Your notes

GCSE Engineering: revision notes

Engineering drawings

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Orthographic projection

- Orthographic drawings show a 3D object as separate 2D views: the front view (front elevation), the side (end) view and the plan (top) view.
- The UK standard (BS 8888) uses **third angle projection**: the plan is drawn above the front view, and the view from the right is drawn on the right. First angle projection places them the other way round. A symbol on the drawing shows which is used.

Other drawing types

- **Isometric drawings** show 3D objects with vertical lines and lines at 30° to the horizontal.
- Oblique drawings show the front face flat, with depth lines at 45°.
- Exploded views show how parts fit together; assembly drawings show the finished product; **sectional views** show inside, with cut surfaces hatched at 45°.
- Circuit diagrams use standard symbols; flowcharts show the steps of a process or program.

Lines, dimensions and scale

- Thick continuous lines show visible outlines. Thin continuous lines are used for dimensions and projection lines. Thin dashed lines show **hidden detail**. Thin chain lines (long dash, dot) show **centre lines**.
- Dimensions are in millimetres, with arrowheads touching projection lines. Ø means diameter and R means radius.
- **Scale** shows drawing size compared with real size. 1:5 means the drawing is one fifth of real size, so 40 mm on the drawing is 200 mm in reality. 2:1 means twice real size.

Key terms

Orthographic projection	Showing a 3D object as separate 2D views.
Third angle projection	The UK standard layout, with the plan above the front view.
Isometric drawing	A 3D drawing with lines at 30° to the horizontal.
Hidden detail	Features that can't be seen, shown with dashed lines.
Centre line	A chain line showing the centre of a circle or symmetrical part.
Scale	The ratio of drawing size to real size.
Sectional view	A view showing the inside of a part as if cut through.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. In third angle projection, where is the plan view drawn?
2. What type of line shows hidden detail?
3. What type of line is a centre line?
4. At what angle are isometric lines drawn?
5. What does Ø mean on a drawing?
6. A drawing is at 1:5 scale. A line measures 40 mm. What is the real length in mm?
7. A drawing is at 2:1 scale. A part is 15 mm long. How long is it on the drawing in mm?
8. What units are engineering dimensions usually in?

Answers

1. Above the front view
2. A thin dashed line
3. A thin chain line
4. 30° to the horizontal
5. Diameter
6. 200
7. 30
8. Millimetres

What to do next

Practise 10 questions on this topic

Try 3 exam questions, with mark schemes

Read the lesson, one step at a time

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