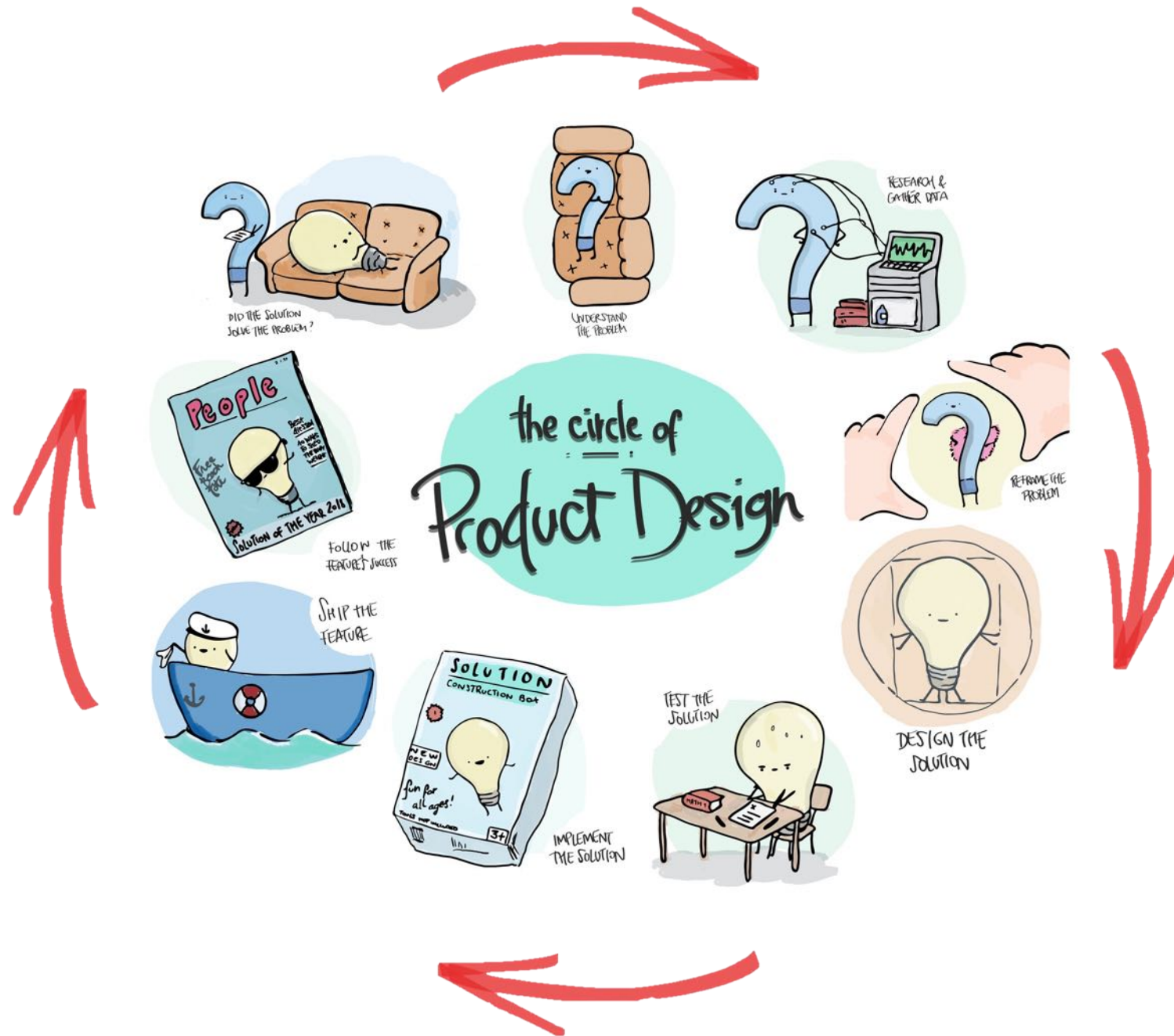


PRODUCT DESIGN

A-LEVEL



Preparation Booklet
Mr Rowberry

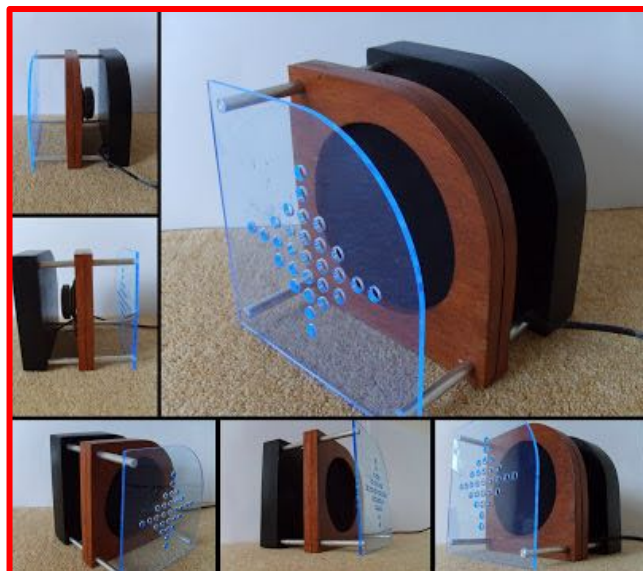
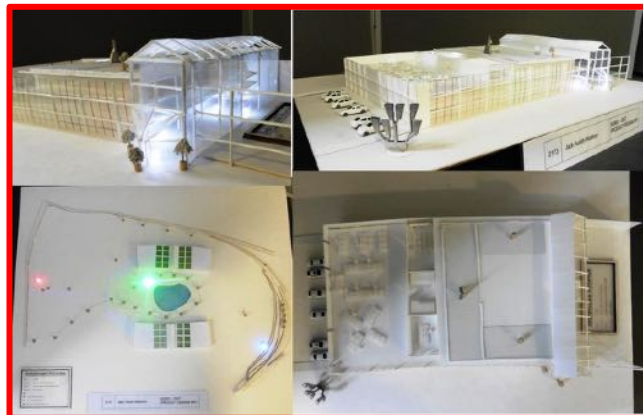
Introduction To A level Product Design

On this course you learn to be creative and how to think around a problem. You will use practical skills, theoretical knowledge and confidence that will help you to succeed in a number of careers. Especially those in the creative industries. You will investigate historical, social, cultural, environmental and economic influences on design and technology, whilst enjoying opportunities to put their learning in to practice by producing prototypes of their choice.

You will gain a real understanding of what it means to be a designer, alongside the knowledge and skills sought by higher education and employers. The skills learnt on this course are widely transferable to other industries.

As the name suggests, the main focus of the coursework is on the design of a variety of products. You will have the opportunity to work with a large range of materials and processes in order to produce your manufactured artefacts. In the first year you will produce a number of scale models and working prototypes. In the second year you will produce one major project with a full sized, working product as the outcome. It is very much like it is at GCSE but more in-depth and more available time to produce your work.

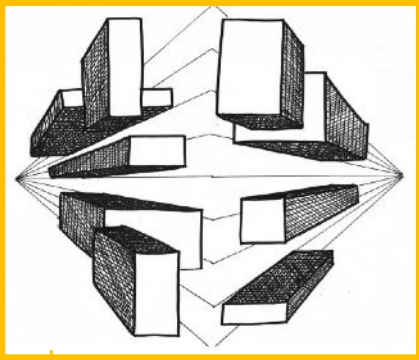
Product Design is equally rewarding and challenging. It is intended to follow on from Design Technology GCSE courses such as Product Design, Resistant Materials and Graphic Products and aims to teach the design process. The course is particularly useful to those wishing to go on to careers such as product design, architecture, automotive design, jewelry design, packaging design and some engineering courses.



Sketching Practice: 3 Quick Methods

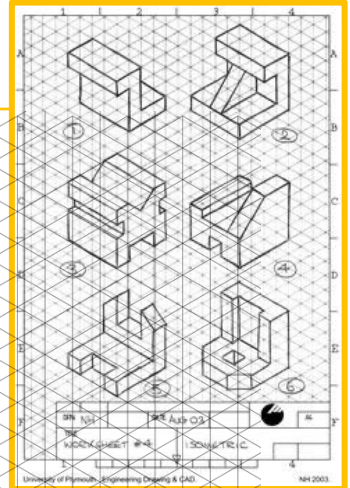
Complete the practice sketching methods in the space provided. You should also practice applying less pressure on the pencil. Do not worry about colour or shading at this point. You do not need to prove in the exam or to the moderator that you know these methods, BUT... they are great techniques that will help you communicate your ideas in a far better and professional way... The moderator IS looking for this. The first drawings we do can be scruffy but still need to be legible/understandable. They are your unrefined thoughts quickly saved on to paper! Nothing more.

Look at the example first at the back of this booklet, then have a go yourself.



Single Point perspective Sketching

Isometric Sketching

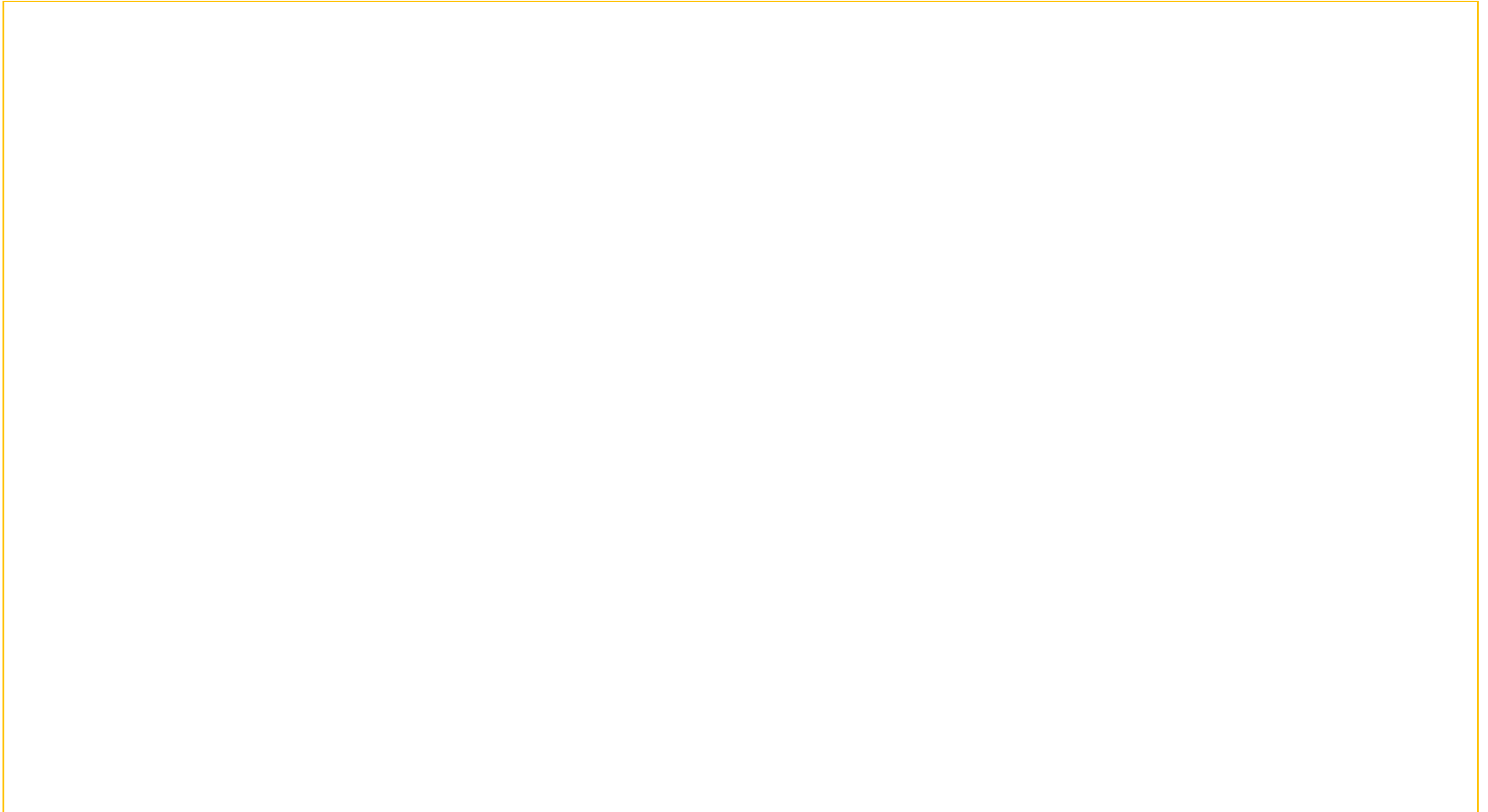


Initial Ideas:

Once you have got your ideas down on page in a rough format, we now need to turn them into something we can use to present to a potential client. Essentially we are redrawing them neater but these design should visually give the viewer more information about the product. They should have annotations with them too. We are still not producing works of art but instead explaining/showing our idea in a visual way so someone else can completely understand your idea.

When producing your initial ideas pages YOU should be confident in your idea, you may not know exactly how it will work or be made, that comes later, you should, however believe that your idea could help to solve the brief.

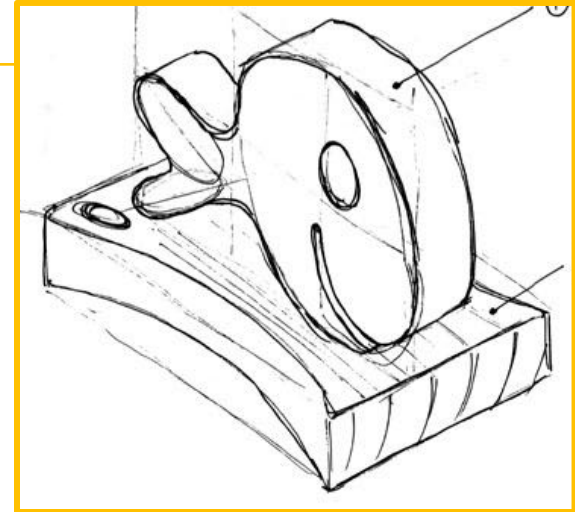
Have a go at drawing one of your rough ISOMETRIC sketches from the previous page NEATER. Look at the example at the back of this booklet to help you find a style.



Developing your ideas:

You have now presented your ideas to your client and they have chosen 2 of your initial designs. You now need to start figuring out all the SPECIFICS of your idea and this will require you to change many aspects of the original design. This could be height, thickness, smoothness, colour, texture, intended material, addition of parts or subtraction of different parts. There are so many things you could change to try and improve it.

Below is an very rough sketch of a product. I would like you to develop it and change it into a much better looking product. There is a visual example at the back of this booklet.

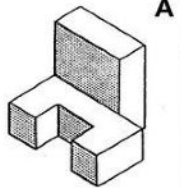
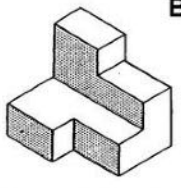
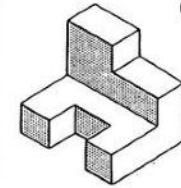
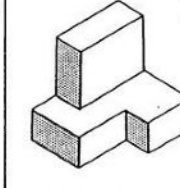
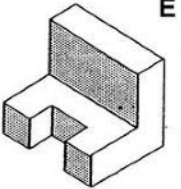
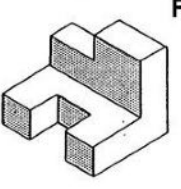
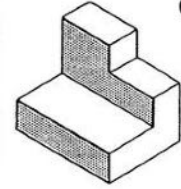
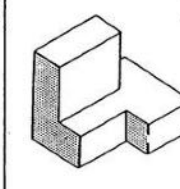
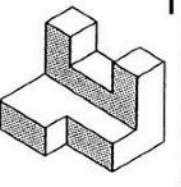
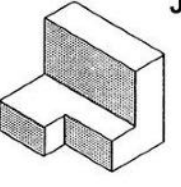
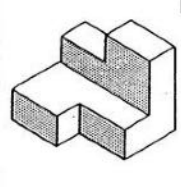
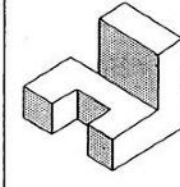
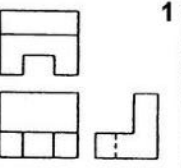
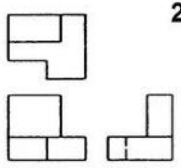
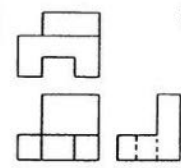
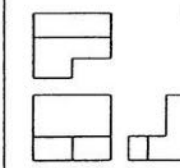
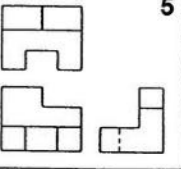
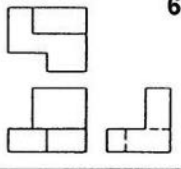
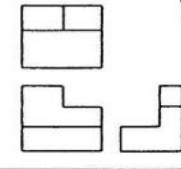
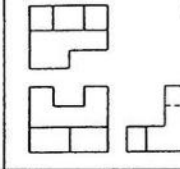
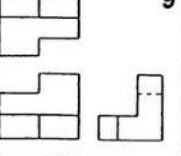
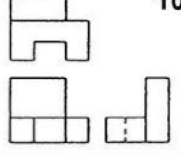
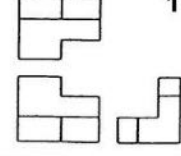
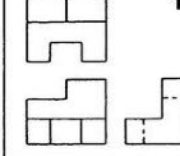


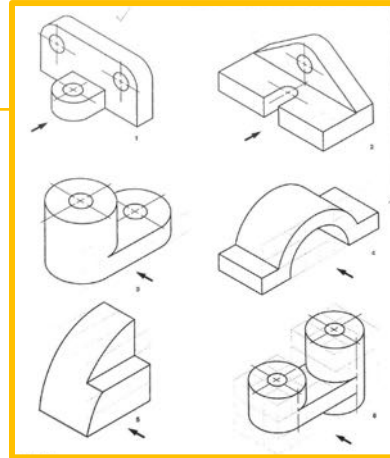
Technical drawing: Orthographic Projection

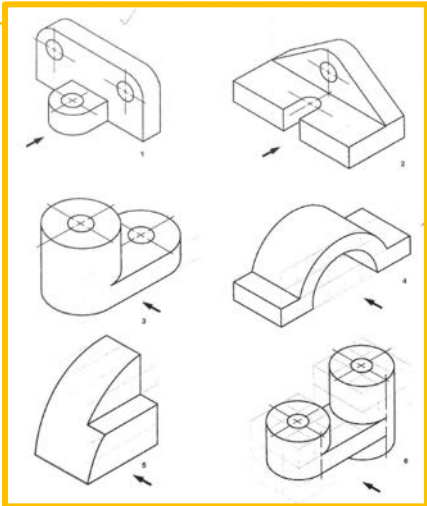
So...You sketched your rough, initial thoughts down. Then refined them to show your client and developed them into a realistic and feasible product. The designing stage is almost over. You would at this point model your design to see what they look like in 3D but this cant really be done at home. Once you are happy with your models and have worked out a few details you would then produce your manufacturing specification. Within the manufacturing specification it **MUST** have a detailed technical drawing. We do this in 2D (flat) as an Orthographic Projection.

Complete an Orthographic Projection of the 3D objects shown. There is an example and explanation in the back of this booklet. Use the next page to complete this section.

Link up the correct isometric drawing with the orthographic projection. Write the corresponding number next to the correct letter.





The Design Process & Product Life Cycle

- This course is NOT just about designing and making, Sure, it is the biggest and best part but we also need to learn the theory in preparation for the exam at the end in the summer. You will need to use the internet resources below to complete the next few tasks. They are not difficult and you may already know the answers...BUT... can you answer them in an A level standard? In the yellow box draw the product life cycle and explain what happens at each stage.
- Watch the following video and answer the questions on this page.
- <https://www.youtube.com/watch?v=KWy4UgbzCBU>

What are the 4Ps of design? give a brief description of each one.

Why do we test a product as an idea before it is prototyped?

Why do we test/get user feedback after we have prototyped?



Dieter Rams

Dieter Rams is like the God Father of product design. His theories and rules have been followed by so many current designers to ensure that their products sell and are wanted in high demand. Take the iPhone for example, The inspiration for the iPhone can be seen as almost a direct copy of Dieter Rams original design for a Braun Calculator. Dieter Rams believes that all design should be understandable and easy to use. Look at the pictures below. What do you think. Circle in a marker, all the things you think make his designs understandable and easy to use.

In the space provided, write down Dieter Rams 10 Principles of good design. Use the internet to help you find them.



10 Principles of Good Design:

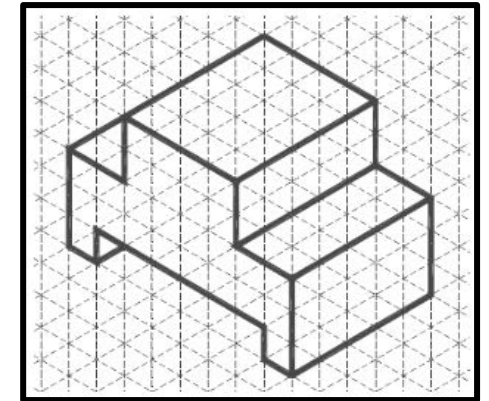
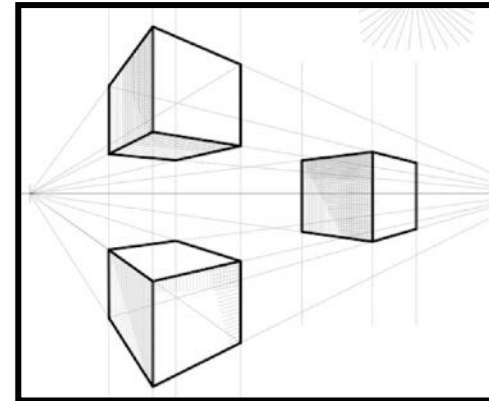
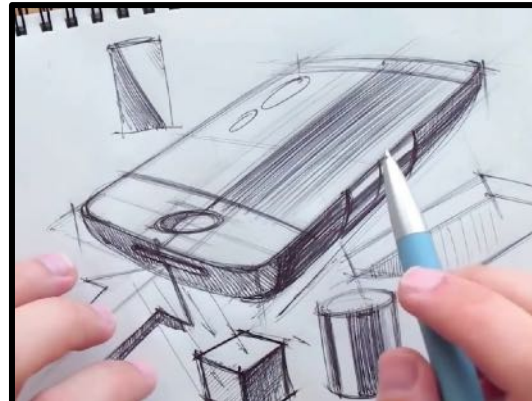
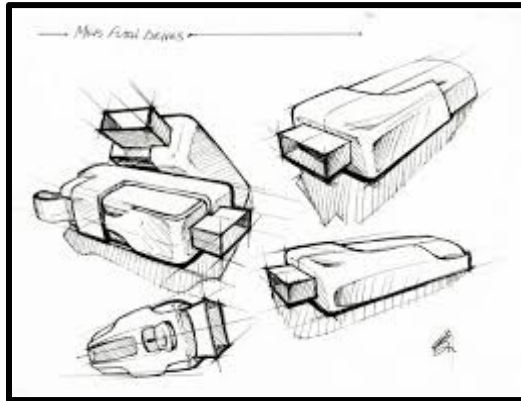
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BRAUN



EXAMPLE TECHNIQUES: Single Point Perspective



One Point Perspective

Start with your Horizon Line and One Vanishing Point

Horizon Line

Vanishing Point

Step 1

In One Point Perspective All Squares/rectangles have 90 degree Corners

In One Point Perspective you start with a square

Step 2

Draw from each corner to your vanishing point. Take care that it is a vanishing point not a vanishing area.

Step 3

Once you have drawn the corners to the vanishing point you choose the thickness of the boxes side/top or bottom and draw another square with right or 90 degree angles.

Step 4

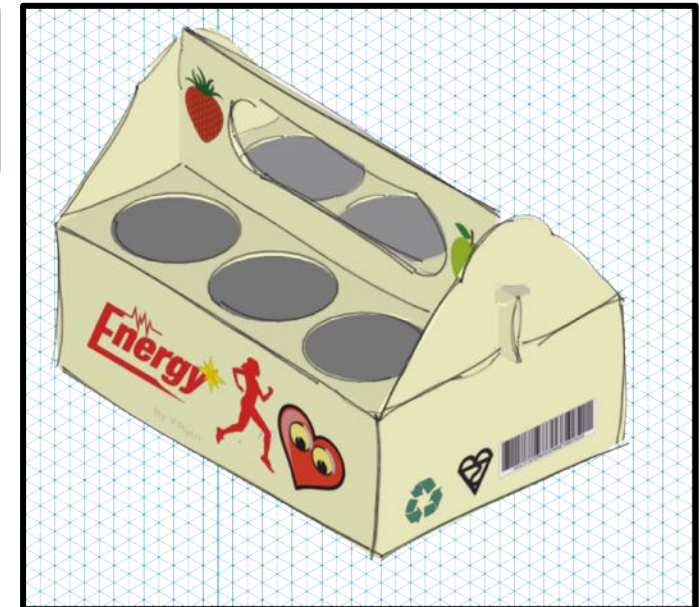
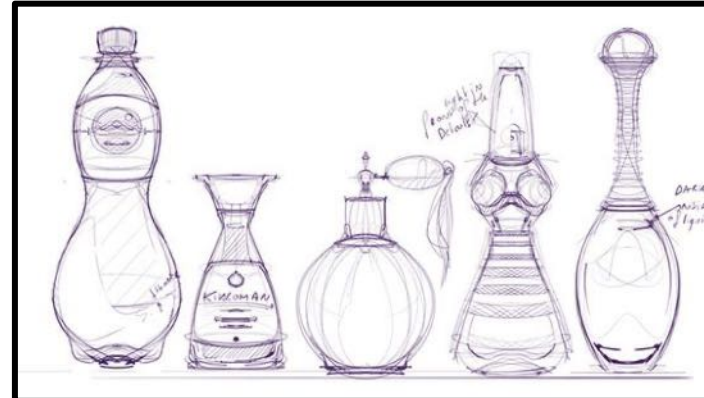
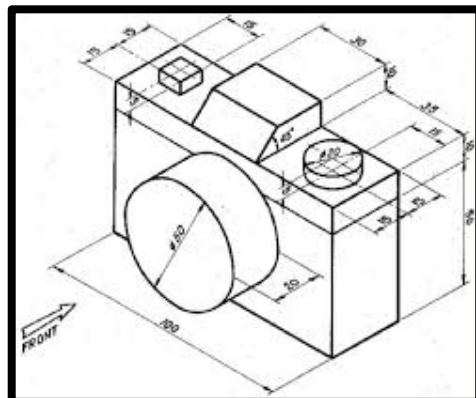
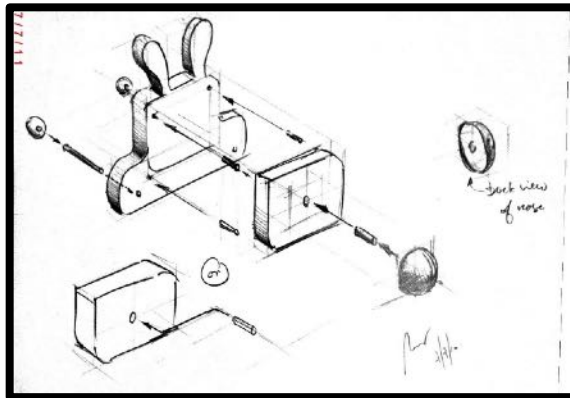
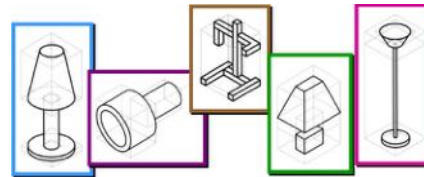
5. Draw lines at where you want the letters' depth to end.

6.

7.

DRAWINGHOWTODRAW.COM

EXAMPLE TECHNIQUES: Isometric



ISOMETRIC STEPS

- 3 LINES
- 3 DIMENSIONS
- CRATE
- CRATING

DRAWING A CRATE

LINES USED IN ISOMETRIC

DATE _____ ISOMETRIC _____ MR. A. MUSCAT _____ I.S.N. NO. 13 _____ FORM 1 _____

Multi-view drawing

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Final isometric view

Isometric Axes

- Vertical lines remain vertical
- Horizontal lines are inclined at 30 degrees
- Used to produce realistic looking 3D views

By Xfeyan

Basic steps for isometric drawing

Isometric grid

(A) THE PART

STEP 1 BUILD THE FRAME

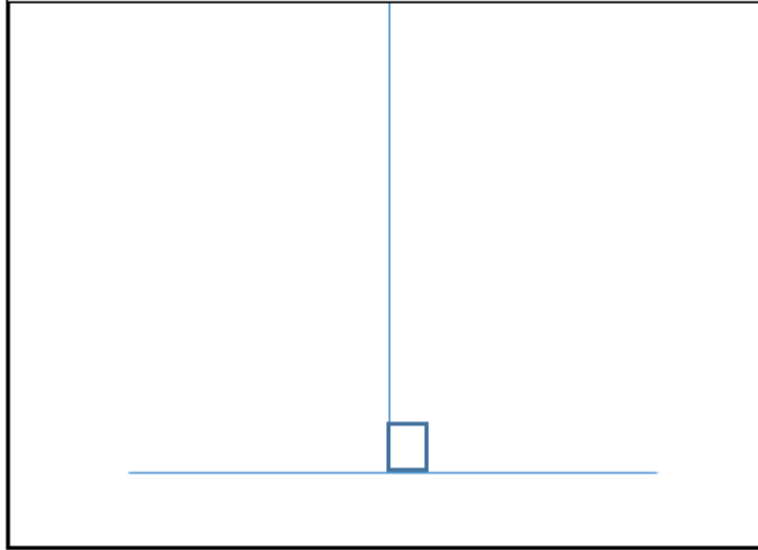
STEP 2 BLOCK IN THE DETAILS

STEP 3 ADD THE DETAILS

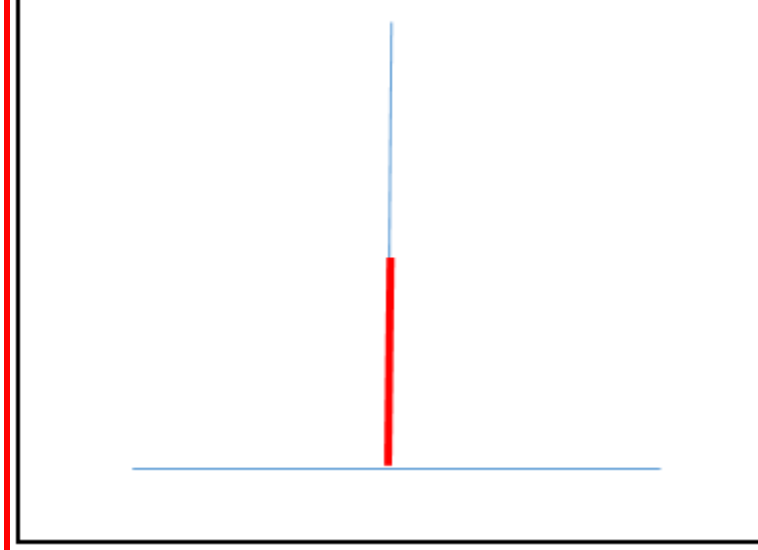
STEP 4 DARKEN THE LINES

EXAMPLE TECHNIQUES: Isometric

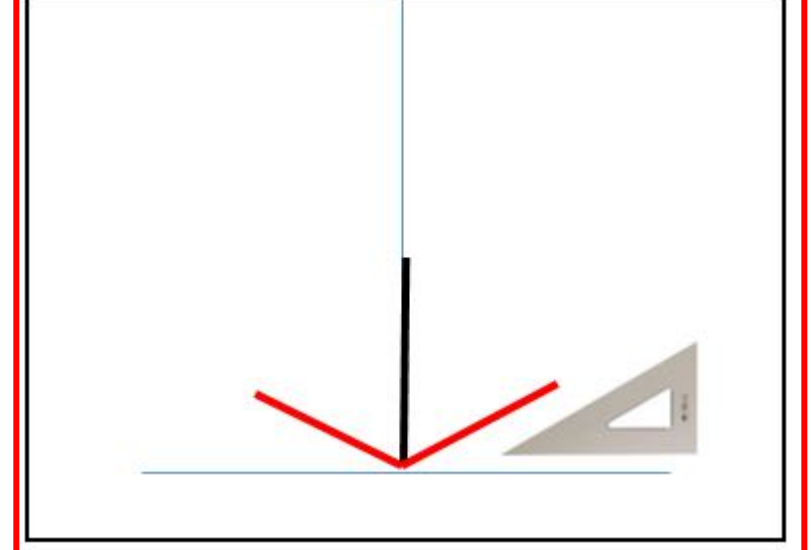
1. Draw a guide line vertical down the page centre of the page and horizontal across the page to form a right angle.



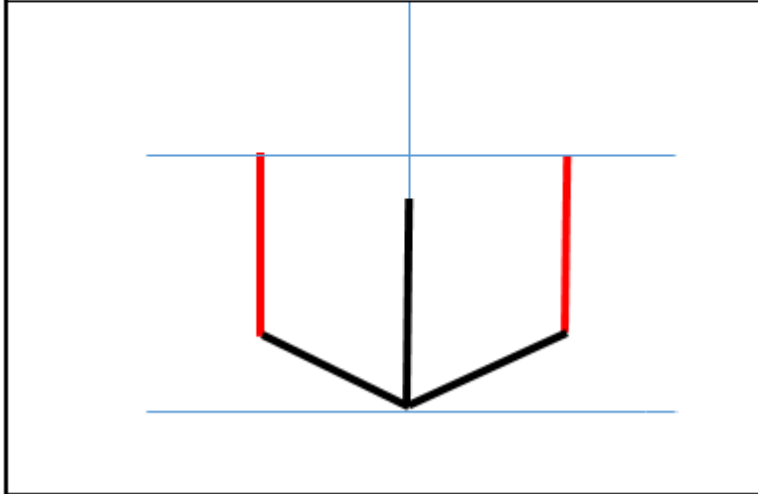
2. Draw the first vertical line of the cube on the centre guide to the length required.



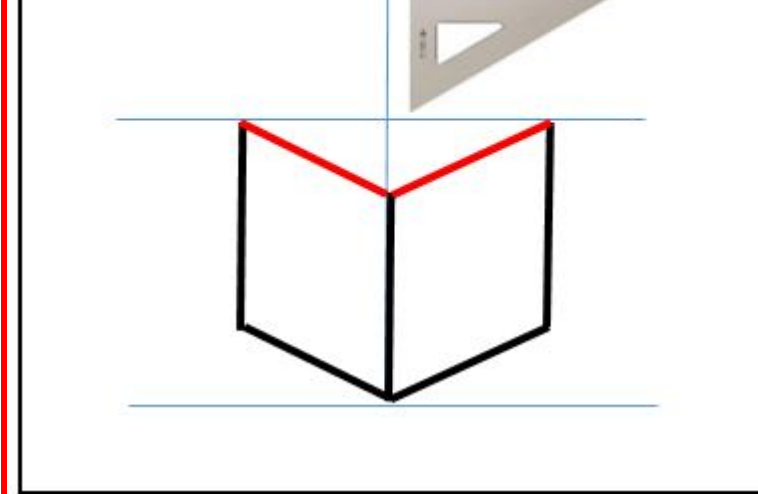
3. Add in the base lines of the cube at 30° angles to the horizontal guide line.



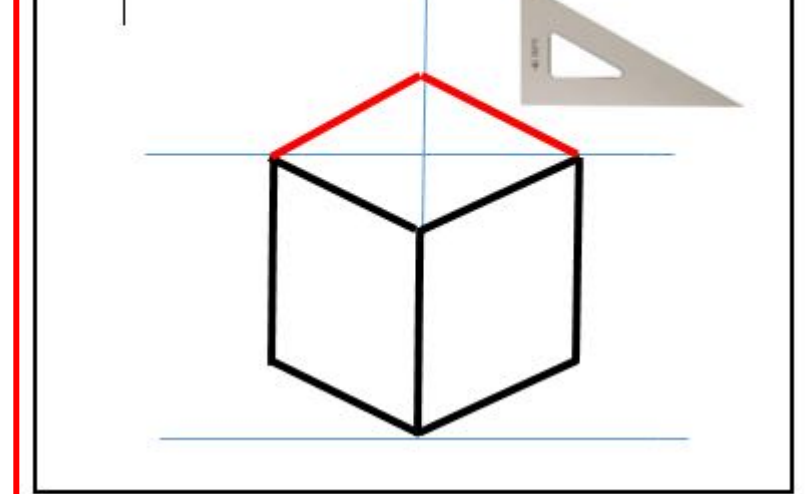
4. Create the side of the cube by drawing two vertical lines the same length as your centre line and parallel to the centre guide line.
5. Add in a new guide line across the top of the two new lines



6. To make the top front of the cube, draw two lines parallel to the two base lines at 30° by connecting the centre line to the two sides.

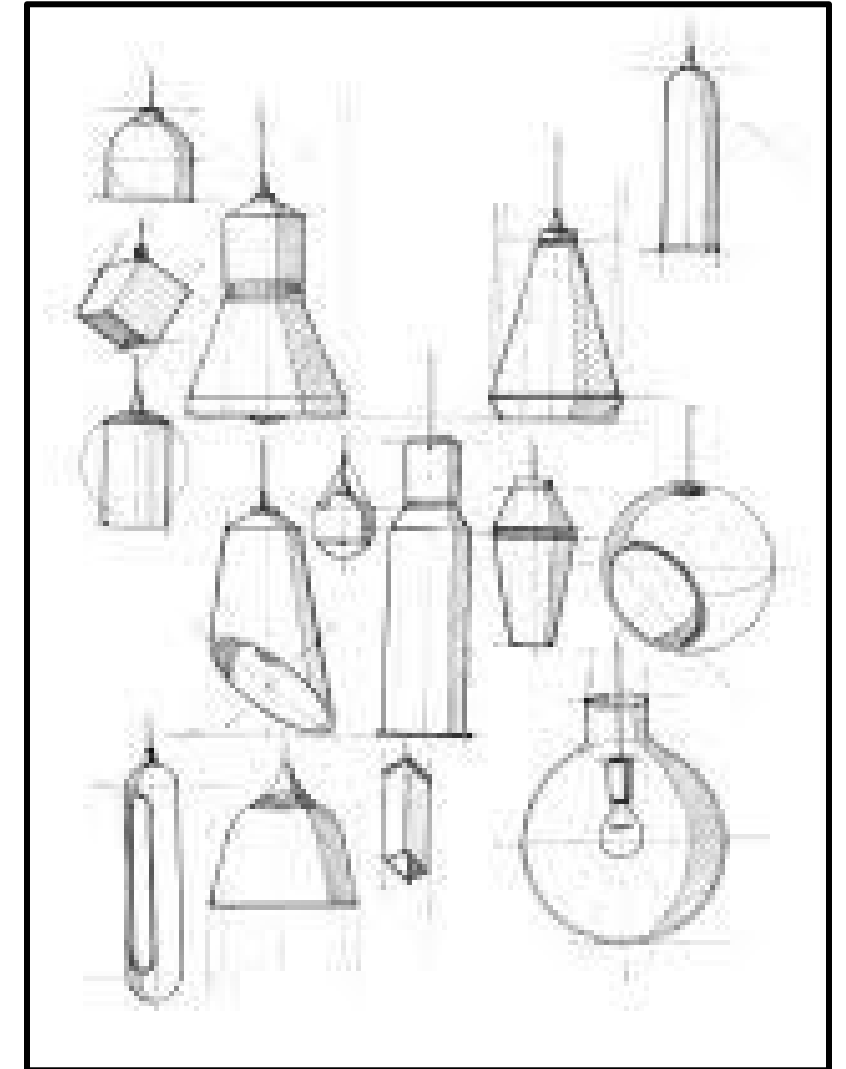
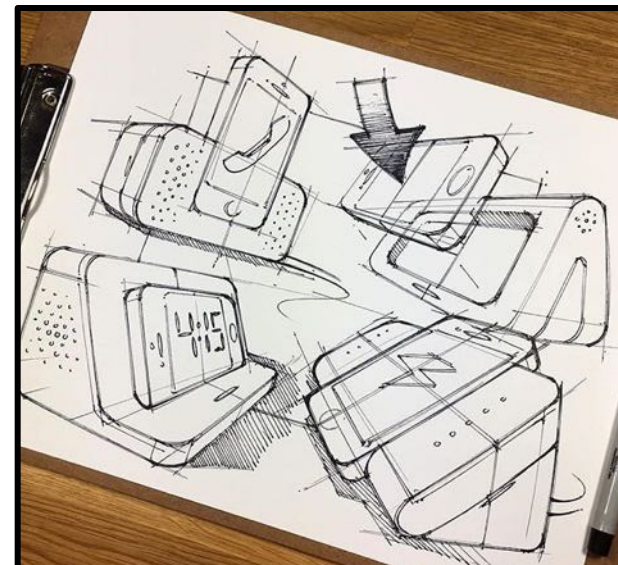
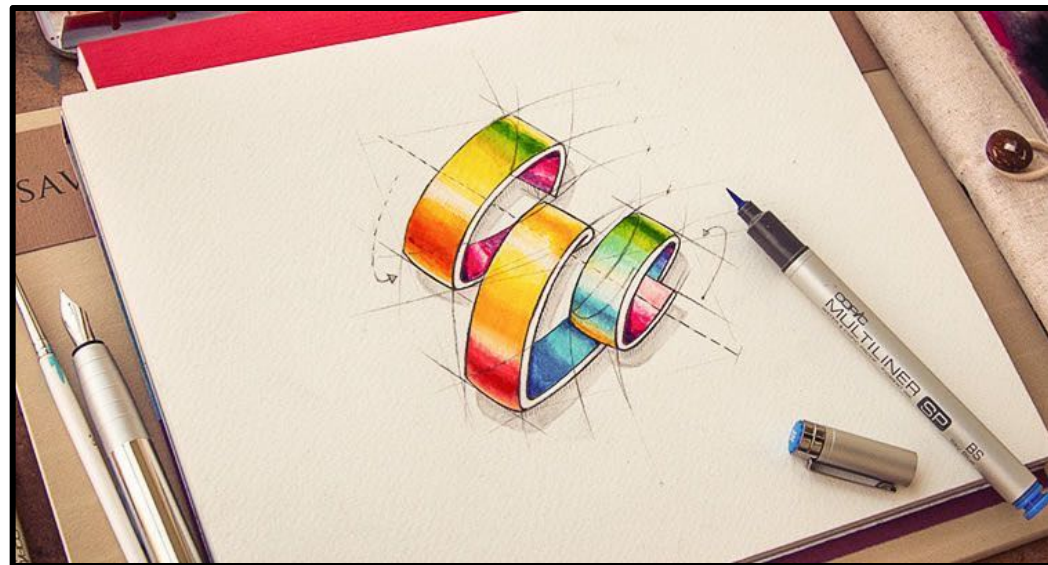
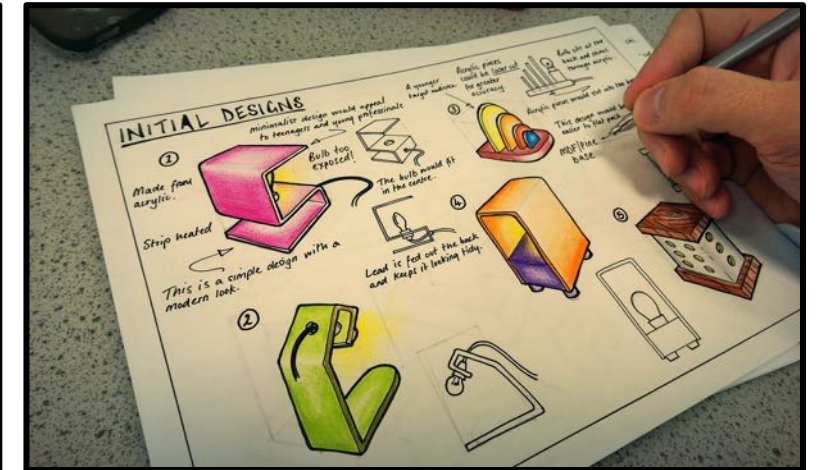
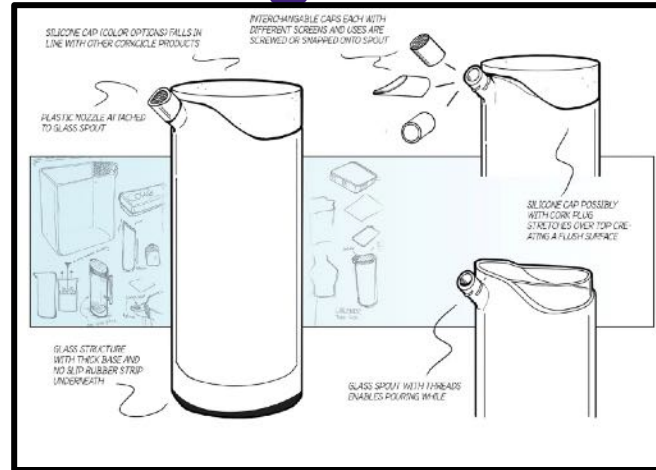
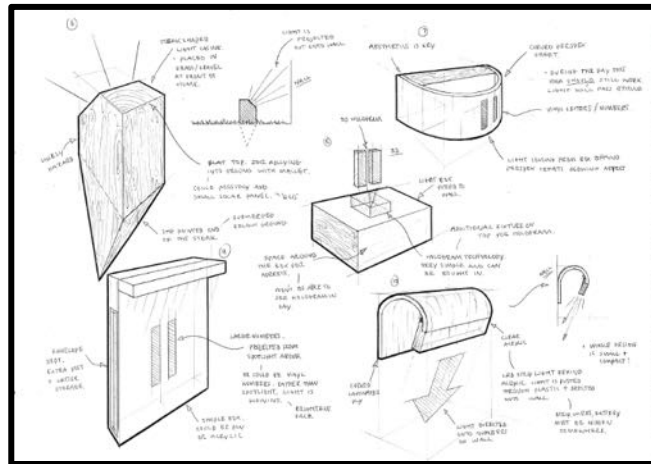
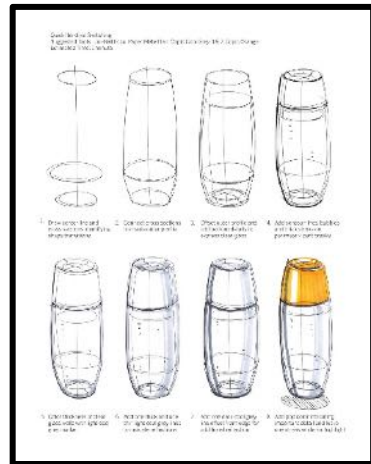


7. Add in the top back edges of the cube at 30° angles to the horizontal guide line.

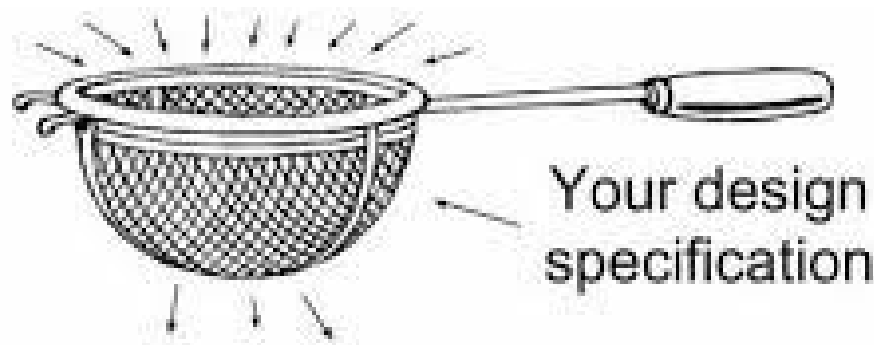


I always use the grid paper underneath to make quick sketches as it gives good accuracy and is quick and easy to do. When you are sketching it shouldn't be perfect but it should be understandable.

EXAMPLE TECHNIQUES: Refining Your Ideas



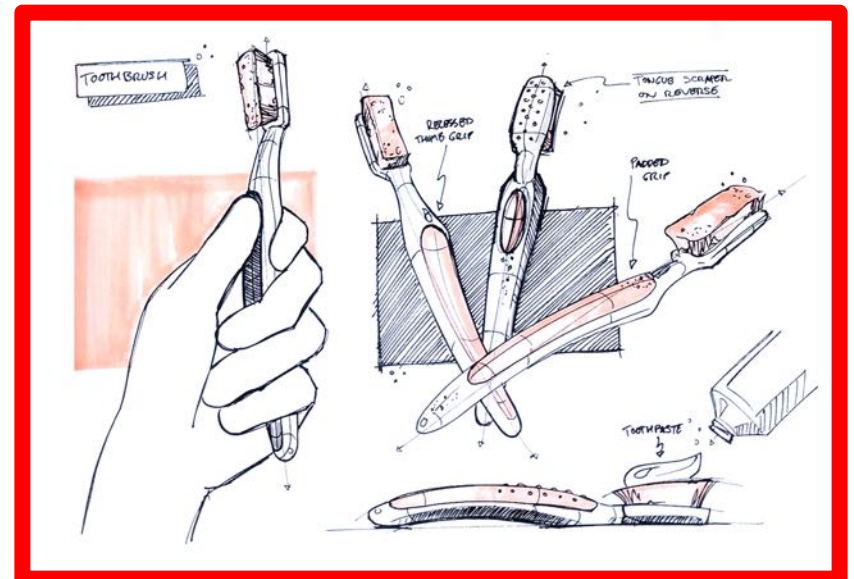
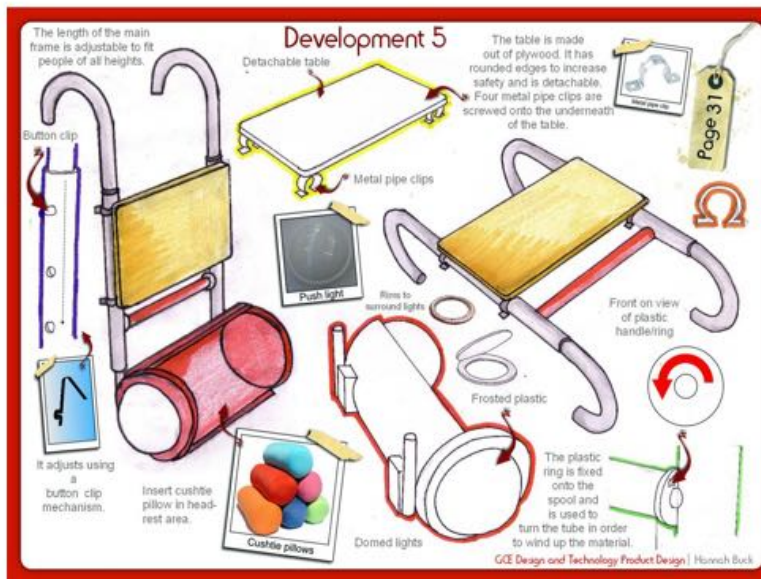
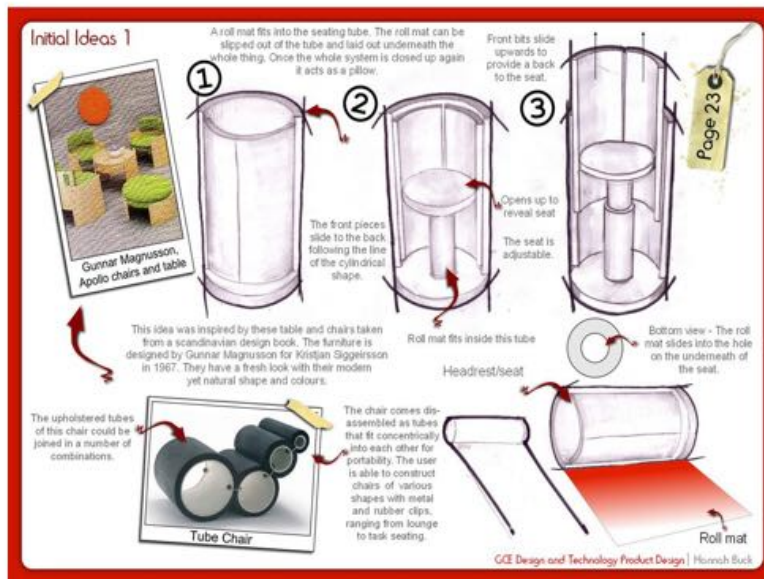
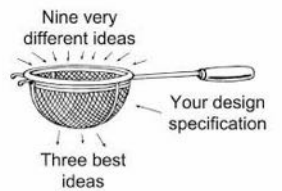
Rough sketches



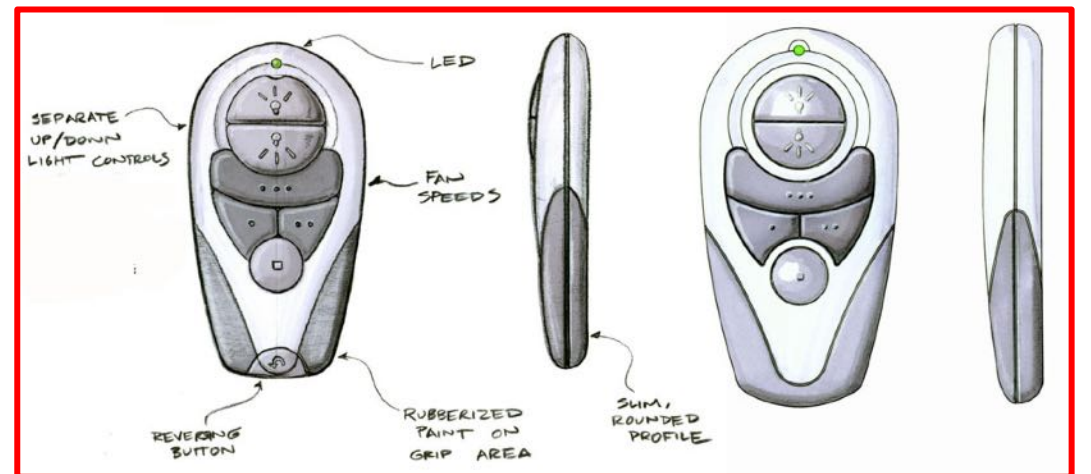
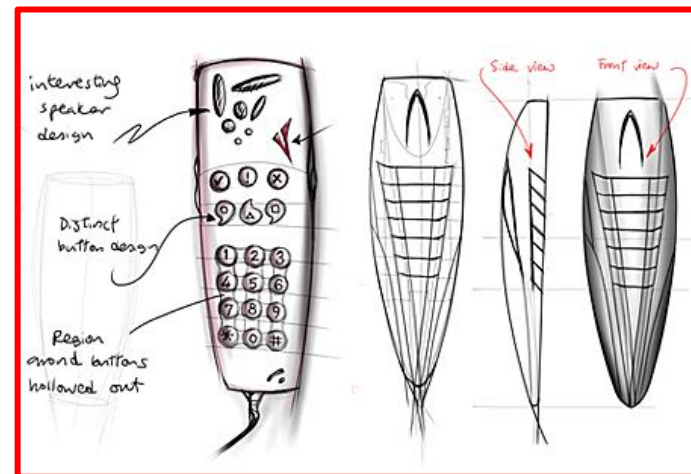
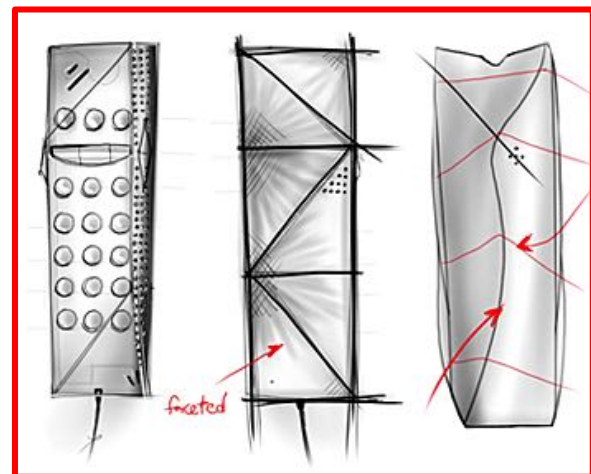
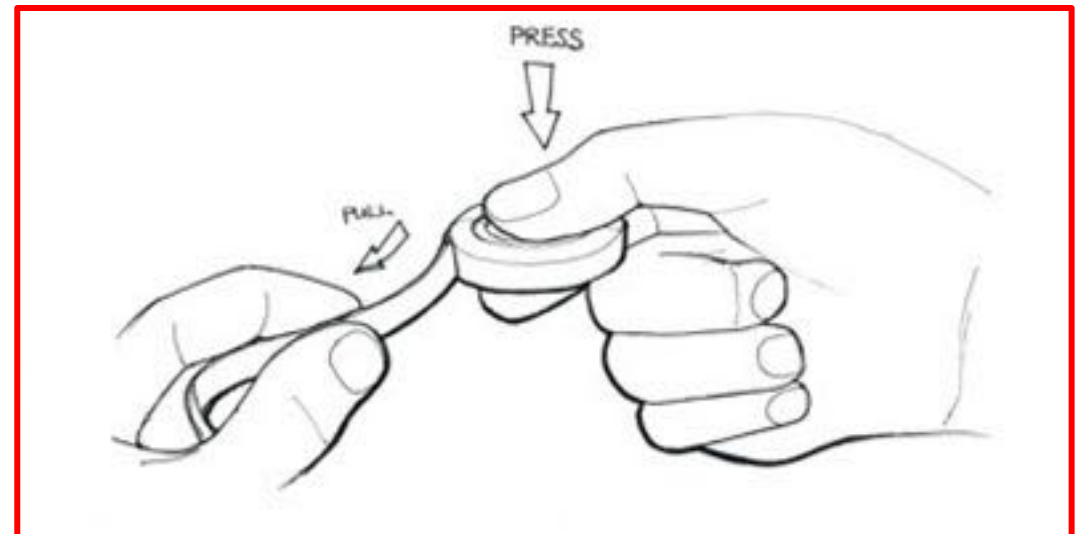
It doesn't matter what your style for refining/initial ideas is. The simple rule is to select the best of the rough sketches and then draw them again, neater with more explanations and colour.

More refined initial ideas

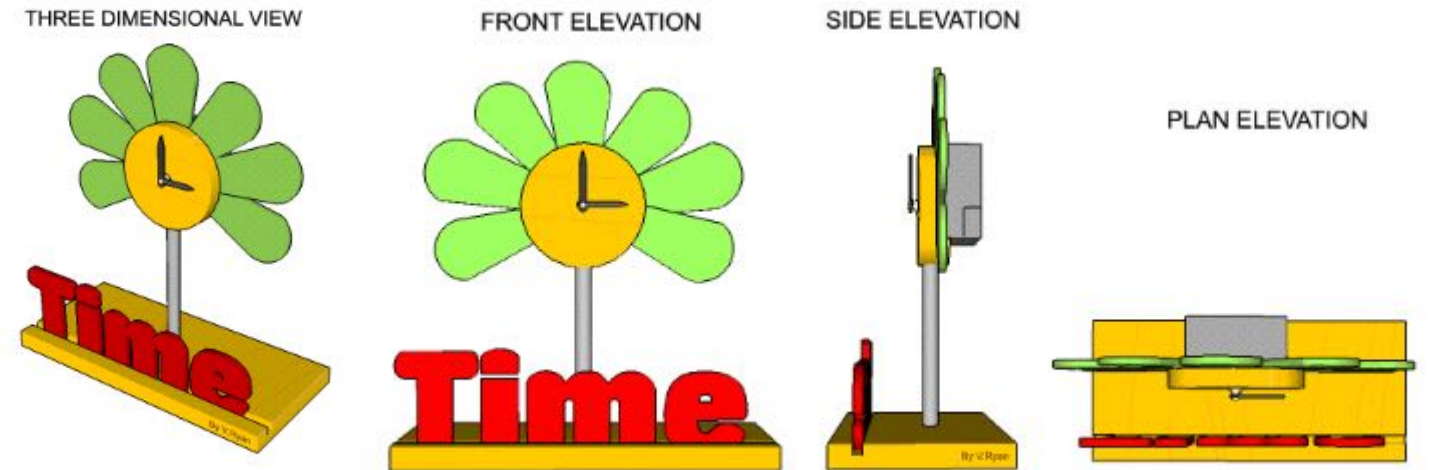
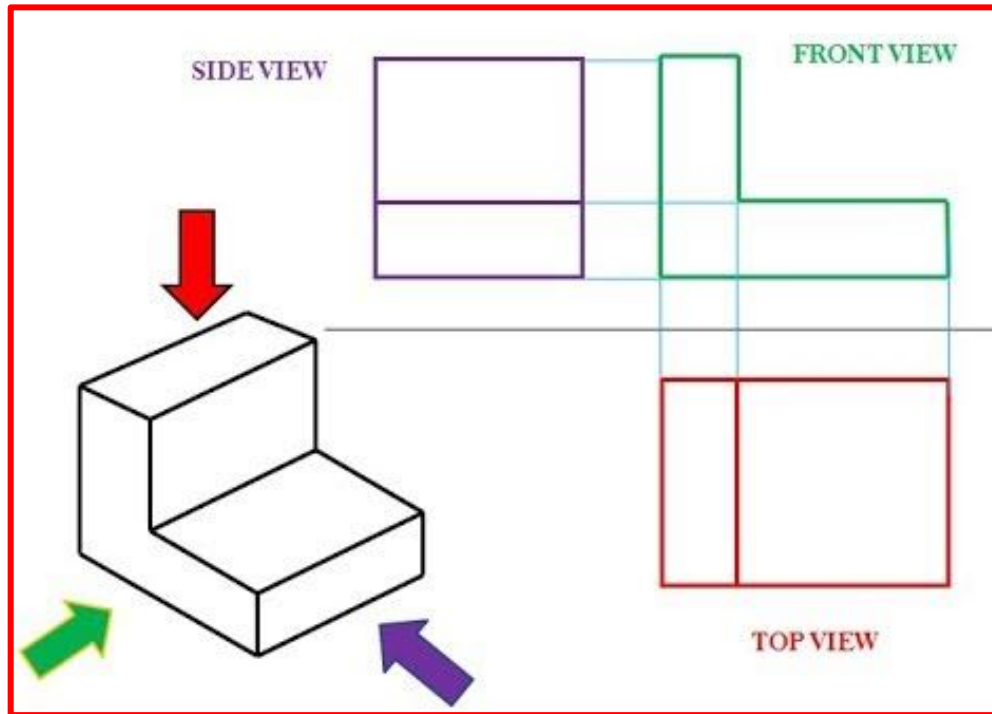
EXAMPLE TECHNIQUES: Developing Your Ideas



As you can see from the images when you develop an idea you are doing a few things. You are getting rid of any flaws, changing parts of it to look/function better and showing how it might work using hands and arrows.



EXAMPLE TECHNIQUES: Orthographic Projection



An orthographic drawing, sometimes called a working drawing, is usually the last drawing produced by a designer. It normally has three accurate views of a product, a front view, side view and plan view. Dimensions (measurements) are also drawn on each view, ensuring the manufacturer can make the product to the precise size and the designers requirements. A parts list is also included. This has the precise measurements for every part of the product and includes details such as materials and finish.

Designers often use remote manufacturing, in an attempt to keep costs low. Designers also produce working drawings so that prototypes can be manufactured, and then tested. This leads to improvements being made to the product. Working drawings are usually produced using CAD, although skilled designers still draw them by hand, at least in the early stage of the designing process. Designers find sketching in orthographic projection very useful.

Information found on a working drawing / orthographic drawing:

All necessary views required for manufacturing.

All the necessary measurements (called dimensions).

A standard format for working drawings.

A parts list which includes all the information needed to make each part of the product.

THIRD ANGLE PROJECTION
SCALE 1:2

PART No	No OFF	DESCRIPTION	MATERIAL	DIMENSIONS	FINISH
1	1	BASE	PINE	250 x 120 x 9mm	VARNISH
2	1	NAME	PERSPEX	150 x 90 x 3mm	POLISHED
3	1	STEM	STEEL	8mm dia X 190mm	NATURAL
4	1	FACE	PINE	8mm dia x 9mm	PAINT
5	6	PETAL	POLYSTYRENE	100 x 70 x 2mm	NATURAL
6					

NAME: _____

WORKING DRAWING

DATE: _____

EXAMPLE TECHNIQUES: Product Life Cycle

Product Life Cycle

