

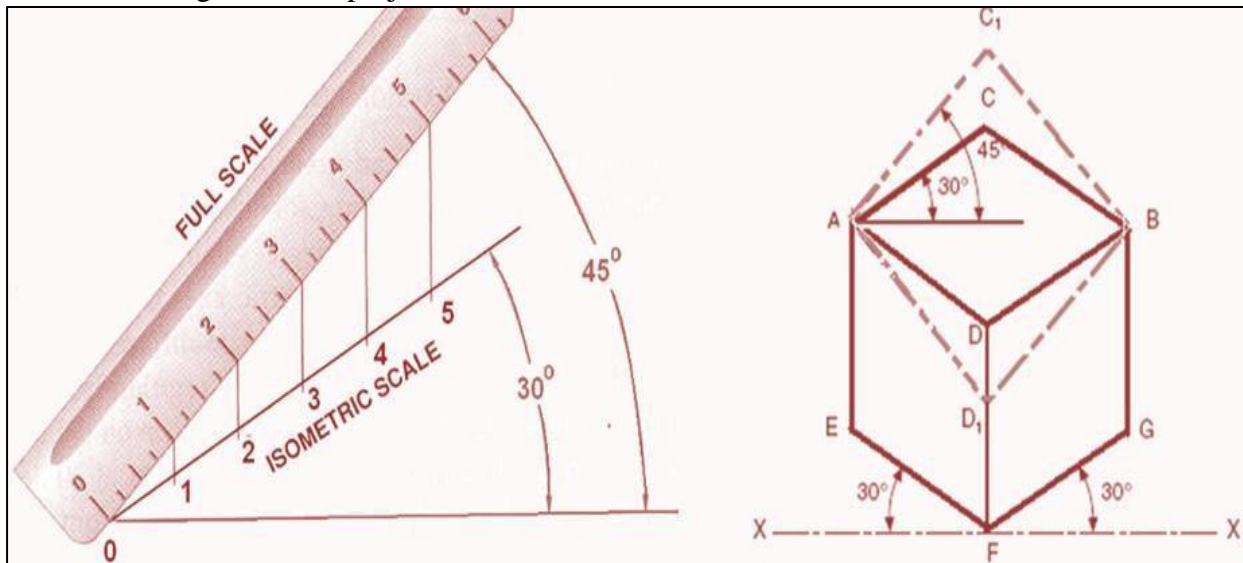
SANGAM SKM COLLEGE - NADI
LESSON NOTES – WEEK 1
YEAR 13
TECHNICAL DRAWING

Strand	TD 13 .3: APPLIED DRAWING
Sub-Strand	TD 13.3.3 Pictorial Projection
Learning Outcome	Demonstrate the skills of projecting assembled and exploded pictorial drawings in a specific project work.

Isometric Projection

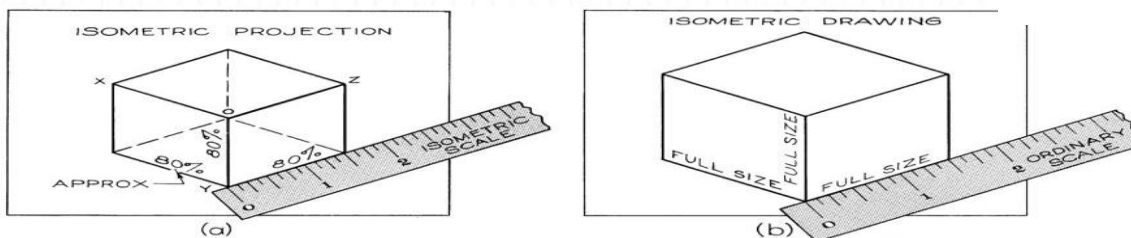
Isometric projection is method for representing three-dimensional objects in two dimensions. (Axonometric projection in which three coordinate axes appear equally foreshortened and angle between any two of them is 120 degrees.

While drawing isometric projection, an Isometric scale is to be constructed



Exercise 1: copy the question on the site and answer
 Site: <https://www.youtube.com/watch?v=64Ft3hc6H9E>

Isometric Projection vs. Sketch



Isometric projections are foreshortened because the object is tipped with respect to the viewing plane. **Isometric sketches**, or drawings, are not usually foreshortened because they still appear proportionate when showing the dimensions full size along isometric axis lines. It is easier just to sketch the full dimension.

$$\text{Isometric scale} = \left(\frac{\text{Isometric length}}{\text{True length}} \right) = \frac{\cos 45^\circ}{\cos 30^\circ} = \frac{1}{\sqrt{2}} + \frac{\sqrt{3}}{2} = 0.8165$$

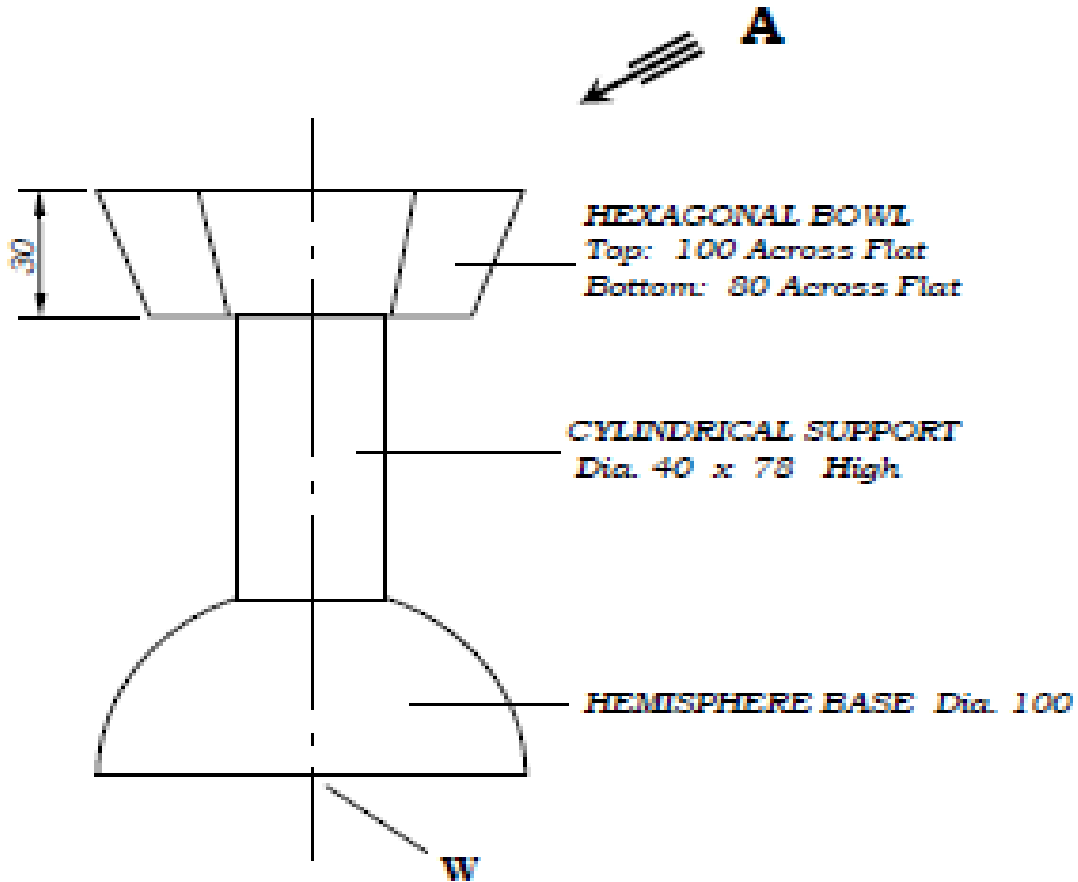
Exercise 2: Answer sheet number 14 from the year 13 technical drawing student workbook.

Use the following video to help you draw isometric sphere

Site: <https://www.youtube.com/watch?v=uKLH5Bkj3a0>

The isometric view or isometric projection of a circle is ellipse, obtained using four-centre method.

Exercise 3: Answer sheet number 15 from the year 13 technical drawing student workbook.



Note: if you cannot print and paste the notes you can write in your note book. Answer all exercises in your year 13 workbook.

SANGAM SKM COLLEGE - NADI
LESSON NOTES – WEEK 2 & 3
YEAR 13
TECHNICAL DRAWING

WEEK 2

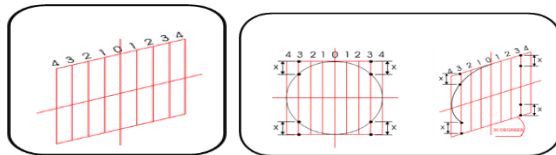
Strand	TD 13 .3: APPLIED DRAWING
Sub-Strand	TD 13.3.3 Pictorial Projection
Learning Outcome	Demonstrate the skills of projecting assembled and exploded pictorial drawings in a specific project work.

Accurate Method (ordinate Method) to draw isometric circle.

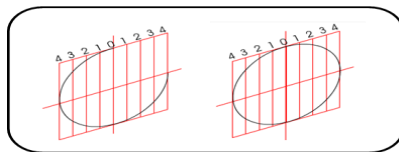
Step 1&2: draw original circle with compass after scaling radius and draw ordinates lines



Step 3 & 4 : draw the grid in isometric and transfer distance

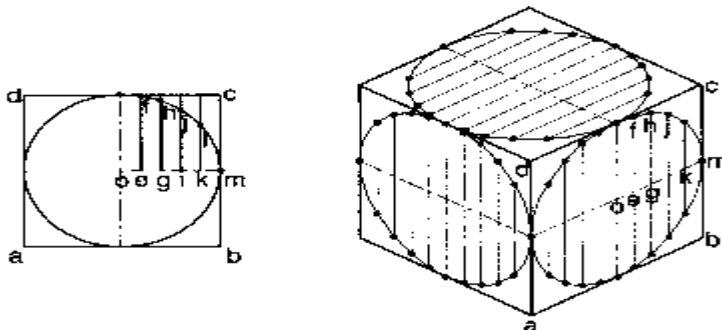


Step 5: joint the points and complete the circle.



Exercise 1:

Draw a cube of length 80mm and use ordinate method to draw isometric circle on horizontal surface and a vertical surface.



Topic: Free Hand Sketching

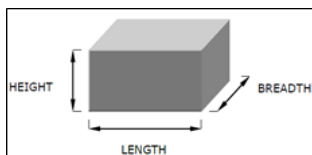
- Is ability to generate ideas and put them on paper.
- Used to communicate ideas, develop and refine ideas before working drawing.
- Must be done without use of a ruler or set square to reduce time for construction.
- way to improve your sketching is through practice.

Exercise 2 : sketch the nature scene on an A4 paper . prepare the page .

Reference site: https://www.youtube.com/watch?v=Z2hE_V9ZhOI

Three Dimensional Sketching

To show ideas clearly you need to sketch in three dimensions. (This means solid rather than a flat two-dimensional shape.)



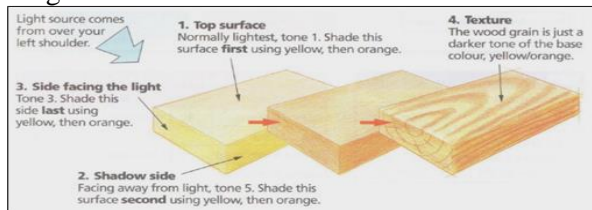
To do 3D sketch crating is often used.(the solid example a cuboid or cube in which the object will be drawn)

Shade and tone added to give it a more realistic appearance. Assuming the furthest surface from light is darkest.

When crating, it is important final object stand out from light outlines. A darker outline distinguishes shape from construction lines.

texture of a material is the feel of a surface. Some surfaces are rough some are smooth and so on.

E.g.



Exercise 3 : sketch a 3D coffee table with its crate, tonal effect and appropriate texture

Reference site: <https://www.youtube.com/watch?v=Jjdjeqxli-w>



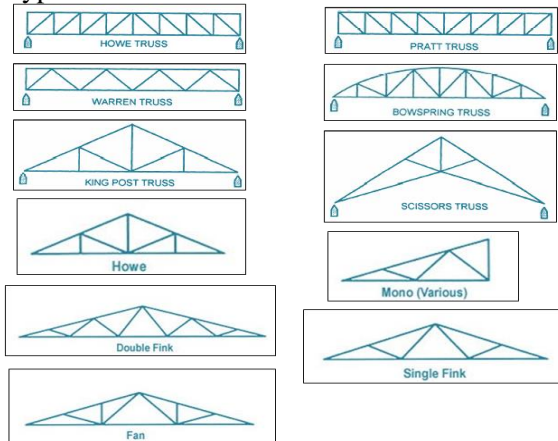
WEEK 3

Strand	TD 13 .4: APPLIED DRAWING
Sub-Strand	TD 13.4.1 Pictorial Projection
Learning Outcome	Analyse the force systems acting on different structures.

Topic: Applied Mechanics – Truss

In architecture and structural engineering, a truss is a structure comprise constructed with straight members whose ends are connected at joints referred to as nodes.

Types of truss



A truss is analysed by using $m = 2j - 3$, where m is number of members, j represents the number of joints and 3 represents the external support reactions.

- Number of members – $m = ?$
- Number of joints – $j = ?$

Guess what type of Frame???



• **$(m = 2j - 3)$**

- Number of members – $m = 7$
- Number of joints – $j = 5$

$$7 = (2 \times 5) - 3$$

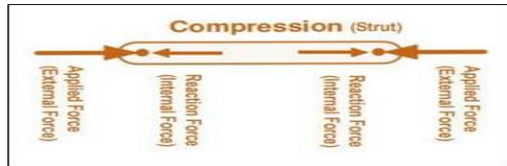
$$7 = 7$$

It is a Perfect Frame!

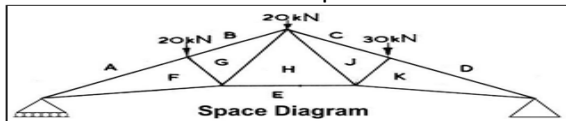
Exercise 1: analyse each of the truss shown above.

Reference site: <https://www.youtube.com/watch?v=XzQ8yslDz0>

Reaction of members:



Bows notation: letter the spaces clockwise as shown in the diagram



Note: 'T' is omitted in Bow's Notation to avoid confusion with numeral one.

Exercise 2: do bows notation of each of the truss drawn on Wednesday 13th may

Friday (15/05)

Topic: Applied Mechanics – Truss

Exercise: do stability analysis and Bow's notation for all the truss exercise in the year 13 technical drawing student workbook. (Sheet 18-21)

Reference site: https://www.youtube.com/watch?v=G5D6F0_4nUM

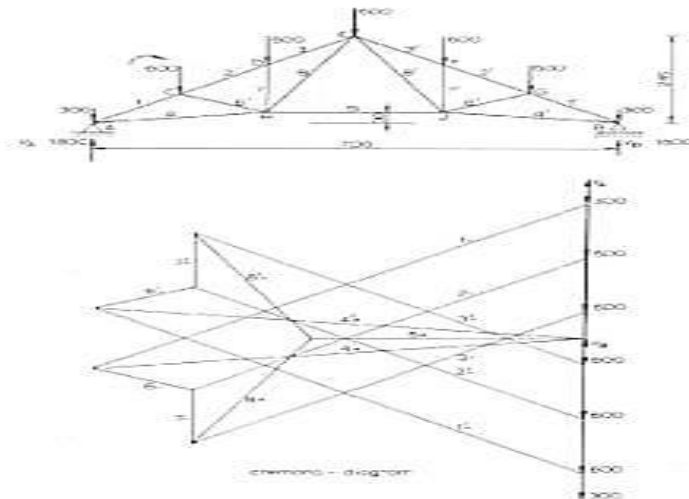
Load line: a line on which scaled loads of the truss are transferred to (head to tail vector addition is used), also used to determine reaction forces R_R and R_L

Polar Polygon/Diagram: diagram formed by drawing lines from a point 'o' (polar point) to head of each force vector which added to make load line

Exercise: Draw the load line and polar diagram using a suitable load line scale for all the workbook truss exercise (Sheet 18 - 21)

Reference site:

<https://www.youtube.com/watch?v=VBG8zN5aSR8&t=207s>



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