Year 8 DT Rotation Department: Technology Unit of Work: Prototyping

Unit	2-3	4-6	7-9
Identifying & investigating design opportunities.	❑ I can identify a design problem and can analyse this problem using the 5Ws. ❑ I can identify the needs and wants of the user. ❑ I can identify the moral, social and economic factors that need to be considered when designing a new product.	❑ I can identify several design problems or opportunities based on the design context. ❑ I can identify the needs and wants of the user and have described the cultural and socio-economic factors of the user. ❑ I can identify the moral, social and economic factors that need to be considered when designing for the potential user and the constraints of these.	❑ I can identify and explain several design problems or opportunities based on the design context. ❑ I can identify the needs and wants of the user and have described the cultural and socio-economic factors of the user and how these might influence my design. ❑ I can explain the moral, social and economic factors that need to be considered when designing for the potential user and the constraints of these.
Analysing existing products	❑ I can analyse 1-2product using ACCESS FM. ❑ I can identify the needs and wants of the user. 5Ws ❑ I can identify the advantages and disadvantages of each product. ❑ I can suggest how the product could be improved.	❑ I can analyse 2-3 products using ACCESS FMM. I can explain and justify each the design decisions made by both the designer and manufacturer. ❑ I can identify the needs and wants of the user and have described the cultural and socio-economic factors of the user. ❑ I can evaluate each product in relation to the needs and wants of the user. ❑ I can suggest 2 improvements for each of the products in relation to the user. I can explain how and why these improvements could be made.	❑ I can analyse 3-4 products using ACCESSFM. I can explain and justify each of the design decisions made both designer and manufacturer and explain how this will impact on my designs. ❑ I can explain the needs and wants of the user in relation to cultural and socio-economic factors of the user and how this will impact on my design decisions. ❑ I can evaluate each product in relation to the user, the materials and components. ❑ I can suggest 3-4 improvements for each product in relation to the user. I can explain how and why these improvements could be made using materials and components subject knowledge.

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Polymers	❑ Identify what a polymer is.	❑ Describe what a polymer is.	❑ Explain what a polymer is.
	❑ Identify the differences between a thermosetting polymer and thermoplastic polymer is.	❑ Describe the differences between a thermosetting polymer and thermoplastic polymer is.	❑ Explain the difference between a thermosetting polymer and thermoplastic polymer is.
	❑ Identify a range of polymers and their common uses	❑ Describe the properties of a range of polymers and their common uses.	❑ Explain the properties of a range of polymers and their common uses.
	❑ Identify the advantages and disadvantages of a range of polymers	❑ Describe the advantages and disadvantages of a range of polymers	❑ Explain the advantages and disadvantages of a range of polymers.
	❑ Identify the impact of using polymers on the environment.	❑ Describe the impact of using polymers on the environment.	❑ Explain the impact of using polymers on the environment.
	❑ Create a design that applies good knowledge of polymers.	❑ Create a design that applies a sound knowledge of polymers and their properties.	❑ Create a design that applies a sound knowledge of polymers and their properties with clear justifications for material decisions stated

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The Design Brief	❑ I can write a design brief in response to this problem based on research carried out.	❑ I can write a design brief that is clearly informed by my research into a range of problems and design opportunities.	❑ I can write a design brief that is clearly informed by my research into a range of problems and design opportunities.
Design Specification	❑ I can write a design specification based on ACCESS FM. ❑ I can identify measurable criteria to inform my design. ❑ I can explain **how** I will meet each of my specification points.	❑ I can write a design specification based on ACCESS FMM and the end users needs and wants being met. ❑ I can identify measurable criteria such as ergonomics how the product could be manufactured in industry in terms of quantities. ❑ I can explain **how** I will meet each of my specification points. ❑ I can **justify** and give reasons for each of my design specification points linking to my research. ❑ I can identify how each of my points meet the needs of my user. ❑ I can prioritise each of my speciation points.	❑ I can write a detailed design specification based on ACCESS FMM and the end users needs and wants being met. ❑ I can identify measurable criteria such as ergonomics how the product could be manufactured in industry in terms of quantities and its impact on cost and the environment. ❑ I can explain **how** I will meet each of my specification points. ❑ I can **justify** and give reasons for each of my design specification points linking to my research. ❑ I can explain how each of my points meet the needs of my user ❑ I can prioritise each of my specification points and explain why I have put them in this order of importance.

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Generating & developing design ideas.	❑ I can draw out 1-2 design ideas and label using ACCESS FM	❑ I can draw out 2-3 design ideas and label using ACCESS FMM.	❑ I can draw 3-4 design ideas and label using ACCESS FMM. These designs are creative, innovative and appealing.
	❑ I can identify social, moral and economic factors.	❑ I can identify social, moral and economic factors relevant to the user	❑ I can explain how social, moral and economic factors relevant to the user and how these have informed my design ideas.
	❑ I can generate ideas that meet most of my specification points.	❑ I can generate ideas that meet all of my specification points.	❑ I can generate ideas that meet all of my specification points and I can explain how I have met them.
	❑ I can evaluate my design ideas identifying advantages and disadvantages for each idea.	❑ I can evaluate my design ideas explaining the advantages and disadvantages for each idea linking back to ACCESS FM and the needs and wants of the user.	❑ I can evaluate my design ideas explaining the advantages and disadvantages for each idea linking back to ACCESS FM and the needs and wants of the user.
	❑ I can identify 1-2 ways of improving my designs based on my evaluations.	❑ I can identify 2-3 improvements and can explain how these could be made.	❑ I can identify 3-4 improvements and can explain how these could be made.
	❑ I can test and evaluate my designs through 3D prototyping.	❑ I can explain how each prototype could be tested and evaluated against my design specification.	❑ I can explain how each prototype could be tested and evaluated against my design specification. ❑ I can explain how each of my prototypes could be improved.
	❑ I can show improvements through drawings and prototypes. (1-2 improvements)	❑ I can show improvements through drawings and prototypes. (2-3 improvements)	❑ I can show improvements through drawings and prototypes. (3-4 improvements)

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Plan of Make	❑ I can identify most stages needed to manufacture my prototype. ❑ I can identify how to carry out each of the stages safely. ❑ I can identify the correct tools, equipment and materials needed to carry out each of the stages. ❑ I can identify a quality control check for each stage. ❑ I can specify dates and timings for each stage.	❑ I can describe each of the stages needed to manufacture my prototype. ❑ I can explain what risk assessments must be carried out for each stage ❑ I can identify the correct size tools, equipment and materials needed to carry out each of the stages. ❑ I can identify quality control checks for each stage and can explain how and why they should be carried out. ❑ I can specify dates, timings, costings and scales of production. ❑ I can identify the key stages needed to operate CAD/CAM machinery.	❑ I can describe in detail each of the stages needed to manufacture my prototype. ❑ I can explain what risk assessments must be carried out for each stage ❑ I can identify the correct size tools, equipment and materials needed to carry out each of the stages and use the correct units for each. ❑ I can identify quality control checks for each stage and can explain how and why they should be carried out. ❑ I can specify dates, timings, costings and scales of production ❑ I can explain how CAD/CAM machinery is operated to a third party.
Technical Drawing *Orthographic Projection*	❑ I can complete a technical drawing of my final prototype to include some of the dimensions needed in order to make it. .	❑ I can complete a technical drawing of my final prototype to include most of the dimensions needed in order to make it.	❑ I can complete a technical drawing of my final prototype to include all of the dimensions needed in order to make it including CAD/CAM settings.

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Analysing & evaluating design decisions & prototypes.	❑ I can test and evaluate my prototypes against my specification using a template.	❑ I can test and evaluate my prototypes against my specification and the views of my client and user in an extended writing piece.	❑ I can test and evaluate my prototypes against my specification and the views of my client and user in an extended writing piece.
		❑ I can record the views of my user and client and explain how I could improve the design further based on their negative points	❑ I can record the views of my user and client and explain how I could improve the design further based on their negative points
	❑ I can record my findings and identify some improvements and modifications as a result of my findings.	❑ I can record my findings and can explain what improvements, modifications and refinements have been made at every stage of developing and making.	❑ I can record my findings and can explain what improvements, modifications and refinements have been made at every stage of developing and making.
	❑ I can use the Life Cycle Analysis to evaluate the impact of each of my prototypes on the environment.	❑ I can use the Life Cycle Analysis to evaluate the impact of each of my prototypes on the environment and explain how I could reduce impact further.	❑ I can use the Life Cycle Analysis to evaluate the impact of each of my prototypes on the environment and explain how I could reduce impact further.
	❑ I can identify the positives and negatives of my prototypes and suggest 1-2 improvements for each.	❑ I can identify the positives and negatives of my prototypes and suggest 2-3 improvements for each.	❑ I can identify the positives and negatives of my prototypes and suggest 3-4 improvements for each.
	❑ I can show these improvements through further drawings and prototypes. (1-2)	❑ I can show these improvements through further drawings and prototypes. (2-3)	❑ I can show these improvements through further drawings and prototypes. (3-4)
		❑ I can explain how these improvements have been made and why they have been made.	❑ I can explain how these improvements have been made and why they have been made referring to technical knowledge of materials and components.

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Making	❑ I can select and safely use specialist tools, techniques, processes, equipment and machinery. ❑ I can make a final prototype that is accurate in parts. ❑ I can make a final prototype that meets some of the needs, wants and values of the user ❑ I can make a prototype that meets some of my specification points. ❑ I can make a prototype that uses more than one skill.	❑ I can select and safely use specialist tools, techniques, processes, equipment and machinery. ❑ I can make a final prototype that is accurate in most parts due to accurate marking out. ❑ I can make a final prototype that meets most of the needs, wants and values of the user. ❑ I can make a prototype that meets most of my specification points. ❑ I can make a prototype that uses a range of skills and techniques.	❑ I can select and safely use specialist tools, techniques, processes, equipment and machinery including CAD/CAM. ❑ I can make a final prototype that is accurate all parts due to accurate marking out and construction. ❑ I can make a final prototype that meets all of the needs, wants and values of the user. ❑ I can make a prototype that meets all of my specification points. ❑ I can make a prototype that uses a range of skills and techniques including CAD/CAM.