# AQA design AND technology

# 2020 – Mini Guide Booklet for NEA Style work

**Candidate Name**

**Candidate Number**

**Unit 2 - 8552**
**Centre Number – 58645**
**Centre Name – Saint George Catholic College.**

# Note on Presentation

**Keep the moderator interested in your work by using creative presentation.**

**Choose:**

- **A colour theme**
- **ONE font to use consistently throughout the project**

**Think about:**

- **Borders – A simple border/ hand drawn and scanned in border relevant to your theme**
- **A background image (keep your text and other images clear if you are using a background image behind the bulk of your information)**
- **How you will show photos/ information (spread images and text out evenly, Keep images big enough so that they are clear. A photograph can say a lot and can show a moderator how you have created your product meaning they are worth marks!)**
- **Titles – Will your titles be underlined? In coloured boxes? The same size throughout.**
- **Using the space on the page wisely – Fill up the space, don't leave gaps, add good quality images to add clarity to your text (remember primary sourced photographs are ALWAYS better to add if possible)**
- **A key – Could you have all ecological issues in green for example?**

# Section 1

## Identifying and investigating Design Possibilities

**(10 Marks)**

**This section should give an overview of the task. It should be clear what you have been asked to do and who you are creating the product for. You must refer to your client throughout in order to show that your decisions are justified and relevant to your clients wants and needs. You should make sure that all of your research is clear and concise. If the task/client has asked you to look at a particular theme or design movement (i.e flat pack, child development) you should make sure that this is clear throughout your annotation, imagery and ongoing evaluation.**

# Design & Technology Assessment – NEA

## Identifying & investigating Design Possibilities (10 Marks)

**By analysing the contextual challenge students will identify design possibilities, investigate client needs and wants and factors including economic and social challenges. Students should also use the work of others (past and/or present) to help them form ideas. Research should be concise and relate to their contextual challenge. Students are also advised to use a range of research techniques (primary/secondary) in order to draw accurate conclusions. Students should be encouraged to investigate throughout their project to help inform decisions.**

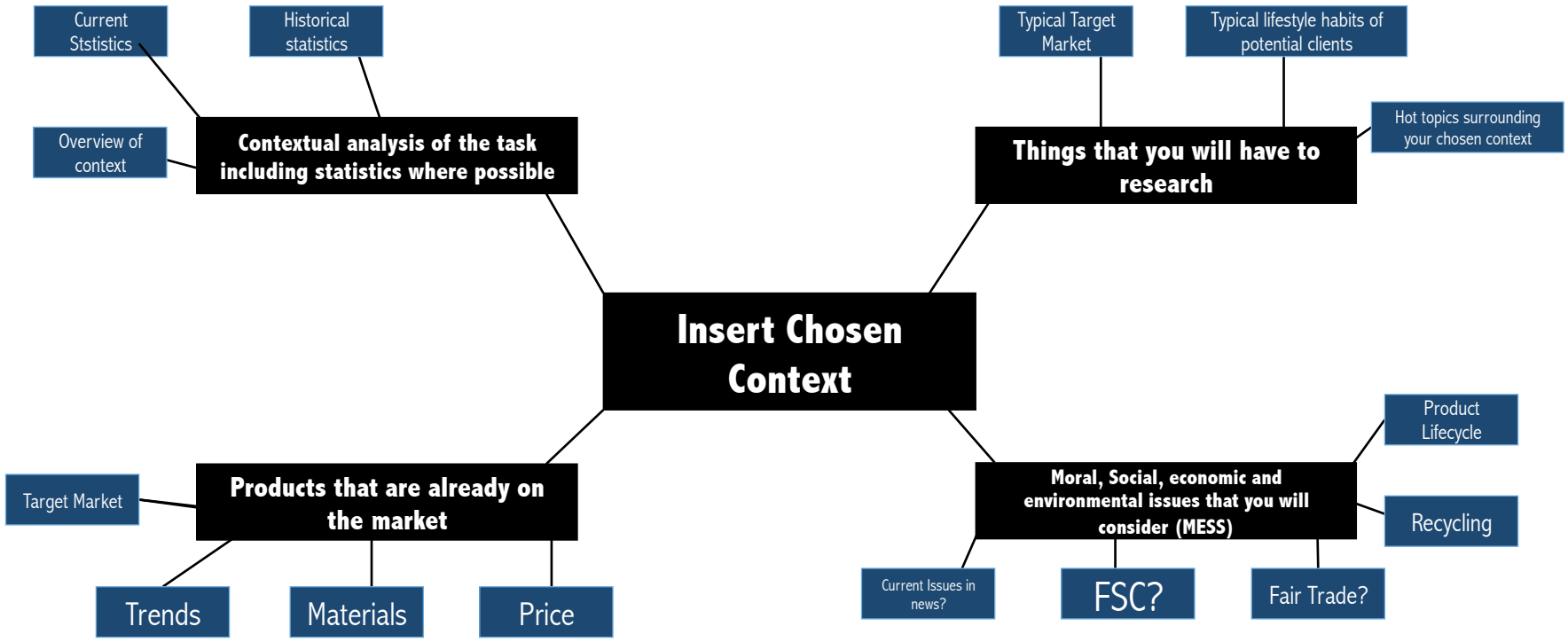
| Mark Band | Description |
|---|---|
| 9-10 | Design possibilities identified and thoroughly explored, directly linked to a contextual challenge demonstrating excellent understanding of the problems/ opportunities.<br>A user/client has been clearly identified and is entirely relevant in all aspects to the contextual challenge and student has undertaken a comprehensive investigation of their needs and wants, with a clear explanation and justification of all aspects of these.<br>Comprehensive investigation into the work of others that clearly informs ideas.<br>Excellent design focus and full understanding of the impact on society including; economic and social effects.<br>Extensive evidence that investigation of design possibilities has taken place throughout the project with excellent justification and understanding of possibilities identified. |
| 6-8 | Design possibilities identified and explored, linked to a contextual challenge demonstrating a good understanding of the problems/opportunities.<br>A user/client has been identified that is mostly relevant to the contextual challenge and student has undertaken an investigation of their needs and wants, with a good explanation and justification of most aspects of these.<br>Detailed investigation into the work of others that has influenced ideas.<br>Good design focus and understanding of the impact on society including; economic and social effects.<br>Evidence of investigation of design possibilities at various stages in the project with good justification and understanding of possibilities identified. |
| 3-5 | Design possibilities identified and explored with some link to a contextual challenge demonstrating adequate understanding of the problems/ opportunities.<br>A user/client has been identified that is partially relevant to the contextual challenge. Student has undertaken an investigation of their needs and wants, with some explanation and justification of some aspects of these.<br>Some investigation into the work of others that has had some influence on their ideas.<br>Some design focus and understanding of the impact on society including; economic and social effects.<br>Investigation of design possibilities goes beyond the initial stages of the project but only some justification and understanding of possibilities identified. |
| 1-2 | Basic design possibilities identified. Link to a contextual challenge is unclear and student demonstrates only a limited understanding of the problems/ opportunities.<br>An attempt has been made to identify a user/client but is not be relevant to the contextual challenge. Student has undertaken a basic investigation of their needs and wants, but given little explanation and justification of these.<br>Basic investigation into the work of others that has not been used to inform their ideas.<br>Limited design focus and understanding of the impact on society including; economic and social effects.<br>Investigation of design possibilities only takes place in the initial stages of the project and there is very little justification and understanding of possibilities identified. |
| 0 | Nothing Worthy of credit. |

**Contextual Challenge –**

**Problem to be fixed through your design-**

**The Task Analysis sets the scene for the project. It shows that you have fully considered the possible routes that you could explore further in order to design an innovative product that fits within your chosen context.**
**You should consider what the considerations that you must investigate further through this project are. Your task analysis should show excellent understanding of the area that you are exploring through your design. You should not specify any specifics about a particular product or design idea at this stage. It is an area to help you gather possible ideas for future designs.**

# Task Analysis

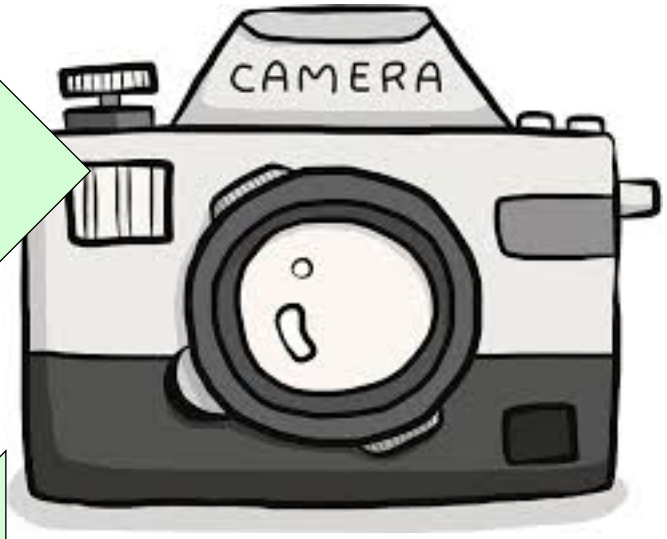


# Researching the theme – Mood Board

In this section you should find a range of existing products that are already on the market.

It is good practice to physically find the products and take your own photographs alongside finding online images/information. You can gain a better idea of scale/materials/ function/quality by looking at and evaluating a physical product. This might mean going out to shops that sell products similar to the product you are thinking of creating. Seeing products in a shop can also give you ideas for aesthetic theme/ marketing of your product and packaging. Often shops will dress the shelves or use point of sale displays to make particular products stand out to the consumer. Having an idea of how this is done will help you to design ideas as you will have a better idea of context and marketing throughout the products life cycle.

USE ME! – Take photos when you are out and about, whilst shopping or in other contexts, this is VERY Valuable first hand research!




Highlight the important parts of your research for the contextual challenge. Do the products follow a certain design theme? Are you going to create packaging as well? Don't forget to include these elements in your research.

Remember that it is good practice to get ONGOING research throughout the project as your ideas develop.

URL links: If you have sourced an image from the internet it is good practice to include the URL link so that A. you can find the product again if you need to. And B, the source is recognized by the moderator.

# Client Profile

**Explain who your client is.**

**What is their age:**
**What is their social demographic?**
**What is their occupation?**
**What are their interests?**

**Include a photo of your client if possible.**

**Who are you designing your product for? It is good practice to find an actual person that you know and therefore can interview to ask what their wants and needs are along with getting consistent feedback about the product as it develops. This will highly benefit your ongoing testing and evaluation. You should refer to your client throughout the project so you need to be very clear on who it is both for your own benefit and for the moderators benefit.**

**Don't forget it is good practice to get feedback from your client throughout you project – This could be in a feedback box or in annotation/ quotes.**

# Section 2

## Producing a Design Brief and Specification

**(10 Marks)**

**The aim of this section is to produce a clear design brief and specification for the product that you will be creating.**

**Both the brief and specification should come from the previous investigations found through the earlier research conducted. The needs and wants of the client should be thoroughly considered alongside any design decision that is made.**

# Design & Technology Assessment – NEA

## Producing a Design Brief and specification (10 Marks)

**Based on conclusions from their investigations students will outline design possibilities by producing a design brief and design specification. Students should review both throughout the project.**

| Mark Band | Description |
|---|---|
| 9-10 | Comprehensive design brief which clearly justifies how they have considered their user/client's needs and wants and links directly to the context selected. Comprehensive design specification with very high level of justification linking to the needs and wants of the client/user. Fully informs subsequent design stages. |
| 6-8 | Good design brief with an attempt to justify how they have considered most of their client's needs and wants and has clear links to the context selected. Detailed design specification with good justification linking to the needs and wants of the client/user. Largely informs subsequent design stages. |
| 3-5 | Adequate design brief with some consideration of their client's needs and wants is evident, as is the relevance to the context selected. Adequate design specification lacking some detail. Some justification linking to the needs and wants of the client/user. Informs subsequent design stages to some extent. |
| 1-2 | Basic design brief that contains only limited consideration of their client's needs and wants and has little or no relevance to the context selected. Basic design specification has minimal detail. Limited justification linking to the needs and wants of the client/user. Very little influence on subsequent design stages. |
| 0 | Nothing Worthy of credit. |

# Research Findings

| Research | Findings | References |
|---|---|---|
| Product Analysis | What were the main points you found and how do they fit with your client's wants and needs? | |
| Client | Who is it and what are their wants and needs? | Did you interview them to ask? Explain how you know this information. |
| Location visit | Only include if you have gone somewhere to help further your research | |

# Design Brief

**Your design Brief should set the scene for the product that you are going to design and make.**

**You should take into consideration the personal situation that your client needs you to address by creating the product, but you should not suggest HOW to combat these issues here. *The Design Brief is all about what the product is going to do*. Do not specify a particular design at this point. Keep your options open.**

***Note* refer to the example booklets published by AQA to inform your understanding of different design briefs.**

# Design Specification

| | My Product Must | This is because: | How will this be achieved? |
|---|---|---|---|
| Client | | | |
| Function | | | |
| Aesthetics | | | |
| Cost | | | |
| Materials | | | |
| Ergonomics | | | |
| Manufacture | | | |
| Environment | | | |
| Safety | | | |
| Sustainability | | | |

Your design specification should be concise. It should fully relate to your client's wants and needs, the task analysis and your design brief.

You should consider the needs and wants of your client throughout the specification in order to ensure your product is something that will be successful in the opinions of your client.

* NOTE* this is a suggested method of presentation only, please use your own preferred styles if you wish.

**Summary Box:**

It is crucial to conclude all of your findings on this page in order to provide clarity to what your designs will incorporate.

# Section 3

## Generating Design Ideas

**(20 Marks)**

**Design ideas should be highly creative and show innovative ways to solve the initial design situation. You should consider a range of different designs in order to meet the needs and wants of the client.**
**Designs should be unique and should avoid design fixation (Make sure that each idea is very different yet still links clearly to your design brief and specification)**

**Your ideas should be fully justified in any design decision and must be relevant to the initial design task, the design brief and specification.**

# Design & Technology Assessment – NEA

## 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.<br>Ideas have been generated, that take full account of on-going investigation that is both fully relevant and focused.<br>Extensive experimentation and excellent communication is evident, using a wide range of techniques.<br>Imaginative use of different design strategies for different purposes and as part of a fully integrated approach to designing. |
| 11-15 | Imaginative and creative ideas have been generated which mainly avoid design fixation and have adequate consideration of functionality, aesthetics and innovation.<br>Ideas have been generated, taking into account on-going investigation that is relevant and focused.<br>Good experimentation and communication is evident, using a wide range of techniques.<br>Effective use of different design strategies for different purposes as an approach to designing. |
| 6-10 | Imaginative ideas have been generated with a degree of design fixation and having some consideration of functionality, aesthetics and innovation.<br>Ideas have been generated that take some account of investigations carried out but may lack relevance and/or focus.<br>Experimentation is sufficient to generate a range of ideas. Communication is evident, using a range of techniques.<br>Different design strategies explored but only at a superficial level with the approach tending to be fairly narrow. |
| 1-5 | Basic ideas have been generated with clear design fixation and limited consideration of functionality, aesthetics and innovation.<br>Ideas generated taking little or no account of investigations carried out.<br>Basic experimentation and communication is evident, using a limited number of techniques.<br>Basic use of a single design strategy. |
| 0 | Nothing Worthy of credit. |

# Generating ideas – Initial Sketches

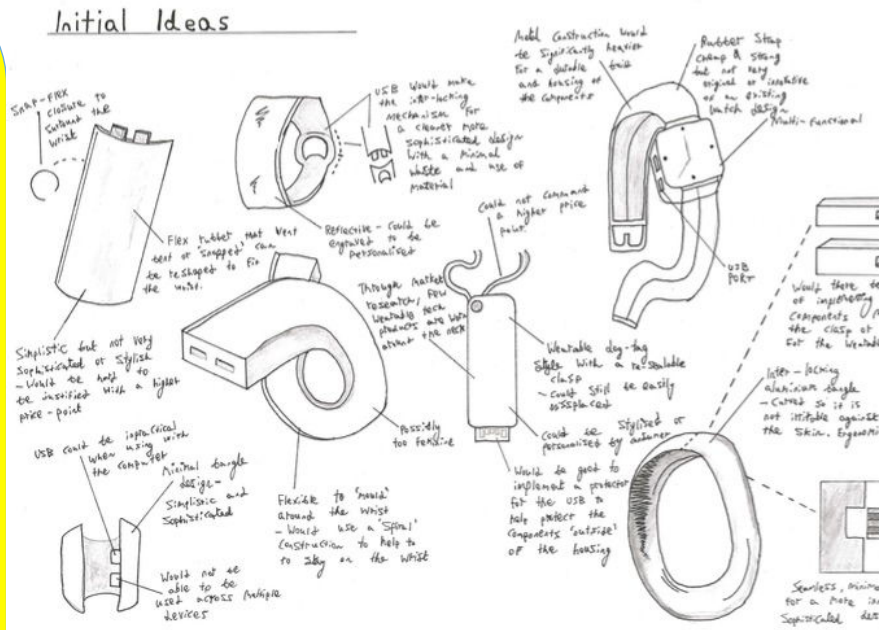
**In this section you should include a range of hand drawn ideas.**

**Your drawing should be clear, showing the product in 3 dimensions (use isometric drawing to aid with this).**

**It is good practice to draw your idea from multiple view points so that the detail in your design can be fully seen by the moderator. This will also help to communicate any function of the product that your design includes.**

**Include references of your influence (Design movements/existing products) – Make sure your idea is not a copy, but shows INFLUENCE.**

***Consider, Shape, form, function & aesthetics in your ideas***




**Client Feedback – Get your client to pick their 4 favourite designs and get quotes about why they like them and what they might modify.**

**ANNOTATION OF IDEAS– If you are writing by hand make sure your writing is clear and legible. If you are unsure of if it will be, annotate your ideas after they have been scanned in and added to your PowerPoint.**

**SCANNING IDEAS IN: In order for your drawings to be clear, you should make your outlines bold enough so that they are picked up well when they are scanned in to the computer. You should also include rendering to show the finish of your idea where possible this will show the intended material and make your presentation the highest possible quality.**

# Refining Initial Designs – Making them more interesting

Pick 2 or 3 ideas to refine further (this will preferably be your client's favourite of your initial sketches). Refining further will typically include the following methods including different methods of drawing (Isometric, 3 point perspective, refined rendering, oblique projection)
In order to refine your designs you should include concise annotation. Your annotation should include:

- Aesthetics
- Materials/Construction
- Function
- Size (Dimensions Link to anthropometrics)
- Environmental issues
- Product Lifecycle
- Economic issues
- Social/moral issues
- Safety

## Aesthetics:

consider a colour scheme. Will this use colour theory to help any particular features stand out/ blend together well?

Use your knowledge of colour theory to help annotate your ideas. Show this colour scheme clearly in your drawings.

Consider graphics such as images or text. Will your product include any of there and if so what will they be and where? How will you include them when you make the design (Sublimation printing, laser cutting/ 3D printing ect)

Will you use traditional aesthetic finishes to your design including things like wood stains and varnishes.

## Additions:

Is there anything that you could add to your design? For example more of an original feature/ graphic or logo?

How would these additions affect the overall product? Would it mean more materials is used and therefore a knock on disadvantage to cost or manufacture and the cost to the client?

How would these additions benefit the client in their needs and wants?

## Function:

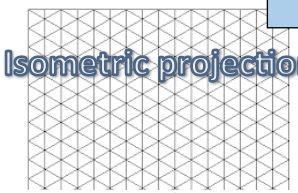
Could you change the function in some way shape or form so that it can do more than originally stated?

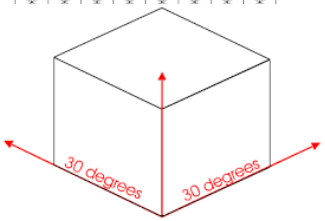
Could you change the way that the product I used?

Could it link with an eco friendly scheme so that it is not going to affect the environment through its use?

Rendering a wooden cube

Isometric projection






**Notes on presentation:**
Use a ruler for straight lines, Render your drawings to show the type of material and the light source. Include detail such as graphics which might be displayed in the product, Show multiple views of the product design Idea, Use Isometric Drawing/ 3 point perspective to make your drawings look realistic and 3 dimensional.
Drawings should be scanned in to the computer to show the highest possible quality.

**Top Tip:**

Get some feedback from your client on which they prefer if possible

# Section 4

## Developing Design Ideas

**(20 Marks)**

**In this Section you should develop the ideas that you have initially created by modifying and refining them through the use of technical drawings, CAD, modeling and 3D printing. You should always reflect back to the design brief and specification, along with your client's wants and needs, throughout all elements of designing.**

**Marks are awarded for quality and relevance over quantity.**
**In this section you may refine particular elements of your design such as any additional components or graphics. Modelling, CAD & 3D printing is a great way to experiment with and develop your designs prior to reaching a final design. Take screen shots to document your CAD/CAM processes along the way, and take photographs of any models that you have created to show your modelling process clearly.**

# Design & Technology Assessment – NEA

## 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.<br>Excellent modelling, using a wide variety of methods to test their design ideas, fully meeting all requirements.<br>Fully appropriate materials/components selected with extensive research into their working properties and availability.<br>Fully detailed manufacturing specification is produced with comprehensive justification to inform manufacture. |
| 11-15 | Good development work is evident, using a range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype.<br>Good modelling which uses a variety of methods to test their design ideas, largely meeting requirements.<br>Materials/components selected are mostly appropriate with good research into their working properties and availability.<br>Largely detailed manufacturing specification is produced with good justification to inform manufacture. |
| 6-10 | Development work is sufficient, using some 2D/3D techniques (including CAD where appropriate) in order to develop a prototype.<br>Modelling is sufficient, using a variety of methods to test their design ideas, meeting some requirements.<br>Materials/components selected with some research into their working properties and availability. Some of these may not be fully appropriate for purpose.<br>Adequate manufacturing specification contains sufficient detail with some justification to inform manufacture. |
| 1-5 | Basic development work is evident, using a limited range of 2D/3D techniques (including CAD where appropriate) in order to develop a prototype.<br>Modelling is basic, using a limited number of methods to test their design ideas meeting requirements only superficially.<br>Materials/components selected with minimal research into their working properties or availability and may not be fully fit for purpose.<br>Basic manufacturing specification that lacks detail and has minimal justification to inform manufacture. |
| 0 | Nothing Worthy of credit. |

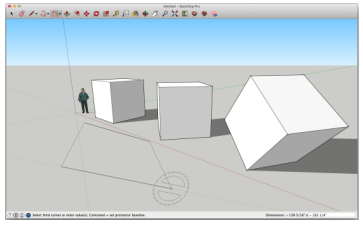
# Developing Ideas CAD

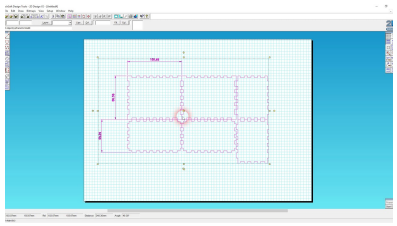
**TOP TIP:**

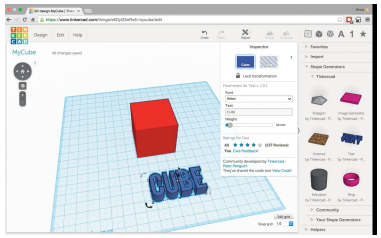
**Whenever you have created something on a CAD based program take a screen shot and input this to your powerpoint straight away!**

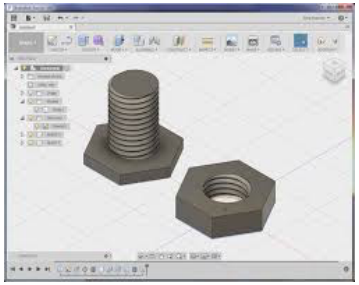
**Any changes you have made input these to your powerpoint and explain the changes as this is a really useful way of developing your design work. Particularly if you have already cut the pieces for a model on the laser cutter from a DXF file. It would be excellent practice to show how you have modified this DXF file once it has been tested in model form.**

**This way you can show the documentation of your developments and modeling.**







## Notes on Sketchup, 2D Design, Tinkercad & Fusion 360:

**Sketchup online & Tinkercad are free web based softwares that you can access from home.**
**Take screen shots or the multiple views of your product (front, back, left, right, iso)**
**Develop different positioning of components and screen shot to justify these decisions in your later annotations.**
**On Sketch up export as an STL file and import into Tinkercad in order to 3D print a scale model of your design. (Take screen shots of each step of the process)**
**On 2D Design Export as a DXF file in order to laser cut it and save to the network in order to access in laser cut software attached to the laser cutter.**

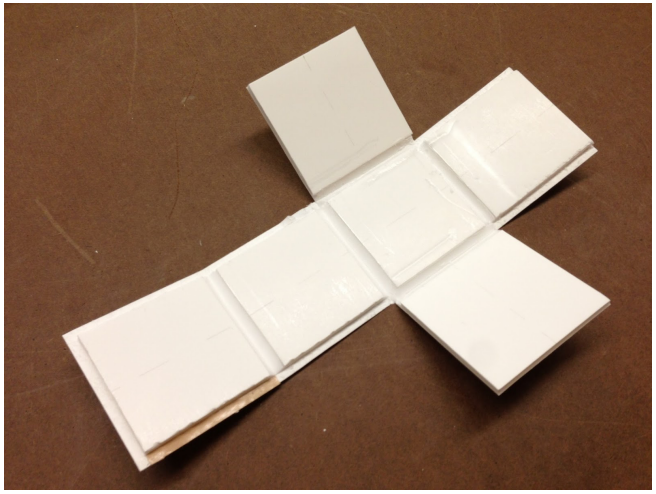
**When developing your ideas you should ensure that you take your initial designs and develop them further, (at this point try to focus on one idea that is your most successful and that would work the best for your client). This could be in terms of: Material, Shape, Function, colour, components, embellishments, structure, graphics. You are not simply copying your design on a computer, it should be modified slightly to improve its function, aesthetic or appeal to your client more.**

**You should include Sketch-up and 2D design in this section to help you develop your ideas further. Using CAD in this manner will help you visualise your ideas in 3 Dimensions, and make quick changes to appeal to your client further which are better at this stage than when you have spent time and money on making the final prototype.**

**CAD based solutions:**

**Sketch up – Visual representation of model on the computer – can be 3D printed with the STL plug in.**
**2D design – Can be used to create full or scaled down models using cardboard – Cheaper material than that used in final prototypes and will help you modify ideas along the way. Keep all 2D design files as they may be useful to make your prototype at a later stage.**
**Tinkercad/ Fusion 360 – Web based 3d printing software. Easily accessed at home in order for you to develop ideas or component parts which can be 3D printed.**

# Developing Ideas Modeling

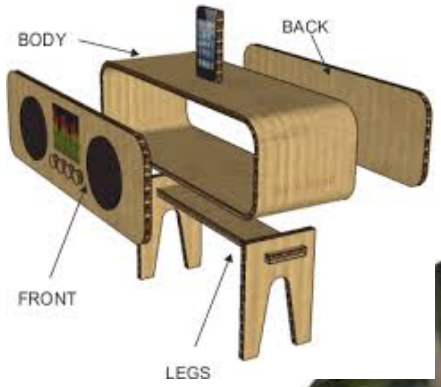


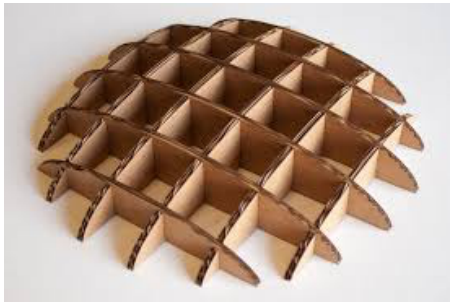
When developing your ideas you should ensure that you take your initial designs and develop them further. This could be in terms of: Material, Shape, Function, colour, components, embellishments, structure, graphics.

In addition why not create a 2d design DXF file to laser cut your model in a scale form. This can add precision to your modelling skill.

## Notes on Modeling:

Take photos throughout the creation of your model to show its development.
Use measurements accurately to create a scale model of your ideas.
Concentrate on Quality!
Include photos of NETs if applicable to your product.
Place a photo of your initial and more refined design, your CAD design alongside your model to show the development and journey it has been on.
Get feedback from your client – a Photo of your client with the model would be ideal as it evidences your feedback from them.
Make multiple models – Particularly if you can laser cut them as this is quick, cheap and easy.



# Final Design Idea

Research image → Initial Sketch Design → Detailed drawing of design → CAD drawing/ plans) → CAD/ CAM (3D print/ laser cut model)

| | Design linked to Design Specification |
|---|---|
| **Moral Issues** | |
| **Environmental Issues** | |
| **Sustainability Issues** | |
| **Social Issues** | |

**Client Feedback: - What does your client think about your design?**

**Summary Box:**

**Explain what your final idea is and conclude the issues listed above here.**

# Section 6

## Analysing and Evaluating

**(20 Marks)**

**In this section you should show a thorough evaluation of your product. You should link this back to your initial context and specification to assess whether you have ultimately met the needs and wants of your user.**

**Your final evaluation should been formed from the ongoing testing and modifications that have taken place throughout the iterative design process.**

# Design & Technology Assessment – NEA

## Analysing and Evaluating (20 Marks)

**Within this iterative design process students are expected to continuously analyse and evaluate their work, using their decisions to improve outcomes. This should include defining requirements, analysing the design brief and specifications along with the testing and evaluating of ideas produced during the generation and development stages. Their final prototype(s) will also undergo a range of tests on which the final evaluation will be formulated. This should include market testing and a detailed analysis of the prototype(s).**

| Mark Band | Description |
|---|---|
| 16-20 | Extensive evidence that various iterations are as a direct result of considerations linked to testing, analysis and evaluation of the prototype, including well considered feedback from third parties.<br>Comprehensive testing of all aspects of the final prototype against the design brief and specification. Fully detailed and justified reference is made to any modifications both proposed and undertaken.<br>Excellent ongoing analysis and evaluation evident throughout the project that clearly influences the design brief and the design and manufacturing specifications. |
| 11-15 | Good evidence that various iterations are as a result of considerations linked to testing, analysis and evaluation of the prototype, including some consideration of feedback from third parties.<br>Good testing of most aspects of the final prototype against the design brief and specification. Detailed reference is made to any modifications either proposed or undertaken.<br>Good analysis and evaluation at most stages of the project that influences the design brief and the design and manufacturing specifications. |
| 6-10 | Some evidence that various iterations are as a result of considerations linked to testing, analysis and evaluation of the prototype, including basic consideration of feedback from third parties.<br>Adequate testing of some aspects of the final prototype against the design brief and specification. Some reference is made to modifications either proposed or undertaken.<br>Adequate analysis and evaluation is present at some stages of the project but does not have sufficient influence on the design brief and the design and manufacturing specifications. |
| 1-5 | Limited evidence that various iterations are as a result of considerations linked to testing, analysis and evaluation of the prototype.<br>Basic testing of some aspects of the final prototype against the design brief and specification. Little reference is made to any modifications either proposed or undertaken.<br>Superficial analysis and evaluation. Little influence on the design brief and the design and manufacturing specifications. |
| 0 | Nothing Worthy of credit. |

# Evaluation of Design Ideas

| | Design Specification: | How my product has met this: |
|---|---|---|
| Aesthetics | | |
| Cost | | |
| Client | | |
| Environment | | |
| Safety | | |
| Size | | |
| Function | | |
| Materials | | |
| Manufacture | | |
| Sustainability | | |

**Here you should be reflective about the process. You should use feedback from your client to justify your points.**

**Use points from your testing/ questionnaires to elaborate on how your product has met the specifications that you have set out.**

*** NOTE* This is just a suggested method of presentation. You should use your own individual style, but be sure to refer back to your design brief, specification and client's needs and wants throughout the journey.**

**Summary:**

# Modifications

Reflect upon the testing/ feedback and evaluation that you have undertaken.

Here you should include drawings/ CAD images to show visually how you may modify your product to improve it if you were to make it commercially.

Use feedback from your client and testing to justify the reasons behind each one.

Final design idea

Final prototype photograph

**Summary:**

Explain what you have done to modify the product and the reasons behind this. Are they to improve the function. Aesthetics, safety, cost ect.

## Modified design idea

(State in annotation which modifications you have made and why!!)

*Note* this could be multiple options!

Explain the modifications that took place through the making as well as future modifications based on client feedback.