Design & Technology
Year 7
CAD/CAM Project

Study to Succeed

KNOW MORE | UNDERSTAND MORE | REMEMBER MORE

What is a product?

What were the last few products you bought?

An article or substance that is manufactured for refined for sale.

A is for **Aesthetics**

C is for **Cost**

C is for **Customer**

E is for **Environment**

S is for **Size**

S is for **Safety**

F is for **Function**

M is for **Material**

Aesthetics means **what does the product look like?**
What is the: Colour? Shape? Texture? Pattern? Appearance? Feel? Weight? Style?

Cost means **how much does the product cost to buy?**
How much does it: Cost to buy? Cost to make?
How much do the different materials cost? Is it good value?

Customer means **who will buy or use your product?**
Who will buy your product? Who will use your product?
What is their: Age? Gender?
What are their: Likes? Dislikes? Needs? Preferences?

Environment means **will the product affect the environment?**
Is the product: Recyclable? Reuseable? Repairable? Sustainable?
Environmentally friendly? Bad for the environment?
6R's of Design: Recycle / Reuse / Repair / Rethink / Reduce / Refuse

Size means **how big or small is the product?**
What is the size of the product in millimeters (mm)? Is this the same size as similar products? Is it comfortable to use? Does it fit?
Would it be improved if it was bigger or smaller?

Safety means **how safe is the product when it is used?**
Will it be safe for the customer to use? Could they hurt themselves?
What's the correct and safest way to use the product? What are the risks?

Function means **how does the product work?**
What is the products job and role? What is it needed for? How well does it work? How could it be improved? Why is it used this way?

Material means **what is the product made out of?**
What materials is the product made from? Why were these materials used? Would a different material be better? How was the product made? What manufacturing techniques were used?

PLASTIC (Polymer)

Thermosetting

Thermosetting plastics once heated and formed to a shape, **cannot be reheated and reformed**.

Because of this they tend to be difficult to recycle.

Thermoplastic

Thermoplastics once heated and formed to a shape, **can be reheated and reshaped**. This means they are recyclable.

However, every time they are reshaped, the quality of the thermoplastic tends to be reduced.

PLASTIC

Thermosetting plastic

Thermosetting plastics once heated and formed to a shape, **cannot be reheated and reformed**. Consequently, they tend to be difficult to recycle.

Examples of thermosetting plastics include:

urea formaldehyde

Melamine Formaldehyde

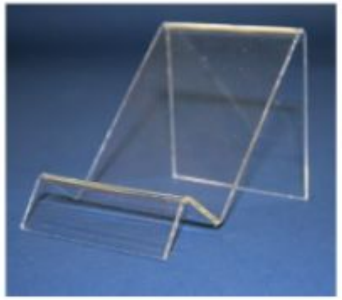
Why is it important that these type of plastics do not change shape when heated?

Thermoplastic

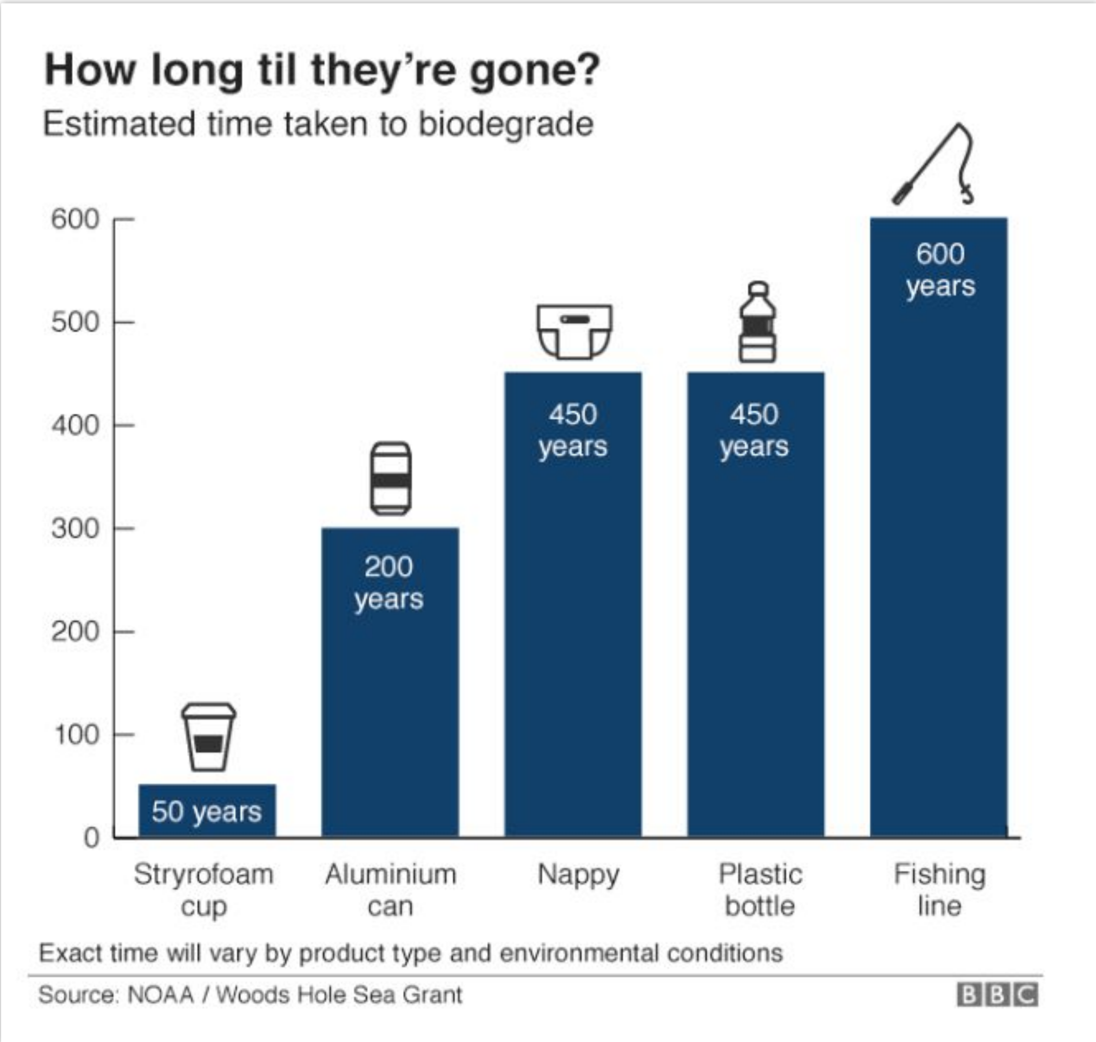
Thermoplastics once heated and formed to a shape, **can be reheated and reshaped**. Every time they are reshaped, the quality of the thermoplastic tends to be reduced.
They are recyclable

Polyethylene

Acrylic



PLASTIC



Where does plastic come from?

https://www.youtube.com/watch?v=IwdUwffecsM Stop at 2min https://www.youtube.com/watch?v=cwTDvqaqPIM

What are the environmental effects of plastic?

https://www.youtube.com/watch?v=1qT-rOXB6NI 2 min 57 sec

Recycled Plastic Bottles You-Tube Clip

1- How many bottle are thrown away each year?

____

2- What can they be turned in to?

____

3- Where does it all start?

____

4- What is the first stage?

____

5- Stretch Question – Why

____

6- Where is it then taken?

____

7- Stretch Question – Why

____

8- How are the coloured caps removed?

____

9- Hany many hours does it take to dry the plastic?

____

10- What type of material does it make?

____

11- What is your jumper made from?

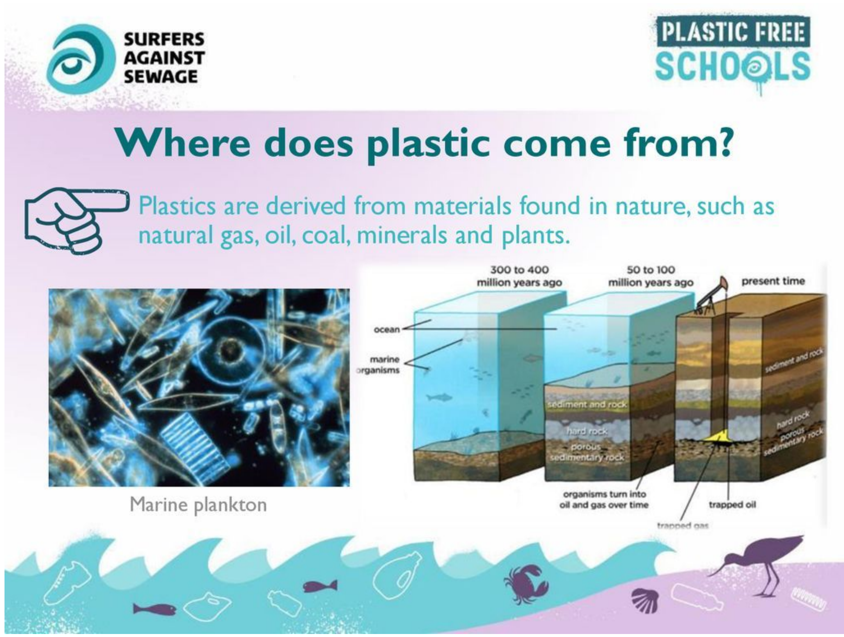
____

http://www.youtube.com/watch?v=zyF9MxlcItw

Where does plastic come from

Most plastics are made from chemicals that come from **petroleum** (oil), natural gas, or coal. Heating these chemicals causes them to break down into **molecules**. (Molecules are groups of two or more atoms, which are the tiny building blocks of everything.) Scientists then join these molecules into chains. These chains make up plastics. Different combinations of molecules form different kinds of plastic.

Plastics can be made into almost any shape by heating them at a high temperature. The heat softens the plastic, which can then be poured into a mold. As the softened plastic cools, it hardens. When reheated, some types of plastic will soften again. The plastic can then be made into new shapes. Other types of plastic will stay hard even when reheated.



What's the problem with plastic?

Plastic is an **amazing man-made material** used to make all kinds of important things. **Bike helmets**, **car airbags** and many **medical supplies** made with plastic save lives, and plastic water bottles can bring **clean drinking water** to people who don't have it.

The problem is that **most of us use more plastic than we need to**, and ***half* of the plastic we produce is designed to be used just once** and chucked away. This so-called '**single-use plastic**' is used to make all kinds of items, such as shopping bags, straws, food wrappers and various packaging . And because plastic takes ***over 400 years* to decompose** (break down), it stays in the natural world, causing damage, for a very long time.

Scientists think that a whopping **8.8 million tonnes of plastic end up in the ocean every year**. That's the same as stacking five plastic shopping bags of rubbish on top of each other on ***every metre of coastline*** in the world! But how does it all get there?

One way is through '**ocean dumping**', when people illegally tip large amounts of waste directly into the sea. But not all plastic in the ocean is dumped there on purpose. In fact, around **80% plastic in the sea comes from the land**....

Much of it is **blown into rivers, streams and sewers** from overflowing rubbish bins or landfill sites, and from streets and parks where people litter. Another way is through our drains. Lots of our clothes contain tiny plastic fibres, called **microfibres,** which enter our water ways from washing machines when people do their laundry. And believe it or not, toiletries such as toothpaste and face wash can contain minuscule bits of plastic, too! These **"microbeads"** get flushed down the drain and, eventually, into the sea ocean. Thankfully, the UK government has banned toiletries containing microbeads, but lots of other countries still use them.

Animals and birds can get trapped, tangled and even strangled by all kinds of plastic waste, such as discarded fishing nets and six-pack rings from drinks cans. They also **mistake small bits of plastic, such as bottle tops and wrappers, for food** and gobble them up – leaving no room in their swollen tummies for *real* food. And the problem doesn't end there…

When plastic breaks down in the ocean, **it doesn't break down *completely* –** it just gets smaller and ends up being swallowed by fish and other marine animals and birds. The tiny particles of plastic absorb **toxic industrial chemicals** which, when eaten by fish, are absorbed into their tissues and are eventually eaten by humans.

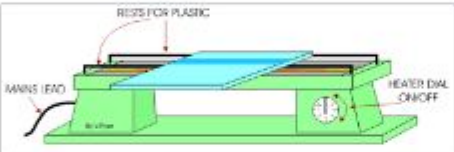
What can we do about plastic pollution?

By working together, **our choices can help clean up the ocean** – and make it a safe place for our amazing marine life!

Look at how much single-use plastic your family uses by filling out a plastic journal for a week – then talk about what you can do to use less! Be sure to drink from **reusable water bottles**, use **multi-use shopping bags** and ask your parents to choose **loose fruit and veg**, rather than groceries wrapped in layers of plastic. And of course, **recycle all the plastic that you can!**

You can also help keep our seasides clean by going along to an organised **beach cleanup**. It's fun, and we promise you'll feel really proud when you see what a difference you've made!

Vacuum Former



Strip Heater

Laser Cutter

Boldon School
INNOVATE: FOCUS: ACHIEVE

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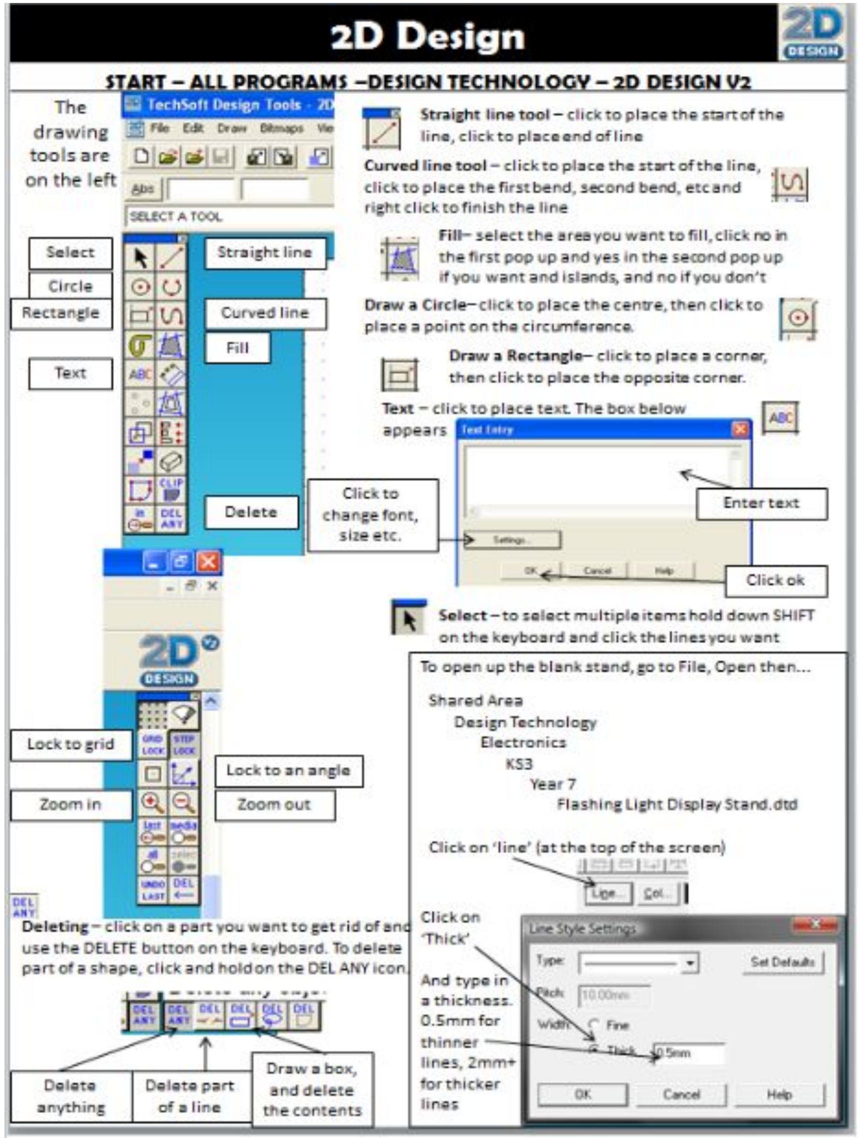

2D Design

START – ALL PROGRAMS –DESIGN TECHNOLOGY – 2D DESIGN V2

The drawing tools are on the left

Select
Circle
Rectangle
Text
Straight line
Curved line
Fill
Delete

Straight line tool – click to place the start of the line, click to place end of line

Curved line tool – click to place the start of the line, click to place the first bend, second bend, etc and right click to finish the line

Fill– select the area you want to fill, click no in the first pop up and yes in the second pop up if you want and islands, and no if you don't

Draw a Circle– click to place the centre, then click to place a point on the circumference.

Draw a Rectangle– click to place a corner, then click to place the opposite corner.

Text – click to place text. The box below appears

Click to change font, size etc.
Enter text
Click ok

Select – to select multiple items hold down SHIFT on the keyboard and click the lines you want

Lock to grid
Lock to an angle
Zoom in
Zoom out

Deleting – click on a part you want to get rid of and use the DELETE button on the keyboard. To delete part of a shape, click and hold on the DEL ANY icon.

Delete anything
Delete part of a line
Draw a box, and delete the contents

To open up the blank stand, go to File, Open then...

Shared Area
Design Technology
Electronics
KS3
Year 7
Flashing Light Display Stand.dtd

Click on 'line' (at the top of the screen)

Click on 'Thick'

And type in a thickness. 0.5mm for thinner lines, 2mm+ for thicker lines