

# 1 - Materials and components

EdExcel GCSE in Design and Technology: Graphic Products






# Paper and board

1.1



# CHECKLIST

TOPIC			
<b><u>PAPER AND BOARD</u></b>			
TRACING PAPER			
CARTRIDGE PAPER			
FOLDING BOX BOARD			
CORRUGATED BOARD			
SOLID WHITE BOARD			
FOIL-LINED BOARD			
TETRA PAK®			
POLLUTION			
DEFORESTATION			

# Weight and size

## Paper

Classified by weight in grams per square metre (gsm).

80gsm is the weight of average copier paper.

## Board

Measured in microns (micrometres, or 1000<sup>th</sup> or a mm). The thickness of a board can be gauged by the number of ply (layers) it has.

\*Paper that is heavier than 220gsm is often reclassified as board as it often made from more than one ply.

# Paper

The choice of paper is essential to how printed graphic products are presented. ***Which paper to choose comes down to a combination of personal preference and discussions with the client.*** Generally, it must;

- Meet the client's brief (durability, surface finish, colour, texture)
- Be able to be printed on using the chosen printing method
- Meet economic considerations (scales of production).

# Cartridge paper

- 120-150 gsm.
- **Completely opaque, accepts most drawing media**
- **Used for** - good general purpose drawing paper, heavier weights can be used with paints.
- **Cost** – more expensive than copier paper
- **Description** – creamy-white paper, smooth surface with a slight texture.



# Tracing paper

- 60/90 gsm
- **Allows tracing through on to another sheet in order to develop design ideas**
- **Used for** – same as regular paper (tracing, sketching, design ideas), heavier weights used by draughtspeople (technical drawings)
- **Cost** – heavier weight can be quite expensive
- **Description** – thin, transparent paper with smooth surface, pale grey appearance.



# Board

**Cartonboard** is the name given to board used widely in retail packaging. These boards may be suitable for **high-quality, high-speed printing and for cutting, creasing and gluing using high-speed automated packaging equipment.**

## Main advantages;

- Excellent print quality on most boards
- Excellent protection in packaging nets
- Relatively inexpensive to produce and process
- Can be recycled readily.



# Folding boxboard

- **Excellent for scoring, bending and creasing without splitting, excellent printing surface**
- **Used for** - Most food packaging and all general cartons.
- **Cost** – relatively inexpensive
- **Description** – usually has a virgin bleached pulp top surface, unbleached pulp middle layers and a bleached pulp inside layer.



# Corrugated board

- **Excellent impact resistance, excellent strength for weight, recyclable**
- **Used for** – protective packaging of fragile goods; most common box-making material
- **Cost** – relatively inexpensive
- **Description** – fluted paper layer sandwiched between two paper liners.



# Solid white board

- **Very strong and rigid, excellent printing surface**
- **Used for** – packaging for frozen foods, ice cream, pharmaceuticals and cosmetics
- **Cost** – expensive
- **Description** – made entirely from pure, bleached wood pulp.



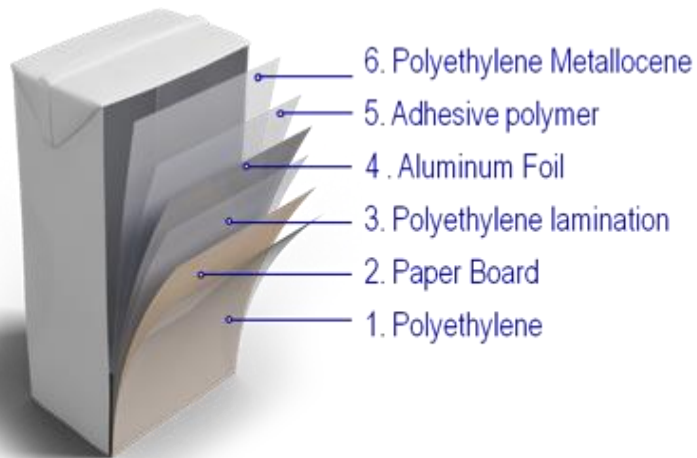
# Foil-lined board

- **Very strong visual impact, foil provides excellent barrier against moisture**
- **Used for** – cosmetic cartons, pre-packed food packages
- **Cost** – expensive
- **Description** – board with a laminated foil coating



# Packaging Laminate

## Tetra Pak



- made of **polyethylene**, **aluminium** and **paperboard**.
- Developed in the 1950's.
- Changed the way food is packaged and distributed.
- Strength – hygienic processing and packaging of drinks.
- Allows for products to be saved and distributed over greater distances.

# Environmental issues with paper and board

Paper and board is mainly made using **hard** and **softwoods**.

**Softwood** tree fibre is **longer** = **greater strength**.

**Hardwood** tree fibre is **shorter** = **smoother, opaque finish**.

To make paper or board the wood **must be first turned into wood pulp**. This happens through either **mechanical, waste** or **chemical pulping**.

# Toxic and air pollution

## TOXIC POLLUTION

Lots of chemicals are used in paper making (chlorines and bleaches, etc.).

Many paper mills have reduced the number of chemicals they use, but this may be off-set by the increase in paper production.



## AIR POLLUTION

Pulp and paper mills are major producers of carbon dioxide.

Depletion in the ozone layer, global warming, acid rain and breathing problems are all knock-on effects of carbon dioxide pollution.

# Deforestation

**Enormous areas** of forest are felled for paper production.

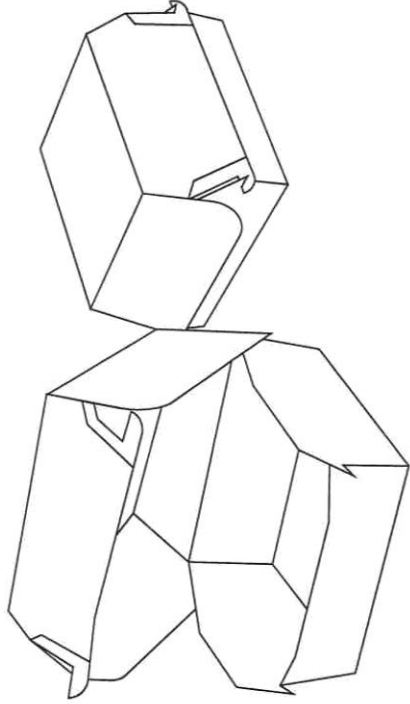
This contributes to the destruction of the world's forest or **deforestation**.

Many UK paper mills import their pulp, some of which may come from **endangered forests**.





13 The drawing below shows a burger box made from solid white board.



(a) Solid white board is easy to cut and fold.

Give **two** other properties of solid white board that make it a suitable material for a burger box.

For each property, justify your answer.

(4)

Property 1 .....

Justification .....

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Property 2 .....

Justification .....

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