

The UCGS standard: Design and Technology

Year group	UCGS standard
13	• Develop an in-depth knowledge and understanding of materials, components and processes associated with the creation of products that can be tested and evaluated in use. • Make informed design decisions through an in-depth understanding of the management and development of taking a design through to a prototype/product. • Create and analyse a design concept and use a range of skills and knowledge from other subject areas, including maths and science, to inform decisions in design and the application or development of technology. • Work safely and skilfully to produce high-quality prototypes/products. • Demonstrate a critical understanding of the wider influences in design and technology, including cultural, economic, environmental, historical and social factors. • Develop the ability to draw on and apply a of skills and knowledge from other subject areas, including the use of maths and science for analysis and informing decisions in design.
12	• Take design risks, showing innovation and enterprise whilst considering their role as responsible designers and citizens. • Develop intellectual curiosity about the design and manufacture of products and systems, and their impact on daily life and the wider world. • Work collaboratively to develop and refine their ideas, responding to feedback from users, peers and expert practitioners. • Gain an insight into the creative, engineering and/or manufacturing industries. • Develop the capacity to think creatively, innovatively and critically through focused research and the exploration of design opportunities arising from the needs, wants and values of users.
11	• Demonstrate and effectively apply comprehensive knowledge and understanding of the principles of design and technology in a range of familiar and unfamiliar situations. • Experiment and innovate to develop and refine fully functioning prototypes safely and effectively, applying relevant technical skills with precision. • Effectively employ sophisticated technical language and a range of communication methods, such as schematic and exploded diagrams, and mathematical modelling. • Critically analyse and evaluate design decisions and outcomes to draw well-evidenced conclusions. • Use a range of mathematical skills and scientific knowledge to make accurate calculations and inform choices.
10	• Generate a range of creative ideas reflecting the various methods of research collected and develop a final idea. • Communicate through annotations to explain and give well justified reasons, for choice of design, materials and manufacturing methods. Consider alternatives but through clear method of communication, explain how choices made reflect better on the environment and customer. • Work independently to solve problems and consider various solutions. • Demonstrate a range of manufacturing methods with a number of materials and rectify errors when occurred. • Communicate through excellent sketching and drawing techniques, relating to those used in industry.

9	• Strengthen prior knowledge to build expertise on one material and understand how to treat and season, in preparation of use. • Independently work to use tools and machinery safely and demonstrate methods of quality during steps of manufacturing. • Building on prior skills to produce a well-made, working product, showing high skills of finishing and manufacturing. • Show skills of being ambitious and open to explore and take design risks in order to stretch the development of design proposals, avoiding clichéd or stereotypical responses. • Factor in the costs, commercial viability and marketing of products. • Use key design and technology terminology including those related to designing, innovation and communication; materials and technologies; making, manufacture and production; critiquing, values and ethics.
8	• Develop prior knowledge to use materials in different manufacturing methods to produce a well-made, working product. • Demonstrate excellent manufacturing skills and precision at each stage of production. Pay particular attention to quality control when making and use tools/machinery correctly to enhance accuracy. • Use ICT skills to incorporate CAD/CAM. • Build on subject knowledge to strengthen understanding of materials and their properties. • Reinforce graphical skills and delivery in various drawing techniques.
7	• Apply theory taught, to explain how materials are formed, modified and prepared, to sell to companies. • Demonstrate their understanding through annotations of how a material is well suited for the purpose of the product, but to also factor in how the working properties are, an advantage or disadvantage for the outcome. • Developed skills and used prior work to generate a range of sketches, demonstrating graphical effects. • Work safely and independently, to operate machinery and use knowledge to select the correct tools for the task.