

## Year 9 Design & Technology Key Stage 4

### Autumn Term

### Spring Term

### Summer Term

#### Half Term 1

**Unit title:** New and emerging technologies

**Learning weeks** 6

**Key learning:** Industry and enterprise, Sustainability and the environment, people culture and society, production techniques and systems, informing design decisions.

**Assessment:** New and emerging technology unit test.

**Key vocabulary:** Computer aided testing, prototype, computer aided manufacturing, rapid prototyping, enterprise, patent, virtual marketing, virtual retail, cooperative, fair trade, Finite resources, life cycle assessment, obsolescence, kaizen, technology push, market pull, cnc, flexible manufacturing systems, just in time,

**Core Text:** Design Technology M J ROSS

**Key websites to support learning:**

<http://www.technologystudent.com/>

<http://www.mr-dt.com/>

<http://www.bbc.co.uk/education/subjects/zfr9wmn>

#### Half Term 1

**Unit title:** Iterative design process

**Learning weeks:** 6

**Key learning:** Design and development techniques, CAD design, model making skills.

**Assessment:** Cad model exam using google sketchup.

**Key vocabulary:** cad, cam, perspective drawing, isometric, exploded diagrams, modelling tools and equipment CNC, Flexible manufacturing, Rapid prototyping, Prototyping.

**Core Text:** Design Technology M J ROSS

**Key websites to support learning:**

<http://www.technologystudent.com/>

<http://www.mr-dt.com/>

<http://www.bbc.co.uk/education/subjects/zfr9wmn>

#### Half Term 1

**Unit title:** Energy materials systems and devices

**Learning weeks:** 6

**Key learning:** Energy generation, Energy storage, modern materials, smart materials, composite materials and technical textiles, systems approach to design, electronic systems, mechanical devices

**Assessment:** Energy materials systems and devices unit test.

**Key vocabulary:** Global warming, turbines, finite, fossil fuels, fracking, renewable, wind turbines, solar farms, tidal, Hydro electric power, biofuel, biomass, nuclear, radio active, pneumatics, hydraulics, compression, kinetic, motion, flywheel, batteries, cells, miniaturisation, biodegradable, nanotechnology, polymorph, biodegradable, prototyping, nitinol, piezoelectric, quartz, thermosetting, condensation, aramids, e textiles, microfibers, polarity.

**Core Text:** Design Technology M J ROSS

**Key websites to support learning:**

<http://www.technologystudent.com/>

<http://www.mr-dt.com/>

<http://www.bbc.co.uk/education/subjects/zfr9wmn>

|   |   |  |
|---|---|--|
| <p><b>Half Term 2</b></p> <p><b>Unit title:</b> lighting project</p> <p><b>Learning weeks:</b> 6</p> <p><b>Key learning:</b> Electronic processes, material manipulation, construction techniques.</p> <p><b>Assessment:</b> Practical Assessment project Completion.</p> <p><b>Key vocabulary:</b> Pine wood, led, electronics, wood joints, mechanical joints, adhesives, design specification, manufacturing specification, design ideas, design development, final concept, design solution, evaluation.</p> <p><b>Core Text:</b> Design Technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.mr-dt.com/">http://www.mr-dt.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zfr9wmn">http://www.bbc.co.uk/education/subjects/zfr9wmn</a></p> | <p><b>Half Term 2</b></p> <p><b>Unit title:</b> Materials and their working properties</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Papers and boards, Timbers, Metals and alloys, polymers and textiles.</p> <p><b>Assessment:</b> Materials unit test</p> <p><b>Key vocabulary:</b> Absorbency, Density, Fusibility, Electrical conductivity, Thermal conductivity, Strength, Hardness, Toughness, Malleability, Ductility, Elasticity, Hardwood, softwood, deciduous, coniferous, evergreen, felling, veneer, ferrous, non ferrous, ore, furnace, Bauxite, Carbon Oxidise Verdigris, patina, Polymers, thermoforming, thermosetting plastics, Yarn, weft, weave, felting,</p> <p><b>Core Text:</b> Design Technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.mr-dt.com/">http://www.mr-dt.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zfr9wmn">http://www.bbc.co.uk/education/subjects/zfr9wmn</a></p> | <p><b>Half Term 2</b></p> <p><b>Unit title:</b> Common specialist technical principles</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Forces and stresses, improving functionality, ecological and social footprint, the six rs, scale of production.</p> <p><b>Assessment:</b> Common specialist technical principle test.</p> <p><b>Key vocabulary:</b> Static load, dynamic load, tension, tensile strength compression, compressive strength Torsion, torsional strength, bending, stiffness, shear force, static forces, dynamic forces, reinforced concrete, composite material, webbing, interfacing laminating, folding, bending, flexibility, net, cut lines, score lines, tabs, carbon footprint, ecological, social footprint, fairtrade, deforestation, slash and burn desertification mining, life cycle assessment, hierarchy of sustainability, bespoke, batch, continuous production.</p> <p><b>Core Text:</b> Design Technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.mr-dt.com/">http://www.mr-dt.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zfr9wmn">http://www.bbc.co.uk/education/subjects/zfr9wmn</a></p> |
|---|---|--|

**Year 10 Product Design  
Key Stage 4**

|                    |                    |                    |
|--------------------|--------------------|--------------------|
| <b>Autumn Term</b> | <b>Spring Term</b> | <b>Summer Term</b> |
|--------------------|--------------------|--------------------|

|  |   |  |
|--|---|--|
| <p><b><u>Half Term 1</u></b></p> <p><b>Unit title:</b> Papers and boards</p> <p><b>Learning weeks 6:</b></p> <p><b>Key learning:</b> Sources origins and properties, working with paper and board, commercial manufacturing surface treatment and finishes. Using paper and board to produce a board game.</p> <p><b>Assessment:</b> Papers and boards unit test and a practical assessment of using paper and board.</p> <p><b>Key vocabulary:</b> printed board, corrugated card, lithography, nets, cymk, sheet, rolls, ply form, embossing, microns, nets, scalpel, tolerance, quality assurance.</p> <p><b>Core Text:</b> Design Technology. M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> | <p><b><u>Half Term 1</u></b></p> <p><b>Unit title:</b> Practise coursework (nea)</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Evaluating an idea, idea linked research, manufacturing a product and evaluation.</p> <p><b>Assessment:</b> Practical assessment of the final model.</p> <p><b>Key vocabulary:</b> Evaluation, Aesthetics, customer, cost, environment, safety, size, function, material, moral, social, ergonomics, anthropometrics.</p> <p><b>Core Text:</b> Design and Technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> | <p><b><u>Half Term 1</u></b></p> <p><b>Unit title:</b> Timber based materials and polymers</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Sources and origins, working with timbers and polymers, commercial manufacturing</p> <p><b>Assessment</b> Timber based materials and polymers unit assessment</p> <p><b>Key vocabulary:</b> Hardwood, softwood, manmade board, thermosetting plastics, thermo plastic. Rough sawn, planned all around, seasoned, lamination, compression, veneer, desertification, global warming, deforestation, provenance, mouldings, architrave, skirting boards, dowel rods, knock down fittings, rebating, hinges, drill bits, Tennon saw, coping saw, rip saw, former, jig, steamer box, quality control, tolerance.</p> <p><b>Core Text</b> Design and Technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> |
|--|---|--|

|  |  |  |
|--|--|--|
| <p><b><u>Half Term 2</u></b></p> <p><b>Unit title:</b> Practise coursework (nea)</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Research, design creation development, model making,</p> <p><b>Assessment:</b> Practical assessment of the completed model.</p> <p><b>Key vocabulary:</b> Iterative design, drawing techniques, cad cam, client analysis, existing product analysis, Primary research, Secondary research, Primary research, secondary data, iterative and inclusive design strategies, variety of drawing techniques, feedback, interviews, questionnaire, product analysis, Ergonomics and anthropometric data, design and manufacturing specification, Environmental, social, economic,</p> <p><b>Core Text:</b> Design and technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> | <p><b><u>Half Term 2</u></b></p> <p><b>Unit title:</b> Designing principles</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Investigating primary and secondary data, the work of others, design strategies, communication of design ideas.</p> <p><b>Assessment:</b> Design principles unit test.</p> <p><b>Key vocabulary:</b> Primary research, secondary data, iterative and inclusive design strategies, variety of drawing techniques, feedback, interviews, questionnaire, product analysis, Ergonomics and anthropometric data, design and manufacturing specification, Environmental, social, economic, Designers, Harry beck, cocochanel, alexander mcqueen, William morris, mary quant, Vivienne westwood, marcel breuer, Norman foster, Charles rennie mackintosh, Aldo Rossi, Gerrit Rietveld, Ettore Sottsass, Rymond Templier Louis Comfort Tiffany, sir alec Issigonis, Alessi, Apple, Braun, Dyson, Gap, Primark, Under armour, Zara, user centered design, design fixation.</p> <p><b>Core Text:</b> Design and technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> | <p><b><u>Half Term 2</u></b></p> <p><b>Unit title:</b> Making principles</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Selection of materials and components, tolerances, material management, tools equipment techniques and finishes, surface treatment and finishes.</p> <p><b>Assessment:</b> Making principles unit test.</p> <p><b>Key vocabulary:</b> components, tolerance, wide range of finishing techniques, Aesthetics, functional properties, CAD, render, Components, Strength, Movement, Electrical and thermal conductivity, Measuring, Allowances, nesteing, tessellation, material requirements, datum, Templates, jigs, patterns, batch, data sheets, ppe, rust, corrosion, decay, wood.</p> <p><b>Core Text:</b> Design and technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> |
|--|--|--|

**Year 11 Product Design  
Key Stage 4**

| Autumn Term   | Spring Term  | Summer Term  |
|---|--|--|
| <p><b><u>Half Term 1</u></b></p> <p><b>Unit title:</b> Coursework worth 50% of the overall grade.</p> <p><b>Learning weeks 6:</b></p> <p><b>Key learning:</b> Task analysis, user identified, investigate the work of others, Questionnaire with results, investigation of design possibilities, Design Brief and specification, imaginative, creative and innovative ideas, functionality aesthetics and innovation. Annotation of design ideas including model making, Ongoing investigation, research ideas styles and materials.</p> <p><b>Assessment:</b> Research and initial idea generation, including design brief and specification. 40 marks available.</p> <p><b>Key vocabulary:</b> Analysis, questionnaire, design brief, aesthetics, innovation, imagination.</p> <p><b>Core Text:</b> Design Technology. M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> | <p><b><u>Half Term 1</u></b></p> <p><b>Unit title:</b> Coursework worth 50% of the overall grade</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Prototype manufacture using all previously learned skills over the past five years. Independent task assessed internally and moderated externally.</p> <p><b>Assessment:</b> Product manufacture 20 marks available.</p> <p><b>Key vocabulary:</b> A variety of tools and techniques will be covered on an individual basis dependant on the designs that have been created.</p> <p><b>Core Text:</b> Design and Technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> | <p><b><u>Half Term 1</u></b></p> <p><b>Unit title: Revision</b></p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Example papers and revisiting areas of concern.</p> <p><b>Assessment</b> Weekly Gcse questions from the AQA paper.</p> <p><b>Key vocabulary:</b> See all of the keywords from y9 and 10 for revision of units, New and emerging technologies, Energy, materials, systems and devices, materials and their working properties, specialist technical principals, papers and boards Timbers, metals and polymers, Design Principles, Making principles.</p> <p><b>Core Text</b> Design and Technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> |

|   |   |  |
|---|---|--|
| <p><b><u>Half Term 2</u></b></p> <p><b>Unit title:</b> Coursework worth 50% of the overall grade</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Imaginative, creative and innovative ideas. Include client feedback, Functionality, aesthetics and innovation annotation of ideas including model making, On going investigations, experimentation, research materials and styles. Development work with annotated drawings and models. Manufacturing specification cad cam, evaluation and testing of the prototype.</p> <p><b>Assessment:</b> Design ideas and development of the ideas worth 20 marks</p> <p><b>Key vocabulary:</b> client feedback, accuracy, tolerance, innovation, aesthetics, modelling, annotation.</p> <p><b>Core Text:</b> Design and technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> | <p><b><u>Half Term 2</u></b></p> <p><b>Unit title:</b> Coursework worth 50% of the overall grade</p> <p><b>Learning weeks 6</b></p> <p><b>Key learning:</b> Evaluation of the product and assessing if it meets the needs of the user. Social moral and environmental considerations of the product, Testing the product against the design criteria and the users requirements, Developments of the product, final presentation.</p> <p><b>Assessment:</b> Final evaluation and testing session worth 20 marks.</p> <p><b>Key vocabulary:</b> Evaluation, social, moral, environmental, testing, developments.</p> <p><b>Core Text:</b> Design and technology M J ROSS</p> <p><b>Key websites to support learning:</b><br/> <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a><br/> <a href="http://www.bbc.co.uk/education/subjects/zybc87h">http://www.bbc.co.uk/education/subjects/zybc87h</a></p> |  |
|---|---|--|