Toynbee Curriculum

KS4 Topic Summaries

DESIGN AND TECHNOLOGY

Toynbee School

Scheme of Learning: Year 10 Design & Technology

Topic Sequence: Year 10 Design & Technology

1	2	3	4	5
Polymers and electronics - Alessi inspired key fob light	Paper based materials – phone stand	Group Design & Make – Solar powered mechanical toy	Smart and Modern Materials	Mini NEA Project – Moisture Sensor

Topic Overview:

This project develops on the foundation skills and knowledge developed through the Key Stage 3 curriculum. Taking the knowledge of materials and manufacturing skill and applying to a smaller, more complex project. Students work with simple electronics, CAD and CAM and learn how polymer based materials can be joined. Students also begin to take ownership of the creative direction of their projects.

Throughout project, there are opportunities to explore and embed related knowledge around CAD and CAM, new and emerging technology and embedding intelligence into products. Students are also introduced to the key designers, explicitly named in the GCSE specification.

Throughout the Year 10 project-based curriculum, students develop their understanding of the design process, to support them in developing the independence required for the "non exam assessment" (NEA), completed in Year 11.

Lesson Sequence:

The sequence of lessons for this project, is driven by the "design process" involved in the design and manufacture of products. Broadly, this can be described using the stages below – those in bold are covered through this topic/project. The stages for most design and manufacture projects would follow a similar chronology. For consistency throughout our Key Stage 4 curriculum, this is based upon the assessment objectives referred to in the "non exam assessment" in Year 11.

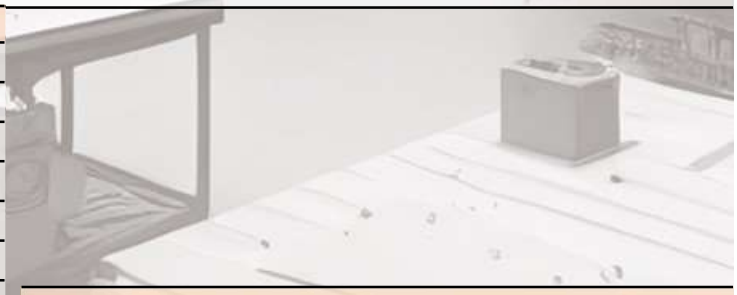
Exploring CAD and CAM in terms of the benefits to designers and a broader understanding of the pros and cons is essential, so that students can choose when to use and when a different approach may be more suitable. Embedding intelligence into products has developed rapidly recently and students must understand how this has been achieved and the pros and cons. Introducing the "Key designers" gives students a foundation from which to explore their own influences throughout Year 10. This broadens their understanding of "design beyond the classroom" and encourages them to consider their preferences and interests.

Identifying opportunities
Relevant research
User wants/needs and analysis
Considered range of design problems
Design brief
Design specification
Use of design strategies and iterative design
Social Moral Economic Factors
Testing to develop designs
Fully developed design proposal

Communication techniques
Planning for manufacture
Worked with materials and components
Produce a high quality prototype
Understanding of materials
Using tools/techniques/processes/equipment
Evaluation and testing of ideas
Evaluation and testing of prototype
Further development

Sequence of Lessons:

1	Project launch and Mind mapping
2	Mood board generation
3	CAD and CAM
4	New and emerging technology
5	Embedding intelligence
6	IT based research - Polymers
7	Meeting consumer needs
8	Design Specification
9	Key Designers Research
10	Initial Design Strategies
11	Idea simplification/Development
12	Feedback and further development
13	Final Design Presentation – Sketchup for Web
14	2D Design – Basic Controls and Approach
15	2D Design – Complete Laser cutting file
16	Laser cutting
17	2D Design Summary and Evaluation
18	Final Assembly
19	Final evaluation of process and product



Topic Resources:

Knowledge Map:	Y10 Autumn Term	**Prescribed Sources:**	SENECA Learning

Assessment:

Knowledge:	Autumn Term Forms Based Assessment
Application of Knowledge:	Key Skills Assessment (Sketchup Modelling, 2D Design Laser Cutting File, Assembly of Light: Function, Finishing of Light: Aesthetics)

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.

Scheme of Learning: Year 10 Design & Technology

Topic Sequence: Year 10 Design & Technology

1	2	3	4	5
Polymers and electronics - Alessi inspired key fob light	Paper based materials – phone stand	Group Design & Make – Solar powered mechanical toy	Smart and Modern Materials	Mini NEA Project – Moisture Sensor

Topic Overview:

This project offers students an opportunity to work with a group of materials not used during Key Stage 3. The versatility of paper based materials is explored, and building students' confidence to create 3D forms using these materials underpins all future projects. This is especially important when students will need to build mock ups.

Through the duration of the project, there are opportunities to explore the most common materials in this category, their properties and applications. Understanding how this category of materials must be protected/finished allows students to make links between other material categories, reinforcing this knowledge. Students develop their knowledge of a further design strategy and focus upon the construction of high quality models.

Throughout the Year 10 project-based curriculum, students develop their understanding of the design process, to support them in developing the independence required for the "non exam assessment" (NEA), completed in Year 11.

Lesson Sequence:

The sequence of lessons for this project, is driven by the "design process" involved in the design and manufacture of products. Broadly, this can be described using the stages below – those in bold are covered through this topic/project. The stages for most design and manufacture projects would follow a similar chronology. For consistency throughout our Key Stage 4 curriculum, this is based upon the assessment objectives (NEA).

Exploring paper based materials, finishing and suitable methods to construct and join, develops the breadth of knowledge students require. Providing an opportunity to practice using sheet materials to create 3D forms is essential to support students' success in future projects, this is an aspect of design development that ensures students are able to fully develop their design proposals. Students develop their skills in design sketching, including annotation to explain and explore.

Students produce a functional mock up for this project, which provides the opportunity to authentically evaluate their successes and areas for further development. This is a skill required throughout the design process, and needs to be practised.

Identifying opportunities
Relevant research
User wants/needs and analysis
Considered range of design problems
Design brief
Design specification
Use of design strategies and iterative design
Social Moral Economic Factors
Testing to develop designs
Fully developed design proposal

Communication techniques
Planning for manufacture
Worked with materials and components
Produce a high quality prototype
Understanding of materials
Using tools/techniques/processes/equipment
Evaluation and testing of ideas
Evaluation and testing of prototype
Further development

Sequence of Lessons:

1	Project Brief Launch
2	Paper and Boards Material Knowledge
3	Existing Project Analysis
4	Paper Finishing Techniques
5	Design Strategies: Morphological Analysis
6	Concept Sketches
7	Prototype Mock Up - Practical
8	Prototype Mock Up - Complete
9	User trials and final development

Topic Resources:

Knowledge Map:	Y10 Autumn Term	**Prescribed Sources:**	SENECA Learning

Assessment:

Knowledge:	Autumn Term Forms Based Assessment
Application of Knowledge:	Key Skills Assessment (Application of Design Strategies, Construction Methods, Final Outcome)

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.

Scheme of Learning: Year 10 Design & Technology

Topic Sequence: Year 10 Design & Technology

1	2	3	4	5
Polymers and electronics - Alessi inspired key fob light	Paper based materials – phone stand	Group Design & Make – Solar powered mechanical toy	Smart and Modern Materials	Mini NEA Project – Moisture Sensor

Topic Overview:

This project facilitates a collaborative design approach, encouraging students to discuss and explore design problems together. Students aim to manufacture a prototype toy, powered by solar energy and engaging young children. There are no limits on the aesthetics or function, this is entirely driven by the group themselves.

Students gain an understanding of the benefits of working as part of a team, drawing on the strengths and experiences of others. The remit of the project encourages fun and experimentation, while also delivering the knowledge of energy sources and generation. Students develop their knowledge of both timber and metal based materials, this builds upon the knowledge from Key Stage 3 and the previous Year 10 projects.

There is a presentation aspect to this project, where students must present their outcome and design process to others. Students should be comfortable sharing their work, giving and receiving feedback, this builds resilience in these areas, ahead of the NEA.

Lesson Sequence:

The sequence of lessons for this project, is driven by the "design process" involved in the design and manufacture of products. Broadly, this can be described using the stages below – those in bold are covered through this topic/project. The stages for most design and manufacture projects would follow a similar chronology. For consistency throughout our Key Stage 4 curriculum, this is based upon the assessment objectives (NEA).

Exploring the full range of mechanical devices, to develop understanding of "machines", leads students to developing more interesting and functional design solutions for any problem with which they are faced, now and in the future.

Learning about the sub categories within both the timber and metal based material categories, ensures students have a bank of knowledge on which to draw, whenever required. While students won't necessarily use all of them in the manufacturing stage of this project, it offers them a good understanding of the available resources within the workshop and beyond. This is planned to build incrementally throughout the year.

Students must consider all of the developed designs from within the group, to identify the strengths and weaknesses of each others' work, developing the skill of "constructive criticism". This skill is more easily employed when considering the work of others, and ensures students are more comfortable with critiquing their own work in the future.

Modelling in two dimensions, before moving onto construct in 3D, encourages problem solving and a deeper understanding of the 3D geometry. It also provides the chance to resolve the layout of the mechanical devices, to ensure a working prototype by the finished outcome.

The final phase of building a prototype is the first time students must manage time and resources collectively, to achieve success.

Identifying opportunities
Relevant research
User wants/needs and analysis
Considered range of design problems
Design brief
Design specification
Use of design strategies and iterative design
Social Moral Economic Factors
Testing to develop designs
Fully developed design proposal

Communication techniques
Planning for manufacture
Worked with materials and components
Produce a high quality prototype
Understanding of materials
Using tools/techniques/processes/equipment
Evaluation and testing of ideas
Evaluation and testing of prototype
Further development

Sequence of Lessons:

1	Project Launch and Existing Product Research
2	Types of Energy and Energy Sources
3	Mechanical Devices
4	Timber based materials knowledge
5	Design Strategies: Collaborative Designing (User/Function focus)
6	Metal based materials knowledge
7	Selecting designs and planning mechanisms/movement
8	Mechanism modelling (2D/card)
9-13	Final prototype manufacturing
14	Group Project Presentation
15	Project Presentations/Q&A

Topic Resources:

Knowledge Map:	Y10 Spring Term	**Prescribed Sources:**	SENECA Learning

Assessment:

Knowledge:	Spring Term Forms Based Assessment
Application of Knowledge:	Key Skills Assessment (Existing Product and Mechanisms Research, Application of Design Strategies, Mechanisms Modelling, Final Prototype)

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.

Scheme of Learning: Year 10 Design & Technology

Topic Sequence: Year 10 Design & Technology

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Polymers and electronics - Alessi inspired key fob light	Paper based materials – phone stand	Group Design & Make – Solar powered mechanical toy	Smart and Modern Materials	Mini NEA Project – Moisture Sensor

Topic Overview:

This topic is very short and concise, with the intention of delivering the knowledge of Smart and modern materials. While there is the opportunity to apply this knowledge in a "design task", there is no "manufacturing" associated with this learning.
Students must have an understanding of the properties and application of this group of highly specialised materials.
Where possible, students gain hands on experience through handling materials and teacher led demonstrations.

Unlike all other aspects of the Year 10 curriculum, there is no structured design & make aspect to this short topic.

Lesson Sequence:

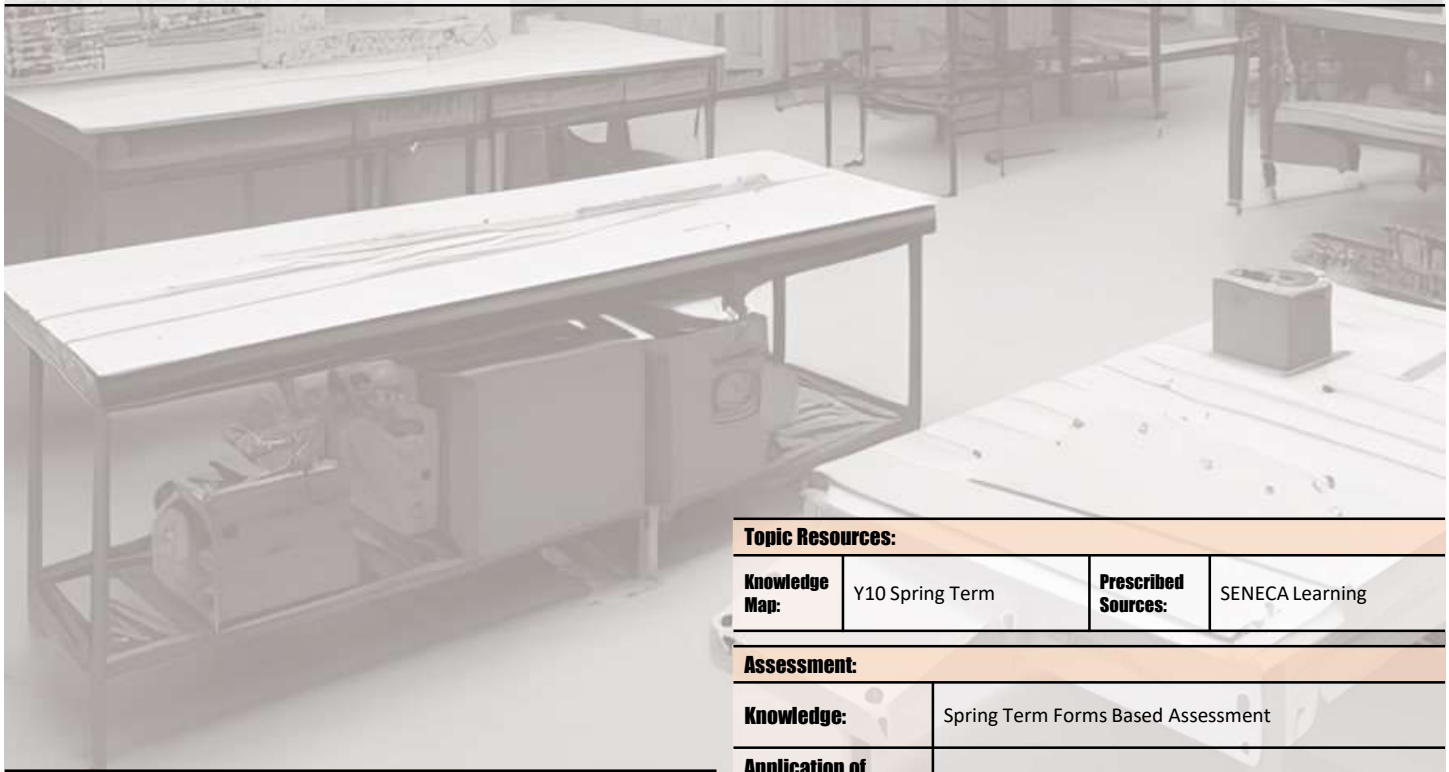
Starting with the most common stimuli for smart materials, developing an understanding the temporary nature of the changes that occur with smart materials.

Students begin to build understanding of specific material examples (SMA/Nitinol and Polymorph) – with demonstrations of both and hands on activities to develop tangible experience of the materials.

Students are next introduced to "technical textiles", all of which have ben designed to offer certain properties. There are a large number of these, of which, students should have a basic understanding. Learning about common applications makes sense of the specific properties that can be exploited by designers, to make products which perform better.

Composites and high performance materials are a category that students would rarely have the chance to use within their own designs, but offer essential knowledge. Understanding the forces/stresses some products are subjected to, clarifies the need for this extraordinary group of materials.

Finally, students are tasked with creating a custom chair concept, that incorporates this group of materials. Students are expected to exploit the materials' unique properties to make interesting and innovative designs.



Sequence of Lessons:

1	Smart Materials – Stimuli and Sample exploration
2	SMA and Nitinol
3	Design Problems/Technical Textiles knowledge
4	Composites and High performance materials
5	Smart and modern materials design task

Topic Resources:

Knowledge Map:	Y10 Spring Term	**Prescribed Sources:**	SENECA Learning

Assessment:

Knowledge:	Spring Term Forms Based Assessment
Application of Knowledge:	Short design task

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.

Scheme of Learning: Year 10 Design & Technology

Topic Sequence: Year 10 Design & Technology

1	2	3	4	5
Polymers and electronics - Alessi inspired key fob light	Paper based materials – phone stand	Group Design & Make – Solar powered mechanical toy	Smart and Modern Materials	Mini NEA Project – Moisture Sensor

Topic Overview:

This is the final topic of the Year 10 curriculum, this topic aims to recap many of the design and manufacture skills learned throughout the year, but also ready students for the NEA task, which begins in June (Summer Term 2 – Year 10).
The focus of the project is to design and manufacture a useful moisture sensor – the specific function is for the students to select.
This projects delivers knowledge on additional manufacturing methods and materials not yet utilised. There is also a focus of developing skills in communication of design thinking and presentation of work, considering making design decisions explicit, choosing relevant content, and evidencing all aspects of the design process.
Students manufacture their designs, which combine electronics, programming, heat forming polymers, timber based materials and standard components. Students are encouraged to engage in quality control checking throughout, to ensure a high quality final outcome.

Lesson Sequence:

The sequence of lessons for this project, is driven by the "design process" involved in the design and manufacture of products. Broadly, this can be described using the stages below – those in bold are covered through this topic/project. The stages for most design and manufacture projects would follow a similar chronology. For consistency throughout our Key Stage 4 curriculum, this is based upon the assessment objectives (NEA).

Students are given a design context, in a similar format as the final NEA task. Students must draw upon all of the previous design knowledge and explore the theme fully, using ACCESSFM to structure their responses. Students then create their own design brief (or modify a standard brief), which provides the direction for the rest of the project.

Students are guided through completing relevant research, which will inform their design process. This is tightly structured, to provide an excellent example to refer back to once they have begun the NEA. There is an opportunity to experiment with programming microprocessors, to take an input from their own moisture sensor and create a range of outputs. This builds a good understanding of how simple electronics can be incorporated into functional products.

Students employ a range of the taught design strategies to create a wide range of varied and interesting design ideas, before developing these to suit the prescribed manufacturing method. Students have the opportunity to produce an exploded view using two different methods, to explore their preferences in terms of communicating their design thinking. These methods are manual draughting, using construction lines and the crating method, the second is using Sketchup for Web (CAD). Both methods develop students understanding of the construction of high quality products.

Students are then taught how to plan for manufacture, with a focus upon the processes, delays and quality control necessary. Students use this planning document to determine their own manufacturing, working independently with most of the workshop tools and equipment.

Identifying opportunities
Relevant research
User wants/needs and analysis
Considered range of design problems
Design brief
Design specification
Use of design strategies and iterative design
Social Moral Economic Factors
Testing to develop designs
Fully developed design proposal

Communication techniques
Planning for manufacture
Worked with materials and components
Produce a high quality prototype
Understanding of materials
Using tools/techniques/processes/equipment
Evaluation and testing of ideas
Evaluation and testing of prototype
Further development

Sequence of Lessons:

1	Project Launch and Explore context (mind mapping)
2	Creating a design brief
3	Completing Relevant research (existing products and circuits)
4	Manufacturing Sensors and Crumble testing
5	Design Strategies: Initial Designing (User/Function focus)
6	Design Strategies: Using Mood boards
7	Design Strategies: SCAMPER
8	Vacuum Forming and Design Development
9	Exploded Views (Tracing Paper method)
10	Sketchup – Basic Exploded View (dimensions and labelling)
11	Manufacturing Planning
12	Manufacture vacuum forming "former" and sensor connector (drawing file and laser cutting)
13	Electronics: Circuit assembly
14-20	Manufacturing and finishing techniques

Topic Resources:

Knowledge Map:	Y10 Summer Term	**Prescribed Sources:**	SENECA Learning

Assessment:

Knowledge:	Summer Term Forms Based Assessment
Application of Knowledge:	Project Folder and Manufactured Prototype (NEA Assessment Sheet)

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.

Scheme of Learning: Non Exam Assessment

Topic Sequence: Year 11 Non Exam Assessment (NEA)

1	2	3	4	5
Identifying and investigating design possibilities (AO1)	Developing a design brief and specification(AO1)	Generating and developing design ideas (AO2)	Manufacturing a prototype (AO2)	Analysing and evaluating design decisions and prototypes (AO3)

Topic Overview:

This stage of the NEA requires that students investigate the contexts given on their exam paper. They need to fully explore all of the design possibilities (design problems or design opportunities.)

Students need to demonstrate that they have a good understanding of the potential design problems, and evidence this through gathering a range of data and information. Students explore the work of other designers and brands, to inform their decision making. It is also important that students engage with their potential target market, to gather their ideas and opinions.

Summarising the main outcomes from the completed research, allows students to have clarity on the direction of their project, before moving onto write their design brief and specification.

Lesson Sequence:

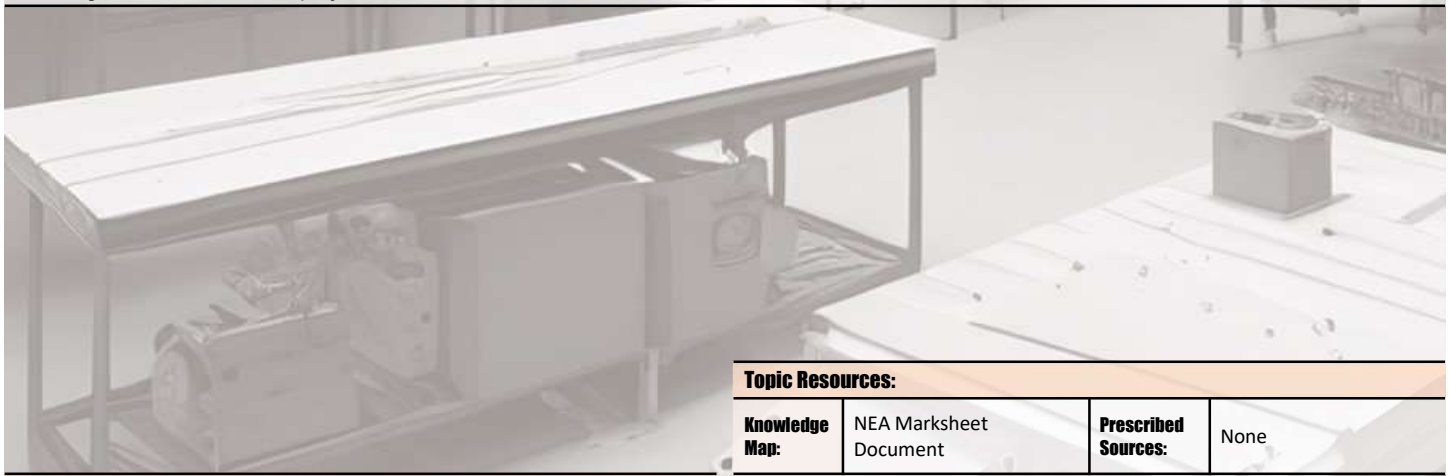
The lesson sequence is designed to enable students to meet the requirements of each Assessment Objective (each is presented as a "topic" at the top of this document). As such, the lessons will lead students through the full design and manufacture process, starting with the design contexts presented on the exam paper.

Students begin this aspect of the project by documenting their initial responses to each of the design contexts. This will include considerations of all aspects of ACCESSFM (Aesthetics, Cost, Customer, Environmental Impact, Size/Structure, Safety, Function, Materials/Manufacturing). This process leads students to consider the design problems linked to the context they might design a solution for, or alternatively design opportunities that they feel would be interesting to explore.

Considering the work of other designers or brands, that the students feels are relevant, provide students with inspiration and direction. Inspiration for forms, materials and features will inform both design brief and specification. Students then need to research into existing products, where other designers have solved similar or related problems. This allows students to really consider the functional aspects of their explored problems or opportunities.

Once students have considered a range of design problems and opportunities, they need to engage with the potential users of some suggestions, to gain insight into whether this would be a product people would be interested in, and whether they have any initial thoughts about how to make them successful and useful.

Summarising all of the learning that has taken place in the explorative phase of the design process, ensures students consolidate their thinking before finalising the direction of their project.



Sequence of Lessons:

1	Design Contexts – mind mapping
2	Design Contexts – mind mapping
3	Design Problems/Opportunities and Users
4	Survey to test design problem ideas
5	Analysis of survey results
6	Existing Design Brands/Companies
7	Existing Products
8	Summary of Design Research

Topic Resources:

Knowledge Map:	NEA Marksheet Document	**Prescribed Sources:**	None

Assessment:

Knowledge:	NEA Assessment Objectives
Application of Knowledge:	NEA Folder and manufactured prototype

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.

Scheme of Learning: Non Exam Assessment

Topic Sequence: Year 11 Non Exam Assessment (NEA)

1	2	3	4	5
Identifying and investigating design possibilities (AO1)	Developing a design brief and specification(AO1)	Generating and developing design ideas (AO2)	Manufacturing a prototype (AO2)	Analysing and evaluating design decisions and prototypes (AO3)

Topic Overview:

This stage of the NEA sets the direction for all future design and evaluation. Students have to draw together all of their learning and formalise this into a clear design brief, and also write a detailed, justified and measurable design specification.

Through a process of engaging with the target market, exploring sources of inspiration and writing a detailed and measurable design specification, students will gain clarity about the next stage of the design and manufacture process. The next stage is manufacturing a functional prototype that meets the user needs and wants, and all aspects of the design specification.

Lesson Sequence:

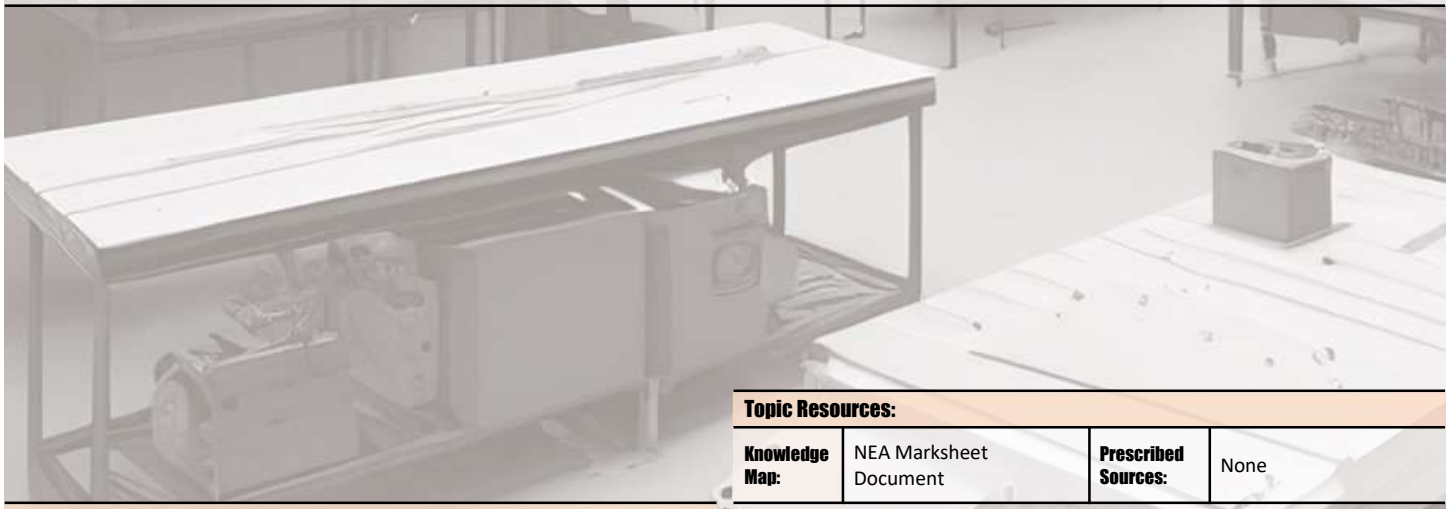
The lesson sequence is designed to enable students to meet the requirements of each Assessment Objective (each is presented as a "topic" at the top of this document). As such, the lessons will lead students through the full design and manufacture process, starting with the design contexts presented on the exam paper.

Students must bring together all aspects of their initial research to craft a design brief, that provides direction, without limiting the opportunities for creativity and innovation. It is essential that students choose their direction carefully, so that the process will be interesting, offer design challenges that must be worked at and solved.

Following the design brief students complete a further piece of target market research, to really dig into the detail of what their customer would want in a good design solution. If it is more appropriate, students may choose to carry out a user interview, this may be more suitable if the student is designing a solution for one specific customer. Some may choose to complete a hybrid piece of research if they feel there is value in completing both.

Gather sources of inspiration is an excellent way for students to collect images that they feel inspired by. It is important that students identify the details they particularly like – this may be materials, finishes, colours, textures, proportions or even the design inspiration.

The final part of this stage of the project is writing a design specification. Students must detail every aspect of their project (ACCESSFM). Students should justify each point they write, by linking back to research completed. They must also explain how they will be able to "test" if their final prototype is a success. They must ensure each point is measurable, relevant and necessary. This document provides a framework for all following work and it's completeness underpins students success. It's importance cannot be overstated.



Sequence of Lessons:

1	Writing a design brief
2	Target market questionnaire
3	Questionnaire analysis
4	Optional – User Interview
5	Moodboard and analysis
6	Design Specification – points and justification
7	Design Specification – Methods to test prototype
8	Design Specification – All aspects complete

Topic Resources:

Knowledge Map:	NEA Marksheet Document	**Prescribed Sources:**	None

Assessment:

Knowledge:	NEA Assessment Objectives
Application of Knowledge:	NEA Folder and manufactured prototype

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.

Scheme of Learning: Non Exam Assessment

Topic Sequence: Year 11 Non Exam Assessment (NEA)

1	2	3	4	5
Identifying and investigating design possibilities (AO1)	Developing a design brief and specification(AO1)	Generating and developing design ideas (AO2)	Manufacturing a prototype (AO2)	Analysing and evaluating design decisions and prototypes (AO3)

Topic Overview:

This stage of the NEA take students from a list of requirements (design specification) to a final, fully resolved design idea, ready for manufacturing.

Students must generate a large range of varied initial design ideas, before applying an iterative design process to continually evaluate and develop their designs. User feedback throughout is an essential part of meeting the assessment objectives. Students must also consider the social, moral and economic factors affecting their design development.

Students must draw upon the knowledge of materials and construction developed through both KS3 and the earlier stages of KS4. Students must explore their design thinking, using computer aided design (CAD). Building on their foundation skills and developing them further to communicate their design ideas skilfully.

Lesson Sequence:

The lesson sequence is designed to enable students to meet the requirements of each Assessment Objective (each is presented as a "topic" at the top of this document). As such, the lessons will lead students through the full design and manufacture process, starting with the design contexts presented on the exam paper.

Students begin the design idea generation through applying a wide range of design strategies, using mood boards, scrufittii and morphological analysis to help produce ideas that are more than just "typical responses". Ideas must be sketched and annotated to make clear their function, and if relevant any material choices, making any links to social, moral and economic (SME) factors that may affect their design and manufacturing.

Evaluation is expected throughout the project, but after producing a wide range of design ideas, students formally evaluate their designs against the most important aspects of the design specification. Students need to summarise the findings of their evaluation, acknowledging which designs are the most successful and any areas they will need to develop further to fully meet the requirements of the specification and user.

Students may choose to sketch and develop their designs further throughout this section of the project, but it is also helpful to model in three dimensions, using both card and computer aided design (CAD).

The card modelling stage allows students to gain an understanding of the form of their most successful design, whilst also exploring how it could be manufactured, using primarily sheet material and timber. Once again, card modelling is evaluated, against the specification and through seeking the opinions of any stakeholders.

Finally CAD is used to refine the overall form and fully resolve the construction of the design. Alongside this element of design development, students will complete research into relevant materials that can be readily sourced and easily used in the workshop facilities. Students will research common methods of construction, which can then be incorporated into the design development. Documenting the process of development, with reasoning for the decisions taken in relation to both user needs and SME factors.

Students will be ready to move to the manufacturing stage of the project once they have a fully resolved final design, materials and finishes. Exploded view detailing the size and shape of each part. Annotation to explain the planned assemble methods.

Sequence of Lessons:

1	Design Strategies – Morphological Analysis
2	Design Strategies – Scruffiti
3	Design Strategies – Mood board inspired design
4	Social, Moral and Economic Factors in Design – ongoing commentary
5	Design Ideas Evaluation and user feedback
6	Card Modelling
7	Card Modelling
8	Card Modelling Evaluation and user feedback
9	Design Development - Sketching
10	Design Development - CAD
11	Design Development - CAD
12	Materials/finishes Research
13	Construction Methods Research
14	Exploded/Assembled Final Design

Topic Resources:

Knowledge Map:	NEA Marksheet Document	**Prescribed Sources:**	None

Assessment:

Knowledge:	NEA Assessment Objectives
Application of Knowledge:	NEA Folder and manufactured prototype

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.

Scheme of Learning: Non Exam Assessment

Topic Sequence: Year 11 Non Exam Assessment (NEA)

1	2	3	4	5
Identifying and investigating design possibilities (AO1)	Developing a design brief and specification(AO1)	Generating and developing design ideas (AO2)	Manufacturing a prototype (AO2)	Analysing and evaluating design decisions and prototypes (AO3)

Topic Overview:

This stage of the project is focussed on the manufacture of a functional prototype. Students must evidence their detailed planning and manufacture a high quality practical outcome, using appropriate tools, equipment and materials.

Students must continue to reflect upon how their design will meet the user needs and specification, and continue to develop the design, should they feel it is necessary.

Lesson Sequence:

The lesson sequence is designed to enable students to meet the requirements of each Assessment Objective (each is presented as a "topic" at the top of this document). As such, the lessons will lead students through the full design and manufacture process, starting with the design contexts presented on the exam paper.

The first stage of manufacturing is to produce a comprehensive and realistic time plan. This should make refence to materials, tools and equipment and also any testing necessary to achieve a high quality, accurate prototype.

Over the next series of lessons, students must work through their plan, selecting materials, manufacturing processes, tools and equipment skilfully to build their prototype. They should refer back to their final design and specification regularly to continue to inform their manufacturing. They may need to manufacture test pieces, to trial a techniques, which they can then apply to their prototype.

This section of the project is largely driven by the students own plans and relies very little on whole class, teacher input. Where there is a need for whole class input, it is designed to suit the needs of each cohort – given that every student is manufacturing something totally unique.

Sequence of Lessons:

1	Manufacturing planning
2	Ensuring quality throughout the manufacturing process
3 - 20	Students working independently to manufacture functional prototypes

Topic Resources:

Knowledge Map:	NEA Marksheet Document	**Prescribed Sources:**	None

Assessment:

Knowledge:	NEA Assessment Objectives
Application of Knowledge:	NEA Folder and manufactured prototype

Supportive Reading:

Technology Student	technologystudent.com
Focus Education	Via the Design & Technology Curriculum Zone on the school website.