PRODUCT DESIGN

Autumn Term Y10

	September	October	November	December
In Depth	**OVERVIEW : Manufacturing Processes & Techniques (Prototyping)** Students will learn about different prototyping materials and processes. They will be required to complete various activities that should prepare them for examination styled questioning and practical applications. Summative Assessment : To design and prototype a hand gel bottle. **BIG QUESTIONS** 1. How can materials and processes be used to make iterative models? 2. How can materials be manipulated and joined in different ways in a workshop environment when making final prototypes 3. How do designers and manufacturers ensure accuracy when making prototypes and products? What materials are commonly used by professionals when making models? **SMALL QUESTIONS** 1. How can modelling materials be cut to size? 2. How can modelling materials be manipulated? 3. What adhesives can be used to join similar and dissimilar modelling materials? 4. What is the difference between a model and a prototype? 5. What is meant by rapid prototyping? 6. How do you use image creation and manipulation software to communicate your ideas? 7. What methods of digital manufacturing do professionals use when making modelling and prototyping? 8. What is CAD, CAM and CAE? 9. Why is the study of anthropometrics and ergonomics important when modelling and prototyping?		**OVERVIEW : Manufacturing Processes & techniques (Memphis Clock)** Students will learn through making about materials, processes and techniques commonly used with in a workshop environment. Summative Assessment : To design and make a memphis clock. **BIG QUESTIONS** 1. How can plastics be shaped and formed? 2. How can similar and dis-similar materials be joined permanently and semi-permanently? 3. How can CAD CAM be used to achieve high quality outcomes? **SMALL QUESTIONS** 1. What adhesives are used to permanently join acrylic to acrylic? 2. How do you mark out for drilling on acrylic? 3. How do you set up and use a pillar drill to correctly drill through holes in acrylic? 4. How do you cut a thread into a hole using a tap? 5. How do you mark out, shape and polish acrylic? 6. How do you line bend plastic using a strip heater? 7. How do you free form acrylic whilst trying to retain previously formed angles? 8. What tools are used to cut through aluminium and other metals? 9. How do you cross file, draw file and chamfer? 10. How do you cut a thread using a dye? 11. How do you polish metal using the polishing mop? 12. What is Memphis design? 13. How can 2d design be used to design and then manufacture a clock face? 14. How is a pre manufactured component (clock mechanism) attached to a clock face of your design?	
Core	1.1 How can exploring the context a design solution is intended for inform decisions and outcomes? 1.2 Why is usability an important consideration when designing prototypes?	2.1 What are the opportunities and constraints that influence design and making requirements?	2.2 How do developments in Design and Technology influence design decisions and practice?	3.1 What are the impacts of new and emerging technologies when developing design solutions?

PRODUCT DESIGN

Spring Term Y10

	January	February	March	April
In Depth	**OVERVIEW : Designing & Communication Skills Students will develop their designing and communication skills both by hand and using CAD.** Summative assessment : Students will be required to demonstrate their understanding of various perspective drawing techniques in an end of unit test. . **BIG QUESTIONS** 1. How are design solutions communicated to demonstrate their suitability? 2.How is CAD used to communicate design intentions? 3. What forms of graphical communication diagrams can be used to communicate manufacturing processes? **SMALL QUESTIONS** 1. What is the difference between 2d and 3d sketching? 2. What is meant by the word perspective? 3. What is a vanishing point? 4. What is oblique? 5. What is isometric? 6. What is thick and thin line technique and how can it enhance a drawing? 7. What is single and two point perspective? 8. How are technical drawing board used correctly? 9. What geometry equipment is used when developing technical styled drawings? 10. What are circles and ellipses? 11. What is an orthorgarphic drawing? 12.Whtat is an exploded drawing? 13. What is a flowchart and how can they be designed to achieve quality control. 14. What is an open loop and closed loop system? 15. What 2d and 3d CAD software is available and how can it be used to communicate ideas?			
Core	unit 4 - Designing & Communication Skills Students should learn about sketching in 2d, Oblique, Isometric, Single Point Perspective, Two Point Perspective and the application of rendering in colour.	4.1 How can design solutions be communicated to demonstrate their suitability to a third party? • clear 2D and 3D sketches with notes • sketch modelling • exploded drawings	4.1 How can design solutions be communicated to demonstrate their suitability to a third party? Mathematical Modelling Flowcharts User Centred Design Mathematical Modelling flow charts of the manufacturing processes used in pencil storage project could be taught here for Pd groups	5.1 What are the main categories of materials available to designers when developing design solutions? NB. There is a broad variety of materials for students to learn in this section and may also be addressed throughout the NEA. It is important that students focus on applying their knowledge of materials to examination questions.

PRODUCT DESIGN

Summer Term Y10

	May	June	July
In Depth		**1.1 Investigations of the Context** • X3 Contextual statements provided by the examination board. • X3 brainstorms – done individually and collaboratively. • X3 images to enhance the visual element for each of the contextual statements. • Written analysis of the three contexts that suggests which is to be taken forward. **1.2 Design Brief** • Identify a range of design problems within the chosen contextual statement. • Produce a written brief that is concise and sets the tone of the project. • Identified a primary user and other stakeholders. **1.3 Investigations of users and stakeholder needs and wants and the outlining of stakeholder requirements (non technical specification)** • Produce a detailed profile of the primary user that includes a photograph and character profile. • A list of primary user and other stakeholders needs and wants for the product. • A questionnaire intended to identify the most important key features that the primary users wants you to include in the final design. • Produce a conclusive list of key features (non-technical specification)	**1.4 Investigations of Existing Products and Design Practices.** • Identify a range of existing products and evaluate the positive and negative features. (both primary and secondary). For higher marks try to include a product disassembly (page 339 of text book) • Summarise the key features of the existing products in the form of a analysis chart (page 338 of text book) Add this information to the non technical specification. **1.5 Exploration of materials and possible technical requirements**. Suggest a range of materials that you have identified as been potentially suitable for your project. Support your suggestion with data. Include material characteristics and properties. Refer to lessons in Y10. **1.6 Non Technical Specification.** • This section should finish with the student producing a list of agreed primary user needs and wants that have been identified from all aspects of the exploration. This will be used to control the development of initial design ideas. **5.1 Analysis and evaluation of primary and/or secondary sources** • Analysis and evaluation of primary and/or secondary sources – It is essential that you analyse the information you collect throughout the project. How impactful are your explorations and how will they move you forward?
Core	5.1 What are the main categories of materials available to designers when developing design solutions? NB. There is a broad variety of materials for students to learn in this section and may also be addressed throughout the NEA. It is important that students focus on applying their knowledge of materials to examination questions.	5.2 What factors are important to consider when selecting appropriate materials and/or system components when designing? a. The characteristic properties of the main categories of materials • density, strength, hardness, durability, strength to weight ratio, stiffness, elasticity, impact resistance, plasticity, corrosive resistance to chemicals and weather, flammability, absorbency, thermal and electrical conductivity.	5.2 What factors are important to consider when selecting appropriate materials and/or system components when designing? b. The physical and working properties of specific materials and/or system components, with consideration of: i. how easy they are to work with ii. how well they fulfil the required functions of products in different contexts. c. Other factors that influence the selection of materials and/or components, including; i. required functionality of the design solution ii. aesthetic attributes iii. environmental considerations iv. availability and cost of stock forms v. social, cultural and ethical considerations

PRODUCT DESIGN

Autumn Term Y11

	September	October	November	December
In Depth	**5.2 Ongoing evaluation to manage progression** • Throughout the design process (strand 2&3) you should continually evaluate your progression. Review the primary user needs and wants frequently and consider next steps. **3.1 Quality of chronological progression.** • It is important that students can communicate a clear and structured approach to their design ideas and development. Ensure designs are labelled and that realtime evidence is a key feature in this section. **2.1 Generation of initial ideas & 3.2 Quality of initial ideas.** • Development of x10 initial ideas on no more than two slides. Draw them by hand, design using CAD, design collaboratively or make a model. • DO NOT be fixated on a design – this is very important! • Initial Ideas must reflect the MLR / none technical specifications. • Finish this section with a Primary User Interview. What do they think about each of your designs?, how do they meet the Primary User needs and wants?, what are your next steps? Identify which initial idea you are going to take forward.		**2.2 Design developments & 3.3 Quality of design developments.** • This section is about EXPLORE, CREATE & EVALUATE. Your work must be iterative and recording the process in real time is essential. This section is about EXPLORE, CREATE & EVALUATE. Your work must be iterative and recording the process in real time is essential. • Refer throughout to your primary User needs and wants – how is your design being developed to meet their needs? • Include lots of sketches, photographs, CAD, models, print screens and videos of your explorations and testing. • Have frequent Meetings with you Primary User. • Limit your design developments to about 5 slides.	**2.3 Development of final design solutions (s) & 3.4 Quality of final design solutions (s)** • Final solution should be shown with clear evidence of the primary users needs and wants been fully met. • Primary user Interview to discuss the final solution. • Evidence of progression from where you started and where you ended up. • Use of Fusion 360 or other CAD programme to develop a high quality rendered image of the final solution. **2.4 Critical thinking** • Students should be encouraged to be innovative and really consider new and inventive ways of developing ideas. **1.6 Technical Specification** • Orthographic Drawing which is fully dimensioned and is sufficient to enable third party manufacture. • Exploded drawing included to show elements of construction/assembly. • Clear information about all materials and components needed (parts list) • LIST OF REQUIREMENTS : A clear written list that describes every aspects of the final product to include: surface finish to be applied, quality of outcome, functional properties, environmental considerations (LCA)
Core	6.3 How do we introduce controlled movement to products and systems? 6.4 How do electronci systems provide functionality to products and processes? Past Paper question starter responding to weekly homework.			7.6 How do new and emerging technologies have an impact on production techniques and systems?

PRODUCT DESIGN

Spring Term Y11

	January	February	March	April
In Depth	**4.1 Quality of Planning for Making the final Prototype(s)** • For every aspect of the product there should be a clear plan for making. Try to demonstrate various methods of planning from grids (shown) and flowcharts. Build into your planning QC (quality control) methods e.g. templates, jigs, moulds. It is also important that you includes H&S an time management. • Link your technical specification to this plan for making – how have you 'planned the making' to meet all of the technical specifications?	**4.2 Quality of Final Prototypes (s)** **4.3 Use of Specialist Techniques & Processes** **4.4 Use of specialist tools and equipment.** • Photographic evidence of the manufacturing process with supporting annotation of quality control methods, materials and manufacturing processes. • Ensure that technical vocabulary is highlighted where used. • Photographic evidence of manufacturing processes with you in the pictures would be advised. • Where have you used CAD CAM and why did you use it? 4.5 Viability of the Final Prototypes The final product needs to be compared to the technical specification. Ensure that all annotation includes point & justification. • Interview with the primary user and other stakeholders to determine how marketable the final prototype would be. • Primary user / stakeholder and personal comments of how the product could be developed further to make it more marketable. • Marketability MUST be a key feature and students should look for various opportunities to determine how saleable their product would be. This is where critical thinking could come into the project again. STRAND 2.4	**5.3 Feasibility of the final prototype(s)** • The final product needs to be fully tested in its intended environment. Video footage and photographs should be used to support this. • An interview with the primary user and other stakeholders to discuss the final product should be included. • General public survey and involvement at the Design Technology exhibition MUST be included in this section. All results and comments should be shown. • Other testing to be conducted e.g. drop test, water splash, repeat stress tests. • Students should brainstorm what type of testing would be appropriate for their project and evaluate why. • 5.4 Evaluation of the final prototype The final evaluation should include in-depth and justifiable strengths and weaknesses and not superficial, personal statements. E.g. my primary user said that …….. Or I tested my product and found out that …….. • Modifications should be as a result of dialogue with primary users, stakeholders and the general public. Again, all improvements should be justified. Further drawings, models and CAD could be used here. • Design optimisation – this is an analysis of if the modifications were made, how would this impact on the marketability of the product.	

PRODUCT DESIGN

Summer Term Y11

	May	June		
In Depth				
Core				

DESIGN ENGINEERING

Autumn Term Y10

	September	October	November	December
In Depth	**Overview: PCB Design, Manufacture and Construction** Students will learn about the various standardised components, which will prepare them for the exam and NEA. Students will be required to complete a variety of practical application methods, as well as exam style, knowledge based questioning. Summative assessment: Students will design, manufacture and house a dedicated circuit. **BIG QUESTIONS** 1. How do sensors respond to a variety of inputs? 2. How are devices used to produce a range of outputs? 3. What are the working properties of electronic components? 4. What mathematical equations are used for electronic systems and components? 5. What manufacturing and disposal methods are used within electronic products? 6. How do we use Ohms law formula to calculate the relationship between voltage, current and resistance? **SMALL QUESTIONS** 1. What defines a digital and an analogue sensor? 2. What different types of switch sensors exist and how do we use them? 3. What is a light sensor and how is a light dependent resistor used? 4. How and why is an infra-red sensor used? 5. How are speakers and buzzers used within electronic products? 6. What is the relationship between motors and drivers, and how are they implemented? 7. How do we calculate the power dissipate across a resistor? 8. How do we use Photo-etching to create a printed circuit board? 9. How is PCB isolation routing used to create a printed circuit board? 10. What is pick-and-place PCB manufacture? 11. What is meant by the WEEE directive?			
Core	1.1 How can exploring the context a design solution is intended for inform decisions and outcomes? 1.2 Why is usability an important consideration when designing prototypes?	2.1 What are the opportunities and constraints that influence design and making requirements?	2.2 How do developments in Design and Technology influence design decisions and practice?	3.1 What are the impacts of new and emerging technologies when developing design solutions?

DESIGN ENGINEERING

Spring Term Y10

	January	February	March	April
In Depth	**OVERVIEW : Manufacturing Processes & Techniques (Prototyping)** Students will learn about different prototyping materials and processes. They will be required to complete various activities that should prepare them for examiantion styled questioning and practical applications. Summative Assessment : To design and prototype a hand gel bottle bottle. **BIG QUESTIONS** 1. How can materials and processes be used to make iterative models? 2. How can materials be manipulated and joined in different ways in a workshop environment when making final prototypes 3. How do designers and manufacturers ensure accuracy when making prototypes and products? What materials are commonly used by professionals when making models? **SMALL QUESTIONS** 1. How can modelling materials be cut to size? 2. How can modelling materials be manipulated? 3. What adhesives can be used to join similar and dissimilar modelling materials? 4. What is the difference between a model and a prototype? 5. What is meant by rapid prototyping? 6. How do you use image creation and manipulation software to communicate your ideas? 7. What methods of digital manufacturing do professionals use when making modelling and prototyping? 8. What is CAD, CAM and CAE? 9. Why is the study of anthropometrics and ergonomics important when modelling and prototyping?		**OVERVIEW : Designing & Communication Skills Students will develop their designing and communication skills both by hand and using CAD.** Summative assessment : Students will be required to demonstrate their understanding of various perspective drawing techniques in an end of unit test. . **BIG QUESTIONS** 1. How are design solutions communicated to demonstrate their suitability? 2.How is CAD used to communicate design intentions? 3. What forms of graphical communication diagrams can be used to communicate manufacturing processes? **SMALL QUESTIONS** 1. What is the difference between 2d and 3d sketching? 2. What is meant by the word perspective? 3. What is a vanishing point? 4. What is oblique? 5. What is isometric? 6. What is thick and thin line technique and how can it enhance a drawing? 7. What is single and two point perspective? 8. How are technical drawing board used correctly? 9. What geometry equipment is used when developing technical styled drawings? 10. What are circles and ellipses? 11. What is an orthorgarphic drawing? 12.Whtat is an exploded drawing? 13. What is a flowchart and how can they be designed to achieve quality control. 14. What is an open loop and closed loop system? 15. What 2d and 3d CAD software is availble and how can it be used to communicate ideas?	
Core	unit 4 - Designing & Communication Skills Students should learn about sketching in 2d, Oblique, Isometric, Single Point Perspective, Two Point Perspective and the application of rendering in colour.	4.1 How can design solutions be communicated to demonstrate their suitability to a third party? • clear 2D and 3D sketches with notes • sketch modelling • exploded drawings	4.1 How can design solutions be communicated to demonstrate their suitability to a third party? Mathematical Modelling Flowcharts User Centred Design Mathematical Modelling flow charts of the manufacturing processes used in pencil storage project could be taught here for Pd groups	5.1 What are the main categories of materials available to designers when developing design solutions? NB. There is a broad variety of materials for students to learn in this section and may also be addressed throughout the NEA. It is important that students focus on applying their knowledge of materials to examination questions.

DESIGN ENGINEERING

Summer Term Y10

	May	June	July
In Depth		**1.1 Investigations of the Context** • X3 Contextual statements provided by the examination board. • X3 brainstorms – done individually and collaboratively. • X3 images to enhance the visual element for each of the contextual statements. • Written analysis of the three contexts that suggests which is to be taken forward. **1.2 Design Brief** • Identify a range of design problems within the chosen contextual statement. • Produce a written brief that is concise and sets the tone of the project. • Identified a primary user and other stakeholders. **1.3 Investigations of users and stakeholder needs and wants and the outlining of stakeholder requirements (non technical specification)** • Produce a detailed profile of the primary user that includes a photograph and character profile. • A list of primary user and other stakeholders needs and wants for the product. • A questionnaire intended to identify the most important key features that the primary users wants you to include in the final design. • Produce a conclusive list of key features (non-technical specification)	**1.4 Investigations of Existing Products and Design Practices.** • Identify a range of existing products and evaluate the positive and negative features. (both primary and secondary). For higher marks try to include a product disassembly (page 339 of text book) • Summarise the key features of the existing products in the form of a analysis chart (page 338 of text book) Add this information to the non technical specification. **1.5 Exploration of materials and possible technical requirements**. Suggest a range of materials that you have identified as been potentially suitable for your project. Support your suggestion with data. Include material characteristics and properties. Refer to lessons in Y10. **1.6 Non Technical Specification.** • This section should finish with the student producing a list of agreed primary user needs and wants that have been identified from all aspects of the exploration. This will be used to control the development of initial design ideas. **5.1 Analysis and evaluation of primary and/or secondary sources** • Analysis and evaluation of primary and/or secondary sources – It is essential that you analyse the information you collect throughout the project. How impactful are your explorations and how will they move you forward?
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DESIGN ENGINEERING

Autumn Term Y11

	September	October	November	December
In Depth	**5.2 Ongoing evaluation to manage progression** • Throughout the design process (strand 2&3) you should continually evaluate your progression. Review the primary user needs and wants frequently and consider next steps. **3.1 Quality of chronological progression.** • It is important that students can communicate a clear and structured approach to their design ideas and development. Ensure designs are labelled and that real time evidence is a key feature in this section. **2.1 Generation of initial ideas & 3.2 Quality of initial ideas.** • Development of x10 initial ideas on no more than two slides. Draw them by hand, design using CAD, design collaboratively or make a model. • DO NOT be fixated on a design – this is very important! • Initial Ideas must reflect the MLR / none technical specifications. • Finish this section with a Primary User Interview. What do they think about each of your designs?, how do they meet the Primary User needs and wants?, what are your next steps? Identify which initial idea you are going to take forward.		**2.2 Design developments & 3.3 Quality of design developments.** • This section is about EXPLORE, CREATE & EVALUATE. Your work must be iterative and recording the process in real time is essential. This section is about EXPLORE, CREATE & EVALUATE. Your work must be iterative and recording the process in real time is essential. • Refer throughout to your primary User needs and wants – how is your design being developed to meet their needs? • Include lots of sketches, photographs, CAD, models, print screens and videos of your explorations and testing. • Have frequent Meetings with you Primary User. • Limit your design developments to about 5 slides.	**2.3 Development of final design solutions (s) & 3.4 Quality of final design solutions (s)** • Final solution should be shown with clear evidence of the primary users needs and wants been fully met. • Primary user Interview to discuss the final solution. • Evidence of progression from where you started and where you ended up. • Use of Fusion 360 or other CAD programme to develop a high quality rendered image of the final solution. **2.4 Critical thinking** • Students should be encouraged to be innovative and really consider new and inventive ways of developing ideas. **1.6 Technical Specification** • Orthographic Drawing which is fully dimensioned and is sufficient to enable third party manufacture. • Exploded drawing included to show elements of construction/assembly. • Clear information about all materials and components needed (parts list) • LIST OF REQUIREMENTS : A clear written list that describes every aspects of the final product to include: surface finish to be applied, quality of outcome, functional properties, environmental considerations (LCA)
Core	6.3 How do we introduce controlled movement to products and systems? 6.4 How do electronci systems provide functionality to products and processes? Past Paper question starter responding to weekly homework.			7.6 How do new and emerging technologies have an impact on production techniques and systems?

DESIGN ENGINEERING

Spring Term Y11

	January	February	March	April
In Depth	**4.1 Quality of Planning for Making the final Prototype(s)** • For every aspect of the product there should be a clear plan for making. Try to demonstrate various methods of planning from grids (shown) and flowcharts. Build into your planning QC (quality control) methods e.g. templates, jigs, moulds. It is also important that you includes H&S an time management. • Link your technical specification to this plan for making – how have you 'planned the making' to meet all of the technical specifications?	**4.2 Quality of Final Prototypes (s)** **4.3 Use of Specialist Techniques & Processes** **4.4 Use of specialist tools and equipment.** • Photographic evidence of the manufacturing process with supporting annotation of quality control methods, materials and manufacturing processes. • Ensure that technical vocabulary is highlighted where used. • Photographic evidence of manufacturing processes with you in the pictures would be advised. • Where have you used CAD CAM and why did you use it? 4.5 Viability of the Final Prototypes The final product needs to be compared to the technical specification. Ensure that all annotation includes point & justification. • Interview with the primary user and other stakeholders to determine how marketable the final prototype would be. • Primary user / stakeholder and personal comments of how the product could be developed further to make it more marketable. • Marketability MUST be a key feature and students should look for various opportunities to determine how saleable their product would be. This is where critical thinking could come into the project again. STRAND 2.4	**5.3 Feasibility of the final prototype(s)** • The final product needs to be fully tested in its intended environment. Video footage and photographs should be used to support this. • An interview with the primary user and other stakeholders to discuss the final product should be included. • General public survey and involvement at the Design Technology exhibition MUST be included in this section. All results and comments should be shown. • Other testing to be conducted e.g. drop test, water splash, repeat stress tests. • Students should brainstorm what type of testing would be appropriate for their project and evaluate why. • 5.4 Evaluation of the final prototype The final evaluation should include in-depth and justifiable strengths and weaknesses and not superficial, personal statements. E.g. my primary user said that …….. Or I tested my product and found out that …….. • Modifications should be as a result of dialogue with primary users, stakeholders and the general public. Again, all improvements should be justified. Further drawings, models and CAD could be used here. • Design optimisation – this is an analysis of if the modifications were made, how would this impact on the marketability of the product.	
Core				

DESIGN ENGINEERING

Summer Term Y11

	May	**June**		
In Depth				
Core				

GRAPHIC PRODUCTS

Autumn Term Y10

	September	October	November	December
In Depth	**OVERVIEW : Manufacturing Processes & Techniques (Prototyping)** Students will learn about different prototyping materials and processes. They will be required to complete various activities that should prepare them for examiantion styled questioning and practical applications. Summative Assessment : To design and prototype a hand gel bottle bottle. **BIG QUESTIONS** 1. How can materials and processes be used to make iterative models? 2. How can materials be manipulated and joined in different ways in a workshop environment when making final prototypes 3. How do designers and manufacturers ensure accuracy when making prototypes and products? What materials are commonly used by professionals when making models? **SMALL QUESTIONS** 1. How can modelling materials be cut to size? 2. How can modelling materials be manipulated? 3. What adhesives can be used to join similar and dissimilar modelling materials? 4. What is the difference between a model and a prototype? 5. What is meant by rapid prototyping? 6. How do you use image creation and manipulation software to communicate your ideas? 7. What methods of digital manufacturing do professionals use when making modelling and prototyping? 8. What is CAD, CAM and CAE? 9. Why is the study of anthropometrics and ergonomics important when modelling and prototyping?		Photoshop - CAD	
Core	1.1 How can exploring the context a design solution is intended for inform decisions and outcomes? 1.2 Why is usability an important consideration when designing prototypes?	2.1 What are the opportunities and constraints that influence design and making requirements?	2.2 How do developments in Design and Technology influence design decisions and practice?	3.1 What are the impacts of new and emerging technologies when developing design solutions?

GRAPHIC PRODUCTS

Spring Term Y10

	January	February	March	April
In Depth	**OVERVIEW : Designing & Communication Skills Students will develop their designing and communication skills both by hand and using CAD.** Summative assessment : Students will be required to demonstrate their understanding of various perspective drawing techniques in an end of unit test. . **BIG QUESTIONS** 1. How are design solutions communicated to demonstrate their suitability? 2.How is CAD used to communicate design intentions? 3. What forms of graphical communication diagrams can be used to communicate manufacturing processes? **SMALL QUESTIONS** 1. What is the difference between 2d and 3d sketching? 2. What is meant by the word perspective? 3. What is a vanishing point? 4. What is oblique? 5. What is isometric? 6. What is thick and thin line technique and how can it enhance a drawing? 7. What is single and two point perspective? 8. How are technical drawing board used correctly? 9. What geometry equipment is used when developing technical styled drawings? 10. What are circles and ellipses? 11. What is an orthorgarphic drawing? 12.Whtat is an exploded drawing? 13. What is a flowchart and how can they be designed to achieve quality control. 14. What is an open loop and closed loop system? 15. What 2d and 3d CAD software is availble and how can it be used to communicate ideas?		Packaging NEA	
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GRAPHIC PRODUCTS

Summer Term Y10

	May	June	July
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GRAPHIC PRODUCTS

Autumn Term Y11

	September	October	November	December
In Depth	**5.2 Ongoing evaluation to manage progression** • Throughout the design process (strand 2&3) you should continually evaluate your progression. Review the primary user needs and wants frequently and consider next steps. **3.1 Quality of chronological progression.** • It is important that students can communicate a clear and structured approach to their design ideas and development. Ensure designs are labelled and that real time evidence is a key feature in this section. **2.1 Generation of initial ideas & 3.2 Quality of initial ideas.** • Development of x10 initial ideas on no more than two slides. Draw them by hand, design using CAD, design collaboratively or make a model. • DO NOT be fixated on a design – this is very important! • Initial Ideas must reflect the MLR / none technical specifications. • Finish this section with a Primary User Interview. What do they think about each of your designs?, how do they meet the Primary User needs and wants?, what are your next steps? Identify which initial idea you are going to take forward.		**2.2 Design developments & 3.3 Quality of design developments.** • This section is about EXPLORE, CREATE & EVALUATE. Your work must be iterative and recording the process in real time is essential. This section is about EXPLORE, CREATE & EVALUATE. Your work must be iterative and recording the process in real time is essential. • Refer throughout to your primary User needs and wants – how is your design being developed to meet their needs? • Include lots of sketches, photographs, CAD, models, print screens and videos of your explorations and testing. • Have frequent Meetings with you Primary User. • Limit your design developments to about 5 slides.	**2.3 Development of final design solutions (s) & 3.4 Quality of final design solutions (s)** • Final solution should be shown with clear evidence of the primary users needs and wants been fully met. • Primary user Interview to discuss the final solution. • Evidence of progression from where you started and where you ended up. • Use of Fusion 360 or other CAD programme to develop a high quality rendered image of the final solution. **2.4 Critical thinking** • Students should be encouraged to be innovative and really consider new and inventive ways of developing ideas. **1.6 Technical Specification** • Orthographic Drawing which is fully dimensioned and is sufficient to enable third party manufacture. • Exploded drawing included to show elements of construction/assembly. • Clear information about all materials and components needed (parts list) • LIST OF REQUIREMENTS : A clear written list that describes every aspects of the final product to include: surface finish to be applied, quality of outcome, functional properties, environmental considerations (LCA)
Core	6.3 How do we introduce controlled movement to products and systems? 6.4 How do electronci systems provide functionality to products and processes? Past Paper question starter responding to weekly homework.			7.6 How do new and emerging technologies have an impact on production techniques and systems?

GRAPHIC PRODUCTS

Spring Term Y11

	January	February	March	April
In Depth	**4.1 Quality of Planning for Making the final Prototype(s)** • For every aspect of the product there should be a clear plan for making. Try to demonstrate various methods of planning from grids (shown) and flowcharts. Build into your planning QC (quality control) methods e.g. templates, jigs, moulds. It is also important that you includes H&S an time management. • Link your technical specification to this plan for making – how have you 'planned the making' to meet all of the technical specifications?	**4.2 Quality of Final Prototypes (s)** **4.3 Use of Specialist Techniques & Processes** **4.4 Use of specialist tools and equipment.** • Photographic evidence of the manufacturing process with supporting annotation of quality control methods, materials and manufacturing processes. • Ensure that technical vocabulary is highlighted where used. • Photographic evidence of manufacturing processes with you in the pictures would be advised. • Where have you used CAD CAM and why did you use it? 4.5 Viability of the Final Prototypes The final product needs to be compared to the technical specification. Ensure that all annotation includes point & justification. • Interview with the primary user and other stakeholders to determine how marketable the final prototype would be. • Primary user / stakeholder and personal comments of how the product could be developed further to make it more marketable. • Marketability MUST be a key feature and students should look for various opportunities to determine how saleable their product would be. This is where critical thinking could come into the project again. STRAND 2.4	**5.3 Feasibility of the final prototype(s)** • The final product needs to be fully tested in its intended environment. Video footage and photographs should be used to support this. • An interview with the primary user and other stakeholders to discuss the final product should be included. • General public survey and involvement at the Design Technology exhibition MUST be included in this section. All results and comments should be shown. • Other testing to be conducted e.g. drop test, water splash, repeat stress tests. • Students should brainstorm what type of testing would be appropriate for their project and evaluate why. • 5.4 Evaluation of the final prototype The final evaluation should include in-depth and justifiable strengths and weaknesses and not superficial, personal statements. E.g. my primary user said that …….. Or I tested my product and found out that …….. • Modifications should be as a result of dialogue with primary users, stakeholders and the general public. Again, all improvements should be justified. Further drawings, models and CAD could be used here. • Design optimisation – this is an analysis of if the modifications were made, how would this impact on the marketability of the product.	
Core				

GRAPHIC PRODUCTS

Summer Term Y11

	May	June		
In Depth				
Core				