

SOURCES, ORIGINS
PAPER AND BOARDS

This mobile revision pdf is based on detailed work found in the GRAPHICS section.

Tap on the green link button below to go to the complete website section



Tap the blue button to view areas covered by this Revision PDF



SOURCES, ORIGINS PAPER AND BOARDS

1. SUSTAINABLE FORESTS

2. HOW PAPER AND CARD ARE MANUFACTURED

3. THE STRUCTURE OF CORRUGATED CARDBOARD

4. LAMINATED CARD (DRINKS CARTONS)

5. PAPER AND BOARDS STOCK FORMS

FOR INFORMATION ON A RANGE OF
PAPER and BOARDS, DOWNLOAD
THE APP:

MATERIALS_MOBILE_UPDATE3.pdf

from the Apps section of

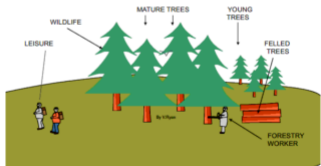
www.technologystudent.com

WHAT IS A SUSTAINABLE FOREST?

V.Ryan © www.technologystudent.com 2019

This is a forest that is carefully managed, so that as trees are felled they are replaced with seedlings that eventually grow into mature trees. The forest is a working environment, producing wood products such as wood pulp for the paper / card industry and wood based materials for furniture manufacture and the construction industry. Great care is taken to ensure the safety of wildlife and to preserve the natural environment.

Tap the image for more information and exercises



Tap the red button to return to the Contents page



PREPARATION OF TIMBER - 1

V.Ryan © www.technologystudent.com 2019

Mature trees are selected by a forestry worker. Only older trees are chosen, allowing the younger trees to grow to maturity. Felled trees are replaced with saplings. Consequently, the forest is sustainable (it should not run out of trees).

Tap the image for more information



Tap the blue button for the next page.



Tap the red button to return to the Contents page

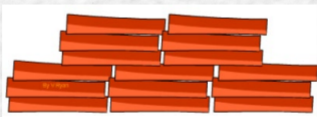


PREPARATION OF TIMBER - 2

V.Ryan © www.technologystudent.com 2019

The tree trunks (logs) are stored / stacked in a clearing. Sometimes logs are stored in the forest until they are needed at the sawmill. This also allows some of the 'free' water content to evaporate, reducing the weight of the tree / log.

Tap the image for more information



Tap the blue button for the next page.



Tap the red button to return to the Contents page



PREPARATION OF TIMBER - 3

V.Ryan © www.technologystudent.com 2019

The logs are transported to the sawmill, using vehicles equipped with lifting gear.

In the Tropics, large numbers of logs are transported by floating them in rivers and allowing them to be carried down stream by the current, to sawmills.

Tap the image for more information



Tap the blue button for the next page.



Tap the red button to return to the Contents page



HOW PAPER AND CARD ARE MANUFACTURED

V.Ryan © www.technologystudent.com 2019

Most materials used for packaging are paper /card based. Card and paper are made from wood pulp and waste paper. When paper is examined through a microscope the fibres that form the material can be seen. The fibres are made from cellulose which is extracted from the wood pulp and recycled waste paper.

Tap the image for more information and exercises



CELLULOSE

Tap the blue button for the next page.



Tap the red button to return to the Contents page

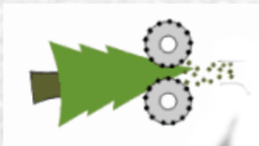


HOW PAPER AND CARD ARE MANUFACTURED

V.Ryan © www.technologystudent.com 2019

The tree trunk is fed into a chipping machine, where it is cut into very small pieces.

Tap the image for more information and exercises



Tap the blue button for the next page.



Tap the red button to return to the Contents page



HOW PAPER AND CARD ARE MANUFACTURED

V.Ryan © www.technologystudent.com 2019

The wood chips are boiled in water to form a thick wood pulp

Tap the image for more information and exercises



Tap the blue button for the next page.



Tap the red button to return to the Contents page



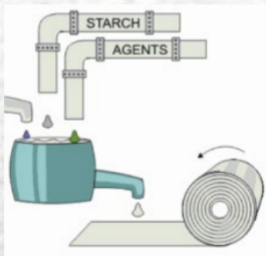
HOW PAPER AND CARD ARE MANUFACTURED

V.Ryan © www.technologystudent.com 2019

Chemicals / ingredients such as starch and bonding agents are added. The pulp is poured over a fine mesh and the water escapes leaving the cellulose fibres behind.

This forms the paper / card.

Tap the image for more information and exercises



Tap the red button to return to the Contents page

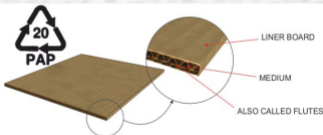


CORRUGATED CARDBOARD

V.Ryan © www.technologystudent.com 2019

The corrugated card box shown below, is manufactured from recycled card. Corrugated card is also called corrugated fibreboard or combined board. It is manufactured in a range of thicknesses. Corrugated board is manufactured from a type of heavy paper called 'containerboard'. The flat outer surface is called the liner board and the triangulated structure between the liner boards is called the medium (sometimes referred to as the flutes).

Tap the image for more information and exercises



Tap the blue button for the next page.



Tap the red button to return to the Contents page

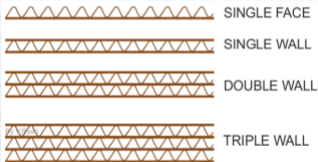


CORRUGATED CARDBOARD

V.Ryan © www.technologystudent.com 2019

The strength and durability of the corrugated card is determined by the number of layers the final manufactured board has (see below). The triangulated section of each layer adds strength to the board.

Tap the image for more information and exercises



Tap the red button to return to the Contents page



LAMINATED CARD (DRINKS CARTONS)

V.Ryan © www.technologystudent.com 2019

Laminated cartons are used to store liquids such as milk and pure orange juice, for up to a year. This type of carton is composed of paper/card and layers of polythene, keeping the contents fresh and hygienic. The most famous laminated cartons are manufactured by Tetra Pak. In Sweden, over 130 billion tetra paks are manufactured each year. Tetra paks are used in over 150 countries, around the world.

Tetra Pak packaging materials, are made up of paperboard (73%), plastic (22%) and aluminium foil (5%).

Tap the image for more information and exercises



Tap the blue button for the next page.



Tap the red button to return to the Contents page



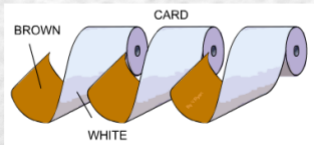
LAMINATED CARD (DRINKS CARTONS)

V.Ryan © www.technologystudent.com 2019

Laminated cartons, are a mix of white and brown card, with layers of polythene. The card is manufactured in the same way as shown on [page / slide 10](#).

The white card is put to the outside of the carton and polythene is sprayed on to the surfaces, ensuring the material is waterproof. Printing is applied before the polythene is sprayed on to the surfaces.

Tap the image for more information and exercises



Tap the red button to return to the Contents page



PAPER + BOARDS STOCK FORMS

V.Ryan © www.technologystudent.com 2019

The International Standard ISO 216 (International Organization for Standardization), sets out the common paper sizes used around the world. 161 countries from around the world are members of the organisation.

The metric system of paper and card sizes are shown on the [next page / slide](#). All 'A' sizes are double the previous size, with A0 being the largest

Tap the image for more information and exercises



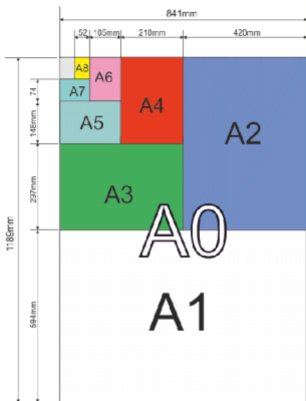
Tap the blue button for the next page.



Tap the red button to return to the Contents page



Tap the image for more information and exercises



V.Ryan © www.technologystudent.com 2019

Tap the blue button for the next page.



Tap the red button to return to the Contents page



PAPER / CARD ROLLS

V.Ryan © www.technologystudent.com 2019

Paper and card is also manufactured as large scale rolls, which used in the manufacture of packaging, wallpaper, newspapers and many more products, that use [Web-Fed Systems](#).

Tap the image for more information and exercises



Tap the blue button for the next page.



Tap the red button to return to the Contents page



PAPER AND CARD WEIGHT / GRAMMAGE

V.Ryan © www.technologystudent.com 2019

The mass per unit area of paper / card is measured in grams per square metre (g/m^2).

This is called grammage, although most people refer to it as weight. Office copier paper is usually $80\text{g}/\text{m}^2$ (80gsm), A4 in size and ordered in reams (packets) of 500 sheets. However, card thickness (sometimes called 'caliper') is generally measured in micrometers (microns).

Tap the image for more information and exercises



Tap the blue button for the next page.



Tap the red button to return to the Contents page



Tap the image for more information and exercises

THICKNESS IN MICRONS	THICKNESS IN MILLIMETRES	METRIC (GRAMS/SQ METER (GSM))
81	0.081	60.2 gsm
92	0.092	67.72 gsm
12	0.12	90.3 gsm
152	0.152	109.11 gsm
157	0.157	131.68 gsm
173	0.173	135.45 gsm
183	0.183	146.73 gsm
185	0.185	150.5 gsm
188	0.188	161.78 gsm
198	0.198	176.83 gsm
216	0.216	199.41 gsm
230	0.23	180 gsm
229	0.229	203.17 gsm
234	0.234	218.22 gsm
241	0.241	244.56 gsm
250	0.25	252.08 gsm
289	0.289	270.9 gsm
33	0.33	285.95 gsm
356	0.356	308.52 gsm
380	0.38	312 gsm
445	0.445	385.06 gsm
500	0.500	460 gsm

COMMERCIAL
CARD

Tap the red button to return to the
Contents page

