DESIGNERS OF CHANGE (LEVEL 3)

Description	Unleash your inner fashion designer and entrepreneur by creating attractive designs and pitching your products to be sold in a store!
Leading Question	Can you sustainably design a clothing item?
Total Time Required	4 hours over 4 days
Supplies Required	Paper, ruler, scissors, pen, tape/glue, color pens (optional), natural fabric/large pieces of paper or tissue paper
Inspiration	https://www.hmhco.com/blog/math-meets-fashion-mathematics-in-fashion-design
Learning Outcomes	- Understanding the role of clothes and their functions - Understanding the impact of fashion on the environment - Understanding the role of mathematics in fashion design - measurements, areas, angles, profit, markups etc. - Holistic understanding of sustainability from production to retail

DAY 1

Today, you will design a fashion sketch of the clothing item you want to create!

Suggested Duration	Activity and Description
20 minutes	In this project, you will sketch and design your own clothing item(s) and think about what makes clothes sustainable! There are many things to consider when designing clothes - what they will be used for, what material should be used to make them, the designs and measurements they should have, and many others. Begin by exploring closets in your own homes and noting down what you notice about your clothes. You will pick at least 5 different items from your and/or your family's clothes. Write down your observations about them in the table below. An example is shown below:

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

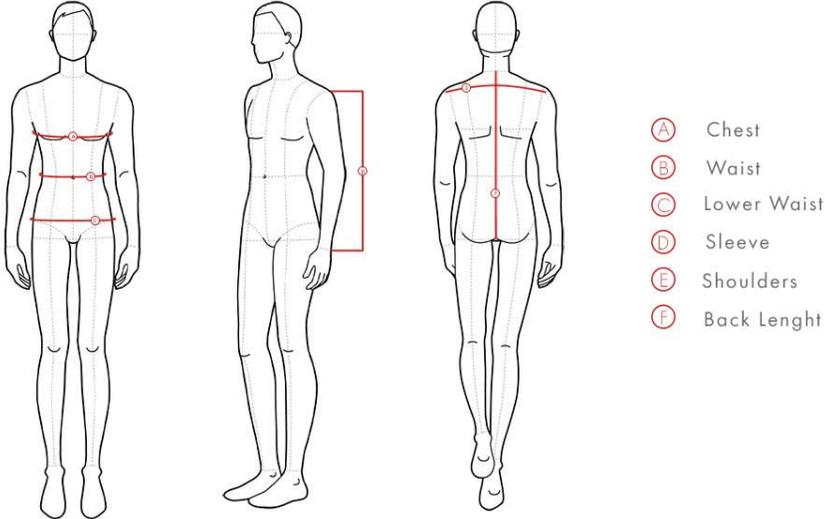| Item	Function	Season	Material(s)	Size	Color & design
T-shirt	Casual wear, keeps me cool	Summer	Cotton Polyester	M	Plain, white

Reflect on your findings:
- What do you notice about the different items of clothing? How are they different and in what ways are they similar?
- How do you think they are made?
- Do you have any idea whether or not it is good for the environment? Why or why not?
- Did you find any items that have not been used in a long time because they don't fit anymore or just not wanted?

5 minutes

What do you think the function of the clothing items below are?
What assumptions can you make about the image below?
What do you think the weather is like on that day?
What occasion do you think they are dressed for?

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

	source: http://thelifepile.com/2017/05/01/an-introduction-to-qatari-culture/a-family-in-traditional-qatari-clothing/
	Each clothing item serves a function - whether it is to protect us from certain elements like the weather, or to just make a statement.

30 minutes	The garment worn by the man and the child in the picture is the thobe, and that worn by the woman is an abaya. These items constitute the traditional clothing of the people of Qatar and many Arabian Gulf countries. They are characterized by loose fitting designs that help maintain a cool body temperature, which is important given the harsh desert climate of these countries.
	
	Can you name 4 other countries in the Arabian Gulf?
	
	We will use the thobe to explore measurements. Imagine that you are asked to sketch a design for a thobe for someone whose measurements are as follows (you can also use your own measurements):
	   ● 6 feet tall
	   ● 15 inches shoulder width
	   ● 35 inches chest width
	   ● 30 inch arm length
	
	Draw a sketch of a thobe keeping in mind the measurements above. You must:
	  - Convert inches to centimeters and write the measurements in both units. 1 inch = 2.54 centimeters
	  - Think about the parts you need to write measurements for
	  - Consider how tight or loose the design will be

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

<table>
<tr><td></td><td>

- Think about how you will scale measurements from the sketch to the measurements of a real person. How much bigger are the actual measurements compared to the sketch?
- Other things to consider when designing a sketch for a clothing item

Tips below:
- Write the measurements for the length, shoulders, chest, sleeve length according to the measurements provided in both centimeter (cm) and inches (")
- Make sure that the thobe is symmetrical
- Make sure that there is enough wiggle room by making designs a little taller and looser than the person's actual measurements
- Measure the length of the different parts of your sketch and write the ratio of your measurements to the actual measurements of the person for whom you are designing the thobe. For example, if the length of the sleeve for a child's shirt is 15 inches and in your sketch you draw a sleeve of length 5 inches, then the ratio would be 5:15 or 1:3 and the scale factor would be 3

</td></tr>
<tr><td>**5 minutes**</td><td>

Reflect:
- What did this teach you about designing clothes? Was it easy or hard?
- What additional measurements do you need to design different clothing items like pants, for example?
- How do you think the fabric or material you use to design clothes will affect the measurements?

Find the scale factor and actual measurements in the following scenario:
Ratio: 6:24
Scale factor: ?
Length of parts on sketch:
- Sleeve length: 4 ⅛ inches, actual length on mannequin: ?
- Shirt length: 6 ¾ inches, actual length on mannequin: ?
- Shoulder width: 3 ⅔ inches, actual length on mannequin: ?

</td></tr>
</table>

DAY 2

Today, you will create 2D versions of your designs.

Suggested Duration	Activity and Description

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

20 minutes	First come up with the concept for your piece. Reflect on why you want to design this item and answer the following questions in your notebook: - What is the clothing item? - What is the function of this item? On what occasions can it be worn? - Is it a traditional piece or a trendy item that makes a statement? - What inspired you to create this item? Where did you get the idea for it or its design?
15 minutes	Think about what makes clothes sustainable. Ask adults and research the meaning of sustainability and sustainable fashion or look at the information below: **sustainable fashion** /sə'stānəb(ə)l/ /'faSHən/ noun the design, production, and consumption of clothing in a manner that respects the planet and the people who make our clothes. **Eco-friendly:** refers to products that have been manufactured in a way that has not harmed the environment. **Circular Fashion:** refers to a cycle in which resources are continuously cycled in various forms, following a reuse and recycle loop. These resources, therefore, do not go to waste. **Ethical:** fashion that aims to reduce the negative impact on people, animals, and the planet. Producing an item of clothing involves design, labour, and materials. Ethical fashion is kind to the planet and people every step of the way: from seed to garment. **Fast Fashion:** used to describe clothing designs that move quickly from the catwalk to stores to meet new trends. Fast-Fashion is often created as cheaply and quickly as possible, meaning that clothes are often crafted with poor quality and garment workers are often subject to dangerous and unfair working conditions. **Sustainable:** capable of being sustained. Harvesting or using a resource without depleting or permanently damaging the resource. Meeting our own needs without compromising the ability of future generations to meet their own needs. **Upcycling:** Upcycling, also known as creative reuse, is the process of transforming by-products, waste materials, useless, or unwanted products into

EAA welcomes feedback on its projects in order to improve, please use this link:
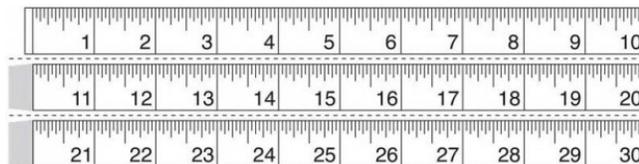https://forms.gle/LGAP9k17fMyJrKJN7

	new materials or products perceived to be of greater quality, such as artistic value or environmental value.
	Zero-waste: Zero Waste is a set of principles focused on waste prevention that encourages the redesign of resource life cycles so that all products are reused. The goal is for no trash to be sent to landfills, incinerators or the ocean.
	source: https://www.swapsociety.co/blogs/all/sustainable-fashion-dictionary
	Reflect:
	- 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 material will you use? What are some examples of sustainable material? You can Research. Suggestions: paper, natural fabrics like cotton, wool etc.
	- Look at the table you created on day 1. Do you think these clothing items are sustainable? Why or why not? Do any of the terms you just learned - fast fashion, upcycled etc. - apply to your clothes?
10 minutes	Imagine and draw the lifecycle of your product. How does it start (by using sustainable materials) and how long does it stay in use until is it discarded? What happens to it at the end? How can we discard it in a way that does not hurt the environment? Can we reuse it? An example is shown below: source: https://twitter.com/scgreen_home/status/494230403343847424

EAA welcomes feedback on its projects in order to improve, please use this link:
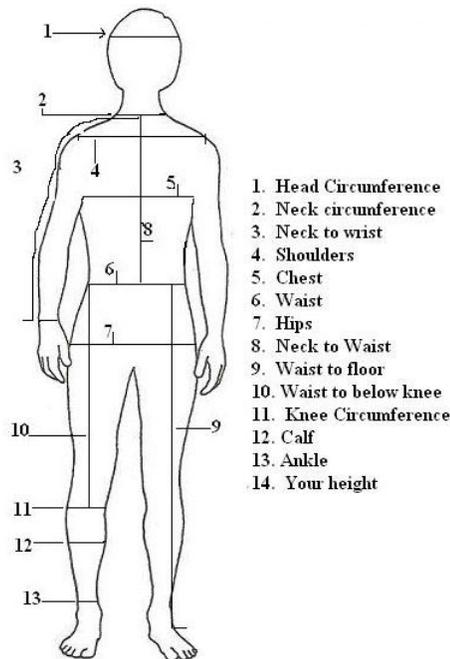https://forms.gle/LGAP9k17fMyJrKJN7

20 minutes	Next, Create a sketch of your design using scaled measurements:

Next, Create a sketch of your design using scaled measurements:
- Think about how you can take the measurements of a real person. What tools around you can you use?
- Come up with your own tool or technique or create a do-it-yourself paper measuring tape using a ruler or any small object that can be used to ensure an equal distance between the numbers. You can make several strips of measuring tape and glue them together to make a long measuring tape of about 150 cm

- Decide whom the design is for and take the measurements of that person (it could be a friend, sibling, or yourself). Measure the following for a dress: height, shoulders, arm length and circumference, chest. For skirts, measuring the waist is also important. For pants, measuring the waist, hips, and circumference of the thighs and legs is important.
- Draw a silhouette and write down the measurements in centimeters and inches for the relevant parts. An image has been provided below as an example:
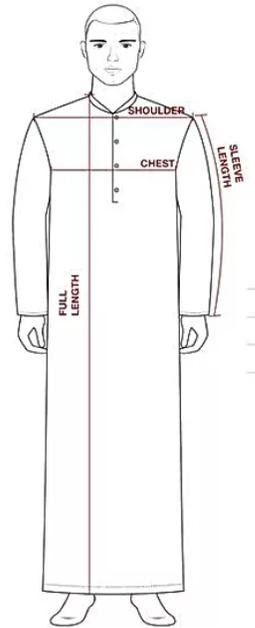

1. Head Circumference
2. Neck circumference
3. Neck to wrist
4. Shoulders
5. Chest
6. Waist
7. Hips
8. Neck to Waist
9. Waist to floor
10. Waist to below knee
11. Knee Circumference
12. Calf
13. Ankle
14. Your height

source: https://www.pinterest.com/pin/121034308713302645/

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

| | - Then scale the measurements down to reasonable numbers that you can use to sketch your design. For example, a scale factor of 10 can be used so that if the actual measurement is 150 cm for height, on the sketch it is 15 cm. |
| | - Sketch your clothing item according to the scaled down measurement and write the scale ratio and add designs to the clothing item. Example: |

Conduct an investigation in your home or neighborhood to identify the degree to which sustainable practices are being applied:
- You can create a survey and share it with members of your family and community. It can include questions on how they buy and discard clothes (and how frequently that is done), whether they repurpose old clothes etc.
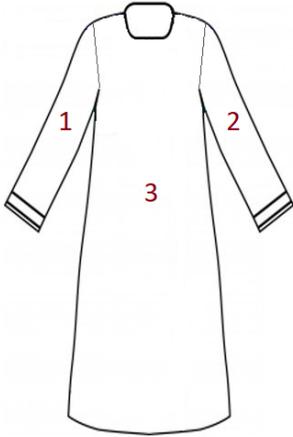- Collect the surveys and analyze and share the findings with your family or class

DAY 3

Today you will bring your designs to life!

Suggested Duration	Activity and Description

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

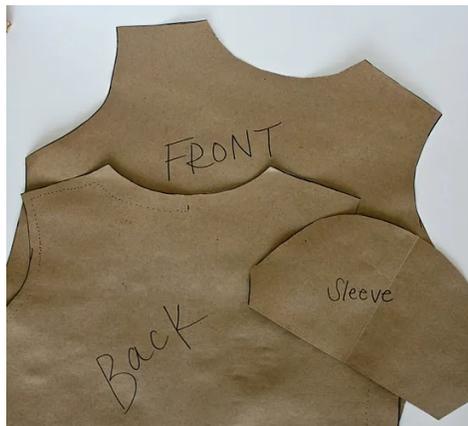|	
20 minutes	Explore your environment to identify material you can use to create your clothes. You should prioritize using any previously used clothes or material you discovered on day 1 (this is called upcycling) - Try to repurpose your existing clothes for this or use scrap fabric from old sheets, towels, rags etc. that are not being used. You can also ask your parents, siblings or neighbors for their old clothes. These must be washed and dried before use. - You can instead use paper or napkins if no unwanted clothes or materials are available. If you choose to do this, you will create a model of your design for a doll so that you do not waste large quantities of these materials - Think about the properties of the material and what makes it sustainable and note down observations in a notebook. For example: cotton is a natural fabric that can disintegrate naturally without harming plants and animals when discarded. It is also durable and can last several years if maintained well.
40 minutes	Once you have decided on the material, the next step is to create the different parts of the item in order to then bring them together as one piece of clothing. How do you think this is done (for example, for a t-shirt)? What are the different parts and how are they brought together? Example of a thobe, which is made of the following three parts: After a tailor makes each part separately, they are then sewn together to make a thobe. Divide the item you sketched into different parts to be made separately as shown above. Next, think about what is needed to create each piece:

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

- Imagine what each piece looks like as a piece of cloth or paper (before it becomes the final piece as we know it). For example, notice how the sleeves looked before being attached to the bodice of the shirt below:

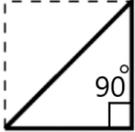source: https://www.itsalwaysautumn.com/free-raglan-tee-shirt-sewing-pattern-womens-size-large.html

source: https://makezine.com/2011/07/23/how-to-make_your_own_sewing_pa/

- Draw the outline for each part as shown in the examples above and cut out the individual parts
- If you are using a large piece of fabric, you can place an old t-shirt, dress etc. on the fabric and trace its outline to get an estimate of your measurements
- To create sleeves, we need to know the circumference of the arms as well as the length of the arms. Use your measuring tape to find out these details or use your old t-shirt or dress for an estimate.
- To create a v-neck or collar, ensure that the opening of the neck area forms a 90 degree angle in order to have enough neck room. In order to get a 90 degree angle, you can cut a piece of paper so that it makes a perfect square (equal sides). Then fold it in half diagonally as shown

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

	below and use the perpendicular lines (lines that intersect at a 90 degree angle) to create your v-neck or v-shaped collar: Original paper Folded right-down - Remember, depending on how elastic your material is, you may need to make each piece bigger than the actual measurements so the person wearing it is able to move freely. - If you are using paper or tissue paper and making the item for a doll, remember to use smaller measurements Next, put all the pieces together by sewing, gluing or taping them depending on the material used. You can add any final designs or touches.

DAY 4

Today, you will determine the price of your item and present your final design.

Suggested Duration	Activity and Description
40 minutes	Think about how you can market and sell your product. Selling clothing items for money is a great way to ensure that your design business is sustainable. - First, determine the total cost of producing the item. This will include the cost of the materials and any help you received making it. For example, if 5 meters of cloth used cost $0.23 per meter, the total cost of materials is $1.15. Let's say the cost of the sewing equipment used (needle, thread, buttons etc.) was $5 and you paid your brother $2.5 per hour for 10 hours to help you take measurements. The total cost is then 1.15 + 5 + (2.5*10) = $31.15 - Find the cost per unit (meter, cm etc.) of your fabric by asking a local tailor or an adult like your parents, neighbors etc., or by looking at price tags in your local market.

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

<table>
<tr>
<td></td>
<td>

- After you calculate the total cost, add a markup. 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. When you divide the profit by the cost, you get the markup, which is how much we are making compared to the cost. If you sell your thobe for $100 and it cost you $60 to make it, your profit is 100 - 60 = 40 or 40/100 * 100 = 40%, but your markup is profit/cost *100 = 40/60 * 100 = 66.67%

$$markup = \frac{profit}{cost * 100\%}$$

- Using the formula above, add a markup on your total cost so that you are making $5 profit. What is the selling price? What do you think is an ethical markup on the cost?
- On a poster, write the following details:
    - Item description (what it is, what it is used for, how it was made, what makes it sustainable)
    - Price - include markup expressed as a percentage
    - Price in at least two currencies. Find the exchange rates for today by asking an adult, looking at the newspaper etc. For example, 1 Qatari Riyal = 3.64 US Dollars

</td>
</tr>
<tr>
<td>20 minutes</td>
<td>

Present your product and describe:
- The clothing item, its concept, uses and sustainability of both the product and your business as a designer
- The product life cycle
- The cost and price of making the product
- Your reflections and one lesson you learned about fashion and sustainability (what does this mean for your shopping habits and how does this influence your relationship to the clothes you currently own)
- One fashion-related change that the you and/or your family will commit to in order to reduce wasteful habits

Parents/classmates should provide you with feedback on the product. Make changes to the design, concept or price based on feedback received to improve your product. You can also make a poster to market and promote your product and share it with the family.

</td>
</tr>
</table>

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7

ASSESSMENT CRITERIA

- Critical thinking and creativity displayed in the identification of the concept and function of the clothing item and selection of the material
- Accurate measurements and scaling. Correct identification of the ratios and scaling factors
- Critical thinking applied in ensuring sustainability of the item and developing the life cycle
- Creativity of the design of the clothing item

ADDITIONAL ENRICHMENT ACTIVITIES

- Learners can explore the importance of repairing clothes instead of purchasing new ones and can attempt to repurpose or repair an old piece of clothing to appreciate the benefit of this practice on the environment as well as on household budgets.
- Learners can visit a local landfill or talk to local waste management workers/companies to understand and report on the prevalence of clothes in landfills or the ways through which fast fashion impacts the environment

MODIFICATIONS FOR SIMPLIFICATION

- Learners can eliminate the markup portion and focus on profit margins
- Learners can limit the final product to a 2-D sketch of the product if materials are unavailable

EAA welcomes feedback on its projects in order to improve, please use this link:
https://forms.gle/LGAP9k17fMyJrKJN7