Rationale for Year 9 Design & Technology

In each year, the units aim to introduce students to wider designing issues alongside their designing and making. All projects have a different focus. Some projects are mostly designing; some mostly making and some are design and making. Because Knowledge is context dependent, all projects have a focus of specific knowledge within them. Simplistically, the detail in which the students can conceptualise the abstract concept of design will increase as time goes by. Across each unit and over the key stage three students will be expected to apply more detail to their designing so that by GCSE the students are able to consider the wide ranging, potential effects their designs could have on society.

What will students learn and why?

The students will study two 13 week, 13 hour modules of Design Technology. In each module, they will complete around 4 hours of independent work through homework. These modules are studies by different populations of the school at different times in the year based on their position in a carousel that is shared with Food preparation and nutrition.
The students learn the subject of Design Technology through a carousel of projects.
Module 1 – Re-usable Ergonomic Pen (3d CAD FOCUS) - In this module, the students create accounts with an industry standard software (Fusion 360) which the students can download at home and easily access their work through the "cloud file storage". Through explicit instruction, the students are taught the fundamentals of using the software. The students then leave the CAD software, engage in a design and make task of designing an ergonomic pen. Students learn a range of communication techniques alongside the skills required to make complex models. They then return to the CAD software to develop their pen design so that it can be 3D printed.
Module 2 – Sustainability and inclusive design - In this module, the students will initially learn how to read orthographic projections so that they can follow the plans and manufacture a toy car to the exact sizes presented in the orthographic projection. Interwoven during this time, the students will learn about sustainability and the impact of polymers on the environment.
The unit of work then continues with the context of developmental toys for children who have a physical disability. Students will be given various types of clothing, which will mimic what the disability feels like (For example, googles with limited transparency, and gloves with limited movement). Students will then complete product analysis of commercial products but also analyse their wooden toy.
Through a design iteration process, the students will develop a toy which is better suited for a child with a disability and the will complete the module with a four lesson period of time to manufacture their final design proposal.

How will students learn?

The sequence of lessons involves the students having lessons at the start of the sequence that are more focused towards "traditional / teacher led instruction" whereas the students are involved in an "I do, we do and you do" methodology. As the sequence continues teachers then use "Fading" to reduce their presence in

the students to increase the level of student independence in their work. Each 12 week unit of work is split into 3 or 4 week sequences and therefore with the full module there would be an "ebb and flow" of periods whereas Teaching and Learning varies backwards and forwards from teacher led and student independence.

How will students be assessed?

Knowledge and Design practice booklets are being rolled out across the KS3. Assessment will be built into the booklets with teachers assessing specific pages in the booklet every 3 to 4 lessons. Students work is assessed against a standards system and analysed through comparative judgement so that we identify students' strengths and weaknesses across different assessed pieces of work in the contexts of the units of work.
Regular online quizzes spaced throughout the module will assess the extent of students' knowledge and give them opportunity to better understand the depth of their learning.

What is the aim for learners by the end of the year in comparison to the previous year?

In Years 7 and 8, the students have worked in a variety of materials and will have a basic understanding of working safely with the tools and equipment They have been taught the basic iterative design cycle and have been given opportunities to sketch and model ideas in both years. They have been given explicit lessons in drawing isometric as have they been taught to use 2d CAD.
Year 9 aims to develop the design approaches further, alongside teach new materials and process. The students will learn how to use 3d CAD and understand parametric design. They will learn about prototype design and designing for stakeholders as well as different user groups. Students will be taught how to follow complex orthographic projections and to draw their own. They will be taught how to respond to an open ended and complex design base.