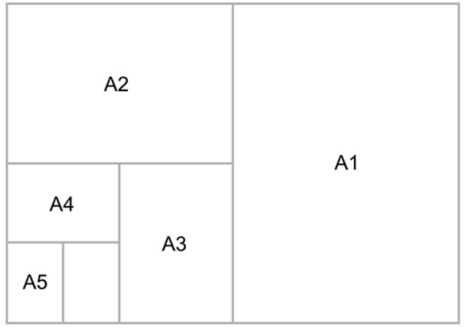
Materials and their properties
Papers and Boards

A: Papers and boards are used for a variety of purposes, from writing and drawing to packaging and model making. Paper and board are made from cellulose fibres found in wood, rags or grasses, which are all renewable materials. Often paper and board is at least part-recycled, making it a more environmentally friendly material than a polymer.

Paper and board has been developed to suit a number of different purposes. It can be given texture or watermarks and can be laminated with other materials such as plastic, which can give board waterproof properties.

B: Common 'A' sizes of paper and board

'A' number	Size in millimetres
A0	841 x 1189
A1	594 x 841
A2	420 x 594
A3	297 x 420
A4	210 x 297
A5	148 x 210
A6	105 x 148
A7	74 x 105
A8	52 x 74



C: Sustainability

The UK use over 12 million tonnes of paper each year and it takes approximately 25 trees to make one tonne of paper.

Trees take in Carbon Dioxide (CO^2) and produces oxygen but it takes a lot of energy to cut them down and make paper.

An alternative is to recycle paper and this is becoming more common as this uses between 40% to 70% less energy to produce.

Another way to improve the sustainability of paper and boards is to ensure the timber used to make them comes from forests which are managed by the **Forest Stewardship Council (FSC)** who are dedicated to ensuring that timber supplies are regulated and sustainably harvested.

D: Paper
Paper is measured in sizes from A0-A6 and in grams per square metre (gsm). Anything less than 200gsm is considered a type of paper. For example photocopier paper is usually 80gsm.

Paper	Characteristics and uses of papers
Bleed proof	Smooth paper, often used with water and spirit-based markers, prevents marker bleed . Used for design ideas and presentation drawings.
Cartridge paper	Good quality white paper often with a slight texture, available in different weights. Due to the good-quality surface, it can be used for paints and markers as well as pencil and ink drawings.
Grid	Paper printed with different grids as guidelines (these can be isometric or square in different sizes). Used for quick model making, graphical and mathematical diagrams and working drawings.
Layout paper	Thin translucent, lightweight paper, can be drawn on with markers and takes colours well. Used for initial quick sketches and tracing.
Tracing paper	Thin transparent paper, available in different weights. Used for tracing, overlays for design adaptation and working drawings.

E: Boards
Boards (card or cardboard) are always greater than 200gsm. An example of this is corrugated cardboard which is 200+ gsm.

Board	Characteristics and uses of boards
Corrugated card	Strong, lightweight material, made up of two or more layers and a fluted middle section leading to good insulating properties, impact resistant, available in different thicknesses. Used for packaging such as pizza boxes and large boxes used for heavy items that need impact protection.
Duplex board	Thin board which often has one side that is suitable for printing. Used for packaging boxes. Often given a waxy coating and used for food and drinks containers.
Foil-lined board	Board covered on one side with aluminium foil, making it a good insulator of heat. Used for takeaway or ready meal packaging.
Foam core board	Two pieces of board with a core of foam to increase the thickness, thick board that is very lightweight. Used for mounting and framing of artwork and photographs, model making, such as architectural models.
Inkjet card	Treated so it can be used in all inkjet printers. Used for printing in inkjet printers, high quality photographic images.
Solid white board	Top quality cardboard, smooth and white, good for printing on. Used for book covers, greeting cards, packaging and advertising.

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F: Keywords

- Primary source: where materials originate (polymers from oil, timber from trees etc) and the raw material that needs to be converted into a workable form
- Renewable: a resource that can replenish itself quickly and therefore will not run out
- Sustainable: naturally replenished within a short period of time

G: Video and web-links

- How its Made Paper: https://www.youtube.com/watch?v=zpmmBBZZU6Q
- How its Made Paper Recycling: https://www.youtube.com/watch?v=2c8YxMb0tlk
- How its Made Cardboard Boxes: https://www.youtube.com/watch?v=HL2yvqSk8Ww

Revision Checklist

I know the primary source of materials for producing papers and boards	
I can recognise and characterise different types of papers and boards	
I understand how the physical and working properties of a range of Papers and boards affect their performance	
I understand the impact papers and boards have on the environment	
I can explain some of the problems associated with the use and disposal of papers and boards	
I know the common A sizes of papers and boards	

Test yourself

1. Justify which papers or boards you would use for the following tasks:
   a. rendering a final design using coloured marker pens

   b. creating the net for a box to transport a cake

   c. producing a high-quality point-of-sale advertising stand to hold leaflets

2. Explain the difference between a paper and a board.

3. What are the primary sources of papers and boards?.

4. List the common sizes of papers and boards, from biggest to smallest.

5. What does gsm stand for?