

FABRIC EXPERTS (LEVEL 3)

Description	Learners will create their own cotton articles and calculate the price they will sell them at. They will use the knowledge of the life cycle of cotton, and profit and loss, to do so.
Leading question	How much money can you make selling fabric products?
Subjects covered	Science, Math, Art & Design
Total time required	40-60 min a day for 5 days
Resources required	newspaper/ fabric scraps, glue/ tape, scissors, crayons, ruler, notebook, and pencil
Learning outcomes:	<p>By the end of this project, learners will be able to:</p> <p>Knowledge-Based Outcomes:</p> <ol style="list-style-type: none"> Relate fabrics with the seasons in which they are suitable to wear. Identify sources of different types of fabrics. Outline the journey of cotton from fibre to fabric. Suggest ways to produce sustainable fabric articles. Calculate the selling price based on fixed profit and cost of production. <p>21st Century Skill Outcomes:</p> <ol style="list-style-type: none"> Think critically while analysing resources and energy used in the production of fabric. Be creative in designing articles using the provided material. Work collaboratively while working with a friend or family to improve their designs. Communicate effectively while presenting their designs.
Previous Learning	Examples of fabric (such as cotton, jute, wool and polyester)
Supervision required	Medium

Day 1 -

Today, you will find out about clothes that we wear in different seasons, the fabrics they are made of, and their sources.

Time	Activity and Description

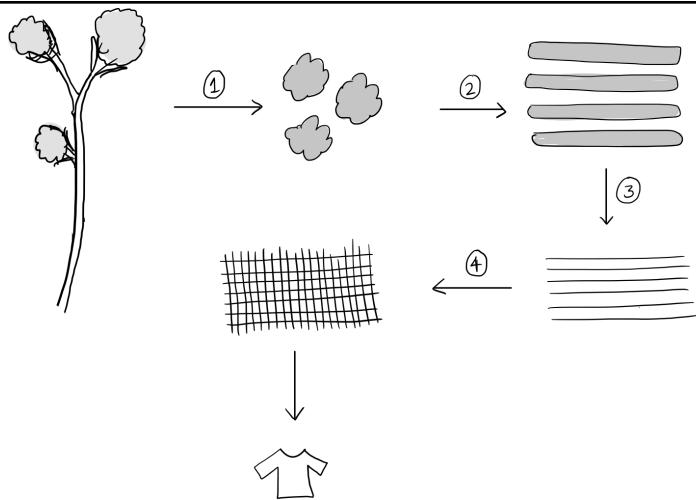
5 minutes	<p>Introduction</p> <p>Let us think about the clothes we buy and wear!</p> <ul style="list-style-type: none"> - Have you ever been to a shop to buy clothes? - What clothing item have you bought recently? How much did it cost? - What material is it made up of? What are some other things made of this material? <p>In this project, you will find out how much money you can make from selling fabric items. We will also find out how making so many clothes for so many people in the world affects our environment.</p>																									
15 minutes	<p>Clothes for Different Seasons</p> <p>Note: Ask learners to copy the table below, fill out the different clothes they wear in each season, why they wear them, the fabric (type of cloth) they are made up of, and where we get the fabric from.</p> <table border="1" data-bbox="380 756 1462 1305"> <thead> <tr> <th>Season</th><th>Summer</th><th>Winter</th><th>Autumn</th><th>Spring</th></tr> </thead> <tbody> <tr> <td>Clothes We Wear</td><td><i>T-shorts shorts skirts</i></td><td></td><td></td><td></td></tr> <tr> <td>Why We Wear Them</td><td><i>They are light and airy and keep us cool</i></td><td></td><td></td><td></td></tr> <tr> <td>Fabric They are Made of</td><td><i>Cotton</i></td><td></td><td></td><td></td></tr> <tr> <td>Source of the Fabric</td><td><i>Cotton plant</i></td><td></td><td></td><td></td></tr> </tbody> </table> <p>Why do you think we wear different types of clothes during different seasons? (<i>During each season, we wear clothes that keep us comfortable during that season. For example, in summer we wear clothes that are airy and cool because it is hot during summer.</i>)</p>	Season	Summer	Winter	Autumn	Spring	Clothes We Wear	<i>T-shorts shorts skirts</i>				Why We Wear Them	<i>They are light and airy and keep us cool</i>				Fabric They are Made of	<i>Cotton</i>				Source of the Fabric	<i>Cotton plant</i>			
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10 minutes	<p>Different Types of Fabric</p> <p>What different fabrics did you list in the table?</p> <p>What other fabrics do you know of? In what seasons do we wear them? (<i>summer - cotton, polyester etc; winter - wool, silk, rayon etc -</i>)</p> <p>Note: Show learners different types of fabric either using real articles or the images below.</p>																									

																								
	Rayon	Cotton	Wool	Silk																				
10 minutes	Sources of Different Fabrics Where do we get different types of fabrics from? (<i>plants - cotton, linen, jute etc; animals - wool, silk etc; synthetic/ artificial/ human-made - rayon, nylon, polyester etc</i>)																							
At home activities	In the table below, learners will record different fabric articles that they use at home, the fabric they are made of, their uses, and their sources. <table border="1" data-bbox="383 756 1462 1157"> <thead> <tr> <th>Article</th> <th>Fabric</th> <th>Use(s)</th> <th>Source(s)</th> </tr> </thead> <tbody> <tr> <td>T-shirt</td> <td>Cotton</td> <td>To wear during summer</td> <td>Cotton plant</td> </tr> <tr> <td>Curtains</td> <td>Polyester</td> <td>To protect from sunlight</td> <td>Human-made</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Article	Fabric	Use(s)	Source(s)	T-shirt	Cotton	To wear during summer	Cotton plant	Curtains	Polyester	To protect from sunlight	Human-made								
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Day 2

Today, you will find out what it takes to turn cotton and jute fibre into fabric articles.

Time	Activity and Description
15 minutes	Fibre to Fabric To understand how fibre is turned to fabric, let us try tearing apart a piece of fabric and see what we find! <i>Note:</i> Ask learners to tear a piece of cotton/ jute fabric into as tiny bits as possible and share what they notice. Once done, use the diagram below to explain the journey of cotton from fibre to fabric.



1. Getting Cotton Fibres: First, we start with these fluffy balls called **cotton bolls**. Inside these cotton bolls are tiny little fibres. They're really soft, almost like a cloud!
2. Ginning: Cotton bolls are compressed into large **bales** and combed to remove the seeds inside them. This process is called ginning.
3. Making Yarn: Cleaned fibres are then pulled into thread or **yarn**.
4. Weaving/ Knitting: Yarn is then **knitted** or **woven** using machines called **looms** into fabric.

Once fabric is produced, it is cut and sewn into various types of clothes and other articles.

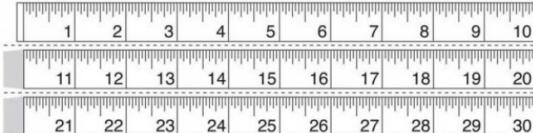
15 min	<p>Making Fabric from Yarn</p> <p>Let us do an activity to find out how yarn is woven into fabric!</p> <ul style="list-style-type: none"> - Take two sheets of paper. One of these sheets will be the horizontal yarn (say, Sheet H) and the other will be the vertical yarn (say, Sheet V). - Colour the two sheets differently. - Take a ruler and mark each of the two sheets with dots that are 2 cm apart. - Draw lines on each of the two sheets and cut them into strips. Each of these strips is our yarn. - Now, weave the Sheet H yarn one by one through the Sheet V yarn. <p>Note: Use the diagram below to explain the process to the learners.</p>
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10 minutes	<p>A Story about Cotton</p> <p>Hundreds of years ago, a tribe called the Inca in South America developed suits of armour that could protect warriors from sword and spear attacks! These suits of armour were worn over the body as clothes.</p> <ul style="list-style-type: none"> - Can you guess what kind of fabric these were made of? - These strong clothes were made of something very soft - cotton! They were made in a way that would make the suit of armour strong and durable, but flexible and soft at the same time! A steel or iron suit of armour could not provide that! <p>Many clothes that we wear are also made of cotton. However, they are usually not strong enough to protect us from sharp objects. How do you think they are different from the suits of armour that the Incas developed?</p> <p>They were woven in a way that they were harder to pierce through. There were also multiple layers of cotton stacked and stitched together to make this possible!</p>
At home activities	<p>Learners will conduct research by going to the neighbourhood tailor and asking them:</p> <ul style="list-style-type: none"> - Where their fabric comes from and the steps they follow to stitch fabric into clothes, and - How much the fabric and stitching costs.

Day 3 –

Today, you will decide what cotton article you want to make and take measurements for it.

Time	Activity and Description
5 minutes	<p>Deciding the Cotton Article to Design</p> <p>Let us decide what cotton article you want to design (such as a t-shirt, a cotton doll, a table cloth, a towel etc)! We will make these samples out of fabric/ paper. Think and answer these questions:</p> <ul style="list-style-type: none"> - What is the cotton article? - What is the function of this article?

	<ul style="list-style-type: none"> - What inspired you to create this article? Where did you get the idea for it or its design?
10 minutes	<p>Visualising the Cotton Article</p> <p>Draw the article you want to design on paper. Make sure you add as many details as possible! (the person wearing it, if it's a clothing article; number of buttons; designs and patterns on it etc)</p>
20 minutes	<p>Taking Measurements</p> <p>Now, you will measure the size of the articles you are making so you can start cutting them out of paper.</p> <p>First, let's make our own measuring tape!</p> <ol style="list-style-type: none"> 1. Cut up 3 cm wide strips of paper that are the length of your notebook paper and join them together using tape/glue. 2. Mark inches on them using a ruler from 0 to 60 to make your own measuring tape.  <p><u>For clothes:</u></p> <ol style="list-style-type: none"> 1. Take your own measurements for the clothes you want to create using the measuring tape. At the end of this project, you will be wearing the clothes you have made, so be sure to measure correctly! 2. You should stand up in your spot and take your measurements, keeping in mind that there should be enough wiggle room. So, make the design a little taller and looser. 3. You can start by marking what measurements you will need on the picture of your end product. For example, if you're making a t-shirt, you should measure your shoulders, chest, waist, lower waist, sleeve length and back length. 4. As you're measuring, you can take help from a friend, if needed. 5. Make sure to correctly write your measurements down in your notebook in inches, labelling your figure. <p>Tip: Look at the appendix to see an example of the kind of measurements learners may need to take.</p> <p><u>For articles:</u></p> <ol style="list-style-type: none"> 1. You should try to visualise how big the object would be and use the measuring tape to help you figure out the approximate measurements in inches. 2. Mark those measurements on the drawing of your product.
5 minutes	<p>Reflection</p> <ul style="list-style-type: none"> - What did this process teach you about designing clothes? - Do you think it is easy or hard for tailors to stitch clothes?

	<ul style="list-style-type: none"> - What will be your next steps as you create your cotton articles? - Do you think there is any wastage when clothes are made out of sheets of fabric? Can you think of any ways to reuse this waste? 												
At home activities	Learners can show their designs to a friend or a family member and ask for their feedback to improve them.												
Literacy/ Numeracy Extension (Optional)	<p>Once learners have all the measurements in inches, they will convert them to cm. 1 inch = 2.54 cm.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Measurement of</th> <th style="text-align: left;">In inches</th> <th style="text-align: left;">In cms</th> </tr> </thead> <tbody> <tr> <td>Length of the shirt</td> <td>30</td> <td>76.2</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Measurement of	In inches	In cms	Length of the shirt	30	76.2						
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Day 4 –

Today, you will make the cotton articles that you had designed the previous day.

Time	Activity and Description
15 minutes	<p>Making 2D Designs</p> <p>Now, you will identify and draw the different parts of the cotton article you designed yesterday. After you do this, you will cut the different parts out and stick them together to make the article!</p> <p><i>Tip: If needed, use the example shown in the images below to walk learners through the process of identifying the different pieces that need to come together to stitch a piece of clothing.</i></p> <p><u>Clothes:</u></p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p>Keep in mind that you should:</p> <ol style="list-style-type: none"> 1. Use the same measuring tape that you used to measure yourself yesterday. 2. Depending on how elastic your material is, you may need to make each piece bigger than the actual measurements so when you wear it, you are able to move freely.

	<p>3. Cut a little bit of extra material on the sides of your measured pieces so you have space to glue/tape these pieces together!</p> <p><u>Other Articles (such as a shopping bag):</u></p> 
Keep in mind that you should:	<ol style="list-style-type: none"> 1. Think about the dimensions (how big or small) of the article first. 2. Depending on the dimensions of the article, think about what pieces of how many sizes you will need. 3. Cut these pieces out slightly bigger than the actual measurements so that you have some amount of fabric left to stitch in.
15 minutes	<p>Assembling the Cotton Article</p> <p>Put all the pieces together by glueing or taping them depending on the material you have used. When you're done, you can take some time to decorate your article with colours and patterns as well!</p>
10 minutes	<p>Sustainable Use of Fabric</p> <p>While designing the cotton article, some fabric got wasted as trimmings.</p> <ul style="list-style-type: none"> - How much fabric was wasted in this process? (<i>encourage learners to share in percentage/fraction</i>) - What can you do to reduce the wastage? Is the wastage completely avoidable? - What can you do with the waste fabric? <p>Wastage can be reduced but not avoided completely because even if we careful, some amount of fabric will get wasted as we cut it into shapes. We can use this fabric to make things such as shopping bags, fabric toys and even make stuffed toys!</p>
At home activities	Learners will find the cost per unit length (metre, feet etc.) of cotton cloth from a local tailor or an adult.

Day 5 -

Today, you will calculate the cost price, selling price, and profit you want to earn from their article. Once done, you will present the article to your friends and family!

Time	Activity and Description

15 minutes	<p>Cost Price</p> <p>What is the cost of cotton fabric per unit length in the market right now?</p> <p>Selling clothing items for money is a great way to ensure that you can make a living out of your clothing business.</p> <p>First, let us determine the total cost of producing the item. This will include:</p> <ol style="list-style-type: none"> 1. The cost of the material 2. The additional money you will charge as profit for the article. <p>Take a minute to use your measuring tape and approximate the amount of “fabric” you used to make your article. Measure this in the unit that your tailor used to tell you the cost of cotton. For example, if the tailor said the cost of cotton is \$9 per sq m, then estimate the length and width needed for your article in cm or m. Remember, 1m = 100 cm.</p> <p>Think of the fabric you used as a rectangle/square. Note down the length and width of the fabric you would use to make each similar article going forward.</p> <p>Length of the fabric needed = _____ units Width of the fabric needed = _____ units</p> <p>Now, we have to calculate the area of the fabric you have used, which will be length multiplied by breadth.</p> <p>Take 2 minutes to calculate the area of the fabric you used and write it down in your notebook.</p> <p>Area = _____ sq units</p> <p>Now, calculate the cost of the fabric you used. For example, if you used 3 sq m of cotton and the cost of cotton is \$9 per sq m, then the total cost of fabric is $\\$9 \times 3 = \\27.</p> <p>Let’s say the cost of sewing equipment used would be \$10 (needle, thread, buttons etc.).</p> <p>Then, the total cost of your material is $\\$27 + \\$10 = \\$37$.</p> <p>Take the next 5 minutes to calculate your cost of materials.</p>
10 minutes	<p>Selling Price</p> <p>After you calculate the total cost, add a profit.</p> <p>When you buy something, you are not giving the seller the same amount it cost them to make the item. The price you pay includes an additional amount that sellers add so that they make a profit. If you sell your article for \$45 and it cost you \$37 to make it,</p>

	<p>your profit is \$45 - S37 = \$8 or Selling Price - Cost Price = Profit</p> <p>Using the formula above, calculate what your selling price will be if you were earning a profit of \$25 on each article you sell.</p> <p>In your notebooks, write down in detail the cost price, selling price, and profit for your article.</p>
10 minutes	<p>Presentation</p> <p>Present your cloth article to your friends and family, and explain to them the following:</p> <ul style="list-style-type: none"> - How the fabric was produced before you used it to make the article. - The process you followed to make the article. - How you computed the selling price of the article.
5 minutes	<p>Reflection</p> <ul style="list-style-type: none"> - Think about your own closet. How do your fashion-related habits influence the environment? Would you say that your habits are eco-friendly? Why or why not? - Now think about your design. How does your design incorporate some of the information you learned? - How is your design sustainable? Can it be worn more than once? Is it a fast fashion item? How long can someone typically keep it? - What is one fashion-related change that you and/or your family will commit to in order to reduce wasteful habits?
At home activities	Show your fabric article to your friends and family and walk them through the process of designing it, making it and calculating the price you want to sell it at. Once done, ask them if they could buy it, and take their feedback on what they liked about the article and what they think could have been done better.

Additional enrichment activities:	Learners can visit a tailor, learn basics of stitching, make their own cloth articles, and calculate their prices.
Modifications for simplification	Learners can be asked to draw their designs and use it as a basis to calculate selling prices using cost price and projected profit.

ASSESSMENT CRITERIA

A majority of my learners were able to:

- Trace the journey of cloth articles from fibre to fabric.
- Create fabric (paper mat) out of yarn (paper strips) to demonstrate the process of weaving.
- Design and make a cloth article.
- Calculate the selling price of the article based on its cost price and targeted profit.

APPENDIX

Sample measurements

