



DESIGN & TECHNOLOGY

Year 7



Collecting data, questions and some independent research.
All should be attempted.



Comparing and applying research.
Most should be attempted.



Advanced questions, analysing, using results and in depth research.
You may find these hard.

Name:

Level:

See back cover
for info.

Due:



Sustainable Design

When we talk about how sustainable a product is we use the 6 R's. Designers try to consider these when creating products.

Task 1: 🍌

Research the definition for each of the R's and give examples of questions that a designer could think about.

An easy way to remember the 6 R's is PC-DUFT:



- Re **P**air
- Re **C**ycle
- Re **D**uce
- Re **U**se
- Re **F**use
- Re **T**hink

The Six R's

Repair	
Recycle	
Reduce	
Reuse	Could the product have another use? Could its parts be used in other products?
Refuse	
Rethink	

Task 2: 🍌

Using plastic can be bad for the environment, but so can cutting down trees in the Amazon rainforest. When we make sustainable design we consider where materials are sourced. Find out what these logos are and what they mean. They can relate to wood, paper and other tree based materials.





Which Plastic?

Our generation will be known as the plastic generation because we use a lot of plastic. It's used in clothing, packaging and chairs just to mention a few. Most plastic comes from oil, which is a finite fossil fuel. It also has a code to identify what type of plastic it is.

Task 3:

Research and complete the table of plastics

Plastic Name	Where its is often used	Is it easy to recycle?	
High Density Poly Ethylene			
	<ul style="list-style-type: none"> • Protective Packaging • Takeaway trays • Insulation 	Yes - but it is hard to recycle and costs a lot.	

Task 4:

Food containers like single use plastic (PETE) pasta pots are good and bad. Explain the advantages and disadvantages of using them.



How Do We Improve Products And Their Impact?

A life cycle analysis is when a company looks at a particular product they make and evaluate it from the very first stage, all the way to disposal or recycling. One reason is to see if they can make their product more environmentally friendly.

Task 5:

Research a product life-cycle analysis and add labels to each step of the diagram in the centre of the page.

Tip: Each company will use a slightly different version so find ones that are closest to this version.

Good Design Changes

Dyson looked at the life-cycle steps of conventional vacuum cleaners. They filled bags with dirt and dust sucked up. Replacements had to be bought when they were full and they were thrown away. Each bag made the other company money but led to more waste. Dyson made a vacuum cleaner that didn't need a bag.

dyson

Task 7:

How is the Dyson vacuum cleaner better for the environment than a conventional vacuum cleaner?

Task 8:

Each individual part of a Dyson can be replaced if it is damaged. This is also great for the environment as there is less waste and the product can be repaired. Explain why you think making this product sustainable has made people want to buy the product.



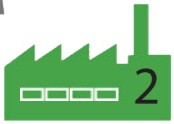


Task 6:

Now you have identified each step in the life cycle analysis, explain how designers could rethink a product at each stage. For example: If the product was a wooden lamp, they could analyse if the wood is sourced sustainably, or if they could use a type of wood that is grown closer to the factory.

1

2



3

YCLE



4

Companies could sell direct to customers. If bought direct they could supply products in plain card boxes to avoid printing and laminating each products box, making them more recyclable.

5

6



Traffic alert!

It is becoming more common to find products that are flat packed for customers to assemble themselves. These two lampshades are similar sizes when they are hanging but one of them is pre-assembled. The other needs to be built by the customer.

Standard Lampshade



Package
Dimensions
46x46x30cm

DIY Lampshade



Package
Dimensions
20x20x14cm

Task 9:

Give advantages and disadvantages of the two lampshade types.

	Standard Lampshade	Build It Yourself Lampshade
Advantages		
Disadvantages		



Task 10:

Explain why build it yourself products like the flat-pack lampshade can contribute to less traffic than conventional lampshades. 🐾

To make your answer stronger you could reference packaging dimensions with some calculations showing what could fit into a standard shipping container (39m³). 🐾

Where Does Fuel & Energy Come From?

Everyday you use energy at home, at school, and even on the go with rechargeable phones and MP3 players. But where does this energy come from?

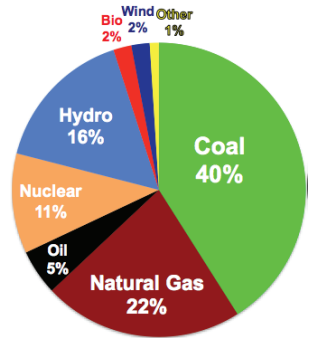
Task 11: 🐾

Research and explain what is meant by the terms:

Fossil fuels _____

Renewable energy _____

Global Electricity Supply



Is All Energy Good Energy?

Task 12: 🐾

Official figures from June 2017 show that 27.7% of all energy in the UK comes from renewable resources and it continues to rise. Why is this considered a good thing?



Task 13:

The UK government will not allow new Petrol or Diesel cars to be sold in the year 2040 onward. Car manufacturers are already starting to sell more electric cars. Even when cars are powered by electricity, energy has to be generated to power them. Explain why it will be better to have electric cars:

Companies are making products from more sustainable materials, making products repairable to avoid landfill, using smaller packaging for less transport and making them use more sustainable energy to list a few sustainable changes. But ultimately each and every one of us have an impact on the environment and sustainability issues in the world.

What ways could you reduce your impact on the environment ?

Your level According To The School Reporting Policy

- O Outstanding - All questions attempted with strong answers. A good effort.
- A Above Expected - Most questions attempted. Working at or above target grade.
- E Expected - Appropriate questions answered. Working towards target grade.
- B Below Expected - Not enough appropriate questions attempted or poor effort.
- C Concerns - Work is incomplete or very poor effort.