

<p>Content – Knowledge and Understanding</p> <p>Skills and concepts</p>	<p><u>Sublimation Water Bottle Project:</u></p> <ul style="list-style-type: none"> ○ Cultural differences discussed and embedded ○ Dye sub process (step by step) ○ Design brief sheet PLC ○ Design ideas x 8 (template) ○ CAD Image enhancement ○ Practical outcome ○ Step by step – evidence of manufacture ○ Health and Safety demo on heat press <p>Technical Principles</p> <ul style="list-style-type: none"> ○ Sustainability and ethics <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> ○ Investigation (A) ○ Responsible design (C) ○ Realising the design (E) ○ Analysis and evaluation (F) ○ Technical Principles (T) 	<p><u>USB stick:</u></p> <ul style="list-style-type: none"> ○ Introduction to 2D design (CAD), cut and etch lines ○ Designing to scale and within specified tolerances. ○ Laser cut work (CAM) ○ Workshop assembly. ○ Scales of production ○ Quality control <p>Technical principles</p> <ul style="list-style-type: none"> ○ Plastics (Part 1-Properties and classification) ○ Electronics (Part 1-circuits and components) <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> ○ Working to a specification (B) ○ Design Ideas and analysis/ evaluation (F) (C) ○ Evidence of developing design using CAD/ CAM (D) 	<p><u>Pewter Casting</u></p> <ul style="list-style-type: none"> ○ Designing for client, biomimicry, ○ graphical skills, ○ pewter casting process, ○ health and safety, ○ Surface finishes. ○ Material properties acrylic and pewter ○ manufacture processes- laser cutting and pewter casting <p>Technical principles</p> <ul style="list-style-type: none"> ○ Plastics (Part 1-Properties and classification) ○ Electronics (Part 1-circuits and components) <hr style="border-top: 1px dashed black;"/> <ul style="list-style-type: none"> ○ Investigation and analysis of natural forms (B) ○ Design development and modelling (F) (C) ○ Evidence of developing design using CAD/ CAM (D) ○ Technical Principles (T)
<p>Assessment</p>	<ul style="list-style-type: none"> • Base line test • Investigation and analysis Quality of the specification and evidence of evaluation. • Developing designs and evaluation 	<ul style="list-style-type: none"> • Working to a specification • Design ideas and evaluation • Development for CAD 	<ul style="list-style-type: none"> • Investigation and analysis of natural forms • Design development including modelling • Technical principles assessment.
<p>Enrichment and extension</p>	<p>The Knatch Bacc in DT: Students will be given monthly challenges that will extend and stretch their Design and Technology Curriculum. It will include wider reading activities, research tasks and activities that inspire and encourage a natural curiosity about the world around them and seek to show how Design and Technology effects all areas of their life.</p>		

NKS Design & Technology Curriculum Map 2021

Year 8

Our Y8 curriculum builds on and extends the work done in Y7 by...

The 6 GCSE core skills: Investigation (A), Producing a Specification (B), Generating design ideas (C), Developing Design ideas (D), Realising design ideas (E), analysing and evaluation (F) are developed. In year 8 students get the chance to work with a range of materials and processes including wood, plastics, graphics, electronics and Computer Aided Design in their project-based learning. They will produce more complex working outcomes with greater independence and build on and develop skills each year in preparation for year 9. We will encourage the students to become ethical and responsible designers who are aware of the impact that products have on the wider world and exploring a range of cultural and historical influences. Then challenging students with more complex tasks that require prior learning and skills / material base. Greater awareness of Health and Safety issues and how to minimise risk to themselves and others (PPE / specific equipment)

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Content – Knowledge and Understanding	<u>Monster Desk Tidy:</u> <ul style="list-style-type: none"> Introduction to woodwork workshop tools and equipment, coping saw, pillar drill, belt sander Creating a specification Designing for a client Manufacturing a product safely Theory <ul style="list-style-type: none"> Timbers (Part 1-Sources, properties and classification) Mechanics (Part1-Forces) 		<u>Animal Light:</u> <ul style="list-style-type: none"> Developing workshop health and safety. Use of sheet metal, marking out, cutting and bending with appropriate tools and equipment. Cultural influences-Charles and Ray Eames Properties of metals. Nets, tessellation of shapes. Soldering electronic components Using jigs and templates. Theory <ul style="list-style-type: none"> Metals (Part 1: Sources, properties and classification) 		<u>Flat pack phone holder:</u> <ul style="list-style-type: none"> Investigations into: <ul style="list-style-type: none"> Living hinges Interference fit Ethical and sustainable design Material properties Design ideas Design development and modelling <ul style="list-style-type: none"> Card prototyping Evaluation and annotation of ideas Prototyping <ul style="list-style-type: none"> 2D design skills CAD Laser cutting Theory <ul style="list-style-type: none"> Environmental, social and economic challenge Polymers (Part 1: Sources, properties and classification) CAD/CAM 	
Skills and concepts	----- <ul style="list-style-type: none"> Task analysis (A) and Writing a specification for a client (B) Workshop health and safety.(D, E) Evaluation of designs (F) 		----- <ul style="list-style-type: none"> Investigation (A) and design ideas (C) Developing Ideas (D) Evidence of manufacture and evaluation (E)(F) 		----- <ul style="list-style-type: none"> Investigation (A) Specification (B) Developing Ideas & recording of process (D) Evaluation (E) 	
Assessment These will be a mixture of peer, self and teacher lead assessment.	<ul style="list-style-type: none"> Base line test Investigation, analysis and design ideas Developing and realising design ideas 		<ul style="list-style-type: none"> Realisation of final design and Evaluation Investigation of theme linking to design ideas Development of the design. 		<ul style="list-style-type: none"> Analysis and Specification Design development including modelling Technical principles assessment. 	

Enrichment and extension	Extra Curriculum – Lunchtime club 2
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NKS Design & Technology Curriculum Map 2021

Year 9

Our Y9 curriculum builds on and extends the work done in Y8 by

Units are sequenced to cover the 6 core GCSE assessment areas. We specifically work through the skills within each assessment objective and develop these at a developing and secure level

It prepares students for the GCSE programme by

Continuing with low risk exam questioning Overview of the AQA mark scheme used from year 9 to identify the 6 assessment criteria and the sub-skills within them. Opportunity for staff and student reflection as skills are developed and secured

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
<p>Content – Knowledge and Understanding</p>	<p><u>Skills stick:</u></p> <ul style="list-style-type: none"> ○ Developing workshop health and safety. ○ Experience in working in wood, plastic and metal ○ Marking out, cutting and bending with appropriate tools and equipment. ○ The use of production aids, tolerance and material management. 	<p><u>Design Ventura:</u> External competition through the Design Museum London</p> <ul style="list-style-type: none"> ○ Designing for a live brief ○ Working as a team ○ Developing and realising a design ○ Constructing a pitch 	<p><u>DESIGN VENTURA & CAD/CAM</u></p> <ul style="list-style-type: none"> ○ e.g. 3D printing/ laser cutter projects ○ Developing Cad skills with 2D and 3D software ○ Use of CAM equipment, e.g. laser cutter & 3D Printer ○ 3D modelling and manipulation of materials ○ Virtual assembly of parts ○ Creation of engineering drawings ○ Concept design and modelling ○ Product Analysis 	<p><u>Passive speaker:</u></p> <ul style="list-style-type: none"> ○ Developing workshop health and safety. ○ Use of sheet material, marking out, cutting and bending with appropriate tools and equipment. ○ Cultural influences-Charles and Ray Eames ○ Properties of metals. ○ Using jigs and templates. 		
<p>Skills and concepts</p>	<p>Theory</p> <ul style="list-style-type: none"> ● Timber plastics and metal: <ul style="list-style-type: none"> ○ Recap Sources/origins ○ Classifications ○ Properties uses ○ Processes 	<p>Theory</p> <ul style="list-style-type: none"> ● Commercial processes and viability ● Working practise in design companies 	<p>Theory:</p> <ul style="list-style-type: none"> ○ New and Emerging Technologies ○ Digital design and manufacture ○ Virtual modelling 	<p>Theory</p> <ul style="list-style-type: none"> ○ Design movements and influences ○ Health and Safety ○ The use of production aids, tolerance and material management. 		
<p>Assessment</p>	<ul style="list-style-type: none"> ● Base Line test ● Communication and evaluation ● Realisation 		<ul style="list-style-type: none"> ● Use of CAD to develop ideas ● Testing and modelling ● Plans for manufacture 	<ul style="list-style-type: none"> ● Design ideas and development ● Technical principles assessment 		

**Enrichment
and
extension**

Live trips will be COVID restriction dependant. Virtual trips e.g. Young Designers exhibition and activities to take place.

NKS Design & Technology Curriculum Map 2021

Year 10

Our Y10 curriculum builds on and extends the work done in Y9 by

Units are sequenced to cover the 6 core GCSE assessment areas.

We specifically work through the skills within each assessment objective and looks at techniques to develop these at a secure and expert level

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
<p>Content – Knowledge and Understanding</p>	<p><u>Multimedia Clock Project:</u></p> <ul style="list-style-type: none"> ○ Design influences: Architects: Zaha Hadid & Thomas Heatherwick ○ Standardised components ○ Material properties, plastics, metal and wood. ○ Concept sketches ○ 3D sketching ○ White on black page ○ Standardised parts and components ○ Plan for manufacture <p>Theory</p> <ul style="list-style-type: none"> ○ The work of others <ul style="list-style-type: none"> ○ Plastics (Commercial manufacture) ○ Metals (Commercial manufacture) ○ Woods (Commercial manufacture) <p>- - - - -</p> <ul style="list-style-type: none"> ○ Investigation (A) ○ Specification (B) ○ Generating Design Ideas (C) ○ Developing Ideas (D) ○ Evidence of manufacture. (E) ○ Evaluation (F) 		<p><u>Designer Light Project:</u></p> <ul style="list-style-type: none"> ○ Design influences: Ettore Sottsass & Gerrit Rietveld (Link to GCSE Specification) ○ Investigating a problem ○ Soldering, ○ Standardised components. ○ Casing manufacture reflects 6R's and client's constraints ○ Design ideas and evaluation throughout ○ Material properties ○ Flow charts <p>Theory</p> <ul style="list-style-type: none"> ○ Electronics (Closed and open loop feedback, component identification.) ○ Manufactured boards-Laminating ○ Systems and Control <p>- - - - -</p> <ul style="list-style-type: none"> ○ Investigation (A) ○ Specification (B) ○ Generating Design Ideas (C) ○ Developing Ideas (D) ○ Evidence of manufacture. (E) ○ Evaluation (F) 		<p>Start section A of NEA 3 NEA context released by AQA</p> <p>Criteria A; Identifying & Investigating Design Possibilities</p> <ul style="list-style-type: none"> ○ Folder layout A3 ○ Teams set up ○ Cloud storage ○ Investigation ○ Primary Client ○ Research plan ○ Primary investigation ○ Secondary Investigation ○ Social Moral and Economic 	
<p>Skills and concepts</p>						
<p>Assessment</p>	<ul style="list-style-type: none"> • Quality of the final project and each strand: <ul style="list-style-type: none"> ○ Investigation (A) 10 marks ○ Specification (B) 10 marks ○ Generating Design Ideas (C) 20 marks ○ Developing Ideas (D) 20 marks ○ Realising design ideas (E) 20 marks ○ Evaluation & analysis (F) 20 marks 		<ul style="list-style-type: none"> • Quality of the final project and each strand: <ul style="list-style-type: none"> ○ Investigation (A) 10 marks ○ Specification (B) 10 marks ○ Generating Design Ideas (C) 20 marks ○ Developing Ideas (D) 20 marks ○ Realising design ideas (E) 20 marks ○ Evaluation & analysis (F) 20 marks • Year 10 PPE's 		<p>Interim deadlines for; Section A</p>	

Enrichment and extension	Extra Curriculum - Live trips will be COVID restriction dependant. Virtual trips e.g. Young Designers exhibition and activities to take place. Additional after school workshops.
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NKS Design & Technology Curriculum Map 2021

Year 11

Our Y11 curriculum builds on and extends the work done in Y10 by

Bringing together the skills for criterion A to F for the Non exam Assessment

Linking the NEA skills to the exam content

Use of Pixl Techniques and diagnostic exam work

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Content – Knowledge and Understanding	<p><u>Exam Theory</u> Section C; Design and Making Principles</p> <p><u>Contextual Context for NEA (released 1st June)</u></p> <p>Criteria B; Design Brief and Specification Criteria C Generating Design Ideas</p>	<p><u>Exam Theory</u> Section C; Design and Making Principles</p> <p><u>Contextual Context for NEA</u></p> <p>Criteria D; Developing Design Ideas</p>	<p><u>Exam Theory</u> Section A; Core Technical Principles</p> <p><u>Contextual Context for NEA</u></p> <p>Criteria E; Realising Design Ideas</p>	<p><u>Exam Theory</u> Section B; Specialist Technical Principles</p> <p><u>Contextual Context for NEA</u></p> <p>Criteria F; Analysing and Evaluating</p> <p>Deadline last week of term</p>	<p>8 Key Pixl principles (feed forward)</p> <p>This focus varies each year</p>	
Skills and concepts	<p>- - - - -</p> <ul style="list-style-type: none"> ○ 8 Point justified Specification ○ Client based Design Brief ○ Initial ideas ○ Concept sketches ○ Quick modelling 	<p>- - - - -</p> <ul style="list-style-type: none"> ○ Design development ○ CAD modelling ○ CAM modelling ○ Materials Testing ○ Manufacture specification ○ Cutting List 	<p>- - - - -</p> <ul style="list-style-type: none"> ○ Manufacture of prototype ○ Evidence of manufacture / diary of making 	<p>- - - - -</p> <ul style="list-style-type: none"> ○ Client testing product ○ Test against specification ○ Suggested modifications and improvements 		
Assessment	<p>Interim deadlines for; Section B and C</p> <ul style="list-style-type: none"> • Exampro / sample questions 	<p>Interim deadlines for; Section D</p> <ul style="list-style-type: none"> • Year 11 PPE • Exampro / sample questions 	<p>Interim deadlines for; <u>Section E</u></p> <ul style="list-style-type: none"> • Exampro / sample questions 	<p>Interim deadlines for; <u>Section F</u></p> <p><u>Students have 2 weeks to improve final mark</u></p> <ul style="list-style-type: none"> • Exampro / sample questions 	<p>Sample questions:</p> <p>Exampro Past papers</p>	<p>Exam end of May</p>
Enrichment and extension	<p>Extra Curriculum - Live trips will be COVID restriction dependant. Virtual trips e.g. Young Designers exhibition and activities to take place. Tuesday After school workshops.</p>					

NKS Design & Technology Curriculum Map 2021

Year 12

Prior to commencing A Level students will have studied

In most cases, GCSE AQA Design Technology with a Product Design focus.

Some external students study with a textiles or graphics background.

On occasion a student will have studied a different exam board if from out of area, or has not taken the subject at GCSE.

An understanding of students' starting points is achieved by...

Baseline assessment of Year 13 Paper 1 and Paper 2 sample questions

Our Y12 curriculum builds on and extends this by...

Having a material and process focus to each project that put theory of material properties and processes into practices.

Exam questioning, back ground reading and theory lessons are used

Year 12 calendar with lesson content, back ground reading and interim deadlines to help manage time and study periods

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Content – Knowledge and Understanding	<p><u>Base line Skills projects</u></p> <p>A variety of small projects and activities to assess to level of skills including:</p> <ul style="list-style-type: none"> • Product Study • Sketching and concept design • Practical skills with wood, metal and plastic <p><u>Introduction to designers and influences of others.</u></p> <p>- - - - -</p>	<p><u>Mini Projects to cover gaps in knowledge from baseline skills:</u></p> <p><u>e.g. Unto this Last</u></p> <ul style="list-style-type: none"> ○ Extending the range ○ Laser cutting birch plywood ○ CAD/CAM <p><u>e.g. Bottle Opener/ cuff links</u></p> <ul style="list-style-type: none"> ○ Metal work ○ Mild steel ○ Brazing ○ Pewter casting ○ Powder coating 	<p><u>e.g. Desk light</u></p> <ul style="list-style-type: none"> ○ Electronic components and circuits ○ Designing within constraints ○ Multi-material products <p>- - - - -</p> <ul style="list-style-type: none"> ○ Folio presentation techniques ○ Communication techniques ○ Practical skills ○ Folio presentation techniques 	<p><u>e.g. Inclusive Design</u></p> <ul style="list-style-type: none"> ○ Client focus ○ Anthropometrics ○ 5th/50th/95th Percentiles ○ Smart Materials <p><u>e.g. Product Life Cycle</u></p> <ul style="list-style-type: none"> ○ Sustainability ○ Social Moral and Economic issues ○ Planned obsolescence <p><u>e.g. Testing</u></p> <ul style="list-style-type: none"> ○ Testing products ○ Industrial methods <p>- - - - -</p> <ul style="list-style-type: none"> ○ Product Life Cycle – specific examples ○ CAD modelling ○ Styrofoam modelling 	<p>Start section A of NEA 3 NEA context released by AQA</p> <p>- - - - -</p> <p><u>Contextual Context for NEA</u></p> <ul style="list-style-type: none"> ○ Criteria A; Identifying & Investigating Design Possibilities (10 marks) 	
Skills and concepts	<ul style="list-style-type: none"> ○ Communication skills ○ Basic practical skills ○ Folio presentation techniques 					

Assessment	Background reading Flipped learning Timed questions Materials and Applications	Background reading Flipped learning Timed questions Materials and Applications Performance characteristics and enhancement. Forming redistribution and additions processes.	Background reading Flipped learning Timed questions Modern scales of practice Materials and Applications Health and Safety Designing for clients	<u>Year 12 PPE</u> Background reading Flipped learning Timed questions Protecting designs and IP Design for manufacturing, maintenance, repair and disposal.	Background reading Flipped learning Timed questions Enterprise and marketing	<i>Folder layout A3</i> <i>Teams set up</i> <i>Cloud storage</i>
Enrichment and extension	Extra Curriculum - <ul style="list-style-type: none"> • Study support lessons • KS4 prefect lessons • BMW Mini Trip to Oxford factory • New Designers Exhibition, London • MJ Allen 					

NKS Design & Technology Curriculum Map 2021

Year 13

Our Y13 curriculum builds on and extends the work done in Y12 by...

Allowing students to select a client based context that will allow them to showcase their design, communication and manufacturing skills to the highest level.

This is interleaved with theory elements. Once the NEA is complete an intense 10 point revision approach targets revision with a diagnostic approach

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Content – Knowledge and Understanding Skills and concepts	<u>Exam Theory</u> <ul style="list-style-type: none"> Technical Principles <u>Contextual Context for NEA</u> <ul style="list-style-type: none"> Criteria A; Identifying & Investigating Design Possibilities (20 marks) Criteria B; Producing a design brief and specification (10 marks) 	<u>Exam Theory</u> <ul style="list-style-type: none"> Technical Principles <u>Contextual Context for NEA</u> <ul style="list-style-type: none"> Criteria C: Development of Design Proposals (25 marks) 	<u>Exam Theory</u> <ul style="list-style-type: none"> Designing and Making Principles <u>Contextual Context for NEA</u> <ul style="list-style-type: none"> Criteria D; Development of Design Prototype(s) (25 marks) 	<u>Exam Theory</u> <ul style="list-style-type: none"> Designing and Making Principles <u>Contextual Context for NEA</u> <ul style="list-style-type: none"> Criteria E; Analysing and Evaluating (20 marks) 	<u>Exam Theory</u> <ul style="list-style-type: none"> Technical Principles Designing and Making Principles 8 Pixl Principles 	<ul style="list-style-type: none"> Study leave Exam dates are typically the first and second week of June
Assessment	Background reading Flipped learning Timed questions Materials and Applications	Background reading Flipped learning Timed questions Metals and Alloys	Background reading Flipped learning Timed questions Designing for clients	Background reading Flipped learning Timed questions Polymers	Background reading Flipped learning Timed questions Paper and Board	<i>Folder layout A3</i> <i>Teams set up</i> <i>Cloud storage</i>
Enrichment and extension	Extra Curriculum - Study support lessons KS4 prefect lessons					