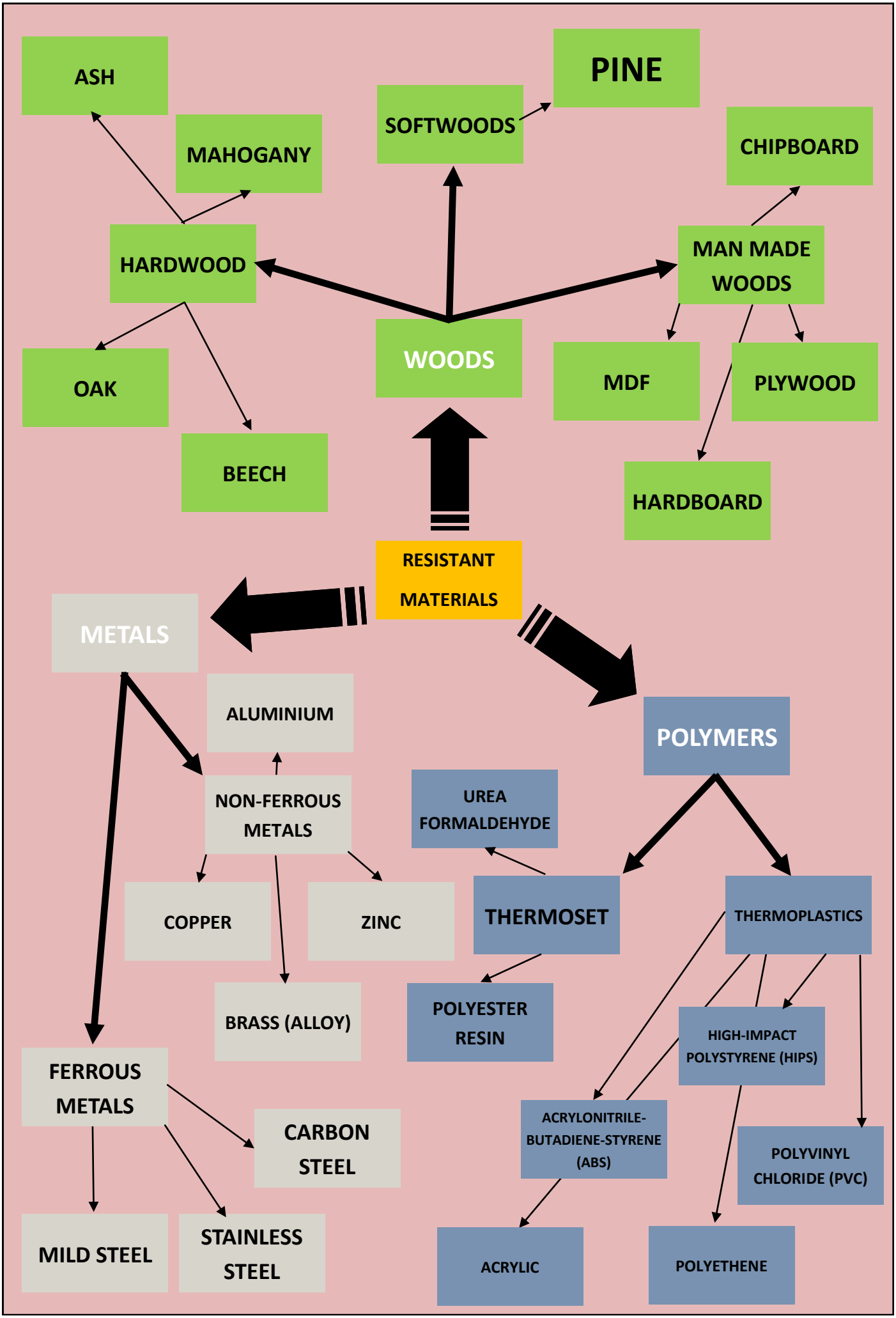
ASH
MAHOGANY
HARDWOOD
OAK
BEECH
PINE
SOFTWOODS
WOODS
CHIPBOARD
MAN MADE WOODS
MDF
PLYWOOD
HARDBOARD
RESISTANT MATERIALS
METALS
ALUMINIUM
NON-FERROUS METALS
COPPER
ZINC
BRASS (ALLOY)
FERROUS METALS
CARBON STEEL
MILD STEEL
STAINLESS STEEL
POLYMERS
UREA FORMALDEHYDE
THERMOSET
POLYESTER RESIN
THERMOPLASTICS
HIGH-IMPACT POLYSTYRENE (HIPS)
ACRYLONITRILE-BUTADIENE-STYRENE (ABS)
POLYVINYL CHLORIDE (PVC)
ACRYLIC
POLYETHENE

# MATERIALS FACTSHEET

## Shape Memory Alloys (SMA)

### Properties

- Shape memory alloys (SMAs) are a collection of metal alloys that can "remember" their original cold formed shape
- If they become strained or deformed they can be returned to their original shape with heat.
- Heat can come from the human body, an external source or in some cases a small electrical current.
- Example is "Nitinol", a nickel –titanium based alloy.

### Uses

- Glasses
- Anti-scalding valves
- Orthodontic wires

### Advantages

- Good elasticity
- Strong in tension
- lightweight

### Disadvantages

- Relatively expensive to make in comparison to stainless steel or aluminium.

# MATERIALS FACTSHEET

## Photochromic paint

### Properties

- Changes colour when it is exposed directly to UV light or sunlight.
- Colour change is reversible—when the light source is removed it goes back to original colour.
- Mainly white
- Can change colour within one second of being exposed to the UV source
- Dyes added to paints or directly into polymers before being injection moulded.

### Uses

- Used in textiles and clothing
- Images on vans for advertising.

### Advantages

- Change colour in response to UV exposure

### Disadvantages

- Amount of change is dependent upon the level of UV falling on it.
- Over time the ability to change will decay (this is called natural fatigue)

# MATERIALS FACTSHEET

## Reactive glass

### Properties

- Glass which changes colour in response to exposure to UV light

### Uses

- Glasses
- Windows

### Advantages

- Ability to change colour in response to UV or an applied voltage
- Replaces the need for separate reading and sunglasses

### Disadvantages

- Expensive to manufacture
- Smart glass is expensive to install
- Time delay of photochromic glasses can cause difficulties when driving.

# MATERIALS FACTSHEET

## Carbon nanotubes as additives to materials

### Properties

- Six times lighter than steel, 500 times stronger
- As flexible as plastic
- Conduct heat and electricity better than any other material discovered
- Can be made from raw materials such as methane gas
- Almost totally inert
- Used to strengthen plastics on cars
- Added to paint to give a very hard, tough finish

### Uses

- These are cylindrical nanostructures made from carbon molecules
- Useful in world of electronics, optics and medicine
- Proposals to use in clothes such as sports equipment and police and military body armour.

### Advantages

- Super tensile strength
- Electrical conductors
- Tough
- Chemically inert

### Disadvantages

- Expensive to manufacture
- Toxic nature may prevent potential application in the world of medicine.