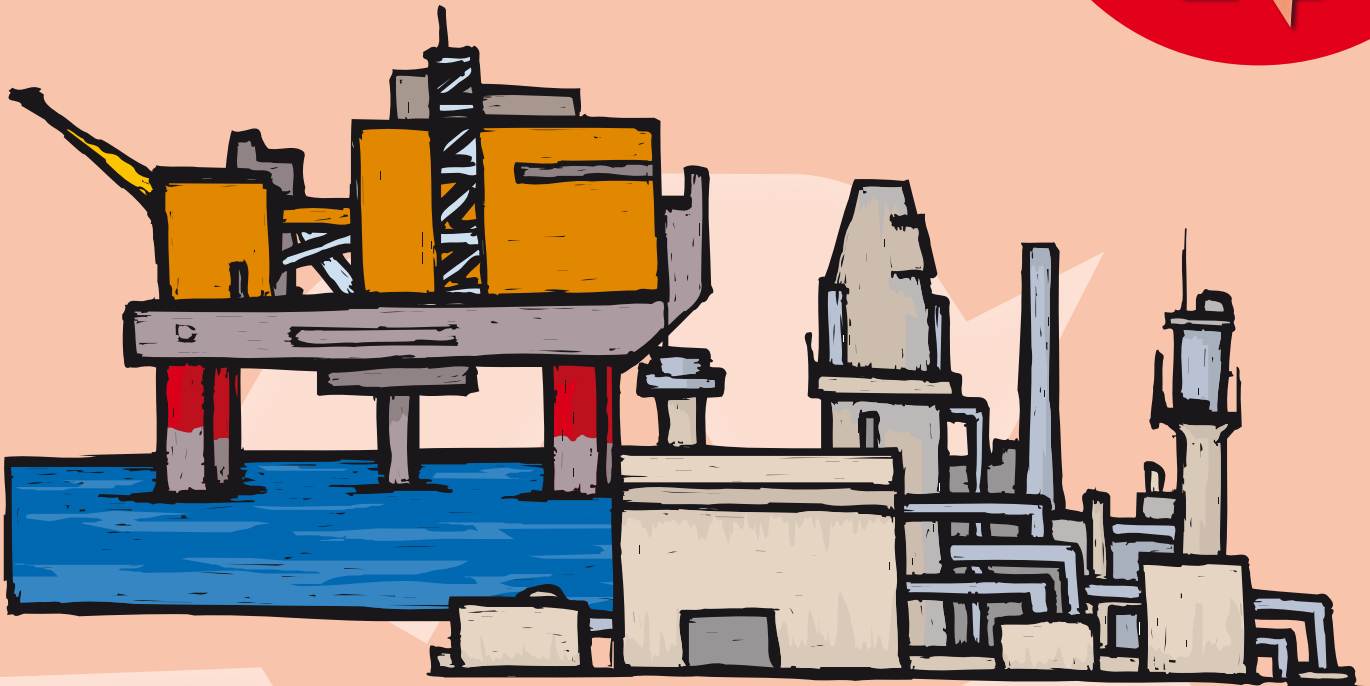


Plastics



How is plastic made?

- Crude oil (oil that has not been processed) is pumped out of the ground at oilfields and is then taken to a refinery
- Oil is made up of lots of different types of hydrocarbons and these have to be separated. This is done in a 'fractional distillation column', which allows the different oil products to be captured at different temperatures as the oil is heated up
- The crude oil is refined to make ethane and propane as well as lots of other oils including fuel for cars
- The ethane and propane are heated to high temperatures in furnaces to turn them into ethylene and propylene. This is called 'cracking'
- The ethylene or propylene is put in a reactor with a catalyst to trigger a reaction, this makes a 'fluff', which is like washing powder
- The 'fluff' is put in a giant blender with other ingredients to create a polymer
- The polymer is fed into an extruder where it is melted ¹

- The melted plastic is cooled and fed into a machine called a pelletiser that cuts the plastic into small pellets ¹
- The pellets are then shipped to the manufacturers
- The manufacturers then use these pellets to make plastic products

Identifying the different types of plastics

- There are seven different types of plastics. Most of the plastics have a symbol on them to identify what they are made from (polymer type). This is normally either a triangle with a number in it or a triangle with some letters in it
- PET bottles are usually clear or with a slight colour tint. There is small dimple at the base of the bottle. Fizzy drinks bottles have a flowery shape to the base
- HDPE bottles are opaque. HDPE bottles cannot cope with pressures so they are used for non-fizzy liquids. They have a line running all the way round the edge of the bottle where the two halves have been pushed together

Plastic recycling

Types of plastic

No.		Type of plastic	Uses
1	PET	Polyethylene terephthalate	Fizzy drinks bottles, meal trays
2	HDPE	High-density polyethylene	Milk bottles, washing-up liquid bottles
3	PVC	Polyvinyl chloride	Food trays, cling film, squash, mineral water & shampoo bottles
4	LDPE	Low-density polyethylene	Carrier bags, bin liners
5	PP	Polypropylene	Margarine tubs, microwaveable meal trays
6	PS	Polystyrene	Yoghurt pots, foam trays, burger boxes, egg cartons, plastic cutlery, vending cups and protective packaging for electronic goods
7	OTHER	What does not fall into the above categories e.g. melamine	Melamine is used for plastic cups and plates

Why have different types of plastic?

- Each polymers produces plastic with different qualities, which makes plastic suitable for a wide range of uses

Recycling plastic

- Many council kerbside collections now accept plastic bottles for recycling
- Plastic banks also accept plastic bottles for recycling. For information on recycling banks and collections in your local area check the www.recyclenow.org.uk website
- In Leicestershire only plastic bottles can be recycled at present. These are mainly PET and HDPE, polymer types 1 and 2. This is because items like margarine tubs and food containers are often made from a blend of polymer types. It is difficult to find markets for other types of plastics due to contamination issues
- When plastic bottles are recycled the different types of plastic are separated
- The bottles are pierced to let the air out and then squashed together. These are then baled (made into compacted cubes) using wire so that they stay compressed

- The bottles are then transported to a mechanical recycling plant where they are shredded and granulated
- The PET is made into PET flake. These are little flakes of plastic
- The PET flakes are then sent to a factory where the flakes are used to make fibres. This fibre can be used to make items like fleece clothing, duvets, pillows and fillings for anoraks
- The HDPE is made into HDPE flakes or pellets. These are then sent to manufacturers where they are made into drainage pipes, wheelie bins, compost bins, kerbside collection boxes or the plastic wood material which can be used to make items like garden furniture



Plastic Facts

- The first plastic was made from the plant material cellulose in 1869 by John Wesley Hyatt, an American printer and inventor ²
- One tonne of plastics is equivalent to 120,000 carrier bags ³
- Plastics use up to 8% of the world's crude oil production ⁴
- 17.5 billion plastic bags are handed out by supermarkets and shops each year, that is 290 bags for every person in the UK ³
- Plastics do not break down so when they are thrown away they simply sit there in the landfill site
- 25 recycled PET bottles can be used to make a fleece jacket ³
- 9.1 billion plastic bottles were thrown away in 2002 and 360 million bottles were recycled ⁴
- 40% less fuel is used transporting drinks in plastic bottles compared with drinks in glass bottles ⁴



Weblinks

- www.wasteonline.org.uk/resources/InformationSheets/Plastics.htm
 - WasteWatch
 - Plastics information sheet
- www.teachingtools.com
 - Slinky – How are plastics made?
 - Plastics processing methods
 - Petroleum to plastics
- www.recycle-more.co.uk
 - Useful statistics
 - Identifying different types of plastics and polymers
- www.recoup.org
 - Plastics Recycling Resource Library
 - Identifying plastic
- www.petcore.org
 - The cycle of PET
 - Video clips

References

- ¹ www.teachingtools.com/Slinky/plastics.html
- ² www.teachingtools.com
- ³ www.wasteonline.org.uk
- ⁴ www.recycle-more.co.uk