








## Lesson 1 – Classification of materials






### Task 1 – General classification of materials

#### What are the following objects made from?

Possible answers: metal, polymer, timber, ceramic, composite

(Some objects may have more than one answer)

Object	Catalan translation	Made from...
 Screwdriver		Metal and plastic Metal and wood (depending on the handle)
 Brick		
 Bucket		
 Tyre		
 Spanner		
 Glass		
 Glasses		

<p>Juice carton</p> 		
<p>Yogurt packaging</p> 		
<p>Electrical socket</p> 		
<p>Tennis racquet</p> 		
<p>Desk</p> 		
<p>Army helmet</p> 		

## Task 2

Write sentences like the following one with the objects in task 1.

Examples:

A **screwdriver** is made from **metal and plastic** or **metal and wood**

A **brick** is made from...

## Task 3

Write the names of 10 objects in the classroom and decide what are they made from.

Example:

A **table** is made of **wood, metal and plastic**

## Task 4

Read the following text:

### Polymers

Polymers are divided into **thermoset plastics, thermoplastics and elastomers**. The main difference between the two is that thermoplastics can be heated and shaped many times, while thermoset plastics can only be heated and shaped once. PVC is an example of thermoplastic.

### Composite materials

Composite materials are formed by combining and bonding two or more materials - a reinforcing material and a bonding agent such as glue.

**Kevlar** and **carbon-fibre** are examples of composite materials.

### Metals

Metals can be either **ferrous** or **non-ferrous**. Ferrous metals contain iron while non-ferrous metals do not.

Both ferrous and non-ferrous metals are divided into **pure metals** and **alloys**. A pure metal is an element – e.g. iron, copper, gold - unalloyed (not mixed) with another substance. An alloy is a mixture of two or more elements (eg, iron and carbon) to make another metal with particular properties (eg steel).

### Ceramics

Ceramics may be made from several substances. These materials are ground to a fine powder, mixed together and fired at high temperatures (700 - 2000°C) in the production process.

### Timbers

Timbers are divided into **hardwood timbers** and **softwood timbers**. Hardwood timbers get their name because of their cellular structure when seen under a microscope - not because they are hard to cut. Softwoods do not have this same hard cellular structure. There are also **manufactured timbers** such as **plywood** and **MDF**

Write the missing words in the gaps:

- ✓ Thermoplastics can be \_\_\_\_\_ and \_\_\_\_\_ shaped many \_\_\_\_\_.
- ✓ Thermosetting plastics can be \_\_\_\_\_ and \_\_\_\_\_ only \_\_\_\_\_.
- ✓ Composite materials are \_\_\_\_\_ combining and \_\_\_\_\_ two or more materials.
- ✓ Ferrous metals contain \_\_\_\_\_, while non-ferrous metals do not.
- ✓ An \_\_\_\_\_ is a mixture of two or more elements.
- ✓ Steel is an example of \_\_\_\_\_.
- ✓ Copper, gold and aluminium are \_\_\_\_\_ metals.
- ✓ Ceramics are ground to a fine \_\_\_\_\_, mixed and fired at high \_\_\_\_\_ in the \_\_\_\_\_ process.
- ✓ Plywood and MDF are \_\_\_\_\_ timbers.

### Task 5

Write an example of every kind of material:

