for? You might like to make a product for the king!
- What problem can your product solve for them?
- What properties should your product have?
- What wool crafting method will you use? Why?

### STEP 3: MAKING

Use the wool crafting instruction sheets to make a prototype of your product.

### STEP 4: EVALUATING

Does your design meet the criteria you listed in your design brief? How could it be improved? What are the possible impacts on the environment of your design?

### STEP 5: PRESENTING YOUR DESIGN

Pitch your design to your classmates to try and persuade them to buy your product.



# WOOL THE WONDER FABRIC

## ROYAL DESIGN TECHNOLOGY CHALLENGE



### Design brief template



Draw and label / annotate your design here:

.....

The user:.....

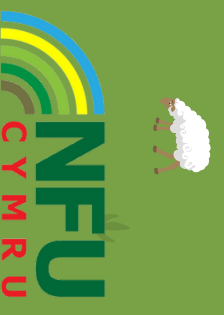
What problem will it solve? .....

.....

.....

What properties should it have?

Design criteria	✓



# WOOL THE WONDER FABRIC

## ROYAL DESIGN TECHNOLOGY CHALLENGE



### Wool craft instructions: Felting



Felt is the oldest fabric known to man as there is evidence that it dates back to Turkey in 6500- 3000 BC and Roman soldiers used felt for their tunics, boots and socks. It is thought that the reason it was such an early fabric is because it was easy to make and could be made anywhere. For the nomadic people of the time, wool was always easy to come by, either from sheep or goats, and could be readily dyed using natural plant dyes such those from as onion skins, berries, red cabbage and nettles.

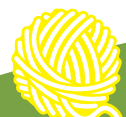
Felt has many good properties. For example, it is easily dyed, flexible, can be shaped, repels water and, like all wool products, keeps you or an object insulated and warm. Felt is created by using soap and water on clean wool, which opens the scales on the outside of each wool fibre and then the action of rubbing and rolling ensures that the individual wool fibres bind together. The process of making felt is irreversible as the felt fabric cannot be changed back into wool fibres.

#### HOW TO MAKE FELT:

1. Choose which colour you want to use and decide if you want to create a shaped piece or a flat piece of felt.
2. Take four lengths of the wool, around 10 cm each.
3. Pull the fibres apart to make 10 cm squares of loose fibres.
4. Place each piece on top of the other but at right angles (perpendicular) to each other.
5. At this stage if you are going to create a flat piece of felt, you can start to soap the wool pieces with a piece of wet soap on a flat surface and gradually begin to gently rub the wool so that the friction and soapy water starts to lock the wool fibres together.
6. If you want to create a 3D shape, you can wrap the four pieces of overlapping wool around a pebble or ping pong ball and begin to roll the object in your wet soapy hands.
7. Wet your hands to keep the rolling or smoothing of the wool easier. The more lather you create, the quicker the felting process will take place.
8. Start rolling or smoothing gently to begin with but as the wool fibres start to bind together you can roll it faster and more vigorously.
9. Keep going until the wool is smooth and has a firmer feel to it – you now have felt. The wool fibres have bonded together due to the friction and breaking down of the original bonds on each wool fibre by the soap and water.
10. Finally rinse your felt in water and leave it to dry.

#### WHAT YOU NEED:

- Wool tops (semi-processed wool ready for spinning)
- Soap – most soaps work well
- Bowls of warm water (with some washing up liquid added)
  - A ping pong ball or large pebble if you want to create a shape



# WOOL THE WONDER FABRIC

## ROYAL DESIGN TECHNOLOGY CHALLENGE



### Wool craft instructions: Weaving



Weaving has been a skill and technique used for around 5000 years. Up until the 19th Century, weaving was carried out on small hand looms in cottages around the countryside using a range of materials including wool. The threads that come down are called the **warp** and the threads that run across are called **weft**. The weft threads go over and under each warp thread to create a woven fabric.

#### HOW TO WEAVE:

1. Make the loom by taking the plastic tray and two short sticks / pencils or dowelling that are the same lengths as the width of the plastic tray.
2. Measure at least eight pieces of string that are triple the length of your plastic container.
3. Fold each piece in half.
4. Attach the folded string (warp thread) to one piece of the wood using a loop and then thread the rest of the string through the loop. Repeat this until you have at least eight pairs of string on the wood.
5. Now tape the wood with the string attached to one end of the plastic tub, and with the string falling over the open side of the container.
6. Space the warps evenly across the wood.
7. Tie the loose end of the warp around the other stick and tape this second stick to the opposite end of the plastic container. This is your loom.
8. Begin weaving by choosing a piece of wool (weft thread or yarn) and, starting one side, go under and over alternate warp threads until you have gone all the way across the loom. Repeat this action, changing colours, type of wool or thicknesses of wool until you have filled the loom area.
9. Remember to keep pushing the weft down on the warp to keep the weaving tight.
10. You can add extra decorations such as feathers, stripes etc. as you become more confident or if you want to add more creativity to your design.
11. Unstick the wood from the plastic food container and finish your weaving by tying the loose threads altogether in a knot and use the top stick (the one with the original loops on it) as a hanging rod to display your weaving.

#### WHAT YOU NEED:

- Variety of wool colours – for the weft
  - Cardboard
  - Scissors
  - Ruler
- Pencil / dowelling / bamboo stick
- Small shallow plastic food tray
- Strong coloured string – for the warp
- Sticky tape

#### LINKS TO THE CURRICULUM FOR WALES

SCIENCE AND TECHNOLOGY AREA OF LEARNING AND EXPERIENCE: DESIGN THINKING & ENGINEERING OFFER TECHNICAL & CREATIVE SOLUTIONS TO MEET SOCIETY'S NEEDS & WANTS

##### Progression step 3:

- I can draw inspiration to design from historical, cultural and other sources.
- I can apply my knowledge and skills when making design decisions in order to produce specific outcomes.
- I can consider how my design proposals will solve problems and how this may affect the environment.
- I can use design communication methods to develop and present ideas, and respond to feedback.

