**Plastics**

* The word comes from Greek word “plastikos” meaning capable of being shaped or moulded
* Main ingredient polymers
* All plastics are based on carbon, most plastics are derived from fossil fuel-based chemicals (natural gas or oil)
* Properties of plastics:
  + Pros:
    - Lightweight, flexible and durable material
    - Non-corrosive material, easily moulded
    - Safe and tough packaging material
    - Strong, non-reactive to air and water
    - Resistant to heat, chemicals, oil and grease
    - Low processing cost
    - Good insulation and low thermal conductivity
  + Cons:
    - Poor mechanical strength
    - Both the production and recycling of plastics pollute the environment
    - Difficult disposal after use (natural decomposition lasts very long and some are non-degradable)
    - Plastic materials affect water bodies like oceans, seas, lakes
    - Many animals consume plastic products and are dying
* Classification of plastics
  + By their behaviour in the manufacturing process:
    - Thermoplastics:
      * Do not undergo a chemical change in their composition when heated, can mould several times
      * Example: PP, PE, PVS and PS
    - Thermosets:
      * Can melt and mould into any shape only once, they cannot be returned to their original state
      * Example: Rubber, acrylic, silicone
  + Commodity plastics:
    - Six major types
    - They are masked with a triangle of 3 “chasing” arrows, with a number giving the plastic type (3 parts of recycling process – Collection, remanufacturing and resale)

1. PET (PETE) – polyethylene terephthalate
   * + - Use: soda bottles, water bottles, polyester film, containers for food, jars, fibre for clothing
       - Recycled: Commonly – into fleece, fiber, bags, furniture, carpets
2. HDPE – high-density polyethylene

* Use: detergent containers, plastic bottles, piping for water and sewer, snowboards, boats
* Recycled: Commonly – into detergant/oil bottles, pens, floor tile, drainage pipe

1. PVC – polyvinyl chloride
   * Use: Window frames, plumbing products, electrical cable insulation, clothing, medical tubing
   * Recycled: Rarely – never burn PVC
2. LDPE – low-density polyethylene
   * Use: Shopping bags, plastic bags, clear food containers, disposable packaging
   * Recycled: Sometimes – into trash bins and cans, compost bins
3. PP – polypropylene
   * Use: laboratory equipment, automotive parts, medical devices, food containers
   * Recycled: Sometimes – into brooms, brushes, pallets, trays
4. PS – polystyrene
   * Use: CD and DVD cases, packing peanuts, single-use disposable cutlary trays
   * Recycled: Rarely – sometimes into insulation, egg cartons, foam packing
5. Other types (PUR, PES, ABS, Polyerethane, Polycarbonate, Lexan)
   * Use: Baby feeding bottles, car parts, water cooler bottles, sippy cups
   * ABS Use: Monitor/TV cases, coffee makers, cell phones, calculators, most computer plastic, lego bricks
   * Recycled: Sometimes – Custom-made products

* Environmental impact of plastícs
  + Waste – the highest negative enviromental impact
  + Single-use plastics accounts for 40% of the plastic produced every year
  + Harm to wildlife – plastics have been consumed by both water and land animals, sometimes causing death
  + other impacts occur during the resource extraction, production, consumption and end-of-life phases of plastics
  + Pollution of air, water and soil
  + Impact on human health
* Possible solutions
  + Reuse it where possible
  + Bring your own bags for grocery shopping
  + Avoid single-use plastics
  + Use renewable plant materials such as cellulose and starch for plastics manufacture
  + Use biodegradable plastics – they can degrade or break down when exposed to sunlight or ultraviolet radiation, bacteria, certain enzymes, dampness or water
* Recycling process
  + 3 parts
    - Collection
    - Remanufacture
    - Resale
  + Only about 40% of plastic packaging waste is recycled in the EU-28
  + Through municipal recycling programs, specific types of plastics are collected, sorted out, and processed for recycling