Engineering - Key Stage 4 Grade Descriptors

	Assessment Foci 1 – Working practices in Engineering	AF2 – Using and interpreting information	AF3 – Electrical and mechanical science	AF4 – Mathematics for Engineers	AF5 – Using CAD techniques
Grade A	Prepare a safety policy, reference legislation Evaluate a working relationship	Search for and identify valid solutions to meet identified gaps in information	Determine the work done and the power dissipated in moving a body Describe the basic construction, function and use of an electromagnetic coil	Carry out chained calculations using a scientific calculator Transpose and evaluate combined formulae	Justify the use of CAD for the production of a range of drawing types Demonstrate an ability to produce detailed and accurate drawings to a deadline
Grade B					
Grade C	Carry out a risk assessment, evaluate and make recommendations regarding emergency procedures Identify how a work activity could be improved	Identify gaps or deficiencies in the information that need to be resolved Evaluate and identify improvements in care and control procedures	Describe the conditions required for the static equilibrium of a body Determine the force on a current carrying wire in a magnetic field	Transpose and solve complex formulae, Identify the data required and determine the area / volume for compound shapes / bodies Use trigonometry to solve complex shapes in 2 and 3 dimensions	Describe methods used to overcome problems when starting up and closing down software and hardware, Describe methods used to create relevant folder and file names Describe the drawing commands used across the range of drawing types
Grade D					
Grade E	Handle materials and equipment safely, select and use PPE, Identify hazards and risk, describe emergency procedures plan and carry out engineering activities, handle materials and equipment safely, maintain good working relationships	Extract information from engineering drawings, select and use other information sources, Identify and obtain relevant drawings and related documents Complete all necessary production documents, describe care and control procedures related to documents	Define the parameters of DC electricity and magnetic fields, determine total resistance, voltage and current in series and parallel dc circuits, define parameters of static and dynamic mechanical systems Determine the resultant and equilibrant of a system of forces, determine the uniform acceleration and retardation of a body, determine the pressure at depth in a fluid	Transpose and solve simple formulae, determine the area and volume of regular shapes / bodies, perform calculations using the basic and special functions of a scientific calculator perform calculations using the basic and special functions of a scientific calculator, plot graphs for linear and non-linear relationships, solve right-angled triangles	Start up and close down CAD software and hardware, produce CAD drawings in orthographic and isometric projection, produce a circuit diagram using CAD, set up an electronic folder Store retrieve print CAD drawings, use CAD commands to modify all drawings

Engineering - Key Stage 5 Grade Descriptors

	Assessment Foci 1 – unit 2	AF2 – unit 3	AF3 – unit 4	AF4 – unit 5	AF5 – unit 6
Grade A	Identifies, explains and justifies in detail most of the activities taken on by the engineer that are specific to the engineered	A range of engineering drawings that contain a majority of detailed information needed to manufacture the design solution. The drawings make appropriate use of most of the industry standard symbols and conventions necessary to manufacture the design solution.	Successful use of the equipment with reliable data extraction to determine accurate tensile strength **and** modulus of elasticity. Fully determines and evaluates the relevant materials and determines the full effects of the structural loading.	Identifies and describes some relevant standards and regulations used with reasons for these being in place. Explains with justifications how the regulations and standards impact on the engineered product or service and the engineering activities.	Select detailed technical information from a wide range of appropriate sources, including justified scientific and/or mathematical data, where appropriate, that can be used to inform future design decisions. The specification is detailed and reflects the technical aspects of the research material. Main key points are considered and justified and can be measured and evaluated against the final prototype.
Grade B	Identifies and describes some relevant activities taken on by the engineer that are specific to the engineered product or service	A range of engineering drawings containing sufficient information to manufacture most parts of the product. The drawings display the correct selection and use of some appropriate industry standard symbols and conventions.	Successful use of the equipment with reliable data extraction to determine accurate tensile strength **or** modulus of elasticity. All the main materials properties and effects of structural loading determined.	Identifies and describes some standards and regulations that are specifically relevant to engineered product or service. Provides some explanation of how these standards and regulations influence the product and the engineering activities.	Use a range of relevant sources to gather technical information, including scientific and/or mathematical data, where appropriate, that can be used to inform future design decisions. The specification uses research material and focuses on most key points from the research. Most points are measurable and explained and can be measured and evaluate.
Grade C	Identifies some specific activities taken on by the engineer with some reference to engineered product or service	A range of recognisable engineering drawings with limited use of industry standard symbols and a limited range of appropriate drawing conventions.	Successful use of the equipment with reliable data extraction but with little understanding of processing the data to determine either tensile strength **or** modulus of elasticity. Some structural loading correctly determined.	Identifies and describes some standards and regulations that are specifically relevant to engineered product or service. Provides some explanation of how these standards and regulations influence the product and the engineering activities.	Gather information from a limited number of sources specific to the product. The specification is developed from some points identified in the research but does not contain measurable points.
Grade D	Identifies an activity taken on by the engineer with little or no reference to the engineered product or service	An engineering drawing with use of an industry standard symbol and an appropriate drawing convention.	Limited understanding of using the equipment. Data is inaccurate **and** cannot determine tensile strength and modulus of elasticity. Some aspect of structural loading determined but analysis is weak and incomplete.	Provides a list of some general standards and regulations but which are not fully relevant to the engineered product or service. States how these affect the product and the engineering activities.	Gather information from a single, general information source. The specification is limited and superficial, containing simple statements and no measurable points.
Grade E	Identifies general areas of activity taken on by the engineer	Drawing that does not comply with industry standards.	Fails to understand the process and use of data. Few aspects of structural loading determined and analysis in very weak.	Fails to identify any relevant standards.	Little to no information gathered. The specification is simple with no measurable points.