

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
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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.