

Rivers Academy Age Related Expectations - (Design and Technology)

	End of KS2	Year 7	Year 8	Year 9	Year 10	Year 11
Investigation	I can use research	I can conduct and use my own research materials.	I can conduct a variety of research tasks myself identifying user needs and design problems.	I can use research and exploration, such as the study of different cultures, to identify and understand user needs, identify and solve my own design problems and understand how to reformulate problems given.	I can use a range of investigation techniques to form research which can be used to identify specific design possibilities to construct a fully justified design specification used to solve identified problems.	I can use a range of investigation techniques which relate to a contextual challenge to form quantitative data and design possibilities used to help develop a fully justified design specification used to solve identified problems.
Design Criteria	I can develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.	I can develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups based on their specific needs and wants	I can develop specifications to inform the design of innovative, functional, appealing products that respond to the requirements of individuals or groups based on their needs.	I can develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations	I can create fully justified design specifications which cover a range of criteria relating to a client's needs and wants informed from the investigation.	I can create a fully justified design specification which includes essential and desirable criteria centred around the needs and wants of a client informed from the investigation while reflecting a contextual challenge
Designing	<p>I can generate design ideas</p> <p>I can develop, model and communicate my ideas through discussion, annotated sketches, cross-sectional and</p>	<p>I can generate ideas based on criteria set.</p> <p>I can develop, model and communicate my ideas through discussion, annotated 3-D sketches, cross-sectional,</p>	<p>I can generate ideas using a range of design approaches such as the work of others as influence.</p> <p>I can develop and communicate design ideas using annotated</p>	<p>I can use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses</p>	<p>I can use a range of design strategies to generate creative and innovative design ideas including designer collaboration.</p> <p>I can develop and communicate design</p>	<p>I can use a range of design strategies and communication techniques to generate creative and innovative design ideas which avoid design fixation.</p> <p>I can develop and</p>

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	exploded diagrams, prototypes, pattern pieces and computer-aided design	dimensional and exploded diagrams, prototypes, pattern pieces and computer-aided design	3-D sketches, exploded diagrams, scaled drawings, modelling and Computer-aided-design software.	I can develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools	ideas through annotation which takes into account materials and sizes, detailed technical drawings such as orthographic projections and a range of 3-D techniques. I can create mathematical models which are scaled both physically and through Computer-aided-design software such as Corel draw and sketch up	communicate ideas through various recording methods which take an iterative design approach. Technical drawings such as orthographic projections, exploded diagrams can all be produced through Computer-aided-design software. Mathematical models and prototypes can be created using a range of techniques
Making	I can select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], I can accurately select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	I can select from and use a wide range of tools and equipment to perform practical tasks in the workshop [for example, measuring and marking with tolerances, cutting, shaping, joining and finishing] I can accurately select from and use a wide range of materials and components within the workshop. Including construction materials according to their	I can select from a wide range of tools and equipment to perform practical tasks in the workshop [for example, measuring and marking to assist manufacturing flow, cutting, shaping with the use of jigs, joining and finishing using different woodworking joints] I can accurately select from and use a wider range of materials from	I can select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture I can select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties I have a good	I can work from a manufacturing specification to ensure the correct tools and equipment are selected and used for specific tasks I can work with a wide range of materials with an understanding of their working properties as well as a range of components I understand the need for tolerance in my own work and the use	I can work from a manufacturing specification to ensure the correct tools and equipment are selected and used for specific tasks to improve quality control measures I can work with a wide range of materials with an understanding of their working properties as well as a range of components I can work to a high

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		functional properties and aesthetic qualities.	different categories including polymers according to their functional properties and aesthetic qualities	understanding for manufacturing processes including nesting to reduce waste	of processes like nesting and tessellation I can use some specialist equipment.	level of tolerance and know how to use various jigs and formers to achieve a high quality product while minimising waste
Evaluating	<p>I can investigate and analyse a range of existing products</p> <p>I can evaluate my ideas and products against my own design criteria and consider the views of others to improve my work</p> <p>I understand how key events and individuals in design and technology have helped shape the world</p>	<p>I can investigate and analyse the strengths and weakness of products</p> <p>I can evaluate my ideas and products against my own design criteria while considering the views of others and suggest ways to improve.</p> <p>I understand how key events, individuals and movements in design have helped shape the world</p>	<p>I can investigate and analyse the strengths and weaknesses of existing products and find similarities and differences between them.</p> <p>I can evaluate my ideas and products against my own design criteria while considering the views of others and suggest modifications.</p> <p>I understand a range of developments in design and technology, its impact on individuals and the environment, and the responsibilities of designers.</p>	<p>I can analyse the work of past and present professionals and others to develop and broaden my understanding</p> <p>I can investigate new and emerging technologies</p> <p>I can test, evaluate and refine my ideas and products against a specification, taking into account the views of intended users and other interested groups</p> <p>I understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers</p>	<p>I can analyse the work of past and present professionals and others to develop and broaden my own understanding with the inclusion of third party interactions</p> <p>I can investigate and evaluate new and emerging technologies and their impact on the world.</p> <p>I can test, evaluate and refine my ideas against my own design specification using the iterative design process.</p> <p>I can test, evaluate and suggest improvements and modifications to my own final products based on user feedback and</p>	<p>I can analyse the work of past and present professionals, design companies and others to develop and broaden my own understanding with the inclusion of third party interactions</p> <p>I can investigate and evaluate new and emerging technologies and their impact on the world.</p> <p>I can test, evaluate and refine my ideas against my own design specification using the iterative design process with support from third party focus groups.</p> <p>I can test, evaluate and suggest improvements and modifications to</p>

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				and technologists	performance data. I understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	my own final products based on user feedback and performance data from specified quality assurances. I understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists
Technical Knowledge	<p>I can apply my understanding of how to strengthen, stiffen and reinforce more complex structures</p> <p>I understand and use mechanical systems in my products [for example, gears, pulleys, cams, levers and linkages]</p> <p>I understand and use electrical systems in my products [for example, series circuits incorporating switches, bulbs, buzzers and</p>	<p>I can apply my understanding of how to strengthen, stiffen and reinforce more complex structures through my own manufacturing</p> <p>I understand and use mechanical systems in my products [for example, gears, pulleys, cams, levers and linkages] by creating my own components.</p> <p>I understand and use electrical systems in</p>	<p>I understand and use the properties of materials and the performance of structural elements to achieve solutions.</p> <p>I understand how mechanical systems used in my products enable changes in movement and force</p> <p>I understand how more advanced electrical and electronic systems can be powered and used in my products</p>	<p>I understand and use the properties of materials and the performance of structural elements to achieve functioning solutions</p> <p>I understand how more advanced mechanical systems used in my products enable changes in movement and force</p> <p>I understand how more advanced electrical and electronic systems can be powered and</p>	<p>I have a breadth of knowledge and understanding of a range of core disciplines such as:</p> <ul style="list-style-type: none"> • New and emerging technologies • Energy generation and storage • Developments in new materials • Systems approach to designing • Mechanical devices • Materials and their working properties <p>I have an in-depth knowledge and understanding of specific specialist principles relating to a focused material category:</p> <ul style="list-style-type: none"> • Selection of materials or components • Forces and stresses • Ecological and social footprint • Sources and origins • Using and working with materials • Stock forms, types and sizes 	

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	<p>motors]</p> <p>I can apply my understanding of computing to program, monitor and control my products.</p>	<p>my products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</p> <p>I can apply my understanding of computing to program, monitor and control my products.</p>	<p>I can apply computing and use electronics to embed intelligence in products.</p>	<p>used in my products [for example, circuits with heat, light, sound and movement as inputs and outputs] apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].</p>	<ul style="list-style-type: none"> • Scales of production • Specialist techniques and processes • Surface treatments and finishes <p>I can demonstrate and apply knowledge of designing and making principles which include:</p> <ul style="list-style-type: none"> • Investigation, primary and secondary data • environmental , social and economic challenge • The work of others • Design strategies • Communication of design ideas • Prototype development • Selection of materials and components • Tolerances • Material management • Specialist tools and equipment • Specialist techniques and processes
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