Design and Technology Knowledge Organiser

Y8

Keyword	Definition	Picture code
Environment	The air, water or land in or on which people, animals and plants live.	
Sustainability	The level to which resources can be used without them becoming unavailable in the future.	
Economy	How money is made, organised and used in society.	
Social	Relating to society and living together in an organised way	
Carbon footprint	A measurement of the amount of carbon dioxide produced by the activities of a person, company etc.	

What is Sustainability?

Sustainability is the idea that humans must interact with the environment in a way that ensures there will be enough resources left for future generations

Product lifecycle

3 Pillars of Sustainability

Environmental

Relating to the natural world and the impact of human activity on its condition.

Social

Relating to society or an organization. Living together in an organised way.

Economical

To make sure to be careful not to waste money or resources.

YouTube

What is sustainability?

Sustainability Explained

Packaging symbols explained

The 'Mobius Loop' shows it can be recycled

Producer contributes to a packaging recovery scheme

Widely Recycled

Widely recycled by 75% or more Local Authorities (LAs)

The 6R's of sustainability

Designers must consider the impact that their products will have on society. Apply the 6 R's of sustainability when designing a product.

Recycle

RECYCLE

- Can the materials be recycled?
- Is the product made from recycled materials?

Refuse

REFUSE

- Do we need all this excess packaging?
- Is the product necessary?

Repair

REPAIR

- Is the product easy to repair?
- Is there the possibility the product is able to be repaired rather than thrown away?

Rethink

RETHINK

- Is there a better way to solve this problem that is less damaging to the environment?
- Are there alternative materials or design options that are more sustainable?

Reduce

REDUCE

- Can we reduce the amount of material we are using?
- Can the use of unsustainable materials be reduced or not used at all?
- Can reduce the distance it has travelled?

Reuse

REUSE

- Is there another way this product can be used?
- Can parts of the product be reused in a different product

Environmental, social and economic challenges that influence designing and making

When a product is designing, the designer doesn't just think about how it will work. They may have to alter (change) the design due to the effect it has on the environment, our society or the economy.

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Polymers

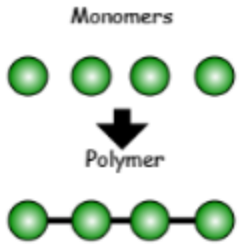
Polymers can be split into 2 subcategories; Thermoforming and thermosetting.

Plastics come from natural materials like cellulose, coal, crude oil and natural gases.

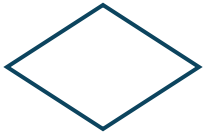


Greek Meaning

Poly – Many
Meros - Parts



Flow Diagrams

Symbol	Name of symbol	Typical use in a flow chart
	Start/ End	Marks the start or end point of a program or sequence
	Decision	These are yes or no questions which determine the next step of the process
	Process	Determines the action required

Plastic Recycling Symbols

1. **PET or PETE** – Polyethylene Terephthalate – Plastic bottles, fruit and veg containers
2. **HDPE** – High-Density Polyethylene – Milk bottles, shampoo bottles, reusable plates and cups
3. **PVC or V** – Polyvinyl Chloride or Vinyl – Window frames, pipes, blister packs for pills
4. **LDPE** – Low-Density Polyethylene – Plastic bags, cling film, food packaging film
5. **PP** – Polypropylene – Bottle caps, yoghurt pots, hard plastic toys
6. **PS** – Polystyrene – Foam packaging, disposable cups and plates, takeaway containers
7. **OTHER** – Miscellaneous Plastics – DVDs, crisp packets, sunglasses, nylon tights

Key points - Polymers

- Thermoforming polymers can be reshaped and recycled. Thermosetting polymers cannot.
- Polymers are very long molecules made from linking monomers
- Thermoforming polymers are also known as thermoplastics.
- Most polymers are **synthetic.** They are manufactured from carbon-based fossil fuels such as oil.
- Most synthetic polymers are made from fossil fuels, a **non-renewable resource.**

Thermoforming

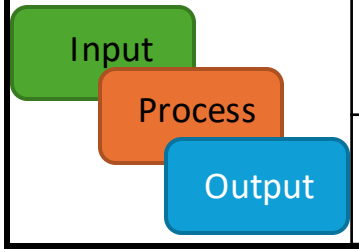
- Can be heated and shaped many times.
- Will soften when heated and can be shaped when hot.
- The plastic will harden when cooled

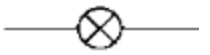
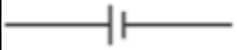
Thermosetting

- Can **only be heated and shaped once**.
- If re-heated they cannot soften as polymer chains are interlinked.

Electronic systems

All systems have an input, a process and an output know as a 'block'
A signal (e.g electricity) passes from one block to the next.
Each block changes the signal in some way.



Component	Symbol
Bulb	
Cell	
Resistor	
Switch