KS3 DESIGN AND TECHNOLOGY
YEAR 8 TOY PLANE PROJECT

Learning Objectives

- To understand how to communicate design ideas through a range of drawing skills and techniques.
- To learn how to use these techniques to develop your own innovative design ideas.

WHAT WILL YOU BE DOING THIS PROJECT?

For this project, you will be learning how to use various 3D drawing techniques, to help you in designing a toy plane that you will later produce in the workshop

Key words

Crating using lightly drawn boxes for guidance when sketching

Rendering the addition of colour, or texture, to enhance a sketch to better communicate design intent.

Isometric Isometric projection is a method for visually representing three-dimensional objects in two dimensions in technical and engineering drawings.

Shading Shading refers to the depiction of depth perception in 3D models or illustrations by varying the level of darkness.

Annotation a note by way of explanation or comment added to a text or diagram.

3D drawings use optical illusions to make it appear that an image has depth. This technique can make any drawing come to life. It may seem difficult to achieve but it is actually easier than it appears. With a few techniques, you can make 3D drawings of a wide variety of objects.

Sketching and Crating

A box or crate can be used as the basis for drawing many other items.

This method of drawing is called **crating**.

- The best way to start is to **imagine that the object** you wish to draw **is packed inside a box** or crate.
- When you have decided on a suitable view point, **the box is lightly drawn** in to the correct size and shape.
- The **details of the object** can be **added using guidelines** where necessary.

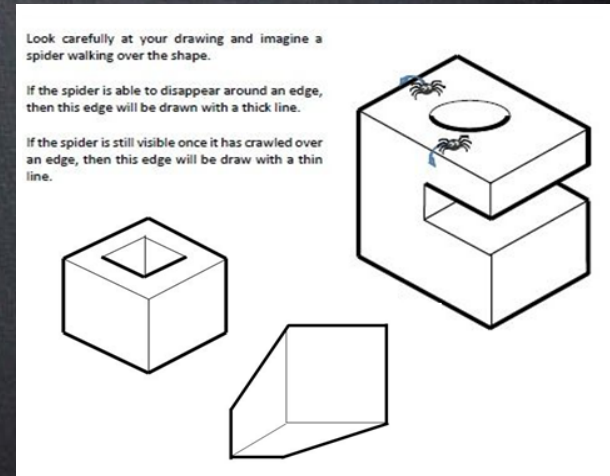**Learning objective – to be able to produce a 3D sketch using crating.**
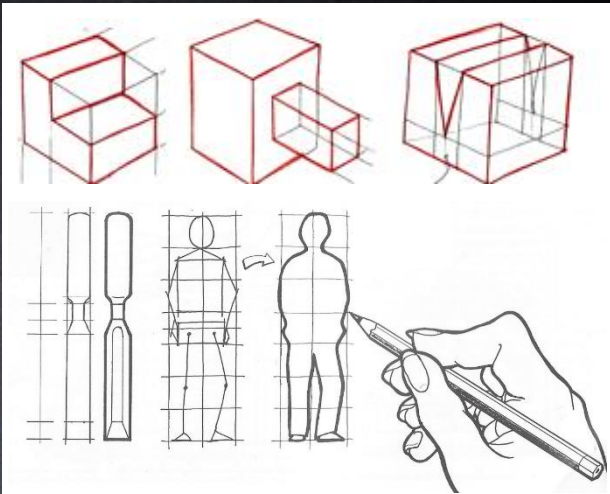
Thick and Thin Lines

Thick and thin lines are used to enhance a sketch and make an idea stand out.

- The trick with thick and thin lines is to ensure the **outer edge is a thicker** black line and the **inner lines are thin**.
- The outline is a **continuous and connected line** that defines the outer boundary of an object.
- Avoid thick lines on the inside of your sketch as you will lose definition and quality of detail

Learning objective – to be able to give your sketch definition by using thick and thin lines.

Look carefully at your drawing and imagine a spider walking over the shape.

If the spider is able to disappear around an edge, then this edge will be drawn with a thick line.

If the spider is still visible once it has crawled over an edge, then this edge will be draw with a thin line.

Shading

Uses shadow to give a sense of depth to an object. It can make a 2D object appear 3D. There are different techniques for shading such as cross hatching, smooth and stipple.

- To shade an object, it helps to choose where the **light source** will be coming from.
- Closest to the light source is called a **highlight**, furthest from the light source is the **core shadow** and in between are the **midtones**.

light source

shadow

highlight

midtones

cast shadow

reflection

Highlight

Core shadow

Cast shadow
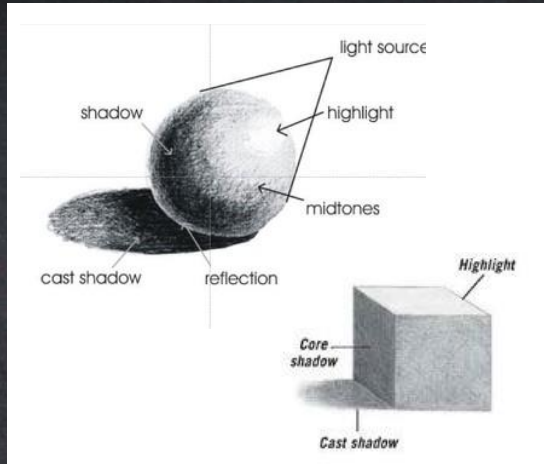
Rendering

This is the addition of colour and texture used to communicate design intent. Colouring pencils are excellent for adding instant colour to design sketches. They are quick to use, easy to control, inexpensive and involve no mess. There are different techniques for using pencil crayons.

- Just one blue crayon can be used to produce all of the different tones of blue. Very light blue results from gentle use. Darker blues are made by pressing harder and working over the same area.
- New shades and colours can also be made by mixing the crayons.
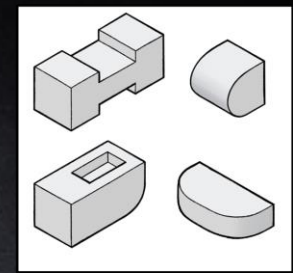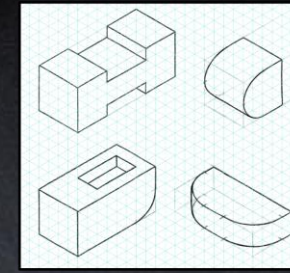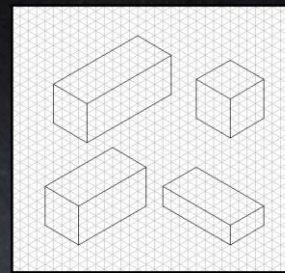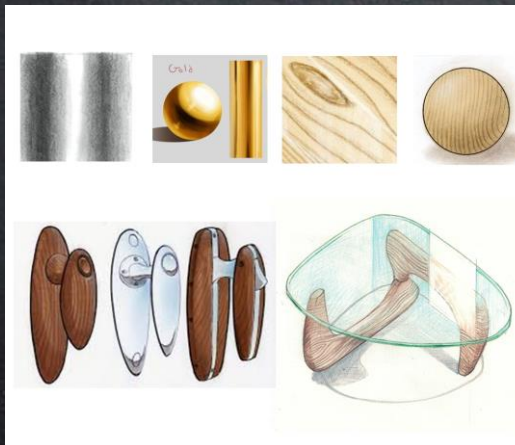
Success Criteria

- Accurate use of **crate as a guideline**
- **Smooth curve** on eclipse
- **Proportions** that match example
- Correct use of **thick and thin lines**
- Excellent **presentation**

Graphic communication
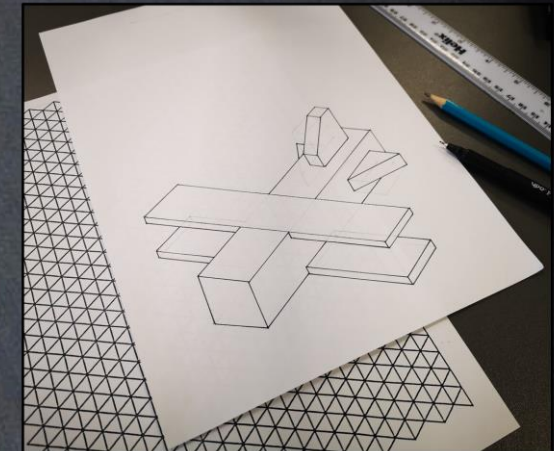
Drawing the plane in isometric

Before adding your own design features to your toy plane, you will first **produce a drawing template** (see example).

The template will be used for tracing and will help improve accuracy on later design sketches.

For this activity you will need:

- **Isometric paper**
- **Plain paper**
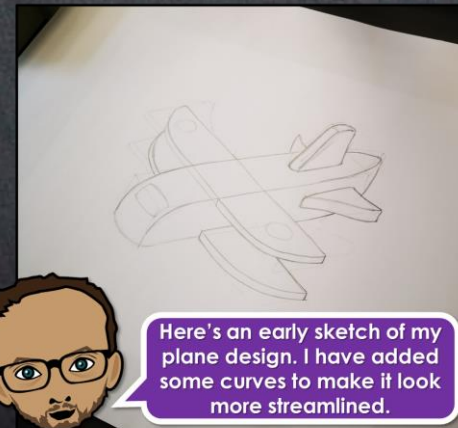- **HB pencil**
- **Ruler**
- **Black fine-line pen**

Come up with your own design

Now that you have a template for the toy plane, you can lightly trace it and then start to add your own design features.

Think about how you might look your toy plane to look different to everyone else's.

Here's an early sketch of my plane design. I have added some curves to make it look more streamlined.