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 – Materials and process research

Introduction- Have you:

Introduction to process sampling – why are you completing this page, what is the benefit of primary research over secondary research?
Explain why these techniques are useful to develop the materials and manufacturing processes that will be used in the final prototype.

Evaluation of materials and processes:

- *Added photos of samples you completed in Year 10.*
- *Next to each sample added annotation which explains how you have created each technique, how easy each material was to work with (cutting, shaping etc.) and other relevant factual information/research about materials and their properties. This should be written using sophisticated subject vocabulary.*
- *Add further annotation that explains key aesthetic features and evaluative personal reflections (e.g. likes, dislikes, further development ideas.)*

Work in italics should have been completed during Year 10.

- In addition to the work completed in Year 10 (first three bullet points), this page should also consider: how each sample fits the aesthetic of your design theme and where you could see this being used in your final prototype.
- You should evaluate whether the materials/ processes reflect the needs of the client and are suitable for your design brief and specification.
- Added small sketches that show how these processes could be applied to your final product.

Possible extra ideas for inclusion:

- Complete additional sampling that you did not get the chance to use in Year 10 but is relevant to your project and add this to your page.

Summary - Have you:

- Explained what you now need to do to further develop your product including any research or further sampling you have identified that you will need to complete.

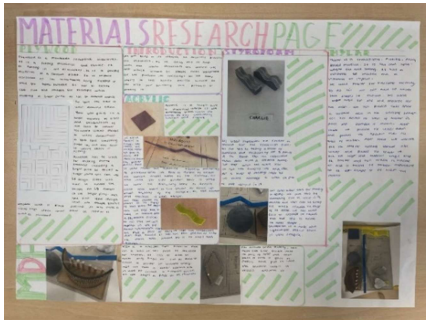
Parent guide – Exploring the customer

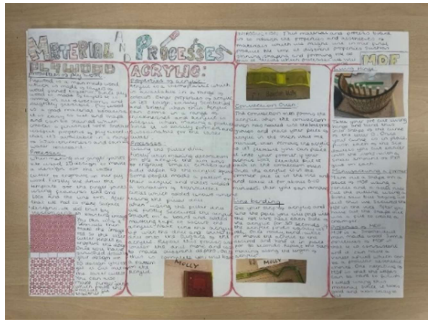
Introduction to this page

This page is a chance for students to practice a range of practical processes and in doing so, evaluate their suitability, and that of the materials used. They should begin to consider which could be appropriate for their final prototype.

Students completed a range of practical samples in Year 10 and wrote about how they completed them and also evaluative comments to identify what processes worked well and where there were issues (the positives and negatives are both important to show students are fully considering material and process suitability).

In Year 11 they should complete this page by considering how they could use these products in their final prototypes – this is important to make the research relevant, which is a requirement of the mark scheme.





How can you support your child at home?

It is important that the work your child completes here relates to their NEA. As well as the overall descriptive and evaluative comments, there should be some evidence of how this links to their final prototype development and manufacture.

Look over your child's page:

- Have they included all required materials and processes (a list is provided on the following slide).
- Read each process description, does it explain how the sample was created in a depth that you understand what they have written?
- Have they included evaluative comments about the materials and processes (e.g. things that went well/ likes and dislikes) not just descriptive comments?
- Have they discussed whether the materials and processes are suitable for their client, design brief and specification?
- Have they added small sketches and / or written annotation showing where the material or process could be used in their final prototype design?

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

Plywood
Laser cutter finger joint (decoration and cutting)
Living hinge
Creating a former (vacuum former)

Acrylic
Pillar drill
Convection oven
Line bending

Styrofoam
File forming
Creating a former

Aluminium
Beating

Flexiply
Lamination

Mylar
Vacuum forming