Transition Pack
GCSE
Design Technology

GCSE Design & Technology Preparation Task
Paper & Boards [Graphic Products]

In order to prepare for starting your Design & Technology GCSE in September, please complete the following tasks and submit the work during your first D&T lesson in **September 2020**. These tasks will help bridge the gap between your performance in Year 9 and the expected level in Year 10.

TASK 1 – Material Properties

The most important part of any product is the choice of material ie what is the best material for that particular design? Knowing about the properties of the materials that you will be studying in your subject specialism – Papers & Board – is therefore very important.

Create a GRAPHIC ORGANISER [eg a Mind Map / Spider Diagram] which illustrates the material **properties** and common **uses** of:

PAPER:	Copier paper	BOARD:	Folding boxboard
	Cartridge paper		Corrugated board
	Tracing paper		Solid white board

The graphic organiser should be a mixture of text and images [eg photos taken from the internet]. It needs to fill an A3 sheet but can be created either by hand or on a CAD program [eg Powerpoint] depending upon what resources you have access to.

The information that you need can be found in a variety of places including:
https://www.bbc.co.uk/bitesize/guides/zjq8jty/revision/1
http://www.technologystudent.com/pdf15/POSTER_PAPERANDBOARDS1.pdf
plus
- The attached Knowledge Organiser for GCSE Paper & Boards
- The relevant section from the text book [attached below].

TASK 2 – Manufacturing Process

You will also need to know about the various printing processes that are used to both **decorate** and **finish** paper & board products.

One of the most popular ways of printing is a technique called GRAVURE. You need to research this process and then present a detailed description of how it works. You must include the following:
1. Write a step by step guide for the gravure printing process
2. Draw and label a diagram of the machinery used during the process
3. Name two advantages and one disadvantage of using gravure over the alternatives eg lithography
4. Name two products that are usually printed using the gravure process.

The information that you need can be found in a variety of places including:
https://www.bbc.co.uk/bitesize/clips/zkh8q6f
https://www.lifewire.com/what-is-gravure-printing-1074611
plus
- The attached Knowledge Organiser for GCSE Paper & Boards: Printing
- The relevant section from the text book [attached below].

Papers & Boards

REMEMBER, **paper** is a thin / flat material made from natural fibres. **Board** is a thicker paper or layers of paper which weighs more than [illegible]gsm

PAPE

OPTIONS	WEIGHT gsm	DESCRIPTION	PROS / CONS
Copier	80	Lightweight / thin / smooth / bright white finish	Cost effective / range of colours / takes pencils + pens well / lightweight so can jam printers
Cartridge	120<150	Heavyweight / thick / creamy finish	Takes paints well / expensive
Tracing	60<90	Thin / translucent [see-through] / smooth	Allows you to trace designs + overlays / relatively strong / relatively expensive
Bond	50<100	Stronger / more durable / less smooth [all compared to copier] / opaque	High quality / range of colours / relatively expensive / eg envelopes; letter heads

BOAR

Heat Transfer Paper	70<140	Glossy / used specifically for colour printing with sublimation inks	Produces high-quality printed images / expensive
Folding boxboard		Stiff / bleached outer and inner surfaces + unbleached core	Cost effective / scores & folds well / printable outer / eg cereal boxes
Corrugated board		Lightweight / layers of fluted paper sandwiched between paper liners	Cost effective / good impact resistance / good insulator / easily recyclable / [eg pizza boxes]
White solid board		Rigid / high-quality / bleached smooth surfaces	Excellent printing surface [foil etc] / eg cosmetics; electronics packaging
Foil lined board		Laminated construction combining foil [aluminium] + board	Provides a barrier against moisture / allows food to stay fresh / eg coffee bean bags / expensive
Laminated construction combining metals + plastics depending upon purpose		Rigid construction combining [illegible]	Offers numerous options especially for food / [illegible]

Pulp, paper and cardboard comes from: China / USA / Japan / Germany / Canada / Finland / Sweden / France / Brazil / Vietnam

PROPERTIES

FLEXIBILTY
The amount a material bends when a force is applied. Depends upon its thickness and weight.

PRINTABILTY
The ability to accept a printed image. Depends upon the both the finish and thickness.

BIODEGRADABILTY
The ability to be broken down by bacteria and other biological methods.

PRINTIN

OPTIONS	DESCRIPTION
Digital	Cost effective [for short runs] / quick / easy set-up / very adaptable
Photocopying	6-stage process [powder] / can also collate documents / average quality
Offset [lithography]	Chemically treated cylindrical plates / good quality / ideal for long print runs / eg: magazines
Flexography	Raised cylindrical plates ie relief / good quality printing / complex set-up / high set-up costs
Gravure	Etched cylindrical plates / very high quality / high set-up costs / eg: invitations; stamps
Screenprinting	Mesh screens [ink] / basic quality / simple set-up / good for short runs / eg: posters; T-shirts

FINISHIN

- Varnish [+UV]
- Hot foil
- Edge staining
- Embossing
- Laminating / films

FABRICATIN

- Split pins
- Mapping pins
- Stapling
- Taping
- Gluing [adhesives]
- Engineering

CHARACTERISTICS

DENSITY
Refers to the 'compactness' of a material.

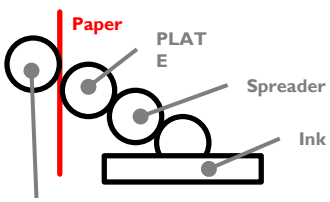
TRANSPARENCY
Refers to the amount of light that can pass through.

TEXTURE
Refers to how the finish and 'feel' of the finished material.

KNOWLEDGE ORGANISER

Papers & Board: Printing

FLEXOGRAPHY

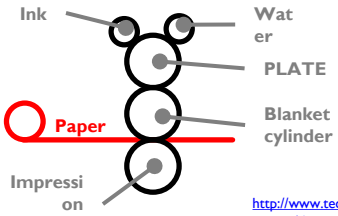


http://www.technologystudent.com/despro_flsh/flexographic1.html

DESCRIPTION
- Raised cylindrical plates ie relief
- Flexible rubber / plastic plates
- Prints onto: paper / board [inc. corrugated] / plastics / metal
- Good quality printing
- Cost effective for long runs
- Complex-set up / high initial set-up costs

USES
- Packaging
- cartons
- calendars

OFFSET LITHOGRAPHY



http://www.technologystudent.com/designpro/prtpro5.htm

DESCRIPTION
- Chemically treated / raised cylindrical plates ie relief
- Works on the principle that oil and water do not mix
- Relies on CMYK [cyan / magenta / yellow / black]
- Good quality printing
- Very cost effective for long runs / high-speed process
- Can print on both sides simultaneously and with a continuous paper roll

USES
- Letterheads
- Business cards
- Leaflets

DIGITAL

DESCRIPTION
- Inkjet / laser printers
- Widely used at home / office / school
- Ideal for short print runs
- Quick / easy / immediate
- Only suitable for short print runs [inks / toner are very expensive]

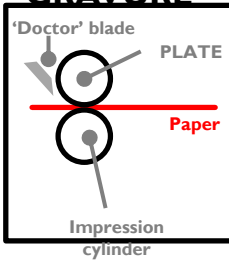
LETTERPRESS

DESCRIPTION
- Raised flat plates ie relief
- Traditional / original printing process
- Increasingly rare
- Offers very creative output
- High-quality printing

USES
- Books
- Stationary

KNOWLEDGE ORGANISER

GRAVURE



DESCRIPTION
- Etched cylindrical plates [often with a laser]
- Image is broken up into dots [small holes]
- Ink floods the dots [excess is removed by a blade]
- Prints onto lower grade paper [cheaper / lighter]
- Very high-quality printing
- Deeper holes = more ink = more depth
- High initial set-up costs

USES
- Photos
- Paintings
- Full-colour magazines
- Books

PHOTOCOPYING

DESCRIPTION
- Uses a part-charged [positively] drum to transfer the toner [dry powder] directly onto the paper
- Photocopiers can also: feed automatically / collate into order / staple / punch holes / rescale
- Can print onto coloured copier paper / acetate

1.9 Papers and boards

Learning objective

By the end of this section, you should know:

- the types, properties, structure and uses of paper and boards.

Paper

Paper consists of fine cellulose fibres, usually from wood but also hemp, flax, cotton or bamboo, pressed together with water and then dried. To achieve the required texture and surface finish, chemicals are added to the pulp – brightening bleaches, for example. It may also be coated with an agent that fills the minuscule pits between the fibres, for a smooth, flat surface with better opacity, lustre and colour-absorption.

In Europe, paper and board is measured in grams per square metre (gsm), which means the number of grams a 1 m × 1 m sheet weighs. Paper usually weighs 80–220 gsm. Thicker paper suggests higher quality – copier sheets are often 80 gsm, whereas writing paper is typically 120 gsm. Table 1.9.1 gives some examples of types of paper.

Apply it

Paper and card are extremely useful materials that are processed from wood fibres. They come in many different sizes and forms.

- How many paper products have you used today?
- Why do you think that some boards are laminated with other materials such as foil?
- How many different paper sizes do you know?

Key term

Paper: thin, flat material made from natural fibres, weighing less than 220 gsm.

Type	Description	Uses	Advantages	Disadvantages
Copier paper 80 gsm	Thin, lightweight, cheap, bright white paper, with a smooth, bleached, uncoated surface	Writing, printing, drawing	Takes colour well, good surface for pencils, pens and markers, cheap, readily available and in a range of colours	Can be prone to jamming printer feed mechanisms
Cartridge paper 120–150 gsm	Creamy, thick heavyweight paper	General drawing and printing, can be used with watercolour paints without buckling	Accepts most drawing media, opaque	Costs more than copier paper
Tracing paper 60–90 gsm	Thin, smooth and translucent, made by beating to remove air and processing to make a dense, strong paper, usually 60–90 gsm	Art, making copies, envelope windows, overlays on working drawings	Strong, translucent	Can be expensive, limited ink absorption and longer drying time

Properties and structure of examples of paper

Board

Papers weighing more than 220 gsm are generally classified as **boards**. Their thickness is measured in microns (μm) which is 1/1000 of a millimetre. A two-ply (layer) board is 200 microns thick. Table 1.9.2 gives some examples of types of board.

Key term

Board: thick paper or layers of paper more than 220 gsm.

Type	Description	Uses	Advantages	Disadvantages
Folding boxboard	Stiff layers consisting of: **1** A printable bleached virgin pulp top surface **2** Unbleached yellowish centre layers **3** A bleached inside layer	• Cereal boxes, food and health care packaging, cartons	• Excellent for scoring and bending without splitting • Accepts print well • Inexpensive	• Lower strength than solid white board
Corrugated board	• Two or more layers of fluted paper sandwiched between two paper liners • Available in different thicknesses • Strong and lightweight	• Protective packaging, for example boxes for electrical products and CD sleeves	• Impact resistant, inexpensive, recyclable	• Brown finish does not convey quality • Can deform under pressure • Not water resistant
Solid white board	• Strong, rigid board made from pure, bleached wood pulp • Excellent printing surface	• Book covers, food, cosmetics and medicine packaging	• Strong, rigid, accepts print well	• Can be expensive

Table 1.9.2 Properties and structure of examples of board

Apply it

Collect examples of packaging using the boards in Table 1.9.2. Photograph them and annotate each photograph explaining why you think that material has been chosen for the product.

Properties

Property	Description
Flexibility	• Amount material bends when a force is applied (stiffness), determined by its thickness and weight • Flexural stiffness is resistance to an external bending force • Handling stiffness is the ability to support its own weight
Printability	• Ability to accept a printed image onto its surface (porosity) • Affected by surface properties, such as smoothness or finish, and structural properties, such as bulk or thickness • Not the same as print quality, which is determined by other factors such as alignment of plates on the machinery
Biodegradability	• Ability to be broken down by bacteria or other biological means • Most uncoated paper products are biodegradable because they are made from wood pulp • Compostable means that a material can biodegrade in less than 12 weeks

Table 1.9.3 Some working properties of paper and boards

3.6 Alternative manufacturing processes for different scales of production

Learning objectives

By the end of this section, you should know:

- that there are seven different techniques for printing onto materials
- that there are different scales of production from one-off to continuous
- that there are methods of ensuring quality products are produced.

Deciding on the best manufacturing process for paper and card will depend on the quality required, as well as the scale of production.

Printing

The type of printing method you choose influences the final quality of your project. Table 3.6.1, on page 147, shows some of the manufacturing processes you could use.

Digital printing

Printing from a PC to a laser or inkjet printer is often the easiest option for small-scale document production at home, at school or in the office. Digital printing is quick, straightforward and immediate, but not economical as long print runs and the inks, or toner, are expensive.

Photocopying

Photocopiers are commonly used to produce multiple copies. A photocopier uses a six-stage process:

1. A cylinder inside the machine is electrostatically charged, then a beam of light travels across the document. The white areas reflect the light back.
2. The areas on the drum that correspond to the white areas become conductive (allowing electricity to run through them), whereas the black areas of the image remain negatively charged.
3. The photocopier has a positively charged fine powder called toner, which is attracted to the negatively charged areas.
4. An image made of powder is formed on the drum.
5. The image is transferred onto paper and fused by heat.
6. The drum is cleaned off and the process repeats for more copies.

Photocopiers can produce multiple copies quickly, and can automatically staple and collate documents. They are also commonly available. However, the electrostatic image fades over time and photocopiers are not cost effective for long print runs.

Letterpress

Raised metal letters locked into rigid frames are covered in printing ink then pressed onto paper in printing presses. Letterpress used to be the standard printing process but is now only used on low-volume production of books and stationery. Letterpresses give high-quality, crisp prints, but are less flexible, slower and more expensive than other methods and the plates need maintenance.

Example of letterpress printing

Offset printing (offset lithography)

Offset lithography works on the principle that oil and water do not mix. A four-stage process is used.

1. The print design is transferred using an oil-based emulsion to a printing plate made of flexible aluminium, or a polymer, fixed to a plate cylinder in the press.
2. Rollers apply water to the cylinder. It is repelled by the emulsion but attracted to the blank areas of the cylinder.
3. Ink is applied that only sticks to areas covered in emulsion.
4. A rubber blanket cylinder transfers the ink from the printing plate to the paper. The paper does not come into contact with the metal plates.

The design can be built up using individual print units or a different plate for each of the four process colours: cyan, magenta, yellow and the key colour, black (often abbreviated to CMYK).

Offset machines can feed cut sheets or rolls of paper known as web fed. Web offset is where a continuous roll of paper is fed through the printing press. Pages are separated and cut to size after they have been printed. It is used for high-volume publications such as books, magazines, newspapers, catalogues and brochures. Offset printing is fast, flexible and provides good-quality material, but it has high set-up costs and can only be used for printing on flat surfaces.

Flexography

Flexography is similar to letterpress printing but uses cylindrical plates. The cylinders rotate and the raised design picks up quick-drying, semi-liquid ink from a roller that prints onto the fed paper. It can be used on corrugated cardboard, cellophane, plastic, label stock, fabric and metallic film. It is suitable for printing continuous patterns, such as for gift wrap and wallpaper, onto webs or rolls of paper.

Using rolls of material allows large orders to run with few interruptions for reloading. However, flexographic printers cannot print fine detail and there are high set-up costs.

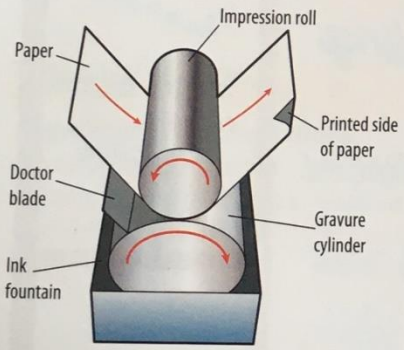


Figure 3.6.1 Gravure process

Gravure

The image is engraved onto a copper plate, which is mounted on a cylinder. The metal plate rotates into a bath of ink, which collects in the sunken sections and is transferred to the paper. It is used for large runs for such items as directories and magazines. The finished result is high quality and the ink is fast drying. However, the cost of producing the plates makes the overall costs significantly higher than other printing methods.

Screen printing

Screen printing can be used to print small quantities of items such as posters, display boards, fabrics, wallpaper, and control panels of electronic products. To produce the screen, fine mesh is stretched over a wooden frame and stapled into place. A stencil is made from either paper or, more commonly, chemicals using a photographic method. The printing ink is placed at the bottom of the screen and moved over the mesh with a squeegee to force it through onto the paper below. It is possible to make multiple prints with the same screen, but you need a separate screen for each colour, so multi-coloured patterns are costly. Screen printing cannot produce fine high-quality images.

Apply it

Investigate the printing options for making a flyer for a club night. If

Single Point Perspective

You can use **perspective techniques** in your design ideas and presentation.

Perspective drawings use a number of points according to the view you wish to represent. They are used to show your client how your final product will **look in reality.**

Perspective drawings

It has **one** vanishing point and is mostly used for **interiors.**

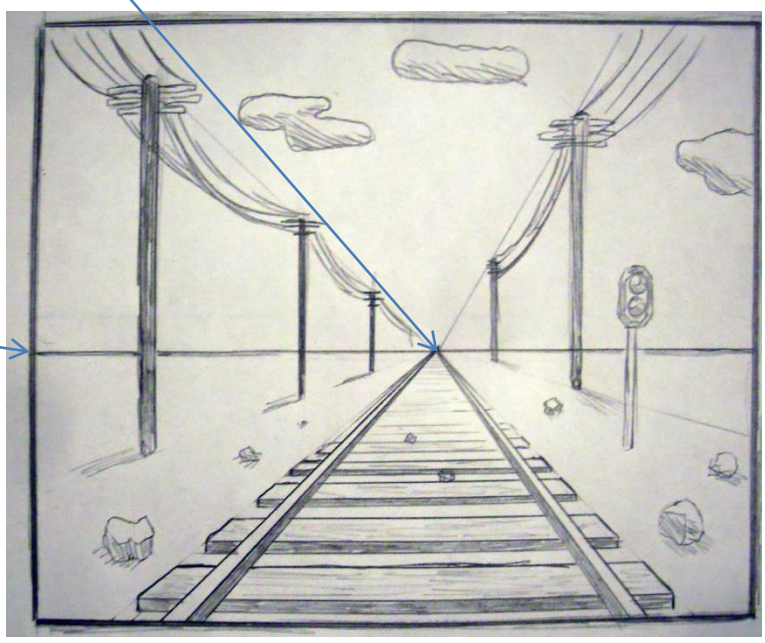
It can be used as a **quick sketching method.**

Perspective drawing is based on the fact that **all** lines appear to converge and meet at a **vanishing point.** This usually sits on a **horizon** or **horizon line;** otherwise known as your '**eye line.'**

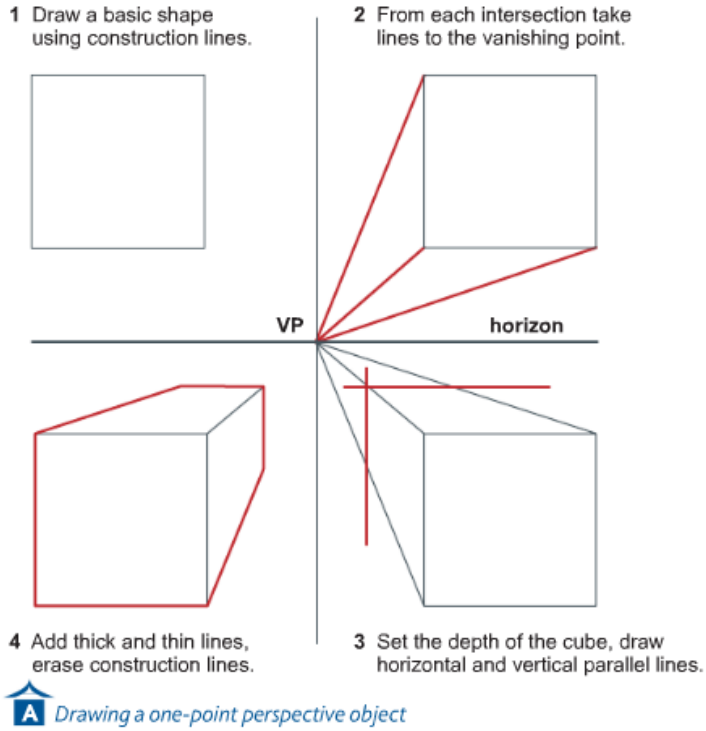
One point perspective

VANISHING POINT

HORIZON LINE



One point perspective – Step by Step



A *Drawing a one-point perspective object*

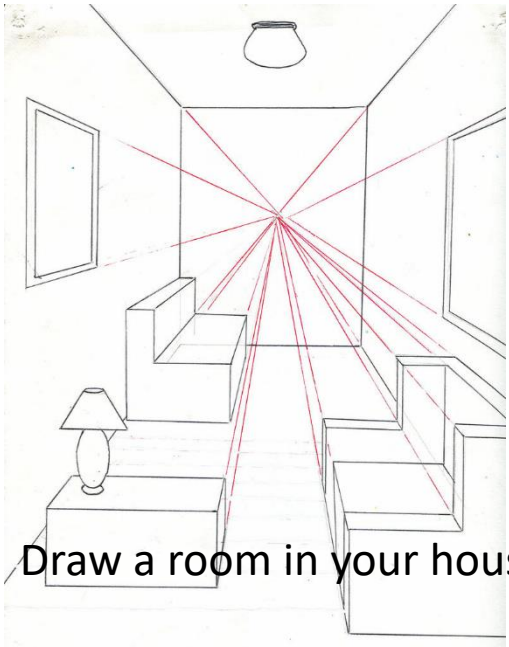
Use these instructions to help you complete the activity **below**

This may also help you complete the next activity

TASK: Using the step by step draw some rectangle shapes

Use this You Tube link to help (also watch also Single Point Perspective videos you tube recommends: https://www.youtube.com/watch?v=bjhkxFDvD78

TASK 3: Single Point Perspective 1



TASK: Draw a room in your house in Single Point Perspective

Use this You Tube link to help (also watch also Single Point Perspective videos you tube recommends:
http://www.youtube.com/watch?feature=player_detailpage&v=7ZYBWA-ifEs
https://www.youtube.com/watch?v=qOojGBEsWQw

TASK 4: Single Point Perspective 2: A room in your house

TASK 5 – Modern and Smart Materials

Using the text book pages about Modern and Smart materials complete a brainstorm that you can revise from for some recall questions at the start of year 10

The first modern material has been completed for you. Complete the rest in the same way.

Modern and Smart Materials

Definition:

Shape Memory Alloys

Description:
Can have their shape changed stretched or crumpled and will return to the original shape when heated

Advantages:
Extends product life
Reduces size
Less complex

Disadvantages:
Expensive
Can wear out

Examples:

Glasses

Dental braces

Exam style question: This is an 'explain' question. You must give a reason for your answer - do not just give an advantage without an explanation.

Explain one use of Conductive Inks…

Links for the text book page:

https://churchdownschool-my.sharepoint.com/:b:/p/nrs/EZQJq-XVVEpKl1wH9Ttd9DYBWDSddaqs_ZwA2v7KsfRt2A?e=MEemsu

1.4 Smart and composite materials, and technical textiles

Learning objectives

By the end of this section, you should know the characteristics, applications, advantages and disadvantages of:

- modern and smart materials
- composites
- technical textiles.

Modern and smart materials

Modern materials do not occur naturally, but are existing materials that have been altered to improve their properties.

Smart materials are existing or modern materials with physical properties that can be varied by an external input such as temperature, light, moisture, force or electrical current. They sense and respond to conditions in their environment and some can return to their original state when the conditions change.

Table 1.4.1 gives some examples.

Material	Description	Applications	Advantages	Disadvantages
Shape-memory alloys (SMAs)	• Can be plastically deformed (have their shape changed, stretched or crumpled) and will return to their original shape when heated or a current is applied • Examples include nickel-titanium (nitinol), gold-cadmium and iron-nickel-cobalt-titanium	• Glasses frames • Greenhouse window openers • Medical stents • Tweezers and hooks • Orthodontic wires	• Lengthen life of product • Reduced overall size, less complexity	• Expensive • Continuous use can cause metal fatigue
Nanomaterials	• Made of tiny components less than 100 nanometres (nm; a millionth of a millimetre) in at least one direction • May be particles, nanowires, nanotubes or thin films and surface coatings	• Fire-retardant materials • Sunscreen • Tennis rackets • Motorcycle helmets • Car bumpers	• Larger relative surface area can improve their strength, elasticity, magnetic, electrical, thermal conductivity and absorbent properties • Can combine properties, e.g. lightweight but robust and scratch-resistant	• Unusual physical and chemical properties – may need specialist risk assessment relating to health and the environment
Photochromic glass	• Darkens when exposed to light and reverses in the dark • Tiny particles of silver halide are added to glass; these react with ultraviolet light, causing a chemical reaction that changes the glass's colour	• Sunglasses • Plane cockpit windows	• Adapts easily to changing conditions • Can undergo thousands of cycles without performance change	• May be slow to react • User cannot control reaction

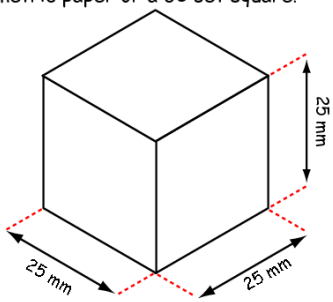
Table 1.4.1 Examples of modern and smart materials *Cont...*

Material	Description	Applications	Advantages	Disadvantages
Reactive glass	• Uses electrochromatic technology to change from transparent to opaque by applying voltage while allowing light to pass through from both sides	• Welding masks and goggles • Windows	• Retains heat, so reduces energy bills • Instant privacy without permanent blocking of light	• Expensive • Requires electricity source
Piezoelectric materials	• Generate a small electric charge when compressed (sensors) • Can work in reverse, generating movement when an electric charge is applied (actuators)	• Generating energy • **Sensors**: burglar alarms, keyless car entry, seat belt sensors, keypads, microphones • **Actuators**: for precise position control, e.g. digital cameras, fast-acting valves and nozzles	• Sustainable • Low maintenance • Compact size especially useful in micro-electronics • In actuators, high response speed and can create a large force	• Wear out • Has temperature, load and voltage limitations
Temperature-responsive polymers, e.g. poly N-isopropylacrylamide (PNIPAM)	• Can change physical properties with a change in temperature, so they are useful in many scientific applications	• Can deliver drugs, cells or proteins to patients in a controlled way when mixed with liquid polymer • When injected into a patient, a gel deposit forms; the drug is released in a controlled way when the temperature is increased • Can be used as sensors and gel activators	• Useful in biomedical applications	• Still being researched so wider application may take time
Conductive inks	• Contain pigments that allow small currents to flow through even when dry • Made with silver, carbon, graphite or other precious metal-coated base material • Used in a pen on any suitable material	• Drawing working circuits on polyester, polycarbonates and paper • Improvising or repairing circuits on printed circuit boards • Printing RFID tags for tickets etc.	• Easy to use • Lighter and more economical than traditional circuit boards • Low waste • Ink can be folded, so you can draw a circuit, fold the paper and unfold it to find the circuit still works	• Silver is expensive • Difficult to get circuits right

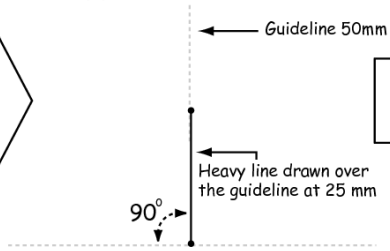
Table 1.4.1 Examples of modern and smart materials

Use the step by step below to draw a simple cube

You will now learn how to draw a '3D cube' to scale in isometric view. You will need isometric paper or a 60° set square!

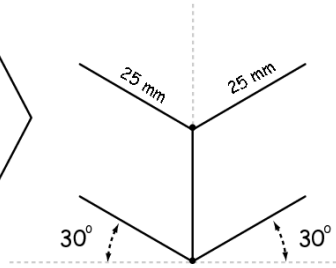


Now draw a light baseline at 90° then draw a light height line also at 90° and 50mm high. Now draw a heavy line over the light line at 25mm and at 90°.



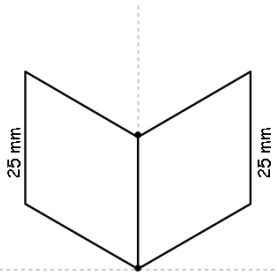
Step 1

From the two ends of your centre line draw four parallel lines at 25mm out at 30°. Note: Use the 30° line on your set square!



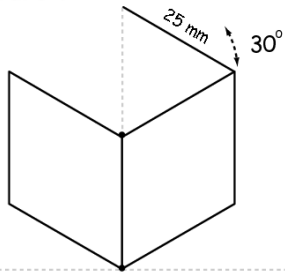
Step 2

Now add the two sides of your cube at 90° and at 25mm high like below.



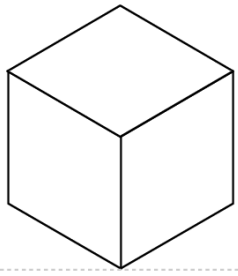
Step 3

From the top right hand corner draw a heavy line to the top of your 50mm light guideline at 30°.



Step 4

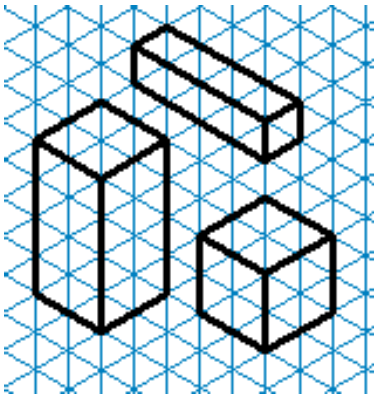
Now join your final line at 30° to close your cube. You have now finished, well done!



Step 5

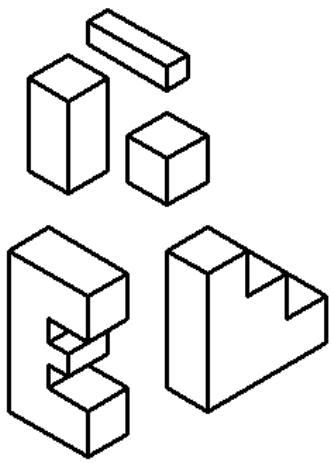
Task 6: Isometric basic cube

TASK: Sketching in 3D using Isometric



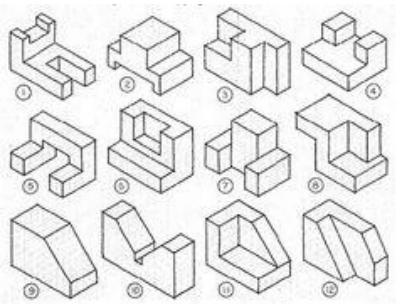
EASY

Use isometric paper to draw different rectangle and square shapes in 3D
TIP: Follow the lines.



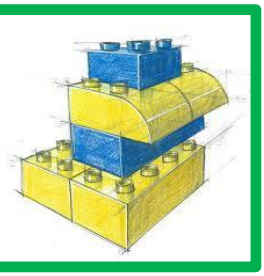
Achievable by all

Use plain paper to draw rectangles, letters and step shapes



Challenge Task

Draw more complex shapes



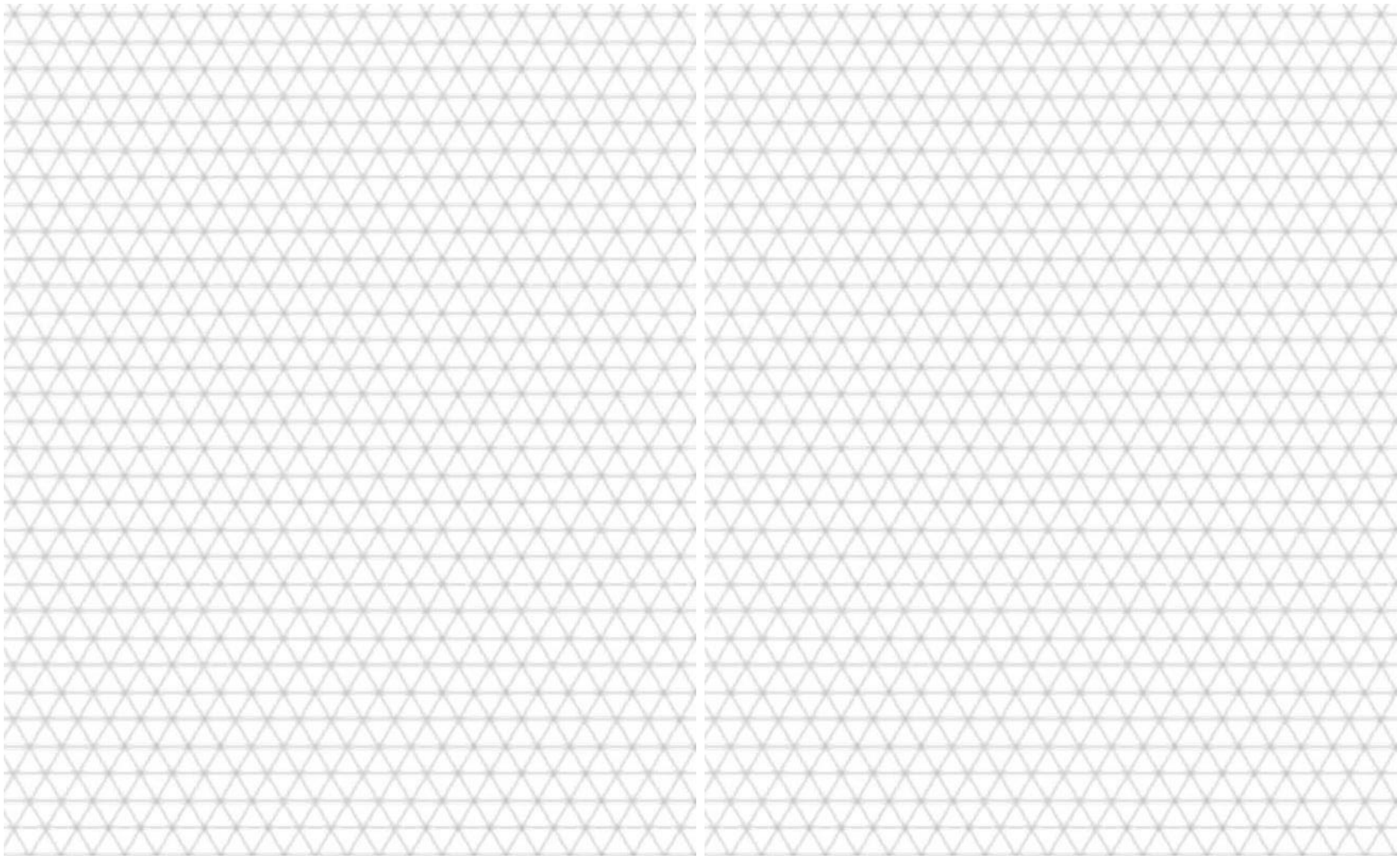
Challenge Task

Render all shapes to show light and shadow

SUCCESS CRITERIA

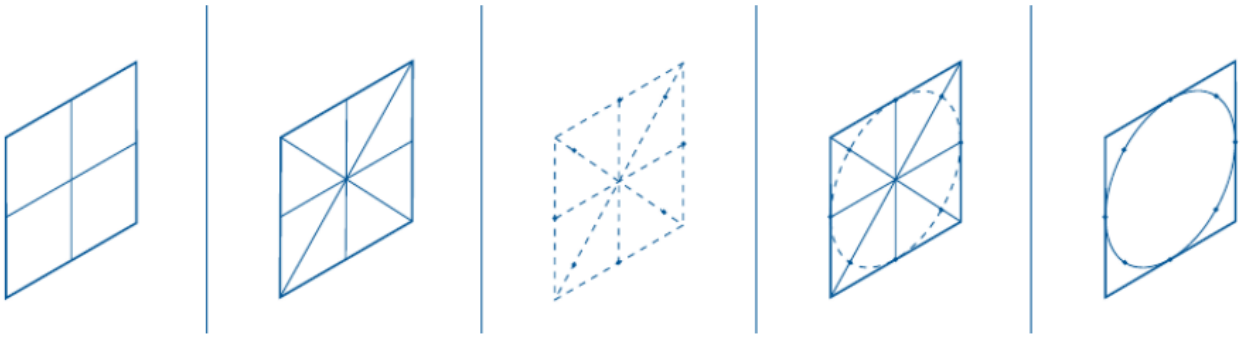
1. **Use Construction and Positive Lines**
2. **Accurate lines using a ruler**
3. **Draw on the grid lines.**
4. **Front and Back edges to be parallel**
5. **Colour shading included to show light and dark surfaces**

Use the easy, achievable and challenge tasks from the previous page draw some shapes in isometric (these links will help: https://www.youtube.com/watch?v=LY5OqKhEP9k
& http://www.youtube.com/watch?v=ZBuhGaGPYfQ)

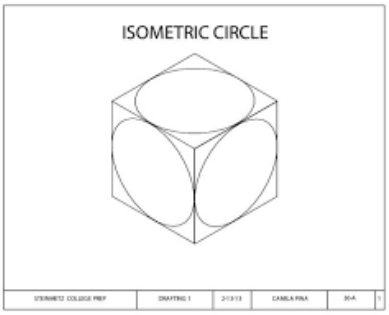


TASK 7: Isometric shapes

TASK: Sketching CIRCLES in 3D using Isometric

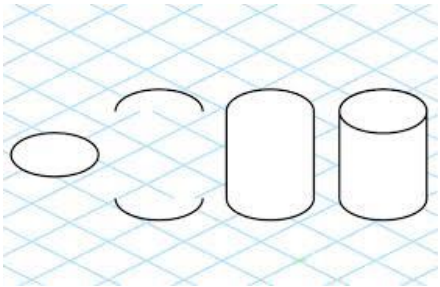


Use these links to see it being done: https://www.youtube.com/watch?v=AiGCMxWyRos & https://www.youtube.com/watch?v=Hg16J_4tmPk



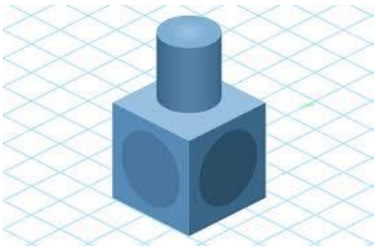
EASY

Use isometric paper to draw circles on all three sides of a cube



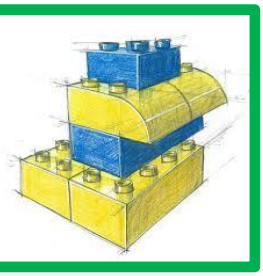
Achievable by all

Use isometric paper to draw some cylinders



Challenge Task

Draw more complex shapes



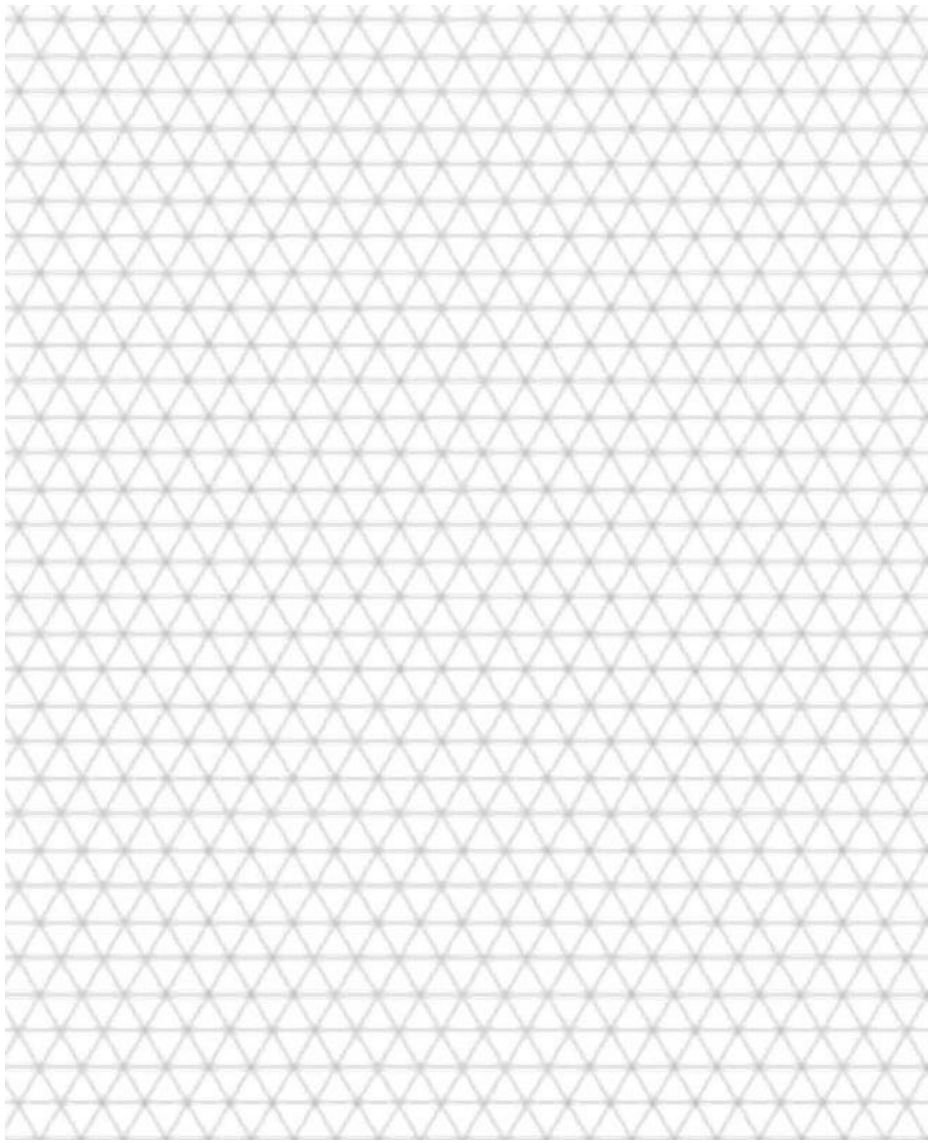
Challenge Task

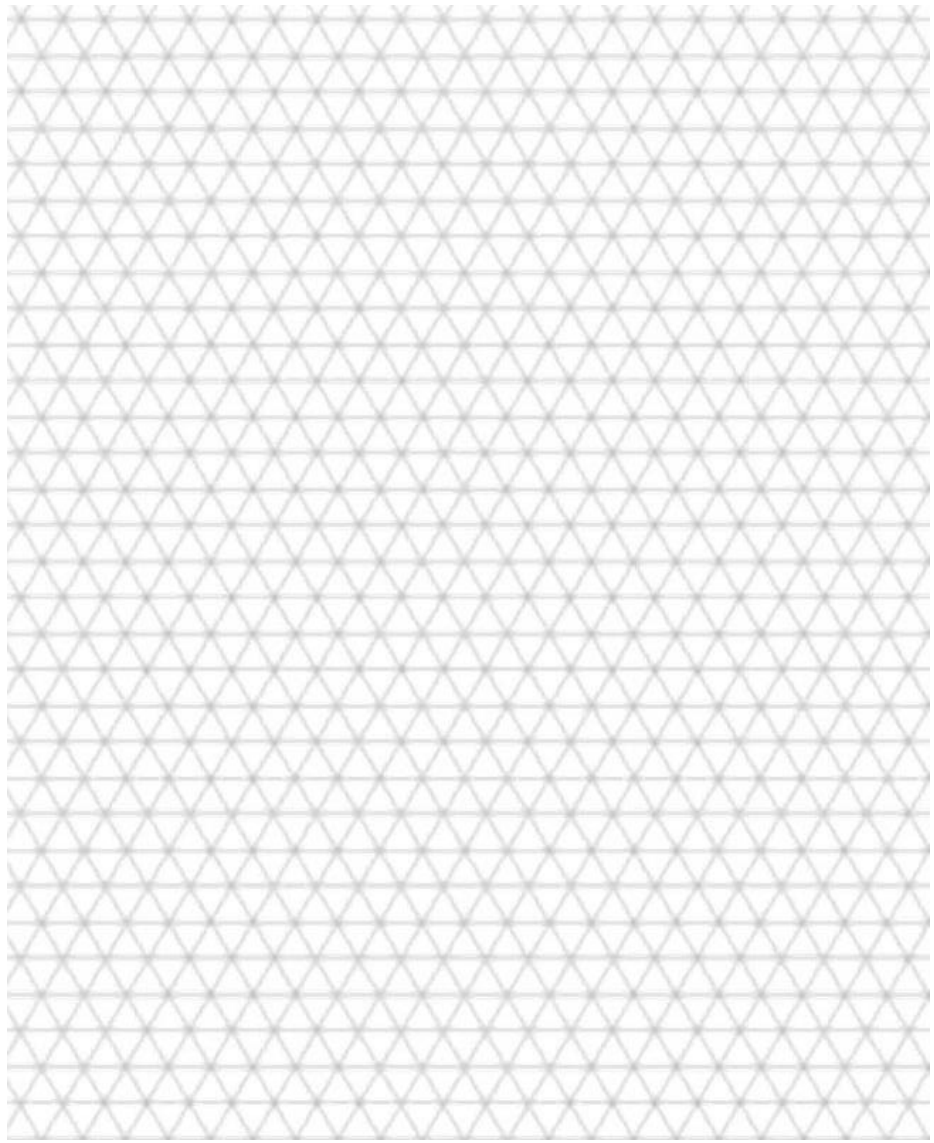
Render all shapes to show light and shadow

SUCCESS CRITERIA

1. **Use Construction and Positive Lines**
2. **Accurate lines using a ruler**
3. **Draw on the grid lines.**
4. **Front and Back edges to be parallel**
5. **Colour shading included to show light and dark surfaces**

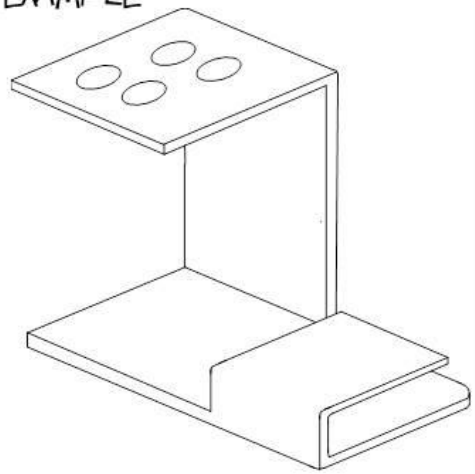
Use the easy, achievable and challenge tasks from the previous page draw some CIRCLE shapes in isometric (these links will help: https://www.youtube.com/watch?v=Hg16J_4tmPk & https://www.youtube.com/watch?v=AiGCMxWyRos





TASK 8: Isometric shapes

EXAMPLE



NAME:.....

KS4 ISOMETRIC DRAWING – DESK TIDY

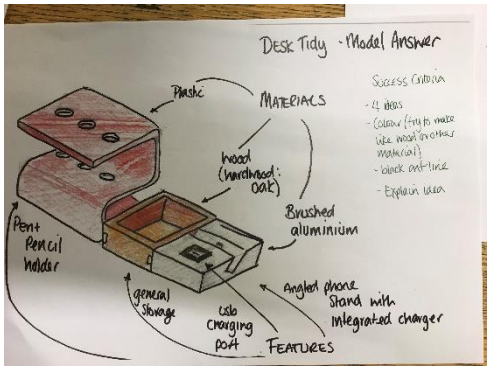
DRAW WITH RULER AND PENCIL HOW YOU THINK YOUR DESK TIDY WILL LOOK WHEN CONSTRUCTED

COLOUR. AND LABEL YOUR DRAWING

TASK 9: Isometric drawing task

Develop the desk tidy:

Draw your own version of a desk tidy (don't just copy this example!)



NAME:..... KS4 ISOMETRIC DRAWING – DESK TIDY

DRAW WITH RULER AND PENCIL HOW YOU THINK YOUR DESK TIDY WILL LOOK WHEN CONSTRUCTED

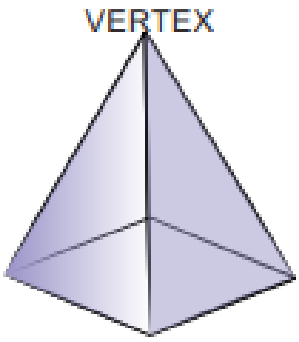
COLOUR. AND LABEL YOUR DRAWING

TASK 10 – Isometric Development Task

TASK 11: Maths – Faded example

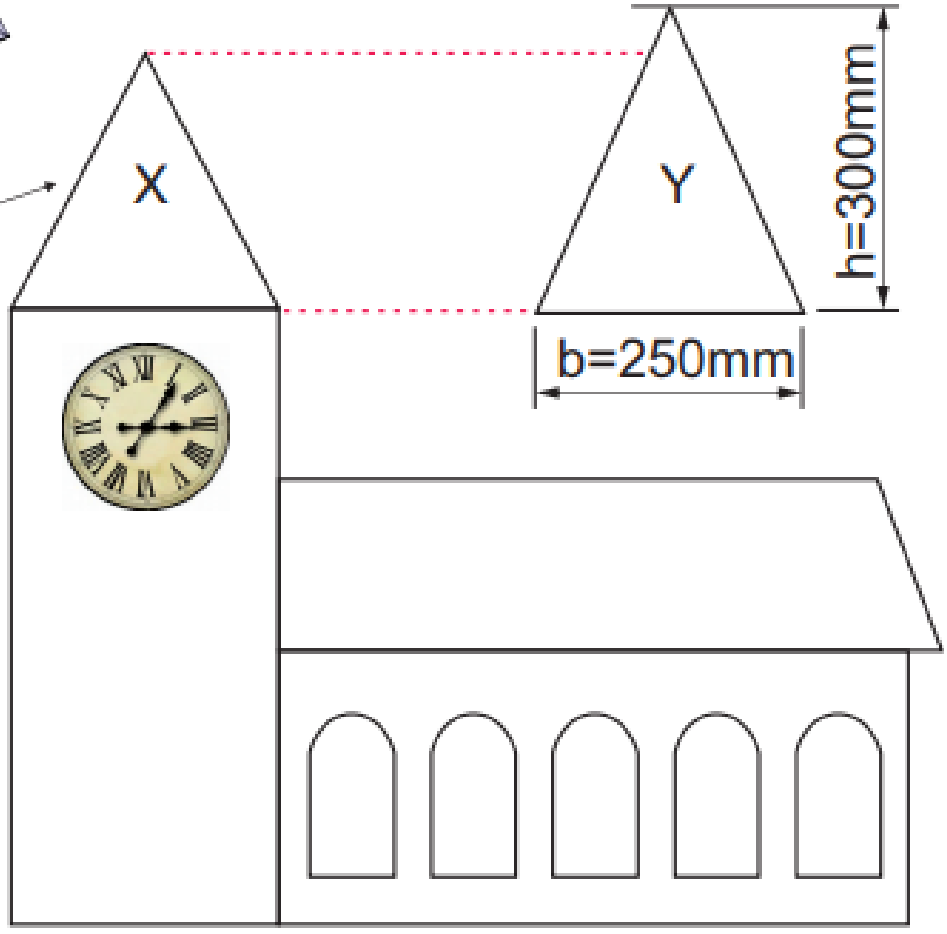
Steps	Worked Example	Partial Example	Q1	Q2
Question: Circle and Highlight	The table shows the number of plastic bags given away in England. Calculate the percentage reduction in bags given away Give your answer to the nearest whole number Year: 2014 — Number of Bags (billions): 7.6 Year: 2015 — Number of Bags (billions): 5.4	The table shows the increase in the amount of waste going to landfill in the last 2 decades. Calculate the percentage increase to one decimal place Year: 2000's — Waste in Tonnes (billions): 3265 Year: 2010's — Waste in Tonnes (billions): 4391	Calculate the increase in screen size from the iphone5 to the iphone 11 pro max as a percentage to 2 decimal places Model: 5 — Screen area (mm2): 36.65 Model: 11 pro — Screen area (mm2): 76.7	Calculate the percentage decrease in Ash trees due to Ash Dieback since 2007 Number of trees: 14611 — year: 2007 Number of trees: 6822 — year: 2017
Write out data and change units (if needed)	Find difference 7.6-5.4=2.2	Find difference 4391-3265=1126	Find difference 76.7-36.65=	
Write out equation	Percentage = Difference/total*100 2.2/7.6*100	Percentage= Difference/total*100		
Solve	Answer = 28.94			
Convert to correct format	Nearest whole number 29			

TO HELP YOU ANSWER THIS QUESTION Follow the link below.
http://www.technologystudent.com/pdf14/maths5.pdf (page 8)



27. Below is a model a typical village church.
The roof of the tower is a square pyramid.

A. What is the area of one side of the square pyramid?

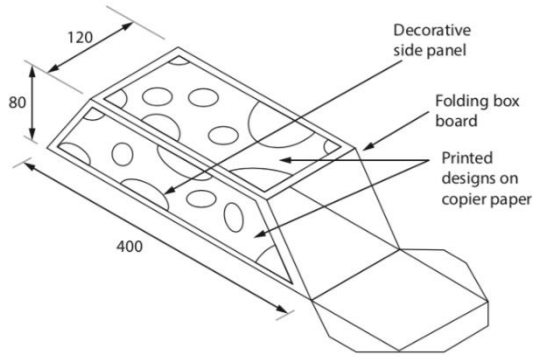


AREA = 1/2 X BASE X HEIGHT
6 marks

B. The labels X and Y represent the same part, one side of the square pyramid. Why does Y appear taller than X ? ***2 marks***

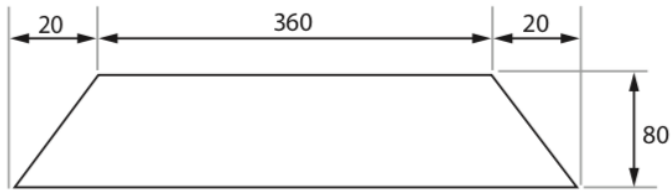
TASK 13 – Maths – practice exam question

The figure below shows a prototype gift box.



All dimensions in mm

The figure below shows the dimensions for the decorative side panel.



All dimensions in mm

Diagram not to scale

Calculate the maximum number of whole decorative side panels that could be cut from a length of paper measuring 782cm long by 8cm wide.

Ignore the width of any cuts.

TASK 14 – Design Technology Reading list

If you have any thoughts about becoming an engineer, or you want to get an apprenticeship then you should start looking at these web sites:

How Stuff Works:
https://www.youtube.com/user/HowStuffWorks

Story of Stuff Project (clue is in the title!):
https://www.youtube.com/user/storyofstuffproject

Design Technology TV on You Tube:
https://www.youtube.com/channel/UCrEUBLZSlhI-8Dxx2pBfZRw

How to be a champion:
https://www.youtube.com/watch?v=px9CzSZsa0Y

Science (Spoiler! – DT uses science all the time!)
https://www.youtube.com/playlist?list=PLAaFUKkgClHDUxumPsnlfJDjINFVw7XEC

DT site – This is the site that teachers use for a lot of our resources
http://www.technologystudent.com

Another DT site:
http://www.mr-dt.com/default.htm

Yet another DT site (useful at GCSE for research)
http://wiki.dtonline.org/index.php/Main_Page

BBC Bite size – great for revision (this link takes you to GCSE and our exam board – Edexcel)
https://www.bbc.co.uk/bitesize/examspecs/zb6h92p