

Areas of interests brainstorm

This will be a large brainstorm. To complete this start by writing different headings for situations from everyday life eg. Travel, school/college, sport etc. For each of these situations you now need to extend the brainstorm to show more specific areas within that heading eg. Sport- football, tennis, stadia, kit etc

Checkpoints:

- Ensure that you have explored the brainstorm in depth, you should be at least 50+ points on your brainstorm.
- Your brainstorm must start with broad headings and then these are explored in more detail.

Situations

From your brainstorm you must select 3 areas which are of interest to you. For each area you are to write a paragraph describing what that situation involves, its history, who would be involved in it, its effect on society and any other points you wish to add. You are not describing problems within that situation.

Checkpoints:

- You must have written at least 3 situations.
- Try to ensure that you are not detailing problems.
- A situation is a description of scenario/environment that people encounter during everyday life.
- It should also reflect how this situation has developed/changed over time.

Problem areas

For each of your situations you must now detail problems which arise. These problems need to be listed and described in detail. Each situation needs a minimum of 3 problems describing.

Checkpoints:

- Ensure you have a minimum of 3 problems. Aim to detail 5 points if possible.
- Ensure that your problems do not only focus on existing products within that situation. You can discuss products but problems should not just be aimed at them.
- When describing the problem link it to how it affects the user.

Gantt Chart

Before you draw your chart make a statement on what you are doing and why (planning your time). Your gantt chart must list all the stages of your project and how you will distribute your time.

Checkpoints:

- Ensure that you have described why you are doing the gantt chart and how this will aid you.
- On your gantt chart you may be able to do two things at once so don't be afraid to put more than one block in a column.
- Consider your deadlines and note them onto your gantt chart.

Mood board

One A3 sheet of images related to your chosen situation. The images should not just be based on products, but should also include environments, colours, textures, users etc.

Checkpoints:

- Ensure the whole page is covered.
- Have a statement about what you have done and why (to help you visually show the situation).

Client identification

You must carry out your project in a mock realistic situation where you are working for a client. You must approach a client to request this. It is recommended that you do this in person or by phone. If this is not possible then a letter or email may be used however these prove to be less successful. You must show evidence of who you have contacted, how and when you have contacted them and why you have contacted/chosen them

Checkpoints:

- You must identify a client and write a letter/email to request that they will:
- Allow you to interview them to identify their requirements.
- Allow a second interview to discuss ideas.
- Allow you to interview them to present your final solution
- Allow you to gain access to any related material to your project eg products, environments.
- You must record what you have done and why.

Research Plan

A description of the research you are going to do to help with your project. Say what you need to find out, where and how you will get the information and how you will record and evaluate this information.

Checkpoints:

- You need to include primary and secondary sources
- You must talk to the end user of the design
- Research should be relevant
- You need research that backs up each factor in your brief.
- You must collect all the details of the environment it will be used in.

Product Analysis

Take a range of existing products. For each one show a photograph and describe in detail the features and how the design works.

Checkpoints:

- For the product discuss: Function, materials, size, aesthetics, ergonomic factors, market and user requirements, safety and materials.
- Make sure the product is related to your project
- Avoid repetition
- Find out as much as you can about the product including how it is made and assembled

Product Disassembly

Find a product (or products) that relate to your brief and take them apart. Identify the parts, materials and function of each part. Also think about areas that work and areas for improvement.

Checkpoints:

- Make sure the product is related to your project
- Take photographs and annotate
- Find out as much as you can about the product including how it is made, assembled and why these methods were chosen

Questionnaire

State what you hope to learn from the questionnaire, who you will be interviewing, why they are important and then show the questions you will ask. Then show your results and say what you have learnt from the questionnaire. Showing the results on graphs will help.

Checkpoints:

- Make sure you identify who you will be interviewing and why
- Make sure your questions relate back to the key points of your brief
- Make sure your questionnaire will allow you to show what people want.
- You may need more than one questionnaire if you have two groups

Environment to be used in

Show with photographs, descriptions and measurements if appropriate the environment your design will be used in.

Checkpoints:

- Make sure you show the full range of environments
- Analyse the photos to say what you have learnt
- Make sure the photos are relevant to the brief

Ergonomics and anthropometrics

Describe the ergonomic factors you will need to consider in your design. Identify the key anthropometric data and show the measurements. You may need to carry out primary research as well as considering average data.

Checkpoints:

- Have you considered male and female users
- Have you included anthropometric data
- Have you addressed all health and safety issues with the use of the product?

Client interview

Describe who you are interviewing, why they are relevant to your project and then include the key information they have provided.

Checkpoints:

- Have you included the main things you have learnt from the interview
- Have you used the interview to further your understanding of what is needed in your project

First Concepts

You will need to produce a range of initial thoughts (drawings) as to possible solutions to your project. These ideas must be creative and not constrained in any way! Use annotations to explain the function and possible ways the concepts will fulfil the needs of the user.

Checkpoints:

- A range of first concepts
- Ensure they are creative and not constrained
- Annotate with reference to your brief and user

First Concepts- Modelling

As well as creating concepts using sketches, you should also explore your ideas using modelling via CAD or physical card models. As with your 'first concept' sketches, be creative and do not constrain your ideas at this stage.

Checkpoints:

- A range of first concepts
- Ensure they are creative and not constrained
- Photograph and annotate with reference to your brief and user

Design brief

Your design brief will be split into 2 sections. The first section is a discussion of the design brief. This is a detailed analysis of the brief you will write. To complete this put down a series of headings for the content of your design brief. For each heading state why this heading is important to the situation/user/client and how it relates to your identified problems.

Checkpoints:

- This is a short paragraph describing the project you are planning to undertake. It should state that:
- This is a design and make project
- Who the client will be
- What situation it is set
- A summary of the problems to be addressed.

Specification

You will need to write a specification that outlines what the potential solution to your brief must include. This must link to your research. Think of this as a checklist for your designing that has been justified. Points to be considered are- needs of the user, needs of the environment to be used within, safety, cost, material selection and quantities, environmental impact, function, aesthetics, ergonomics, anthropometrics, sizes or proportion, needs of the market and manufacture.

Checkpoints:

- Ensure, as a minimum you have covered all the points suggested.
- Avoid repetition
- Justify the points through evidence from your research.

Initial designs

This will be spread over at least 3 A3 sheets. You are to produce a range of sketches which are possible solutions to the specification. Each idea needs to be different and unique. You should be aiming at this stage to produce a range of possible solutions (7-10). Each idea needs to be annotated in detail.

Checkpoints:

- Minimum of 3 sheets
- Minimum of 7 possible solutions
- Each solution needs to be unique
- Colour to be used on sheets
- Ideas are not formal drawings but are sketches
- Annotations must include:
 - Reference to specific points in the specification
 - Reference to how the identified problems are solved
 - Reference to how it functions
 - Reference to how the user will interact with it
 - Reference to any other findings in research

Developed ideas

Select 1 or 2 initial ideas. You are now going to develop these ideas from an initial thought, into a product where you have finalised its form, how it functions and how it could be manufactured. You may find the ideas eventually merge into one.

Checkpoints:

- Develop a minimum of 2 ideas
- When developing you must address:
 - Different proportions
 - Different material combinations
 - Technologies and methods of production
 - How the user interacts with the product
 - Function
 - How does it meet the specification

Decision on design solution

Once you have developed your designs you need to make a decision on which one you are going to propose. Your decision should be based upon how well it meets the specification, how well it solves the problems and client feedback. This can take the form of a table or a written analysis.

Checkpoints:

- Ensure that you have talked about how the designs relate to:
 - The specification
 - The user
 - Client feedback
- Ensure that you state which design you will take forward and why this is better than the others.

Modelling

Photographic evidence of modelling that you have undertaken in order to fully understand your product in 3 dimensions. The evidence must be accompanied by notes on what you did, why you did it, what you found out and further recommendations.

Checkpoints:

- Have you modelled your product in 3D?
- Have you discussed what you did, why and what you need to do next?
- Remember you do not have to model to full size.
- Remember you do not have to model in the same materials it will be made from- this is sketch modelling only to look at form.

Further development

Using information that you have found out from your modelling you must now refine your idea using these findings. These development sheets must contain annotations related to your findings and discuss the changes that you have carried out.

Checkpoints:

- Have you taken into account the findings of your modelling and annotated this?
- Have you arrived at a final solution?
- Have you annotated what improvements you have carried out?
- Have you discussed:
 - the specification
 - Materials
 - Possible manufacturing techniques

Testing

This sheet will record testing that you have carried out, why you did it, what you found out and any recommendations. Your testing will be based upon certain aspects of your product that you need to model and see if it works, Testing could be based upon material properties, moving parts, form or any other identified aspects.

Checkpoints:

- Have you stated what you have done, why and what you have found out?
- Is your testing relevant and does it inform your design?
- Do you need to develop your idea further?

Materials research

This is a detailed look at possible materials/components that you could use in the manufacture of your product (in industry). You will need to describe the properties and state if that meets your requirements, why or why not and which will you select and why are they selected over others.

Checkpoints:

- Have you identified a range of materials/components?
- Have you evaluated them against your requirements?
- Have you stated which ones you have selected and why?

Final product description

This is a sheet showing your final product ideally using Google Sketchup. You must also include a description of what the final product is and how it functions including unique points.

Checkpoints:

- Have you shown several 3D views of what the final product will look like?
- Have you described what the product is and how it functions?
- Have you described the unique points about your product?
- Have you used Google Sketchup if possible?

Cutting List & Costings

Once you have decided on your final product you will need to produce a cutting list outlining the main materials including stock forms, the sizes of these materials (length/width/depth in MM) and components you will require to make the prototype. Don't forget to also include the quantity of each component required. You should also include estimated costings leading to an overall manufacturing cost for the product.

Checkpoints:

- State each part, the materials and the sizes
- State pre-manufactured components and the quantity required
- State a cost for each part and component
- State an overall manufacturing cost

Orthographic

You will draw an orthographic drawing of your product showing 3 views and measurements.

Checkpoints:

- Have you shown the front, plan and end elevations?
- Have you shown the dimensions?
- Have you used the correct layout?
- Have you included a title box including important details such as scale, measurements details and what projection you have used?

Industrial Manufacture

This sheet will show in detail what industrial manufacturing techniques will be used for your product and why they are suitable. Remember you are meant to design your product to be suitable for batch/mass manufacture. Ensure that you cover all aspects of the making process.

Checkpoints:

- Have you stated a manufacturing process for each stage of manufacture?
- Have you justified the reasons for selecting this process?
- Have you considered JIT, CAD CAM?

Manufacturing Specification

This is an updated version of your original Specification. Highlight any changes and why these have been made. Link it to where in your folder you made these decisions. You will also need to make reference to relevant quality control checks during manufacture and manufacturing processes.

Checkpoints:

- Ensure, as a minimum you have covered all the points suggested.
- Avoid repetition

- Justify the points through evidence from your research.
- Ensure you have included reference to the manufacture of the product.

Manufacturing table & Contingency Planning

Ideally presented in table format for clarity this sheet details each individual step for how you will make your product in school. Each stage should make reference to Quality Control and health and safety along with materials and tools/processes. You also need to add, at key points, plans for contingency (i.e. when its possible things could go wring leading to additional time being required)

Checkpoints:

- Have you covered each individual step of making?
- Have you included a contingency?
- Have you mentioned:
 - Tools/processes
 - Quality control
 - Safety
 - Materials
 - Time required

Flowchart

Using your manufacturing table you are to produce a flowchart using the step by step instructions (if done on a computer these could be copy & pasted). Each instruction must be encapsulated by the correct flow chart symbol to give a graphical representation of what type of instruction it is.

Checkpoints:

- Have you used the correct symbol?
- Curved rectangle- start stop instruction
- Rectangle- process
- Diamond- Check
- Is each instruction linked with an arrow so that they are in sequence?
- Is it in detail?

Modifications

The purpose of this page is to record any changes/modifications you have made during the making process. You will need to state what you have changed and why. To aid this you may need to produce sketches/photographic evidence to demonstrate what you are talking about.

Checkpoints:

- Have you recorded every change you have made?
- Have you given reasons why you have had to do this?
- Have you used sketches/photographs to help explain?

Evaluation plan

Before you carry out your evaluation you will need to state how you are going to carry it out and why you are going to carry it out this way/selected these techniques. To guide you use

the folder checklist to see what is suggested you do and then state why you need to do each sheet.

Checkpoints:

- Have you discussed each technique you are going to use?
- Have you stated why this technique is relevant to your evaluation?
- Have you checked the coursework folder checklist to see what is recommended?

Questionnaire

This evaluation questionnaire is aimed at the user to find their opinions on the final product. The questions should be based upon the completed final product and include a visual so that the user can see it. You should present your results and discuss what you have found out and why you think the user has drawn those opinions.

Checkpoints:

- Have you asked questions to find out people's opinions of your final product?
- Have you discussed the conclusions to your questionnaire and why you think the outcome is so?
- What modifications would you have to make to improve the product based upon the conclusions?

Testing

You will need to test your product with the intended user and in the environment it is designed for. You must provide evidence of doing this (usually photographic) and record your findings and any modifications required as a result of the testing process.

Checkpoints:

- Have you stated how you tested the product and why?
- Have you tested it in its intended environment?
- Has the intended user been involved?
- Have you provided evidence of the testing process?
- Have you discussed your findings and made recommendations?

Client evaluation

You must gain the opinion of your selected client on the completed product as in theory it is them that you are working for. Carry out an interview to gain their opinions and recommendations. Analyse your findings.

Checkpoints:

- Have you asked questions that are relevant?
- Have you identified possible modifications?
- Have you analysed why the client arrived at those opinions?

Specification evaluation

You must look back at your original specification and evaluate how your product meets each point. It is important that you use examples in your arguments and highlight any problems which will need to be addressed.

Checkpoints:

- Have you discussed each specification point?
- Have you used examples to justify your comments?
- Have you identified any problems and why they have occurred?

- Have you suggested possible improvements?

Commercial production evaluation

You will need to refer to your 'Industrial manufacture' sheet for this. Taking into account the making process and any modifications do you think that the processes you suggested earlier are still suitable?

Checkpoints:

- Have you discussed each process suggested?
- Have you given reasons why they are still suitable/not suitable?
- If they are to be changed refer to points during your making to support your answers.

Conclusions and recommendations

The contents of this sheet are a summary of your evaluation process. You must summarise what you have found out, usually as bullet points. Once you have summarised the evaluation you need to make recommendations as to how the project could proceed- what needs to change and why? What is good and why? What steps need to be taken before this product can be manufactured?

Checkpoints:

- Have you summarised the main findings both positive and negative?
- Have you recommended what needs to be done next for the product to progress?