### Subject
Stage 2 Material Products (Metal Fabrication) – Full Year

### Teacher
Dave Jennings

#### Course Content

Students will complete projects working with a range of welding, cutting, machining and turning processes. Very clear instructions will be given around processes and safety, but students are increasingly responsible for the design composition of their projects and finding their own, best solutions to problems. There is an initial fabrication task which is designed to acquire skills and refine accuracy. The students’ second design investigation and development task requires them to develop their own design and formulate a process for its construction. Students are required to evaluate the effectiveness of the processes and materials they use and to propose improvements for future examples.

#### Assessment

**Skills and Assessment Task:**

**Fitting skills test - jaw retainer**

Use a single piece of metal to demonstrate production of a specified part using hand and machine (Milling) techniques. The construction requires the students to demonstrate safe application of skills and techniques, resources, equipment and materials to create a product. Students are also required to produce an evaluation of the effectiveness of their processes and skills, suggesting possible improvements to either.

**Skills and Assessment Task:**

**Lathe skills test – vise threads**

Use a single piece of metal to demonstrate proficiency at the following techniques using a metal lathe: Facing, Drilling, Turning to diameter, Chamfering, Parting, Threading, and Knurling. The construction requires the students to demonstrate safe application of skills and techniques, resources, equipment and materials to create a product.

**Materials Application Task:**

**Properties of TIG and MIG welds**

Students investigate the processes and properties of welds produced by the two different welding processes: Oxy Acetylene welding and Metal Inert Gas welding. They look at the chemical properties of the metal and gases involved, and the implications for the type of weld produced. They produce a report that outlines their specific findings and makes a recommendation for use in their own major product. A maximum of 800 words or 5 minutes of oral, or the equivalent in multimodal form.

**Major Assessment Task:**

**Design and Fabrication Task**

Students produce the product that they designed in their Folio task. They keep a product record that includes evidence of:

- development of skills
- selection and use of appropriate components, specialised processes, and production techniques
- application of knowledge and understanding to create the product
- safe and accurate use of appropriate equipment and processes
- modification of the design brief as a result of technical problems that arise
- use of materials with appropriate characteristics and properties
- ongoing reflection on ideas and procedures.

The product record is not assessed, but is used to provide evidence of modification and planning, production, and/or evaluation aspects of the design process that occur during the creation of the product.

**Folio Task:**

Product design (analysis and documentation): Students create a design brief and document their investigation and planning for their major product, based on the skills and activities outlined in the section ‘The Design Process’. The investigation part of the design process should include an investigation of the impact on individuals, society, and/or the environment of technological practices related to the type of product that the student is designing.

The combined evidence in the folio should be a maximum of 2000 words if written or a maximum of 12 minutes recorded oral documentation of the design process and evaluation, or the equivalent in multimodal form.