KS4 AQA Design Technology: Careers & Resources

Design Technology Topic & Content	Careers & Useful Links
New Tech, Enterprise & Production Systems *Content:* • Automation, robotics, CAD/CAM, JIT, FMS, and lean manufacturing. • Enterprise (crowdfunding, virtual retail, fair trade). *Potential links to Maths & Science:* Algorithmic logic for automation; calculating production efficiency and business innovation metrics.	**Careers:** 1. **Robotics Engineer** (High: designs automated workplace systems) 2. **Manufacturing Systems Engineer** (High: designs FMS and JIT workflows) 3. **E-Commerce Manager** (Medium: oversees virtual retail and marketing) 4. **Assembly Line Operative** (Low-Medium: works alongside automated lean manufacturing systems) **Useful Links:** • BBC Bitesize: Careers in Tech & Coding • NCS: Robotics Engineer • icould: Watch videos on Business & Finance
Energy Generation & Sustainability *Content:* • Fossil fuels, nuclear, and renewable energy. • Battery storage systems. • Resource consumption, ecological footprint, and pollution. *Potential links to Maths & Science:* Understanding carbon production, chemical energy storage, calculating energy generation outputs, and choosing appropriate energy sources.	**Careers:** 5. **Renewable Energy Engineer** (High: develops wind/solar tech) 6. **Battery Technology Researcher** (High: innovates alkaline/rechargeable storage) 7. **Environmental Consultant** (Medium-High: assesses ecological footprints) 8. **Waste Management Officer** (Medium: manages finite resource disposal and recycling) **Useful Links:** • BBC Bitesize: Jobs that use Geography • NCS: Renewable Energy Engineer • icould: Watch videos on Science & Research
People, Culture & Society *Content:* • Tech push/market pull. • Designing for the disabled, elderly, and different faiths. • Changing job roles and fashion trends. *Potential links to Maths & Science:* Using anthropometric data and percentile ranges; understanding physiological differences to avoid negative impacts on users.	**Careers:** 9. **Human Factors Engineer** (High: ensures products fit human physical/cognitive needs) 10. **Accessibility Consultant** (Medium-High: advises on inclusive design for all groups) 11. **Trend Forecaster** (Medium: predicts cultural shifts and fashion trends) 12. **Care Equipment Technician** (Low-Medium: builds/maintains products for the elderly/disabled) **Useful Links:** • BBC Bitesize: What is it like to be an Equality Officer? • NCS: Equality and Diversity Officer • icould: Watch videos on Social Care
Developments in New Materials *Content:* • Modern materials (Graphene, Titanium). • Smart materials (Shape memory alloys, thermochromic). • Composite materials (GRP, CRP) & Technical textiles (Kevlar). *Potential links to Maths & Science:* Classification of material properties; understanding external stimuli (temperature, PH); extracting information from technical specifications.	**Careers:** 13. **Materials Scientist** (High: researches new composite/smart material structures) 14. **Nanotechnologist** (High: works with micro-materials like Graphene) 15. **Textile Technologist** (Medium: develops fire-resistant/conductive fabrics) 16. **Composite Laminator** (Low-Medium: builds CRP/GRP products manually) **Useful Links:** • BBC Bitesize: Jobs that use Chemistry • NCS: Materials Scientist • icould: Watch videos on Manufacturing and Engineering

KS4 AQA Design Technology: Careers & Resources

Electronic & Mechanical Systems *Content:* • Inputs/Outputs (sensors, microcontrollers, buzzers). • Rotary, linear, reciprocating, oscillating movement. • Levers, linkages, cams, gears, and pulleys. *Potential links to Maths & Science:* Arithmetic/numerical computation (ratios, angular measures); forces (magnitude/direction); logic flow.	**Careers:** 17. **Mechatronics Engineer** (High: combines mechanical and electronic systems) 18. **Automation Programmer** (High: writes logic for microcontrollers/timers) 19. **Electronics Technician** (Medium: solders, builds, and tests circuit boards) 20. **Mechanical Maintenance Fitter** (Medium: repairs gear trains, pulleys, and cams) **Useful Links:** • BBC Bitesize: Careers in Engineering • NCS: Mechatronics Engineer • icould: Watch videos on IT and Telecoms
Material Categories & Properties *Content:* • Woods, Metals, Polymers, Papers & Textiles. • Physical properties (density, conductivity). • Working properties (toughness, ductility, malleability). *Potential links to Maths & Science:* Scientific vocabulary (metals vs non-metals); physical and chemical differences; testing composition (e.g., alloys).	**Careers:** 21. **Metallurgist** (High: extracts and modifies metals/alloys) 22. **Polymer Processing Technician** (Medium: formulates thermoforming/thermosetting plastics) 23. **Destructive Testing Technician** (Medium: tests material strength, hardness, and elasticity) 24. **Timber Yard Manager** (Medium: handles hardwood/softwood seasoning and distribution) **Useful Links:** • BBC Bitesize: Careers in Construction • NCS: Metallurgist • icould: Watch videos on Construction trades
Forces, Stresses & Stock Forms *Content:* • Tension, compression, shear, torsion. • Stiffening (lamination, webbing). • Standard commercial stock forms and components (screws, IC packages). *Potential links to Maths & Science:* Calculating surface area, volume, and material quantities; efficiently spacing patterns to minimise waste.	**Careers:** 25. **Structural Engineer** (High: calculates load-bearing forces and stresses) 26. **Estimator (Manufacturing)** (Medium-High: calculates material quantities and costs from stock forms) 27. **Quality Assurance Manager** (Medium: ensures standard components meet tolerances) 28. **Civil Engineering Technician** (Medium: assists in testing structural reinforcements) **Useful Links:** • BBC Bitesize: Jobs that use Maths • NCS: Structural Engineer • NCS: Estimator
Commercial Processes & Finishes *Content:* • Shaping, fabrication (casting, injection moulding, turning, milling). • Surface treatments (galvanising, powder coating, varnishing). *Potential links to Maths & Science:* Extracting info on manufacturing tolerances (min/max measurements); understanding chemical treatments to inhibit oxidation/corrosion.	**Careers:** 29. **CNC Programmer** (Medium-High: codes precise cutting/milling paths) 30. **Injection Moulding Setter** (Medium: calibrates polymer manufacturing machines) 31. **Powder Coater / Finisher** (Low-Medium: applies anti-corrosion chemical finishes) 32. **Foundry Caster** (Low-Medium: pours and sets molten metals) **Useful Links:** • BBC Bitesize: What is it like to be a Machinist? • NCS: CNC Machinist • icould: Watch videos on Transport and Logistics

KS4 AQA Design Technology: Careers & Resources

Investigation & Design Strategies *Content:* • Market research, client briefs, and user-centered iterative design. • Analysing past designers (e.g., Dyson, Starck, Apple). *Potential links to Maths & Science:* Tabulating client responses; producing frequency tables; writing specifications based on analytical data.	**Careers:** 33. **Industrial Designer** (High: drives the iterative design of mass-manufactured goods) 34. **Design Historian** (Medium-High: analyses the work of past designers and movements) 35. **Consumer Data Analyst** (Medium: processes primary/secondary market research data) 36. **Product Manager** (High: oversees the complete lifecycle from brief to market) **Useful Links:** • BBC Bitesize: Jobs that use Business Studies • NCS: Product Manager • icould: Watch videos on Marketing and Advertising
Communication of Ideas & Prototyping *Content:* • 3rd angle orthographic, exploded diagrams, and CAD. • Physical modelling, scaling, and evaluating fitness for purpose. *Potential links to Maths & Science:* Scaling drawings; geometric layouts; recording, evaluating, and tabulating prototype test data.	**Careers:** 37. **Architectural Technologist** (High: creates precise scale drawings and CAD models) 38. **Rapid Prototyping Specialist** (Medium: translates CAD into physical 3D prints/models) 39. **Draftsperson (Mechanical)** (Medium: creates standard orthographic and exploded engineering drawings) 40. **Usability Tester** (Medium: tests and evaluates if physical prototypes meet user needs) **Useful Links:** • BBC Bitesize: Jobs that use Art & Design • NCS: Architectural Technologist • NCS: CAD Draughtsperson