

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
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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.