4.4.4.3 Section C: Generating design ideas (20 marks)

Students should explore a range of possible ideas linking to the contextual challenge selected. These design ideas should demonstrate flair and originality and students are encouraged to take risks with their designs. Students may wish to use a variety of techniques to communicate. Students will not be awarded for the quantity of design ideas but how well their ideas address the contextual challenge selected. Students are encouraged to be imaginative in their approach by experimenting with different ideas and possibilities that avoid design fixation. In the highest band students are expected to show some innovation by generating ideas that are different to the work of the majority of their peers or demonstrate new ways of improving existing solutions

Mark band	Description
16–20	Imaginative, creative and innovative ideas have been generated, fully avoiding design fixation and with full consideration of functionality, aesthetics and innovation. Ideas have been generated, that take full account of on-going investigation that is both fully relevant and focused. Extensive experimentation and excellent communication is evident, using a wide range of techniques. Imaginative use of different design strategies for different purposes and as part of a fully integrated approach to designing.

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 - Initial Modelling

Introduction- Have you:

- Fully explained and justified what you have done so far and why we are completing a more developed specification?

Modelling – Have you:

- Created multiple models (or changed your initial model, taking photos throughout) to show iterations of your product that test or show development of aspects of your design (you could consider most of ACCESSFMM at this stage – how can your model be more aesthetically pleasing, how could you improve the function or ergonomics of your design, could you refine the size etc.?

Model Development – Have you:

- Added sketching on to your model photos to illustrate missing design details e.g. surface textures, openings, or changes/developments you intend to make.
- Added additional sketching to illustrate further changes you wish to make, that can not be shown on your photos.
- Included annotation around the design using ACCESSFMM to guide you. You should use specific and technical language.

Model Development cont. – Have you:

- Gained client or third party feedback and considered how you could apply this to your design.
- Evaluated your model against your specification and the needs/wants of your client.
- Added in any realisations e.g. if you realised through modelling that making a lockable compartment on the base layer would make more sense for security reasons, add a sketch to show this aspect and explain how these realisations made you redevelop your idea from the previous sketch.

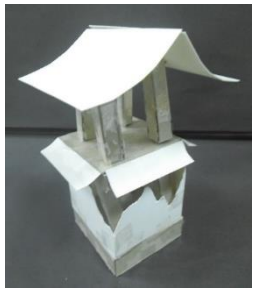
Possible extra ideas for inclusion:

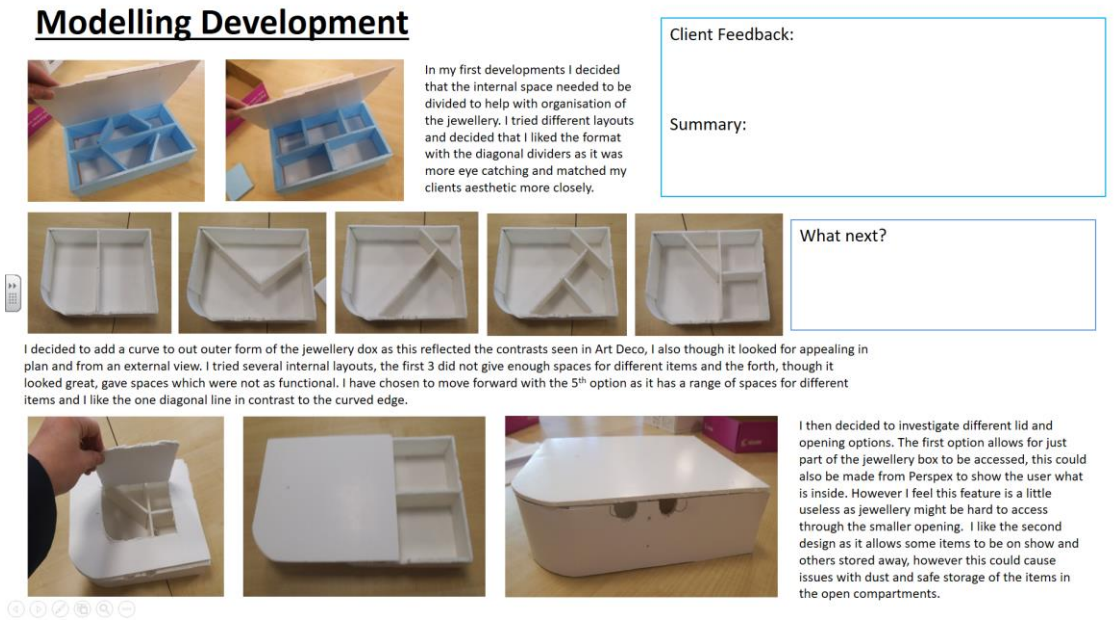
- Highlight or underline key vocabulary to ensure this is obvious.
- Manufacture an additional model(s) to test or illustrate your design (or part of it).
- Use Google Sketchup (free online) software to draw out your developed design concept.

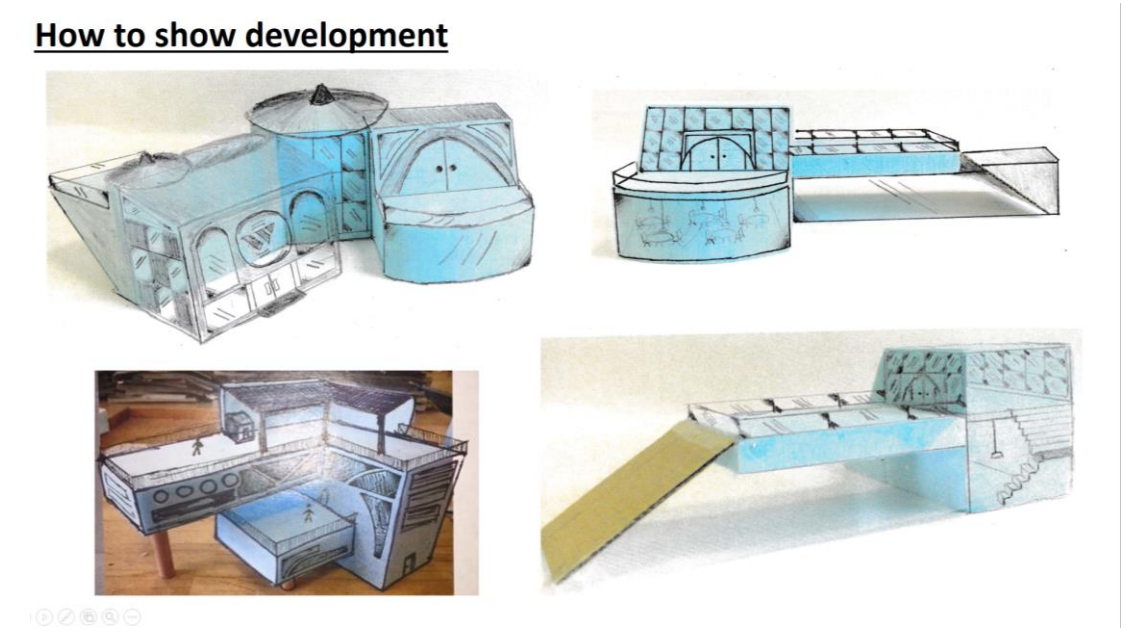
Summary - Have you:

- Explained what you like and dislike about your modelled ideas and how you intend to move forward e.g. changes to be made, testing or materials and processes, increasing dimensions.

Initial Modelling - Examples







Modelling is used to:

- Understand your design in 3D
- Look at mechanisms
- Consider joining methods
- Engage with scales and proportions within the design
- Possibility of testing in 1:1 scale
- Making design evaluations
- Gaining 3rd party feedback
- Making design developments

Key vocabulary:

- **Design iteration –** The process of prototyping, testing, analysis and refinement of a product. This is repeated to create different ‘iterations’ of a product until a final prototype meeting all intended criteria is generated.

Parent guide – Initial Modelling

Introduction to this page

This page is students first opportunity to create a 3D model of their intended design and establish a clear direction for their project.

This is an important step for students, as it will help them to understand how their design will look and function in 3D. Students will also begin to consider how it could be manufactured and how well it meets their brief.

They should use the design idea which most closely met the specification (as established on the previous page – *evaluation against specification*) and create an initial model of this as it is. Once this is completed, they should create different iterations of this design to show development (examples of what development could look like are shown on the previous slide). Students should photograph these as they make any changes.

This page should be an explanation of the process they have gone through, what they have realised with each iteration, and changes they have made as a result.

How can you support your child at home?

Look over your child's page:

- Has the product changed and developed between the photos and sketching you can see?
- Is there a combination of photos and sketch work that explain the idea in detail?
- Does the annotation explain what changes have been made and why they have been made?
- Have they recorded 3rd party or client feedback and explained what they could/will change as a result?
- Do their design developments meet their client's needs and wants, the design brief and specification?

Ask your child to discuss their design and how it has changed and developed through modelling and **why** they have made these changes. Do you think they have captured this level of detail in their written work? Could you help your child to identify how they can further develop their design work to more closely meet the needs and wants od the client, the design brief and specification?

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