4.4.4.4 Section D: Developing design ideas (20 marks)

Students will develop and refine design ideas. This may include, formal and informal 2D/3D drawing including CAD, systems and schematic diagrams, models and schedules. Students will develop at least one model, however marks will be awarded for the suitability of the model(s) and not the quantity produced.

Students will also select suitable materials and components communicating their decisions throughout the development process. Students are encouraged to reflect on their developed ideas by looking at their requirements; including how their designs meet the design specification. Part of this work will then feed into the development of a manufacturing specification providing sufficient accurate information for third party manufacture, using a range of appropriate methods, such as measured drawings, control programs, circuit diagrams, patterns, cutting or parts lists.

Mark band	Description
16–20	Very detailed development work is evident, using a wide range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype. Excellent modelling, using a wide variety of methods to test their design ideas, fully meeting all requirements. Fully appropriate materials/components selected with extensive research into their working properties and availability. Fully detailed manufacturing specification is produced with comprehensive justification to inform manufacture.

Student Guide – Third angle orthographic drawing (3AOP)

Introduction- Have you:

Explained why are creating a third angle orthographic projection of your final design concept at this stage in the design process? (Consider how it will help you to plan ordering materials, costing and the final manufacture).

Third angle orthographic drawing:

- Decide whether a hand drawn or computer generated drawing is most appropriate for your design (more organic forms are better suited to hand drawing)
- Hand drawn 3AOP should be drawn to scale to fit a piece of A3 paper (e.g. 1:1, 1:2, 1:4 etc.)
- Computer generated 3AOP should be drawn at 1:1 scale.

Have you:

- Drawn cross hairs to suit the overall shape of your product? Started with the front view and filled the space with this initial drawing?
- Ensured all views are drawn in line with each other.
- Included all construction details e.g. joints, engravings and layers of material?
- Included all relevant dimensions using dimension lines to show the real dimensions of your product (dimensions should be in mm).
- Ensured there is no colour in your drawing.

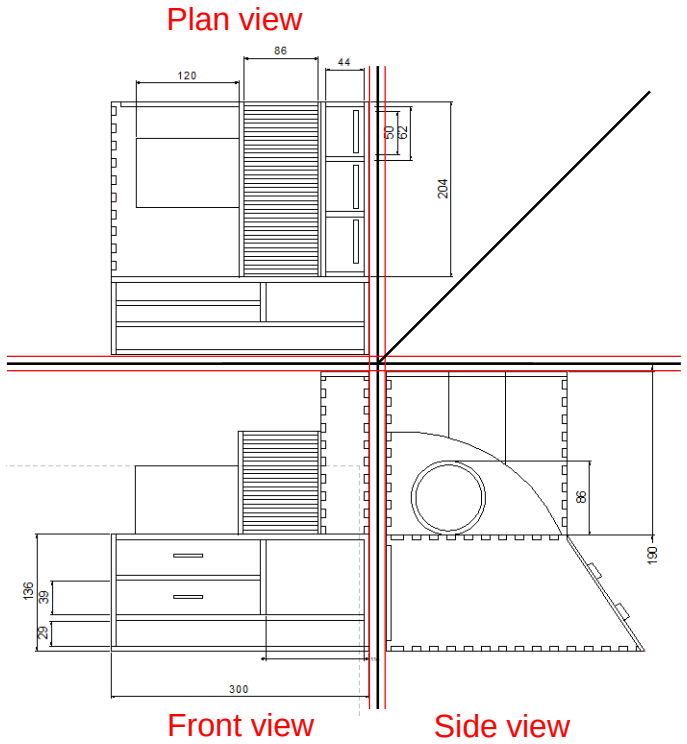
Possible extra ideas for inclusion:

- Use Google sketch up to create a final design concept that is 3D and includes use of texture and/or colour.

Summary - Have you:

- Explained what you intend to do next (create a cutting list for the materials you require, plan the costing and complete a plan for manufacture).

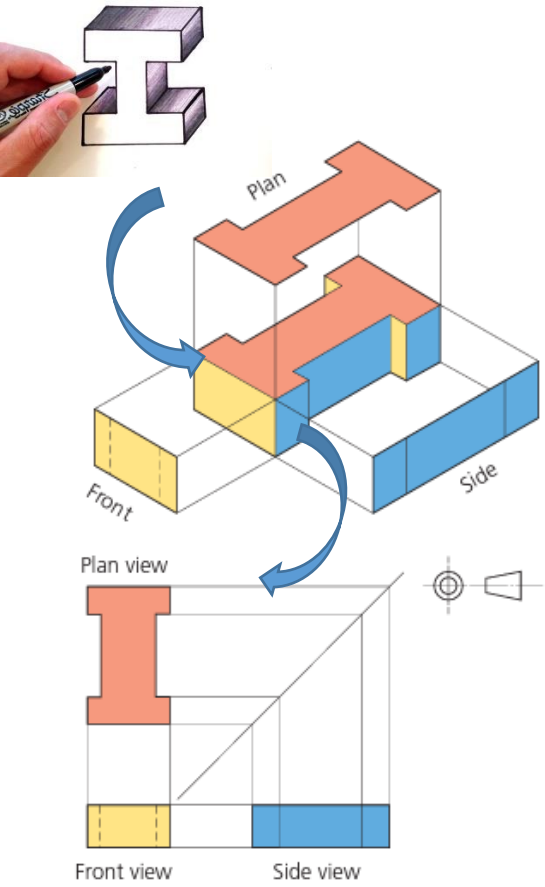
Third angle orthographic projection example:



Parent guide – Third angle orthographic drawing

Introduction to this page

This page is a presentation of students' final design concepts and this third angle orthographic drawing will include different views and dimensions that could be used to help a third party manufacture their product.



Third angle orthographic projections are 2D drawings that show the front, side and top view of a product. Construction lines are used to ensure the drawings are accurate from all angles. The work should be completed to scale and include all relevant dimensions.

It is essential students use this as an opportunity to deepen their knowledge and understanding of this type of communication, as this is also included in the theory content for their GCSE.

How can you support your child at home?

Look over your child's page:

- Have they drawn a front, side and top (plan) view of their product using the format shown in the example (note – there is an additional example provided on the student guide page).
- Do the three drawings line up with each other? Could you encourage more accuracy through use of construction (guide) lines?
- Have they included all required detail? For example joints, layers of material and engraving?
- Have they included all dimensions? (Note they do not need the same dimensions on different views e.g. the width of the front view is the same as the width of the plan view and so only one of these would be required).
- Can they explain third angle orthographic projection to you? Talking through their drawing might help them to spot errors in their work and help deepen their understanding for the exam.

Could you encourage them to add in the extra ideas for inclusion (in green) to help them gain more marks.