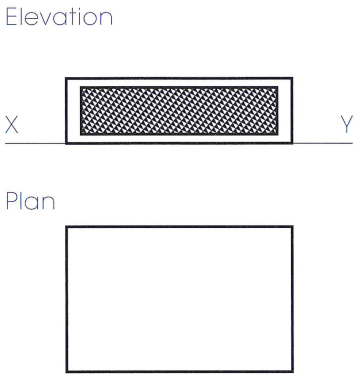
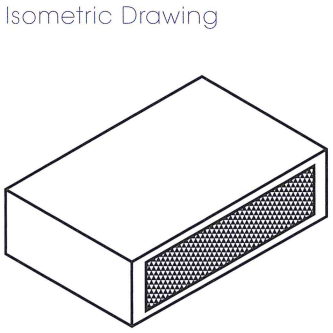
# Isometric Projection using the Isometric Scale

Isometric drawings are useful to give an overall impression of what an object looks like. However, an isometric drawing of an object makes the object appear larger than it actually is. This can be seen by comparing the orthographic views and the isometric drawing of the box for matches shown below.



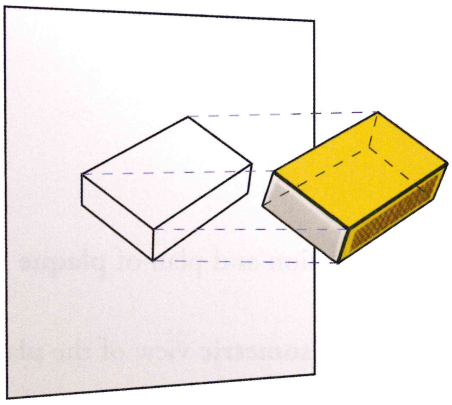




Consider the illustration shown across. If the matchbox is:

(i) positioned so that its three principal faces are equally inclined to the plane of projection,

(ii) projected perpendicularly onto the plane of projection,

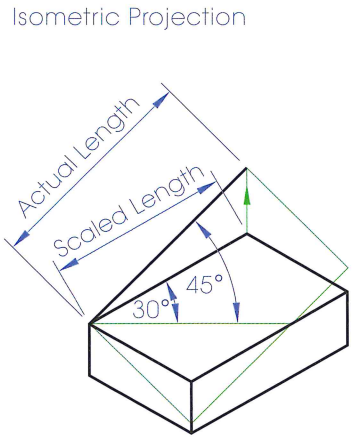
the result is an **isometric projection**.

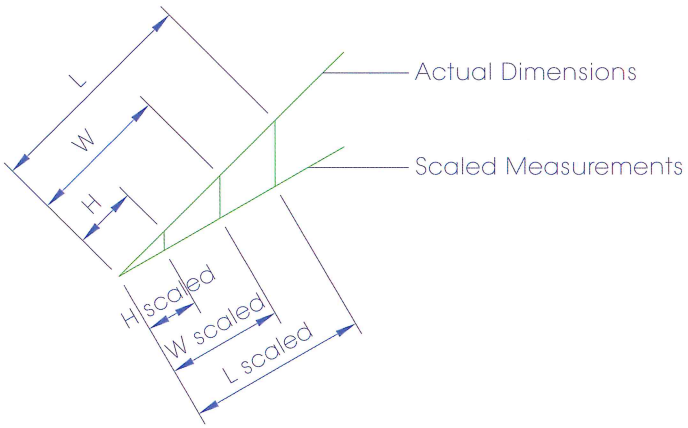


In an isometric projection:

- the principal axes are in the same directions as they are for isometric drawing.
- distances along (or parallel to) the principal axes are foreshortened in the same proportion.

An isometric projection of a matchbox is shown below, left. Imagine that the top surface of the box is rotated so that it appears as a true shape as shown. This allows us to establish the relationship between the actual dimensions and the scaled measurements required for isometric projection, as indicated below right.

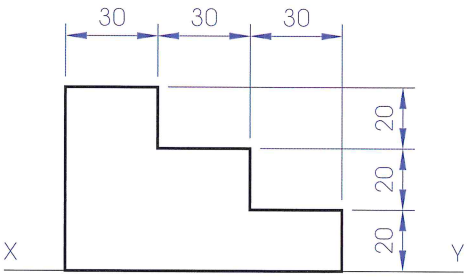


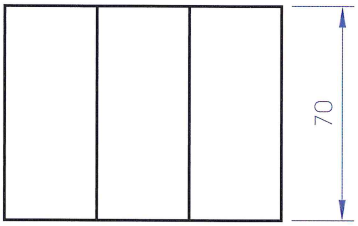

An isometric projection is an isometric drawing of an object which has been scaled to a certain proportion.

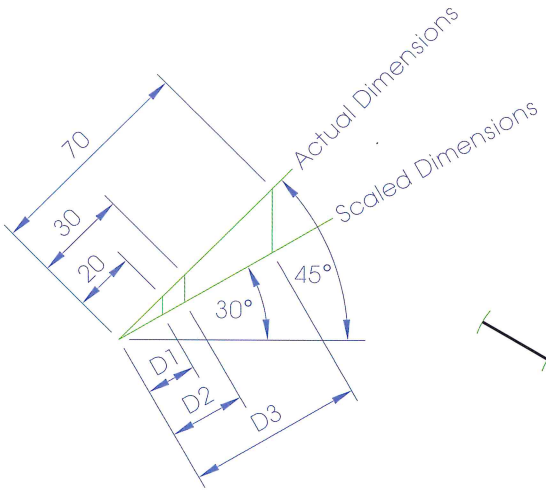
## Example

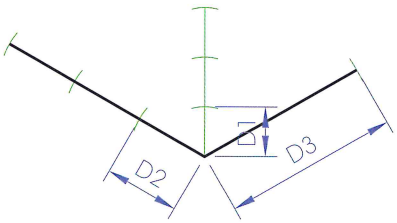
The elevation and plan of a **flight of steps** are shown over.
Draw an **isometric projection** of the steps using the **isometric scale**.

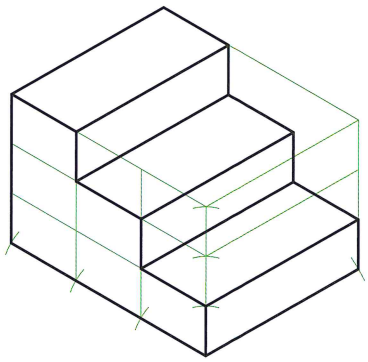



1. Draw a line at 45° and a line at 30° as shown below, left. Then mark off the actual dimensions of 20, 30 and 70 mm along the 45° line as indicated.
2. Transferring these distances vertically downwards to the line at 30° gives the scaled dimensions D1, D2 and D3 which correspond to the actual dimensions.
3. The scaled dimension D1 is marked-off along the vertical axis to represent each length of 20 mm, as shown below, centre.
4. The scaled dimension D2 is marked-off along the axis at 30° to the left to represent each length of 30 mm.



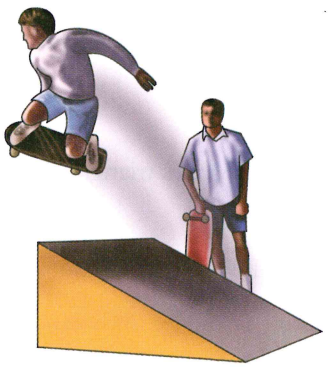



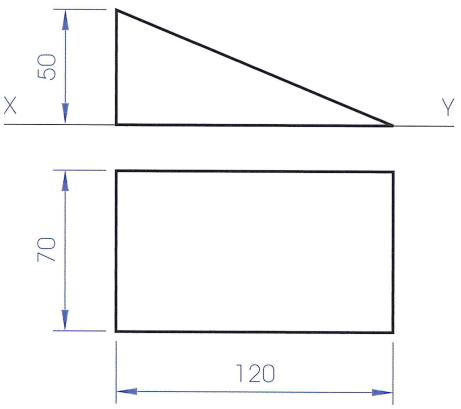



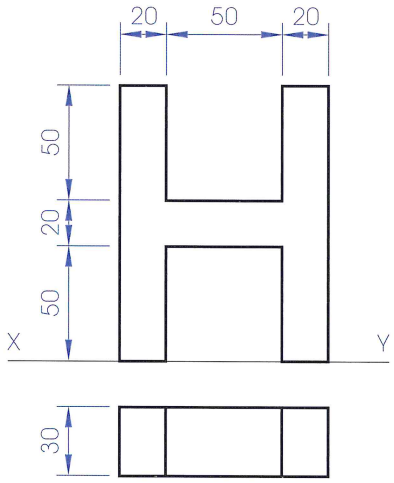
5. The scaled dimension D3 is marked-off along the axis at 30° to the right to represent a length of 70 mm.
6. The isometric projection is completed as shown above, right.

## Exercise

The elevation and plan of a **skateboard** ramp and a letter **H** are shown over.
In each case draw an **isometric projection** of the object using the **isometric scale** method.






**Answer Worksheet 14D**