	Plastic	Paper	Ceramic	Glass	Rubber
What natural resource(s) is it made from?					
How is/are the natural(s) resource extracted?					
How is the synthetic material made?					
How is the synthetic product disposed of?					

Mission Assignment: Explain how synthetic materials are made from natural resources

KS3-17-07

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Mission Assignment: Explain how synthetic materials are made from natural resources

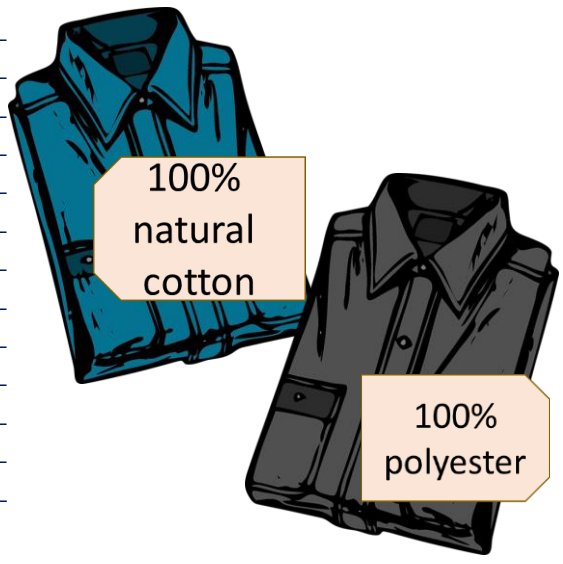
KS3-17-07

1. Which of your three items has the lowest impact on the environment? Explain your idea.

2. How could this item be made more sustainably or are there alternatives which are less damaging to the environment?

3. If something is damaging to the environment, how does this affect societies and people?

4. Challenge: Compare how the two shirts were made and suggest how else they may differ, i.e. texture, cost, quality.



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Mission Assignment: Explain how synthetic materials are made from natural resources

ANSWERS

KS3-17-07

	What natural resource(s) is it made from?	How is/are the natural(s) resource extracted?	How is the synthetic material made?	How is the synthetic product disposed of?
Rubber	Rubber trees	Cuts are made in the bark and rubber sap drained out	Heated and chemicals added / processed	Can be recycled but often ends up in landfill
Glass	Sand, sodium carbonate and limestone	Sand from beaches or quarries. Sodium carbonate and limestone are extracted from underground mines	Raw materials melted together and then shaped and cooled into final form	Recycled or landfill
Ceramic	Clay	Mined from the Earth	Wet clay is shaped and then fired in a kiln.	Long lasting so little disposed of but sent to landfill
Paper	Wood	Trees are harvested from forests and then processed into wood pulp	The wood pulp is presses and dried into thin sheets	Recycled, composted or landfill
Plastic	Crude oil	Drilling deep underground and pumping up oil	By processing into monomers (small molecules) that are then joined together to form a long chain	Recycled, incinerated or landfill

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Mission Assignment: Explain how synthetic materials are made from natural resources ANSWERS

KS3-17-07

1. Which of your three items has the lowest impact on the environment? Explain your idea.

Students' own ideas but in general, materials that are sustainably sourced, manufactured using low-energy and low-toxicity processes, and can be easily recycled or composted are likely to have the lowest impact on the environment.

2. How could this item be made more sustainably or are there alternatives which are less damaging to the environment?

Students' own answers - for example, follow the principles of refuse, reduce, reuse, and recycle. This means reducing the amount of waste generated in the production and use of the item, finding ways to reuse the item (such as through repair or repurposing), and recycling the item at the end of its life. By doing so, the amount of raw materials needed to produce new items is reduced, and less waste ends up in landfills or the environment. Instead of using plastic, which is derived from non-renewable fossil fuels and can take hundreds of years to decompose, items can be made from bioplastics, which are derived from renewable resources such as cornstarch or sugarcane.

3. If something is damaging to the environment, how does this affect societies and people?

- Public Health: For example, air and water pollution can lead to respiratory and other health problems.
- Economic Impacts: Damage to natural resources such as fisheries or forests can lead to lost income and jobs.
- Social Disruption: Climate change can lead to displacement of people due to sea-level rise, extreme weather events, or other impacts, which can in turn lead to social unrest, conflict, and migration.

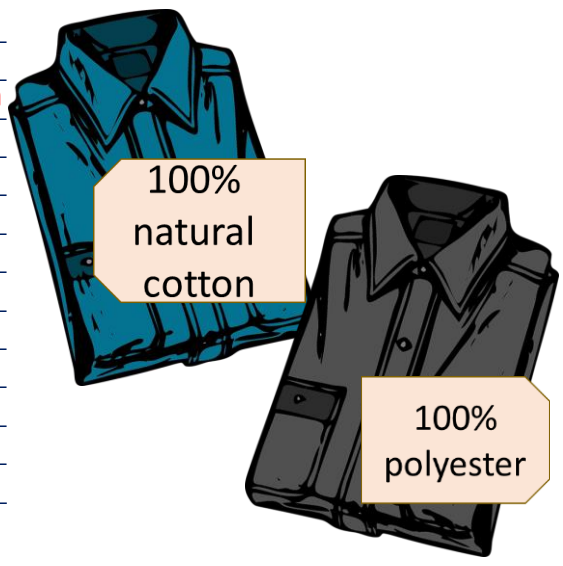
4. Challenge: Compare how the two shirts were made and suggest how else they may differ, i.e. texture, cost, quality.

Cotton shirt, made by cotton plants grown on farms which are then harvested. For the polyester shirt, the fabric is made from synthetic fibres that are made from crude oil. The fibres are created through a process of polymerisation. The resulting fibres for both shirts are then spun into yarn, which is woven or knitted into fabric.

Texture: Cotton has a softer, more natural feel than polyester, which can feel stiff or plastic-like.

Cost: Cotton is generally more expensive than polyester, due to the higher cost of raw materials and the more labour-intensive production process.

Quality: Cotton is often considered to be a higher-quality fabric than polyester, as it is more breathable and comfortable to wear. However, polyester is more durable and resistant to wrinkles and stains.



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