14 Freehand Drawing

SYLLABUS OUTLINE

Areas to be studied (in an applied context):

• Materials for freehand drawing. • Observation techniques. • Representing shape, form, texture and material. • Light and shade. • Design sketching. • Freehand detailing. • The use of colour.

Learning outcomes

Students should be able to:

Higher and Ordinary levels

- Use freehand sketching as a tool to explain an idea.
- Produce freehand drawings.
- Select the most suitable medium for producing and rendering sketches and drawings.
- Identify the surfaces of an object relative to each other in three-dimensional space.
- Use various methods of rendering and colouring to enhance a drawing.

Higher level only

- *Analyse critically the texture and colour of a surface and choose suitable rendering media by which the surface can be accurately represented.*
- *Represent graphically the effects light and shade have on surface.*

Freehand sketching is the process of representing an object, a scene, or an idea by making lines on a surface. This drawing is generally linear in nature but it may include other elements such as dots and brush strokes. Whatever form a drawing takes, it is the principle means by which we organise and express our visual thoughts and perceptions. It can be regarded as a form of artistic expression but also as a practical tool for formulating and working through design problems or graphics problems as presented in a subject like this one.

In design, the role of sketching expands to include recording what exists, working out ideas, as well as speculating and planning for the future. Throughout the design process we use drawing to guide the development of an idea from concept, to proposal, to constructed reality.

Materials for Freehand Drawing

Two of the most versatile media for sketching available to students are pencil and ink. Of the two, the pencil provides the best solution for quick sketches, sketching used to develop ideas, sketches of a non-permanent nature and sketches used to rough-out an idea.

Fig. 14.1

Fig. 14.2

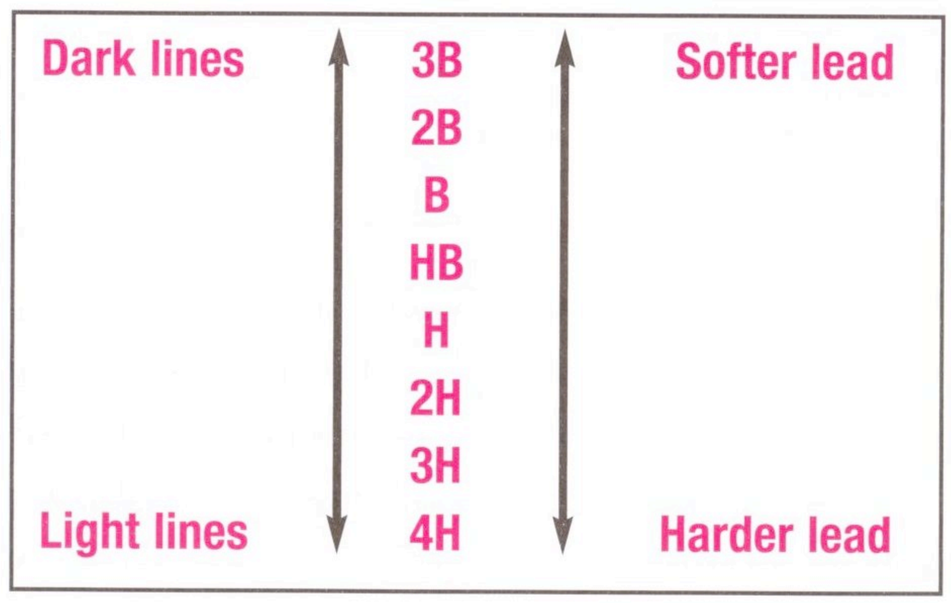
The use of ink can produce permanent and almost microscopically detailed drawings which can then be further improved using water colours, colouring pencils etc. Ink as a medium, therefore, is usually reserved for the final presentation drawing.

There are many other drawing media which can be used for sketching purposes or to enhance sketches already produced in pencil or ink. These include felt-tipped markers, pastels, wax crayons, colouring pencils, charcoal etc. Throughout this chapter we will focus on building up skills with a pencil with the understanding that the skills learned are transferable to these other media.

Pencil Types

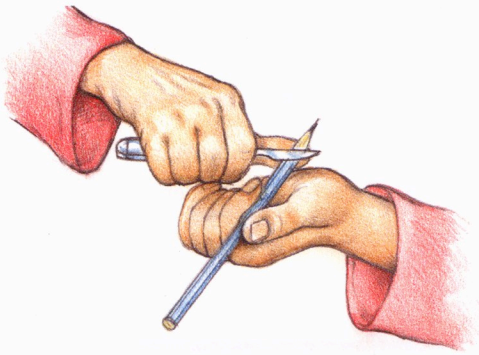
There are many different types of pencil to allow the drawing of lines of various weights and thicknesses. A pencil's grade is denoted by using the letters **H** and **B**, which refer to the pencil lead. H stands for hardness while B stands for blackness. In general it is the softer pencils that are used for freehand sketching but of course any pencil may be used.

Fig.14.3



Fine-line pencils and/or clutch pencils may also be useful. Because fine-line pencils hold leads of specific thickness, e.g. 0.3 mm, 0.5 mm, they do not need sharpening. The constant line thickness can, however, be restrictive, particularly when shading or applying tone and texture. Clutch pencils hold lengths of pencil lead which are available in a range of grades and as such can be sharpened and used in the same way as a pencil.

Pencil Sharpening/Pencil Points



The tapered point produced by a pencil sharpener is perfectly satisfactory for most work. The lead point can be touched up using a sandpaper pad or a sheet of medium/smooth sandpaper. Another useful point type is the chisel point. Here the wood is usually whittled away with a sharp knife, taking care not to break the lead or reduce its size by too much, Fig. 14.4.

Then, holding the pencil in a normal drawing position, rub the point on some sandpaper until it is quite blunt. This point can now be used to make either a broad or a fine stroke, depending on how the pencil is held, Fig. 14.5.

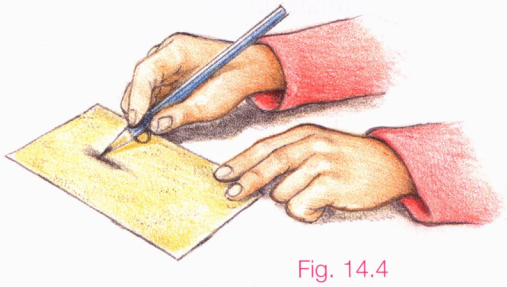


Fig. 14.4

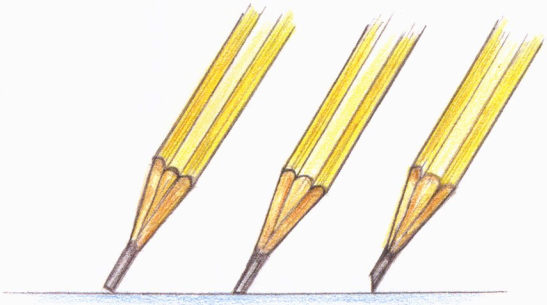


Fig. 14.5

Point may be used to give broad lines or fine lines.

Sandpaper to give chisel point.

Wood pared away.

Holding the Pencil

How you position your hand depends on the drawing being done – whether it requires bold, sweeping strokes or more carefully executed lines. Most typically, the pencil is held as if for writing with the hand resting lightly on the table. For short lines and lines demanding considerable pressure you need little arm movement. Swing the hand at the wrist, or let the fingers alone perform the necessary motion, Fig. 14.6. For longer strokes the pencil is held back from the point. The entire forearm and hand are swung freely from the elbow and there is minimal wrist and finger movement, Fig. 14.7.

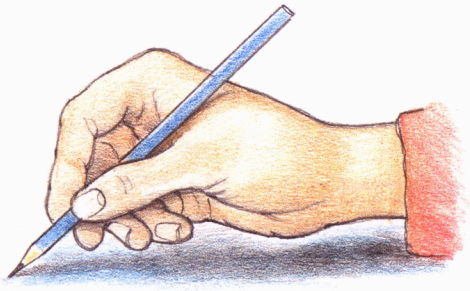


Fig. 14.6

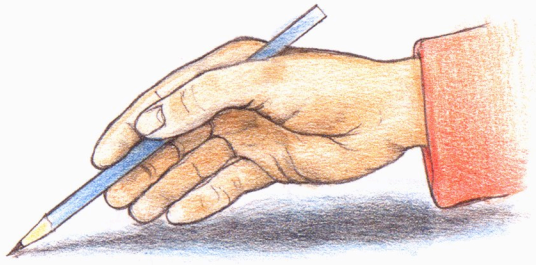


Fig. 14.7

For particularly unrestrained sketching hold the pencil at its unsharpened end. The pencil should be full length. Swinging the hand will produce rapid, bold lines, Fig. 14.8.

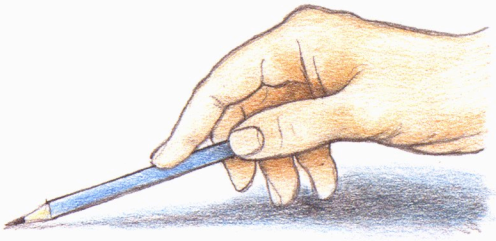


Fig. 14.8

Sketching Practice

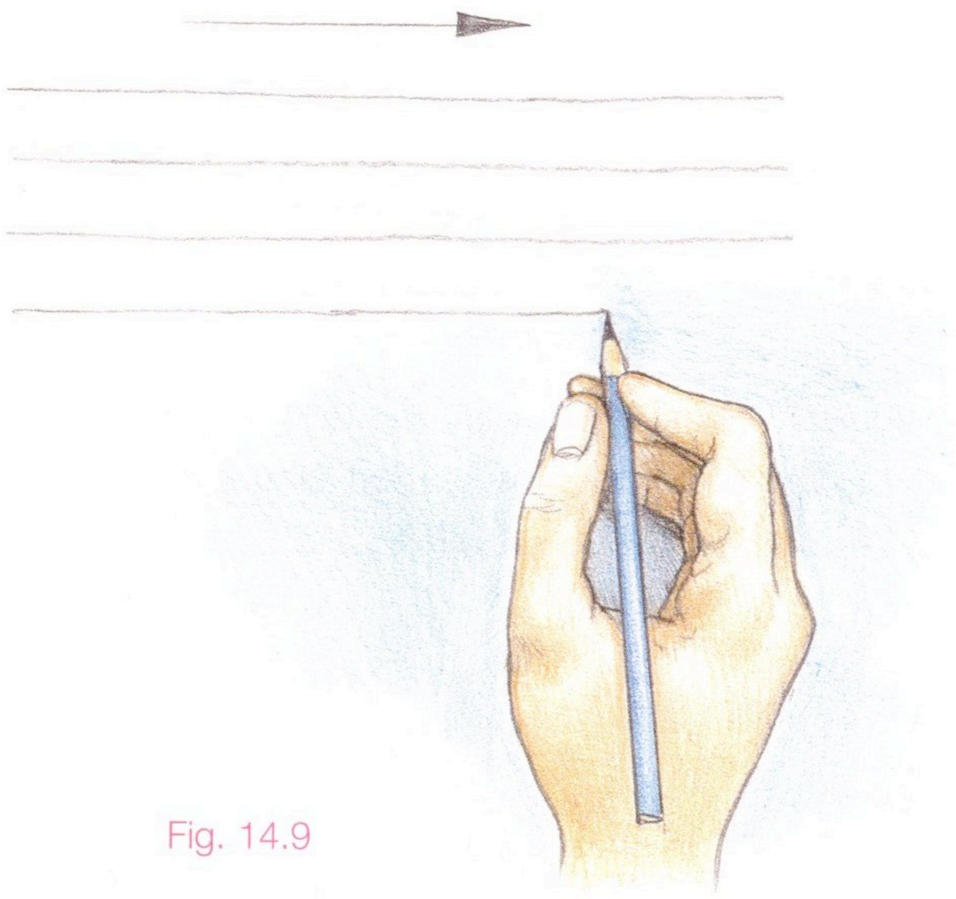


Fig. 14.9

Horizontal Lines

Lock your wrist and fingers and use an arm movement to move the pencil. Your hand slides across the paper as you are sketching the lines.

Vertical Lines

Again an arm movement is used rather than a wrist or finger movement. It may prove easier to rotate the sheet by 90° and draw the lines as if they are horizontal.

Sketching with Short Overlapping Strokes

Rather than trying to draw long lines using one continuous stroke it may often be better to build up the line with short overlapping lines. Sketch a short line return to the middle of the first line and make a similar, second short line. Repeat this overlapping process until the line is as long as is needed.

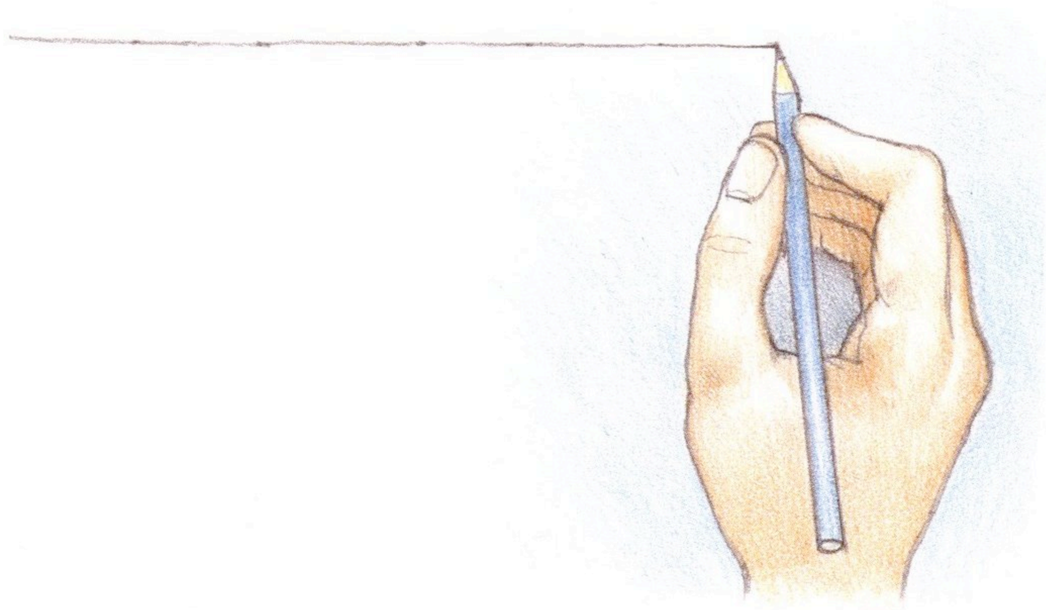


Fig. 14.10

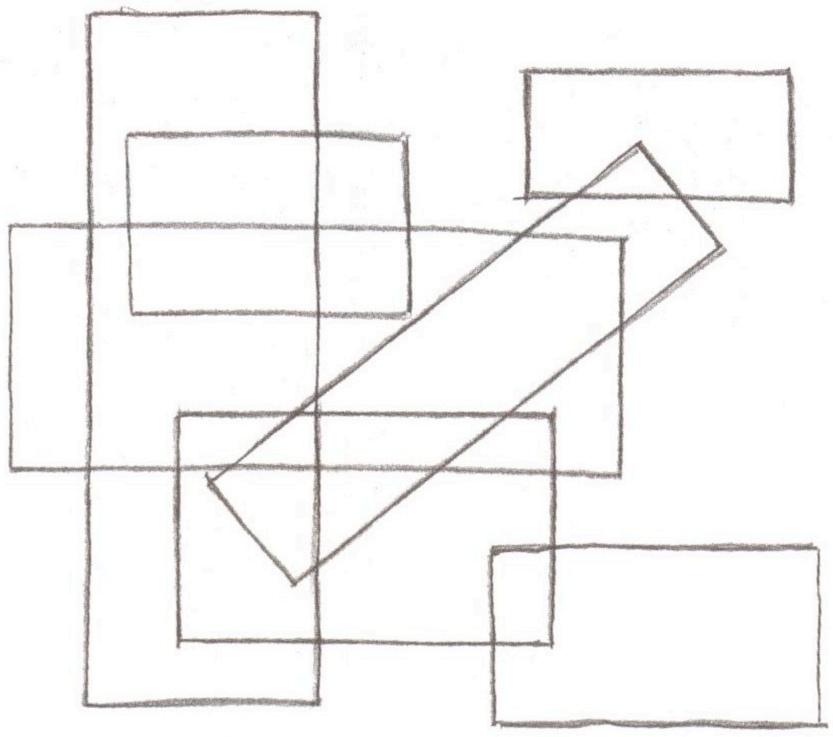


Fig. 14.11

Squares and Rectangles

Continue to practise drawing horizontal, vertical and inclined lines and use these lines to build up squares and rectangles. These two-dimensional shapes will form the building blocks for many diagrams.

Circles

Before drawing a circle it is advisable to draw the square into which the circle is to fit. Divide the square into quarters. This gives the circle centre and four points on the circumference. When drawing the circle draw in one quarter at a time. Use the overlapping stroke technique and sketch lightly. Use your wrist as a pivot to help draw the curves. You will draw more naturally if your hand is inside the curve. When you are happy with the circle it can be darkened. The sheet can, of course, be rotated to any position to help the drawing of the curve.

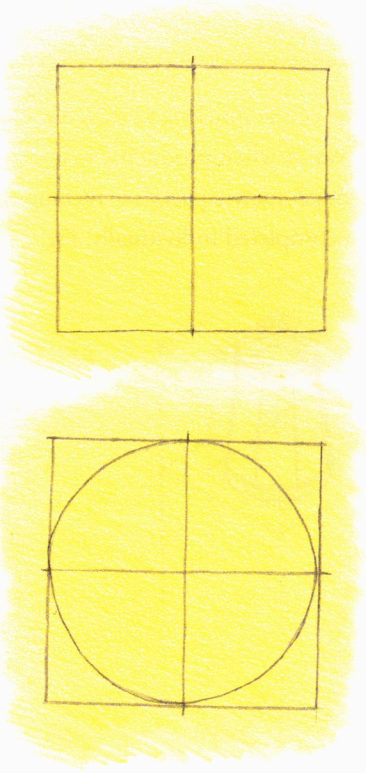


Fig. 14.12

For larger circles:

(1) Draw the square into which the circle is to fit.
(2) Sketch in the diagonals and lines to divide the square into quarters.
(3) If each half-diagonal is now divided into three equal parts (Fig. 14.13) then more points can be found on the circumference.
(4) Draw in the curve as before.

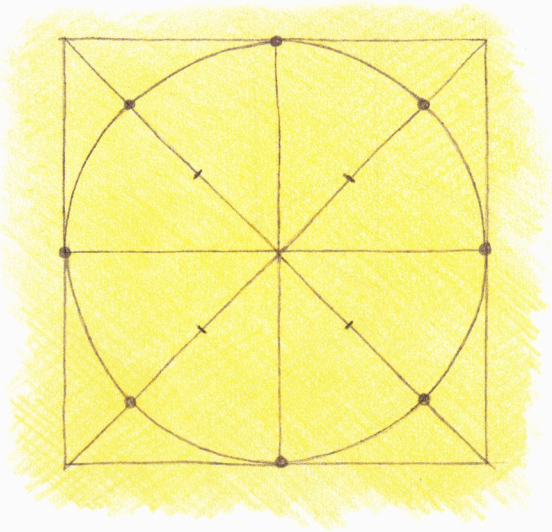


Fig. 14.13

Ellipses

All ellipses will fit into rectangles just as circles fit into squares.

(1) Draw the rectangle into which the ellipse is to fit.
(2) Draw in the centre lines which form the major and minor axis of the ellipse.
(3) Sketch in the ellipse.

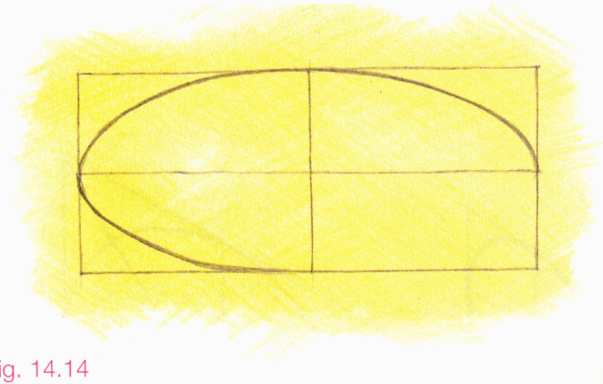


Fig. 14.14

Large ellipses may be constructed using any of the methods discussed earlier in the book. The rectangle method is probably the most suitable as it is constructed solely using straight lines.

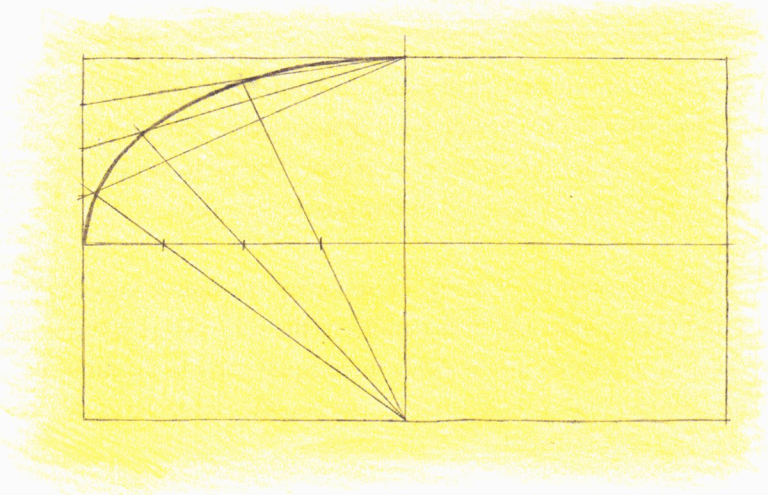


Fig. 14.15

Sketching Pictorials

There are many different types of pictorial views. One of the quickest to sketch and the easiest to visualise is an isometric view. The sketches are built up using **crating** in a similar way as when producing isometrics using instruments. The idea behind crating is to break down an object into its component geometric parts, i.e. rectangular prisms, cylinders, cones etc. Each component part is then crated in, on the sketch, and completed individually. Fig. 14.16 shows an example of this technique.

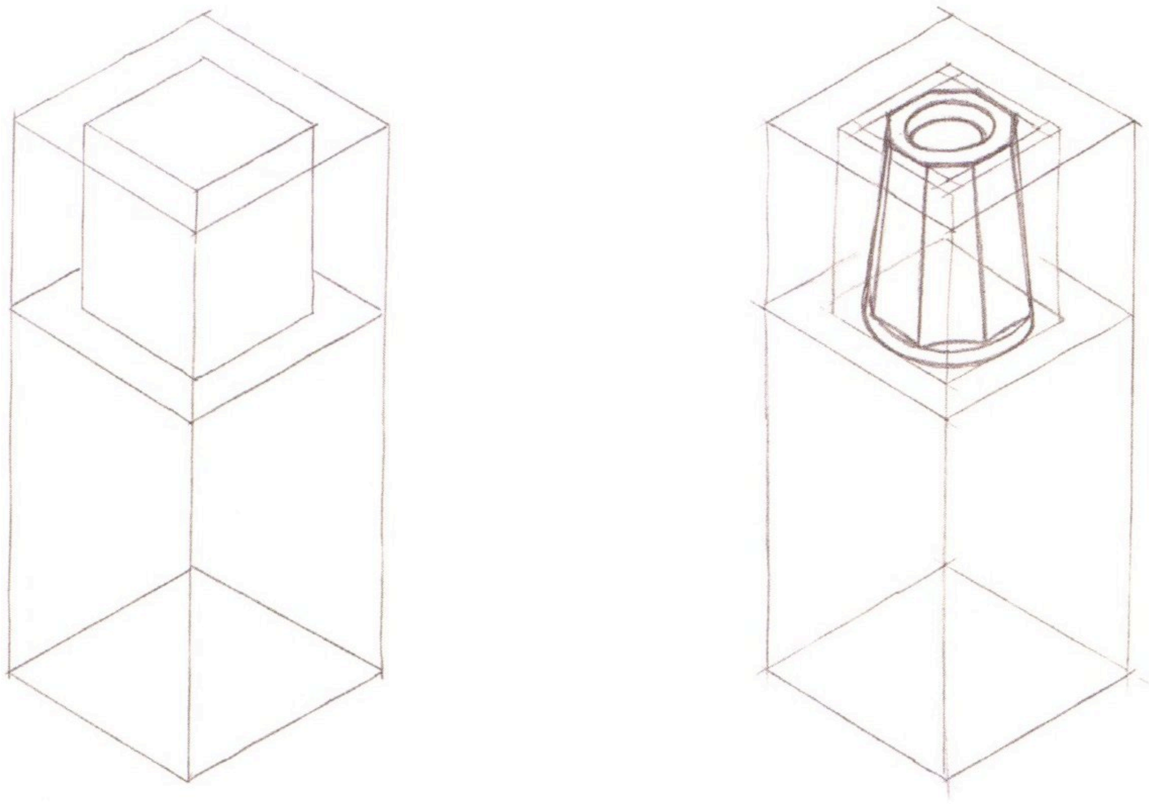


Fig. 14.16

This procedure remains the same whether the object is simple or complex. What should be remembered, however, is that the larger masses should be outlined/ghosted in first, with more detail coming later. In this way it is easier to keep the sketch in proper proportion.

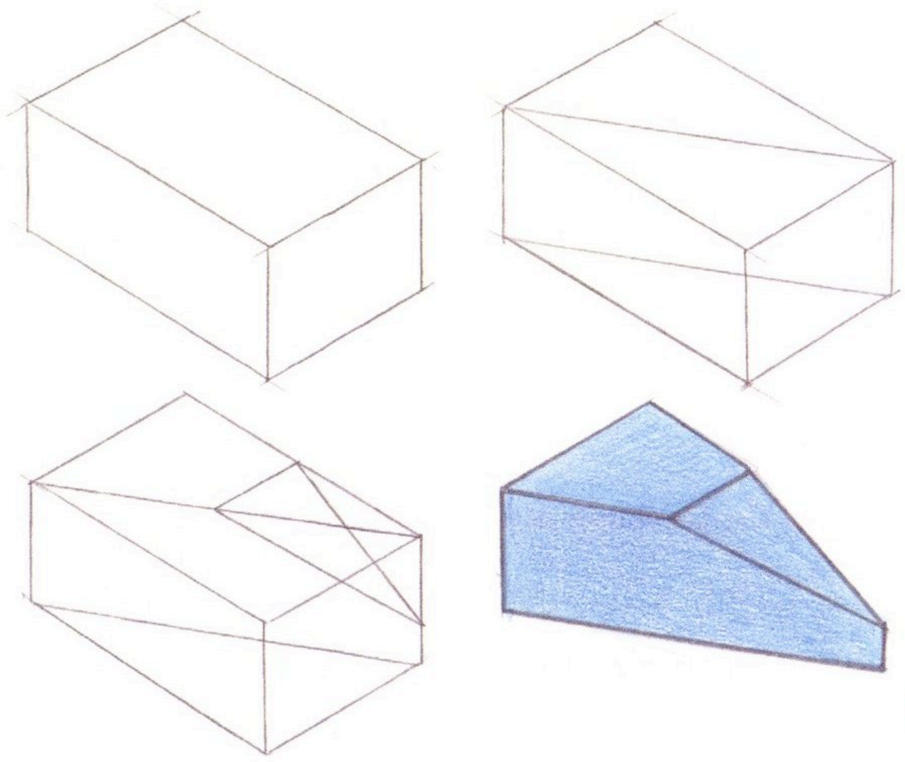


Fig. 14.17

Circles in Pictorials

For smaller circles we start by drawing an isometric square into which the circle will fit. Then divide it into quarters. This gives the centre and four points on the circumference. The circle, which appears as an ellipse, is sketched in one quarter at a time.

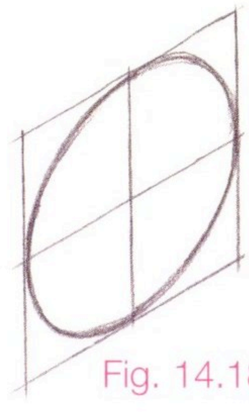


Fig. 14.18

For larger circles start by drawing, in isometric, the square into which the circle will fit. Sketch in the diagonals and lines parallel to the sides through the square's centre. Each half-diagonal is divided into roughly three equal parts in the same way as when drawing a circle. This provides eight points on the isometric circle's circumference. Sketch in the pictorial circle.

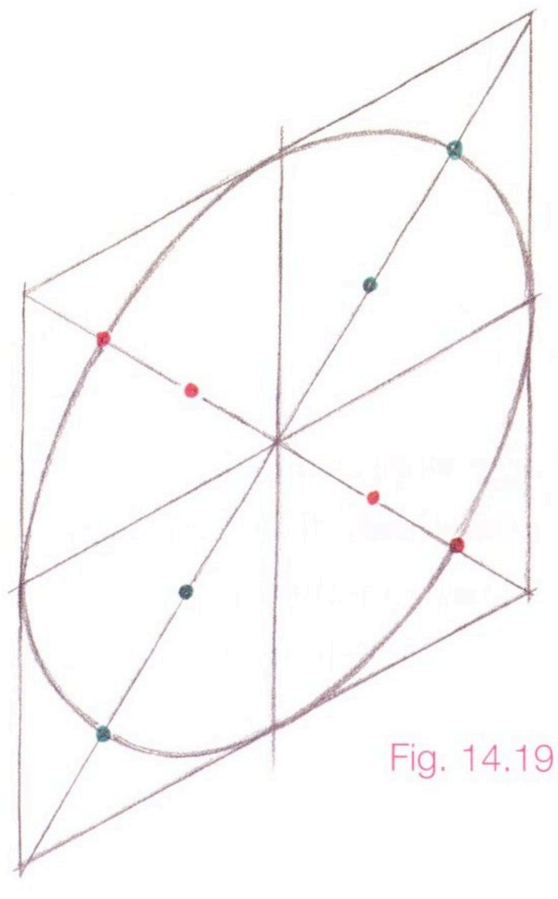


Fig. 14.19

Worked Examples

Given the orthographic views of an object in Fig. 14.20. Produce a neat pictorial sketch of the solid. Choose a viewing orientation that gives a good view of the object's details.

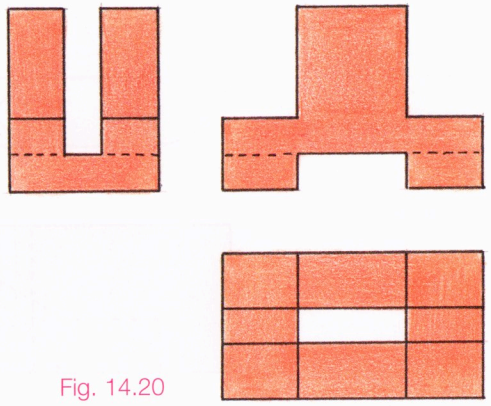


Fig. 14.20

(1) Decide on the best angle to view the object.
(2) Sketch out the cage frame to the overall length, width and height.
(3) Rough in the object's features on the cage faces.
(4) Complete the shape and darken all visible lines, Fig. 14.21.

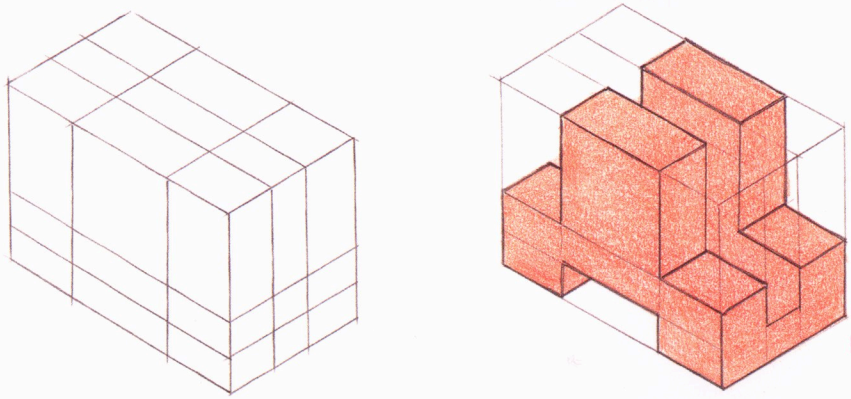


Fig. 14.21

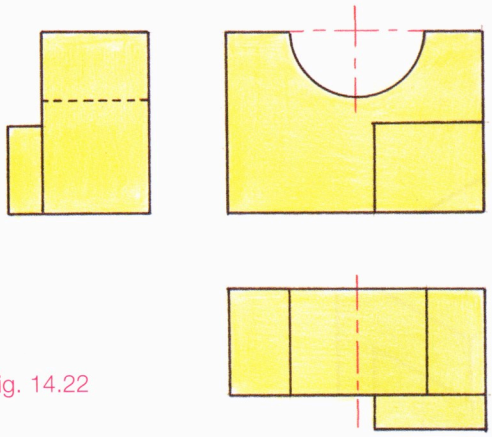


Fig. 14.22

Given the plan, front elevation and end view of an object in Fig. 14.22. Make a neat, freehand, pictorial sketch of the object.

(1) Some objects are best divided into parts with a separate cage framework for each part.
(2) Locate the semicircle centre and complete the half square into which it will fit.
(3) Draw in the diagonals and centre lines.
(4) Draw in the curve.
(5) Darken all visible lines, Fig. 14.23.

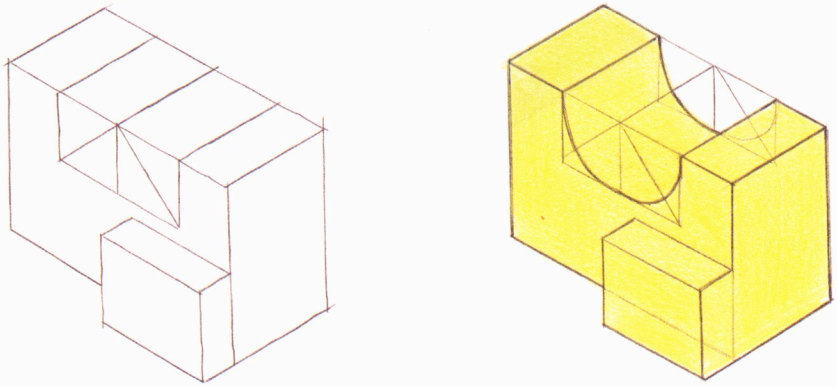


Fig. 14.23

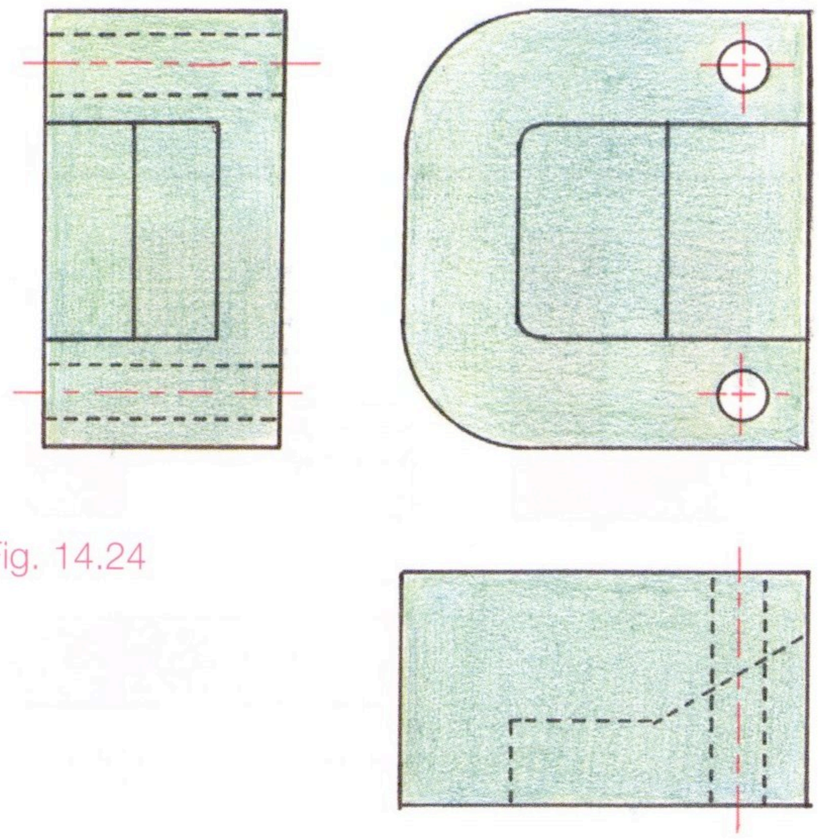
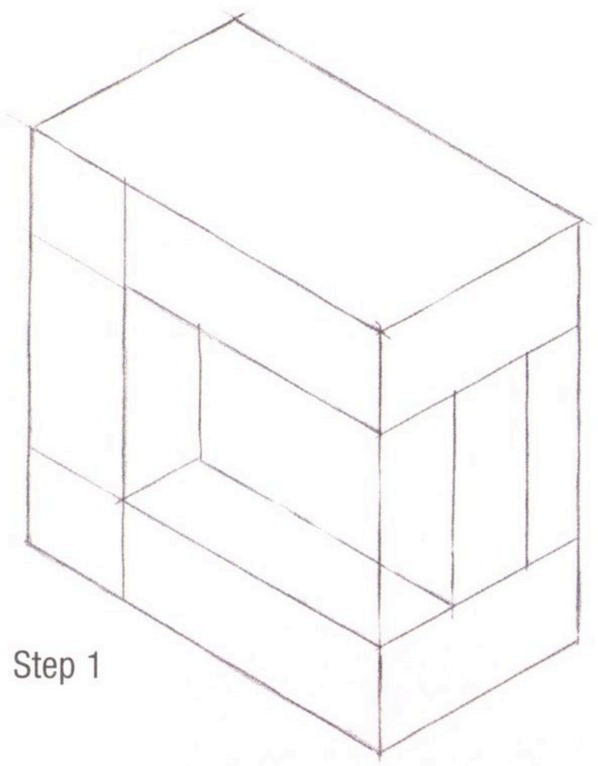


Fig. 14.24

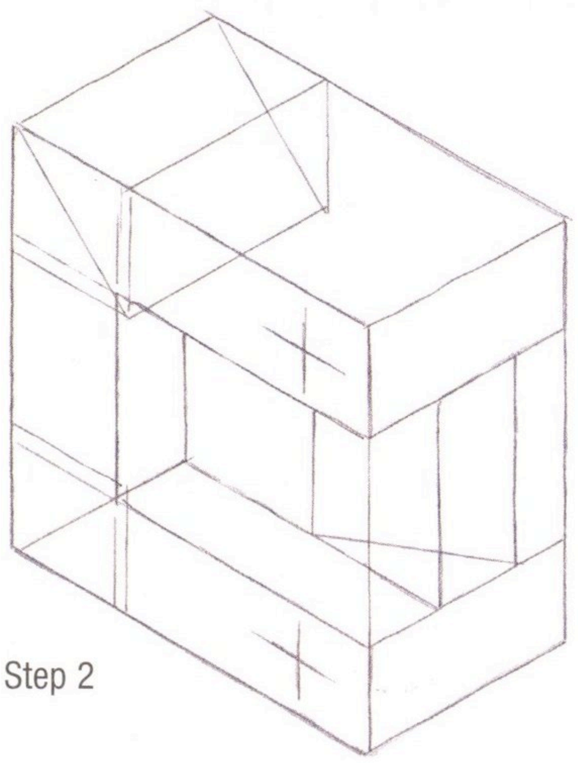
Given the orthographic views of an object in Fig. 14.24. Produce a neat pictorial sketch of the solid. Choose a viewing orientation that gives a good view of the object's details.

(1) Decide on the best orientation for the sketch.
(2) Box out the overall dimensions.
(3) Locate the main features and planes.
(4) Locate the centres of all circular features. Draw their centre lines and box out the general shape.
(5) Darken the visible shape, Fig. 14.25.

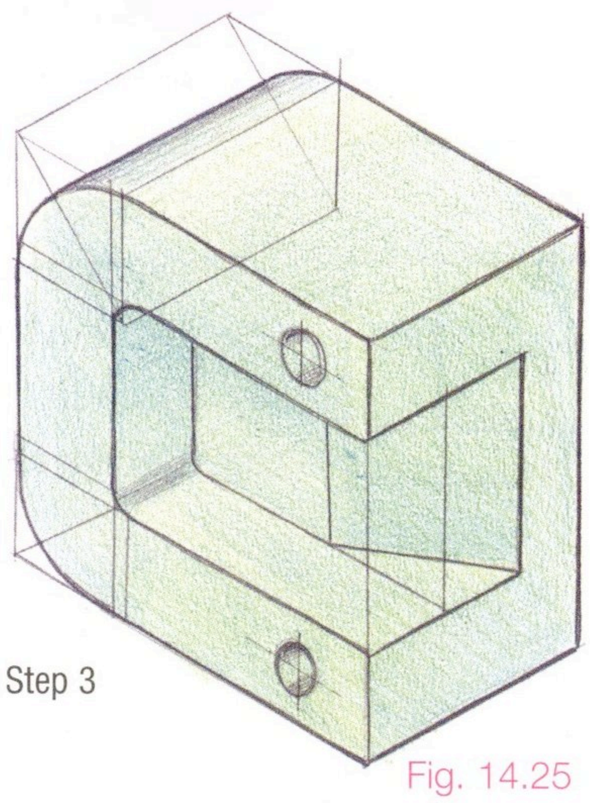
Note: The main outline may be thickened slightly to improve the visual impact of the drawing.



Step 1



Step 2



Step 3

Fig. 14.25

Given the plan and elevation of an object in Fig. 14.26. Produce a neat isometric sketch of the object choosing the most descriptive orientation.

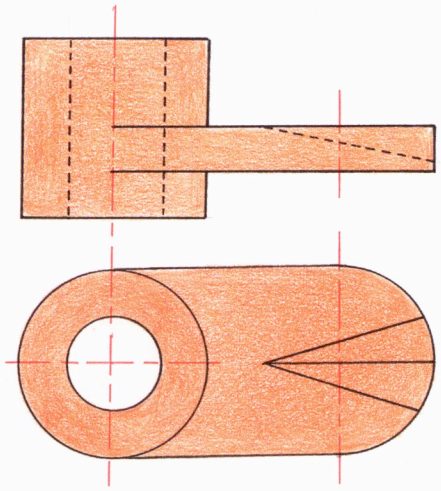
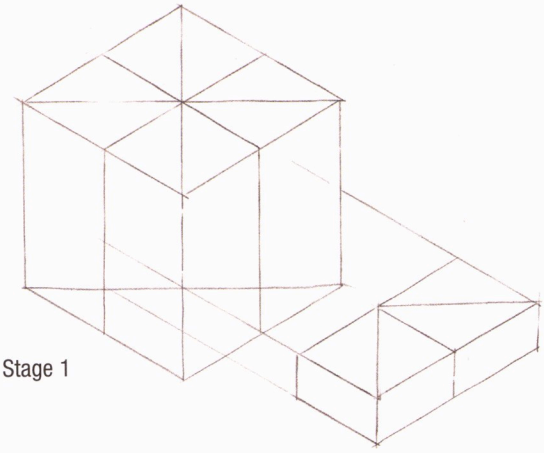
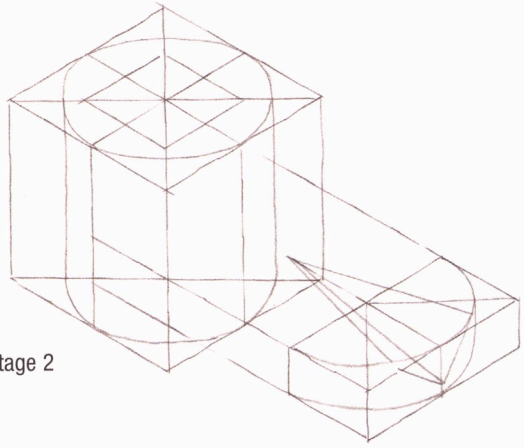


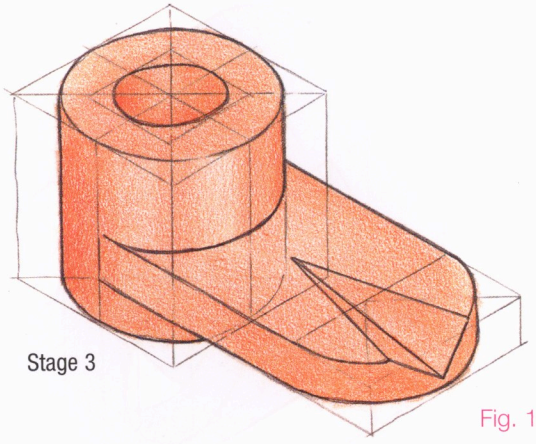
Fig. 14.26



Stage 1



Stage 2



Stage 3

Fig. 14.27

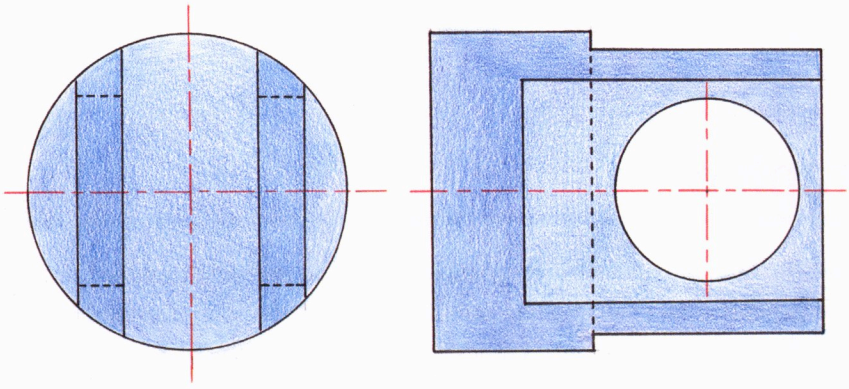
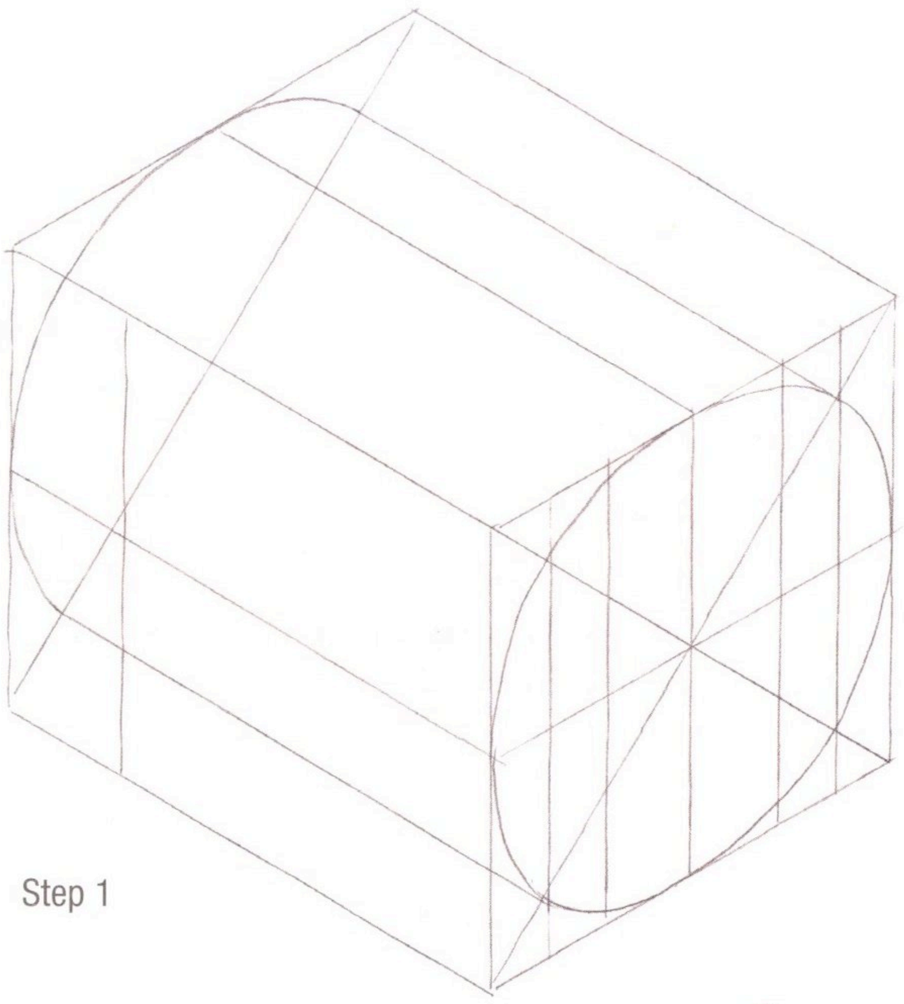
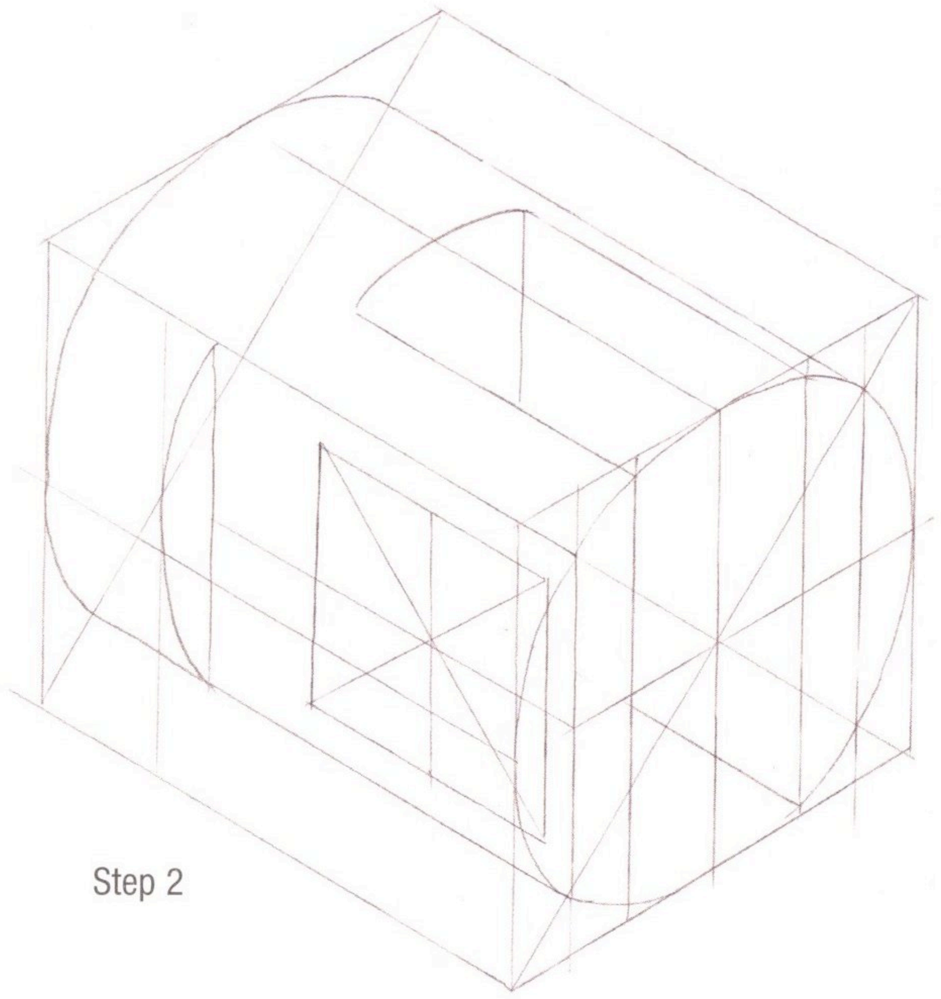


Fig. 14.28

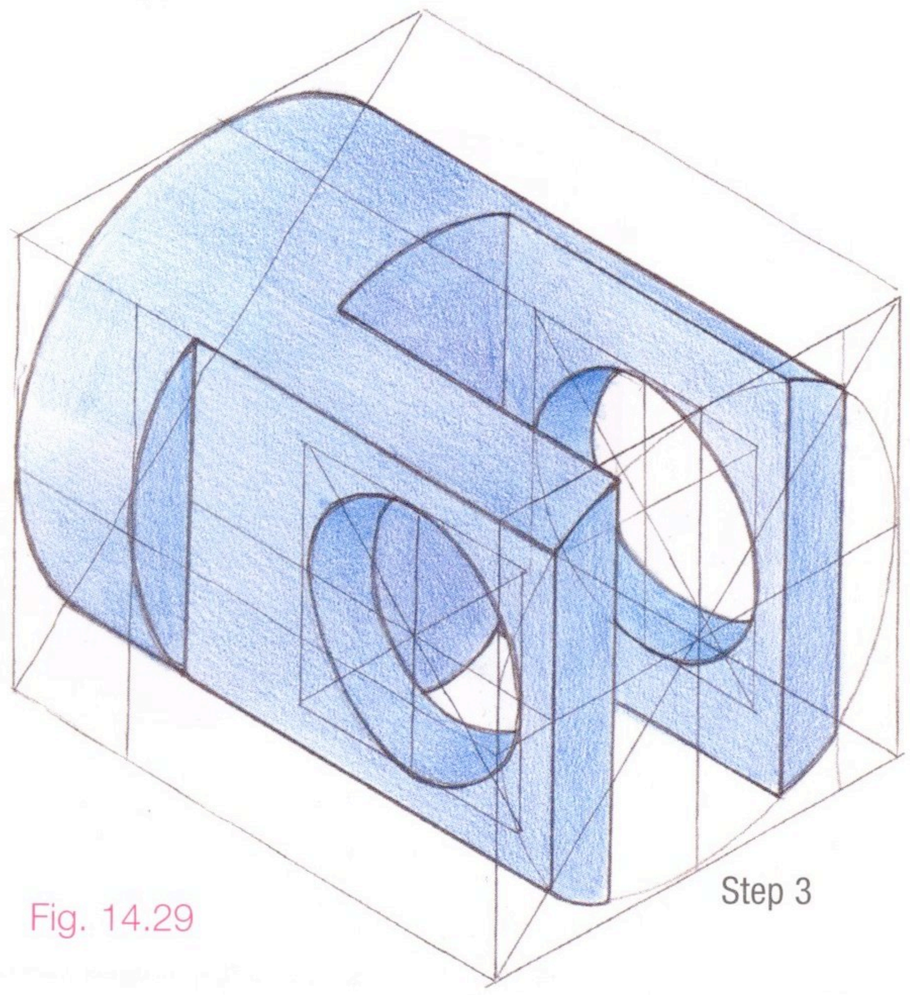
Given the front elevation and end elevation of an object in Fig. 14.28. Complete an isometric sketch of the object choosing the most descriptive orientation for your pictorial.



Step 1



Step 2



Step 3

Fig. 14.29

Sketching in Orthographic

As we have seen elsewhere throughout this book, the fundamentals of orthographic projection are widely applied to most areas of technical drawing. Moreover, these fundamental principles are universally accepted and understood in most countries around the world. Sketching in orthographic can provide a quick method of conveying ideas and also provide more information than a pictorial sketch. Furthermore, orthographic sketches lend themselves better to dimensioning than do pictorials and it is with measurements and proportions that design ideas move from the drawing board into production.

All the practices observed when drawing orthographic views using instruments should be followed when sketching in orthographic. Position of views, projection lines, xy lines etc. are all equally important in the sketch as in the drawing produced using instruments. An orthographic sketch which is technically inaccurate is of little value as it does not communicate the idea(s) properly.

Worked Examples

Given a pictorial view of an object. Make neat, freehand, orthographic views of this object showing all hidden detail.

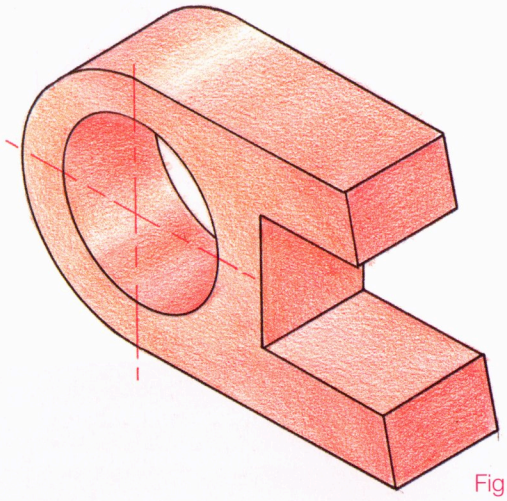


Fig. 14.30

(1) Start by drawing in an xy line and boxing in the space for the front elevation and the plan directly beneath it.
(2) 'Project' these boxes around in the usual way to give the position and size of the end view.
(3) The circle and semicircle are sketched in by first drawing squares and fitting the circles into these squares.
(4) Thicken and darken all outlines and visible details, Fig. 14.31.

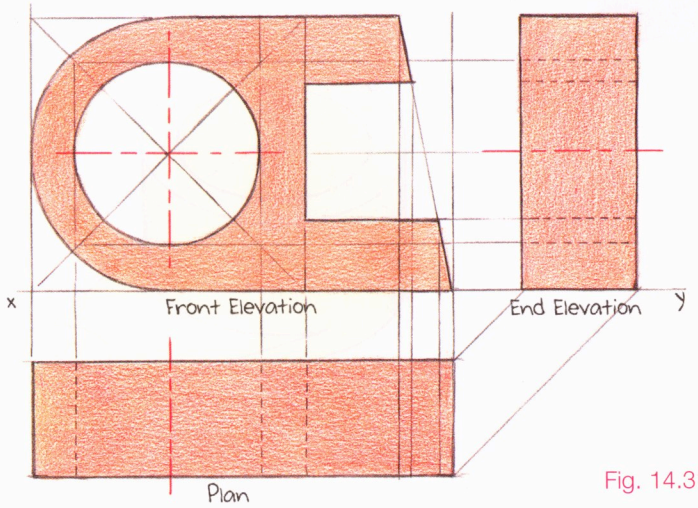


Fig. 14.31

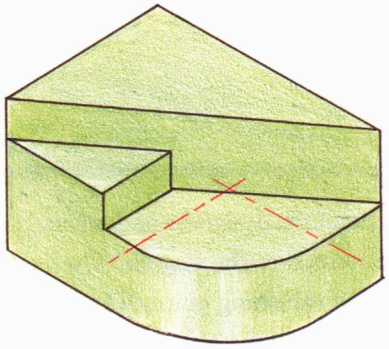


Fig. 14.32

Given the pictorial of an object in Fig. 14.32. Make a neat, three-view orthographic sketch of the object.

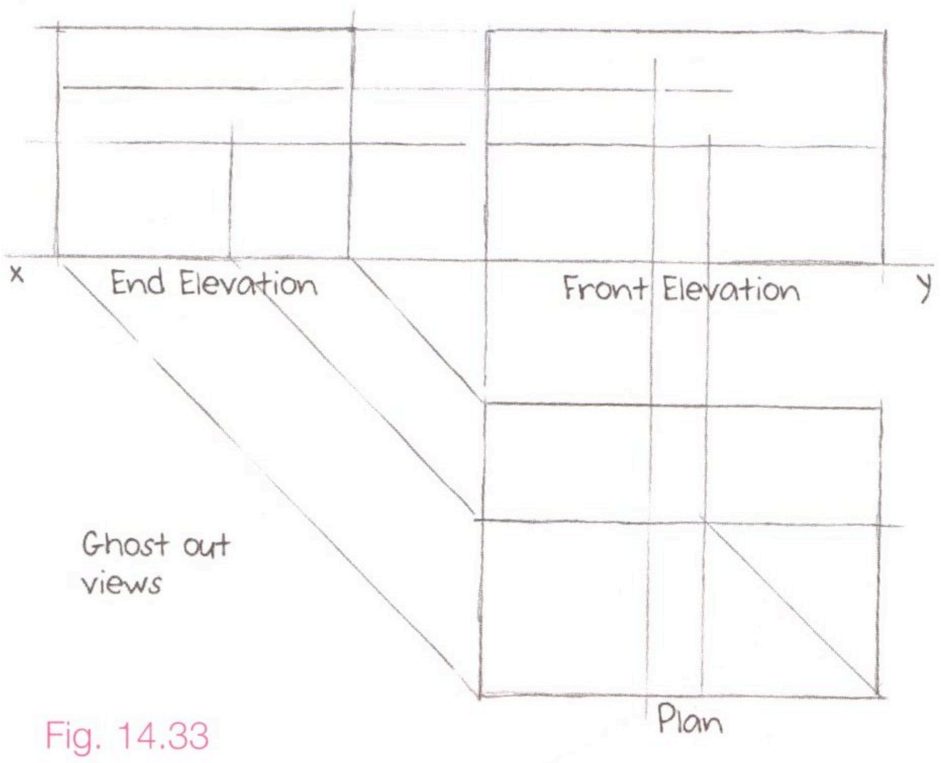


Fig. 14.33

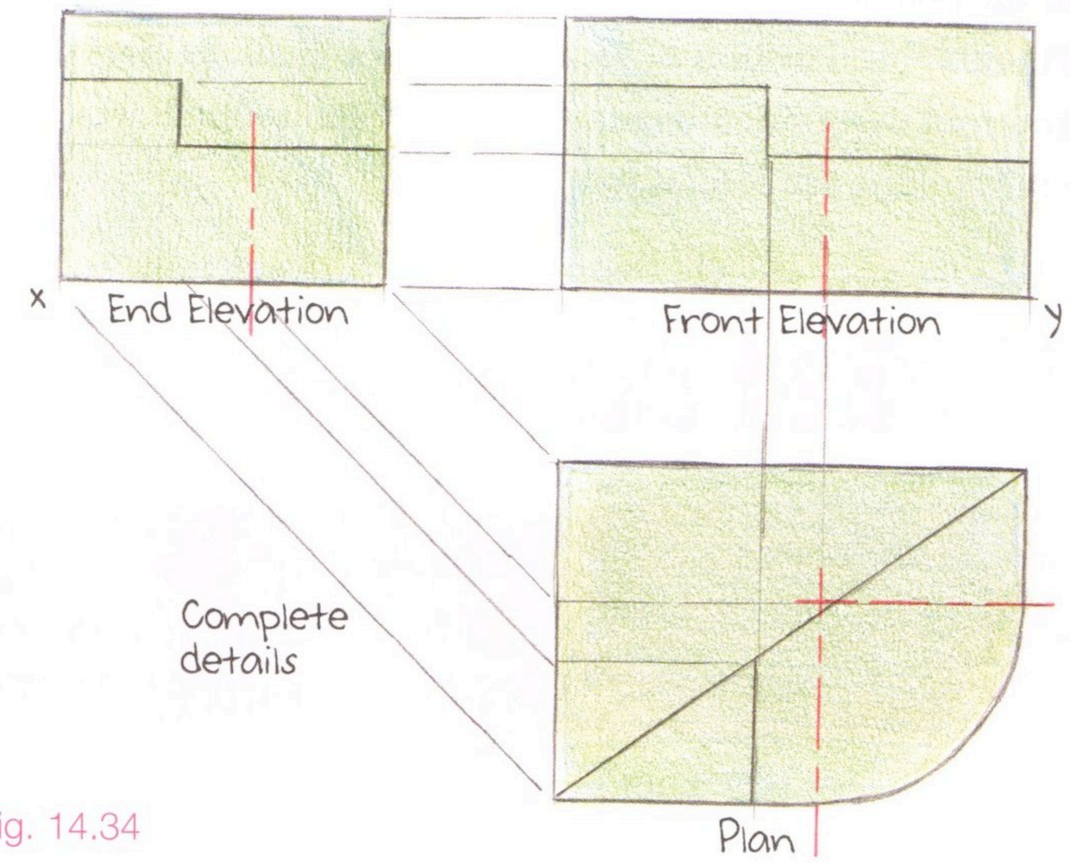


Fig. 14.34

Given an isometric of a shaped solid in Fig. 14.35. Make a neat, freehand sketch showing a front elevation, end elevation and plan of this object.

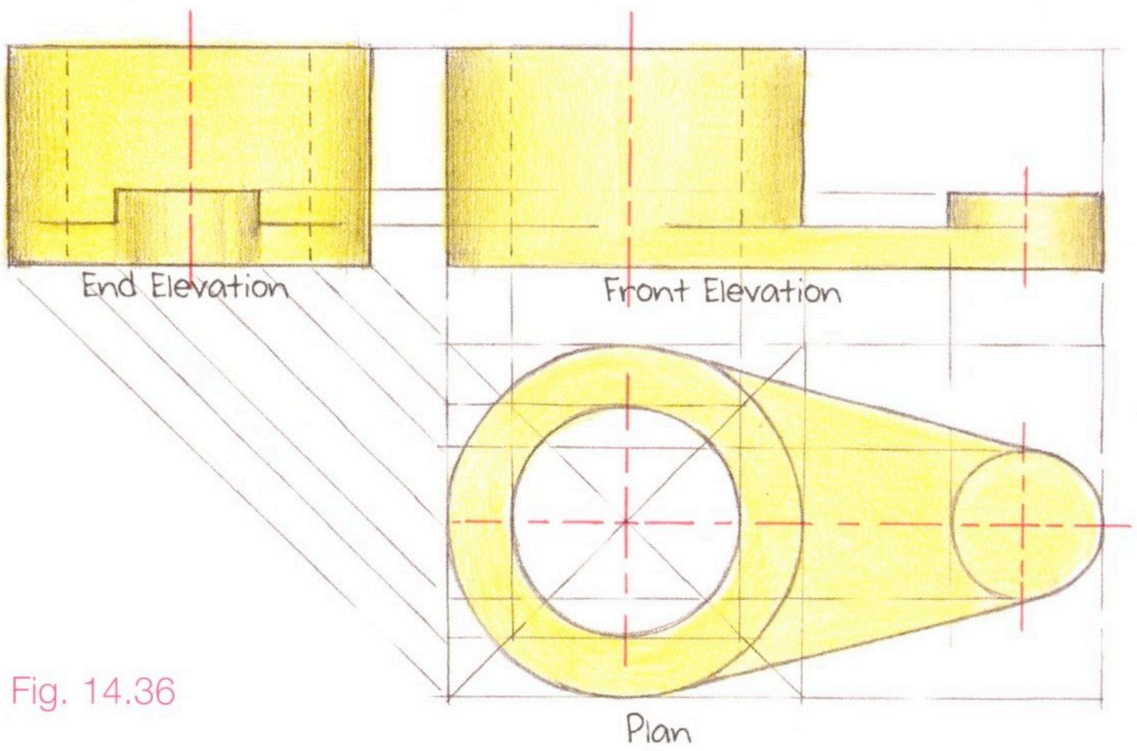


Fig. 14.36

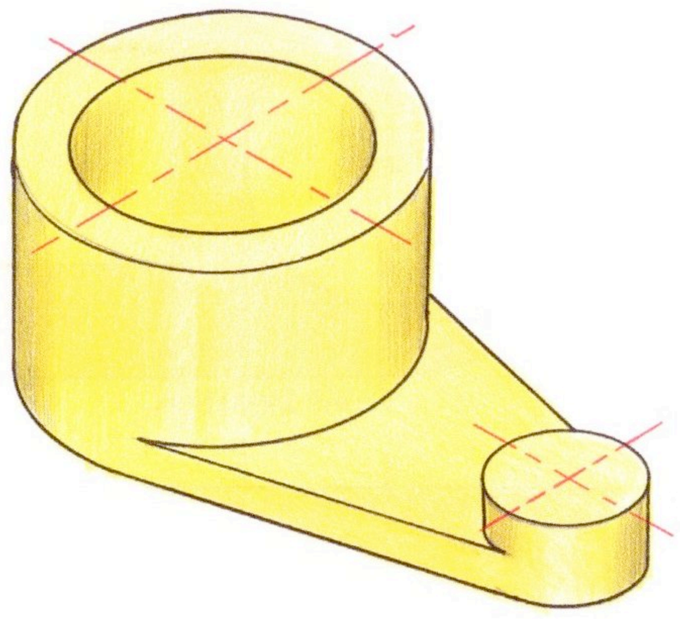


Fig. 14.35

Perspective Sketching

One of the most popular types of pictorial sketches are perspective sketches. Many illustrators, designers and architects use it almost exclusively because it presents a drawing most like the image the camera records or the eye sees. The perspective drawing is a pictorial projection that can take several forms depending on the vanishing points. Unlike orthographic or isometric projections which assume parallel lines of sight from the observer to the object, the

perspective uses lines of sight that converge at one, two, three or more points. Fig. 14.37 shows an upside-down cardboard box drawn using one-point, two-point and three-point perspective.

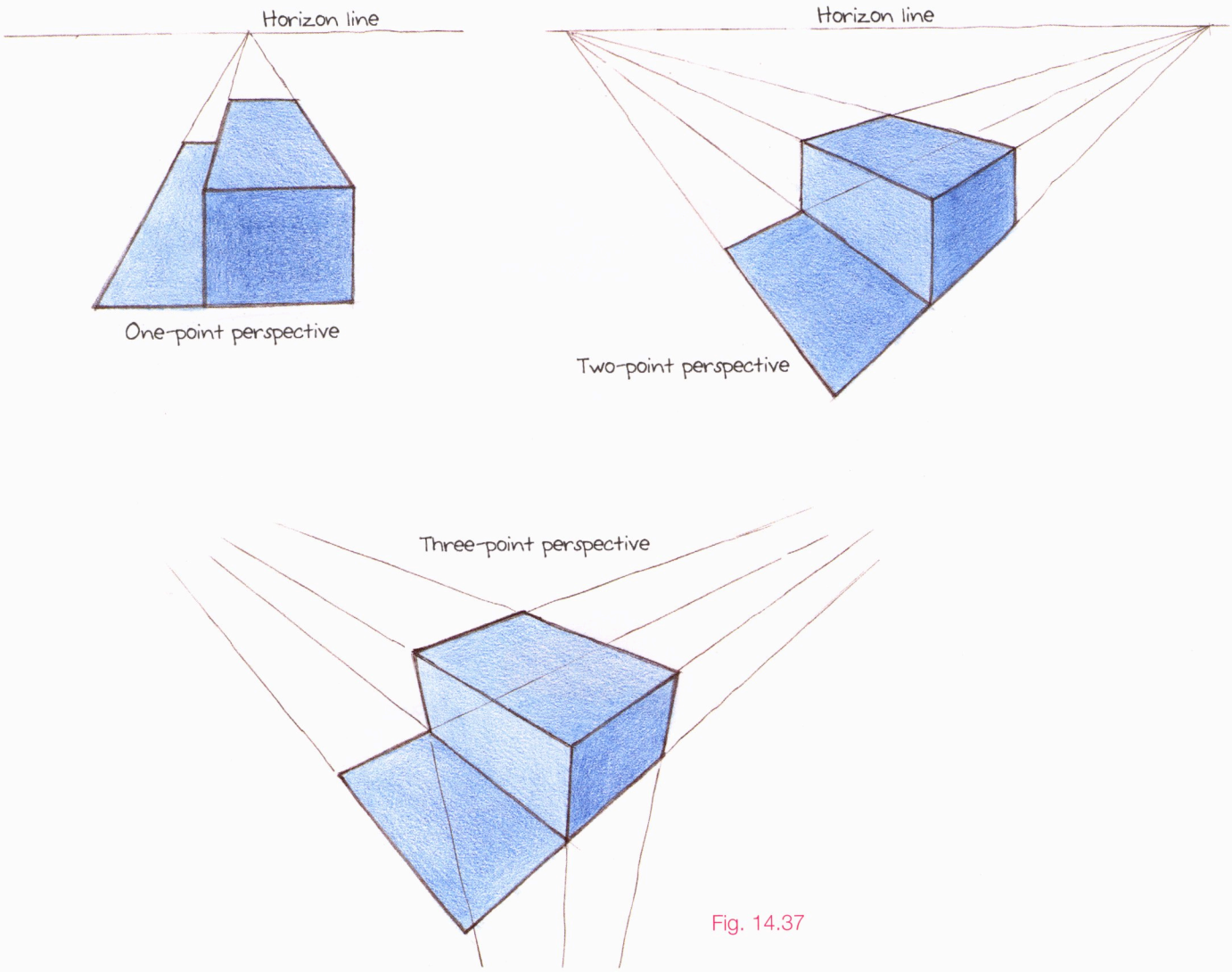


Fig. 14.37

The rules followed when drawing perspective views with instruments should also be followed when producing a perspective sketch.

- Horizontal lines vanish to vanishing points on the horizon.
- Parallel lines vanish to the same vanishing point.
- Lines and edges behind the picture plane appear shorter than their true length while lines/edges in front of the picture plane appear longer than their true length.

As with the isometric pictorial sketch, your first step is to establish the major points and lines by boxing in the object. The object is then broken into parts with the larger areas/planes being found first and then working toward the finer details.

It is vital before setting up a perspective sketch to understand the relationships of the various elements: the picture plane spectator, ground line, horizon line, vanishing points. A variation in any of these produces a different perspective view, Fig. 14.38.