



Government of **Western Australia**
School Curriculum and Standards Authority

BUILDING AND CONSTRUCTION

GENERAL COURSE

Year 11 syllabus

IMPORTANT INFORMATION

This syllabus is effective from 1 January 2015.

Users of this syllabus are responsible for checking its currency.

Syllabuses are formally reviewed by the School Curriculum and Standards Authority on a cyclical basis, typically every five years.

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Content

Rationale	1
Course outcomes	2
Organisation	3
Structure of the syllabus	3
Organisation of content	3
Representation of the general capabilities	6
Representation of the cross-curriculum priorities	7
Unit 1	9
Unit description	9
Unit content	9
Unit 2	12
Unit description	12
Unit content	12
School-based assessment	15
Grading	16
Appendix 1 – Grade descriptions Year 11	17

Rationale

The Building and Construction General course develops students' knowledge and practical appreciation of building technologies. The course provides students with a context in which to practise and integrate their knowledge and apply it to meet community and environmental responsibilities. It develops their knowledge of environmental issues. It allows them to apply and extend mathematical knowledge and strategies for problem solving. It develops their skills in planning and management, in technical communication and in the use of information technologies. In achieving the course outcomes, students learn and practise building processes and technologies, principles of design, planning and management and social considerations.

The course nurtures environmental and community responsibility in students and promotes the importance of ongoing learning. It develops interaction and communication skills with varied audiences and fosters an understanding of teamwork. It prepares students to appreciate the continually changing conditions and expectations within building professions and encourages innovation and creativity. In dealing with issues, such as quality assurance, duty of care, time management, contract management and liability, it develops ethical practices and considerations. The course requires compliance with the *Occupational Safety and Health Act 1996* and trains students in the principles of occupational safety and health (OSH).

The course is an introduction to further studies in trades, engineering and architecture. It helps young people become informed contributors to the community through application of their knowledge and skills. The course leads to employment options, further vocational education and industry training.

Course outcomes

The Building and Construction General course is designed to facilitate achievement of the following outcomes.

Outcome 1 – Building and construction processes

Students use processes to meet human needs in building and construction.

In achieving this outcome, students:

- investigate issues, values, needs and opportunities in building and construction
- devise and generate ideas and prepare building and construction proposals
- produce solutions and manage building and construction processes
- evaluate intentions, plans and actions.

Outcome 2 – Building and construction understanding

Students understand concepts relating to materials, structures and locations required for compliance in building and construction projects.

In achieving this outcome, students:

- understand the properties and structure of materials used in construction
- understand principles of sound building practices in building construction and design
- understand orthographic, pictorial projection and model shapes, locations and arrangements related to construction.

Outcome 3 – Building and construction technology

Students apply organisational, operational and manipulative skills appropriate to using, developing and adapting building and construction technologies.

In achieving this outcome, students:

- monitor and manage construction resources
- apply building and construction procedures
- manage and safely operate equipment and use resources.

Outcome 4 – Building and construction in society

Students understand how societal expectations, cultural values, beliefs and ethical positions are interconnected in the building and construction industries.

In achieving this outcome, students:

- understand that beliefs, values and ethical positions are interconnected and impact on building and construction technologies
- consider consequences when evaluating building and construction solutions
- understand the principles and underlying standards that regulate the building and construction industry.

Organisation

This course is organised into a Year 11 syllabus and a Year 12 syllabus. The cognitive complexity of the syllabus content increases from Year 11 to Year 12.

Structure of the syllabus

The Year 11 syllabus is divided into two units, each of one semester duration, which are typically delivered as a pair. The notional time for each unit is 55 class contact hours.

Unit 1

This unit introduces students to the considerations required in building design and explores properties of common, natural or pre-made construction materials, their mechanical properties and use in construction. Students realise differences in structure and materials used. Basic plan drawing and reading is practised with application in building, in addition to the skills in areas of content, such as working with construction materials, spatial perception and computation and levelling. The unit explores processes drawn from building projects. Students work with a variety of materials and develop a range of practical skills.

Unit 2

This unit explores properties of common, natural and pre-made construction materials, their production, mechanical properties under direct loads (tension or compression) and use in construction. Concepts in space and computation are developed. Basic plan reading is practised with application in building, as well as skills in areas of content, such as working with materials, spatial perception and computation and levelling. The unit explores processes in contexts drawn from building projects. Students work with a variety of materials and develop a range of practical skills.

Each unit includes:

- a unit description – a short description of the purpose of the unit
- unit content – the content to be taught and learned.

Organisation of content

The course content is the focus of the learning program.

The course content is divided into three content areas:

- Design, planning and management
 - planning and management
 - design processes
 - drafting
- Materials
 - properties and selection
 - working with materials
- Systems
 - structures and services
 - environment and sustainability

Design, planning and management

Planning and management

Planning is an important stage in the process of construction. This includes the planning of operations, time management, quantity surveying, ordering procedures, scheduling and costing, communication of the planning process, identification of needs and issues, and, where appropriate, contingency plans. Evaluation of successful projects and the generation of new ideas help to develop innovative skills. Analysis, synthesis and evaluation are important during the planning and production of projects to inform improvements in the design and to establish what impact the project will have, both socially and environmentally.

A range of skills is needed to manage projects effectively. Such skills include risk assessment, the planning and implementation of sequences of operations and using appropriate communication skills to document project development. Effective management of a project is aided by understanding the various roles of individuals and institutions involved in tasks and stages, along with the structures that integrate these factors. The roles of professional and administrative bodies regulating industry practice and the procedures for project approvals by these bodies are integral to projects. Knowledge of financial institutions, managing the accounts of small businesses, quantity surveying, costing and tendering are required for the realisation of projects.

Project documentation (using word processing), computation and processing of information (using database and spreadsheets) are necessary skills. A competency in English for different contexts and diverse audiences is necessary for the practice of building and construction.

Design processes

Building and construction design involves choosing between several alternatives on the basis of criteria that are either explicit in the project specifications (economy, safety, functionality and environmental issues) or implicit (market trends, societal and aesthetic). Establishing project aims and strategies to develop and modify design are required to complete a design that satisfies the aims of projects. Professional and governmental standards regulate design and technology in the building and construction industries. Building and construction relies heavily on drawings to formulate and communicate aesthetics, form and structure. This requires competence in geometrical and pictorial perception and projections; the ability to apply the fundamentals of proportions and scaling in the interpretation and production of design drawings; and the ability to translate field measurements into graphical and numerical forms for drawing and calculating quantities.

The building and construction industry fulfils needs of individuals and communities. Such needs include people's need to address beauty and function in their built environment; links between style, function and economics; historical developments; and cultural and regional variations.

Drafting

The representation and communication of building and construction artefacts require the development of a perception of space and the ability to understand, reflect on and convey details of designs. This will be practised in various forms, such as sketching, freehand drawing, technical drawing, including reading of computer-aided drawing and drafting technologies, and by three-dimensional modelling, using industry-specific graphical symbols and conventions.

Surveying involves the extraction of raw information about the space of a construction project to execute the design. This includes the operation of surveying and levelling equipment, plotting plans and the use of maps. Skills in reading plans and setting up construction activities are necessary. This requires an understanding of digital/analog data acquisition and processing used in electronic measurement equipment.

Materials

Properties and selection

An understanding of the scientific nature and properties of materials underpin fundamental decisions within building and construction. This includes common materials as well as emerging materials. Identification and scientific testing of materials is conducted. Properties, such as metals, polymers, ceramics, textiles, timber, composite, organic materials and alloys are investigated. Chemical reactions and mechanical actions involved in the production and use of composite materials are studied, such as concrete, mortar, plaster, laminates and paints. The physical and mechanical properties of materials; their elasticity, tensile strength, toughness, ductility, malleability, axial (tensile and compressive) and shear strength and stress and strain, are considered and evaluated. Thermal properties of building materials are important considerations both during construction, for example, for curing of materials and metal welding, and after completion of a building, for example, for insulation, movement and safety.

The ability to select appropriate materials is developed in the course. Materials are selected for specific contexts. This involves an understanding of the nature of a material's properties, conducting scientific testing of materials and assessing the availability of materials. Materials are selected by balancing structural, economic, environmental, aesthetic and social concerns. Issues are considered, such as required thermal properties, conductivity, environmental suitability and sustainability, characteristics and properties of materials for specific purposes and aesthetic appearance and production processes.

Working with materials

Project work is used to introduce techniques and skills for the production, use and handling of construction materials. This includes composite materials (such as concrete, mortar, plaster, laminates and paints) and materials used in the welding and coating of metal structures. The control and testing of materials, either mixed on-site or prefabricated, is necessary for quality control. The effects of handling, forming and curing techniques on the properties of materials are investigated. These include the effects of time, wind, humidity and temperature on composite materials, metal welding and finishing.

The ways, advantages and limitations of combining and connecting building parts of the same or different materials in building up whole structures are examined.

Occupational safety and health practices and obligations to self and others are of prime importance. The aim is to work with various materials and machines in a safe and responsible manner.

Systems

Structures and services

Structures are defined as bodies that can resist applied forces. Scientific and mathematical principles of different types of structures are considered. Such structures may include: mass structures, skeletal structures and shells; types of loads (concentrated and distributed loads and static and dynamic loads) and equilibrium of forces; static friction; external forces and internal actions; stability; components; and resolved parts.

Water systems are necessary for the supply of water to the construction site and the completed building, and for the disposal of excess and rainwater. Supply networks for natural gas are also introduced.

Environment and sustainability

The impact of systems on the environment and its sustainability is important. The integration of environmental impacts in an ecological system is important for the planning of building and construction projects. Opportunity, cost, waste management and rehabilitation are essential in assessing the environmental impact of building projects.

Representation of the general capabilities

The general capabilities encompass the knowledge, skills, behaviours and dispositions that may assist students to live and work successfully in the twenty-first century. Teachers may find opportunities to incorporate the capabilities into the teaching and learning program for the Building and Construction General course. The general capabilities are not assessed unless they are identified within the specified unit content.

Literacy

Literacy is of fundamental importance in the study of the Building and Construction General course. Students may access design processes, building instructions, materials and technological content through a variety of print, oral, visual, spatial and electronic forms, including data books, texts, computer software, images, and written technical materials. They learn to investigate, interpret, and apply design and technology principles from a variety of sources to design solutions for tasks. They analyse and evaluate information for relevance and accuracy. They learn to monitor their own language use for accuracy in the use of design principles and technological terms. Accurate language use supports clarity of ideas, processes and explanations of design activities and the development and evaluation of functioning products.

Numeracy

Numeracy is fundamental in calculating and evaluating quantities of materials, and in the design and construction of structures. Students develop their understanding and skills of numeracy while undertaking tasks to produce, test and evaluate products. Common and specific theory continues to be studied to forge greater understanding of the scientific, mathematical and technical concepts that explain how designed and constructed products are built and function.

Information and communication technology capability

Information and communication technology (ICT) capability is important in all stages of the design process. Students use digital tools and strategies to locate, access, process and analyse information. They use ICT skills and understandings to investigate and devise design ideas. Students access information from websites and computer programs to develop design solutions. Students use computer aided drawings and computer software to design and build products.

Critical and creative thinking

Critical and creative thinking is integral to the design process. The principle of design, build and appraise is fundamental to the Building and Construction General course. Students develop understandings and skills in critical and creative thinking during periods of evaluation at numerous stages of the design and build

process. They devise plausible solutions to problems, and then through interrogation, critically assess the performance of the most efficient solution. Students identify possible weaknesses in their design solutions, and evaluate and modify the developing solution to construct a functioning product.

Personal and social capability

Personal and social capability skills are developed and practised in the Building and Construction General course with students enhancing their communication skills and participating in teamwork. Students have opportunities to work collaboratively during stages of investigation and production of products. Students develop increasing social awareness through the study of the impact of the use of materials and construction technologies in society, and on the environment.

Ethical understanding

Students have opportunities to explore and understand the diverse perspectives and circumstances that shape design processes and building methods, the actions and possible motivations of people in the past compared with those of today. Students have opportunities both independently and collaboratively to explore the values, beliefs and principles that have influenced past building designs and technological achievements, and the ethical decisions required by global design processes of today.

Intercultural understanding

Students have opportunities to explore the different beliefs and values of a range of cultural groups and develop an appreciation of the cultural diversity. Students have opportunities to develop an understanding of different contemporary perspectives with regard to design inspiration, architectural styles, building materials, energy supply and use, and design and technological influences on different groups within society, and how they contribute to individual and group actions in the contemporary world.

Representation of the cross-curriculum priorities

The cross-curriculum priorities address contemporary issues which students face in a globalised world. Teachers may find opportunities to incorporate the priorities into the teaching and learning program for the Building and Construction General course. The cross-curriculum priorities are not assessed unless they are identified within the specified unit content.

Aboriginal and Torres Strait Islander histories and cultures

Students may have opportunities to explore Aboriginal and Torres Strait Islander development and use of building technology, and the interconnectedness between technologies and identity, people, culture and Country/Place.

Asia and Australia's engagement with Asia

Students have opportunities to explore traditional, contemporary and emerging technological achievements in the countries of the Asia region. Students may explore Australia's rich and ongoing engagement with the peoples and countries of Asia to create appropriate products and services to meet personal, community, national, regional and global needs.

Sustainability

Students take action to create more sustainable patterns of living. Students can develop knowledge, understanding and skills necessary to design and build for effective sustainability.

Students focus on the knowledge, understanding and skills necessary to choose technologies and systems with regard to costs and benefits. They evaluate the extent to which the process and designed solutions embrace sustainability. Students reflect on past and current practices, and assess new and emerging technologies from a sustainability perspective.

Unit 1

Unit description

This unit introduces students to the considerations required in building design and explores properties of common, natural or pre-made construction materials, their mechanical properties and use in construction. Students realise differences in structure and materials used. Basic plan drawing and reading is practised with application in building, in addition to the skills in areas of content, such as working with construction materials, spatial perception and computation and levelling. The unit explores processes drawn from building projects. Students work with a variety of materials and develop a range of practical skills.

Unit content

This unit includes the knowledge, understandings and skills described below.

Design, planning and management

Planning and management

- the various people, trades and their roles in the construction industry
- the scope of the industry, such as in building, utilities and resource industries

Design processes

- investigate existing and similar designs using design considerations of:
 - function
 - ergonomics
 - cultural and architectural styles
- collect examples of site and project information
- identify building components
- devise design ideas using annotated graphics and sketches reviewing the design's suitability
- develop a design solution using hand generated solution drawings with conventions
- manage production of a solution, including a simple sequence of manufacture
- evaluate the result of the project against design criteria using simple statements

Drafting

- read and interpret plans
- apply fundamentals of practical geometry
 - right angles
 - triangulation
 - 3/4/5 triangles
 - level
 - squareness
 - plumbline

- use orthogonal projection and drafting conventions
- read and convert scaled drawings to actual size
- operate levelling equipment
- recognise industry specific conventions and building and construction terminology

Materials

Properties and selection

- mechanical properties in terms of:
 - hardness
 - elasticity
 - conductivity
 - flexibility
 - strength
- materials appropriate for a chosen application
- surface finishes

Working with materials

- use a variety of standard building materials, such as:
 - bricks
 - pavers
 - mortar
 - cement
 - tiles
 - steel
 - timber
 - timber framing
- develop skills in:
 - laying and finishing of simple paving
 - straight line bricklaying
 - wall and floor tiling setting out, procedure and tool usage
 - mixing of mortar, grout and cement and their correct usage
 - cleaning up procedure at completion of the activities
 - identification and production of a range of surface finishes
 - oxy welding procedure: purpose, materials and equipment
 - electric arc welding procedure: purpose, materials and equipment
 - methods of cutting and fixing timber for frame and carcass construction
 - correct use of various portable power tools, equipment and hand tools within the building and construction industry: measuring tools, cutting tools, lifting equipment
 - non-licensed plumbing activities
- identify and apply occupational safety and health (OSH) rules and regulations relating to the use of materials and processes

Systems

Structures and services

- different structures, structural components, joints and trusses
- methods for basic on-site water supply, drainage and sewerage provision

Environment and sustainability

- ways for sustainable practices in building and construction
- types of environmentally friendly alternatives in methods of building and construction

Unit 2

Unit description

This unit explores properties of common, natural and pre-made construction materials, their production, mechanical properties under direct loads (tension or compression) and use in construction. Concepts in space and computation are developed. Basic plan reading is practised with application in building, as well as skills in areas of content, such as working with materials, spatial perception and computation and levelling. The unit explores processes in contexts drawn from building projects. Students work with a variety of materials and develop a range of practical skills.

Unit content

This unit builds on the content covered in Unit 1.

This unit includes the knowledge, understandings and skills described below.

Design, planning and management

Planning and management

- the structure of the building and construction industries
- the integrated relationships between people and regulatory bodies

Design processes

- investigate different
 - design ideas
 - structural configurations
 - assembly of components
- use ICT and manual presentation skills
- devise similar design ideas using annotated graphics and sketches
- review the design's suitability against design needs, including investigation of construction methods
- generate suitable 2D drawings with conventions for designed solution
- manage production of a solution, including a simple sequence of manufacture
- evaluate the result of the project against design criteria using simple statements

Drafting

- read and draw plans utilising fundamentals of practical geometry with orthogonal projection
- estimate quantities
 - perimeter of drawn shapes
 - area of drawn shapes
 - volume of materials
- apply appropriate scaling of drawings
- operate levelling equipment

- recognise industry specific conventions
- use building and construction terminology

Materials

Properties and selection

- mechanical properties of materials under load (tension or compression)
 - hardness
 - elasticity
 - conductivity
 - flexibility
 - strength
- selection of materials based on properties appropriate for a chosen application
- alternative surface finishes

Working with materials

- use standard building materials
 - bricks
 - pavers
 - mortar
 - cement
 - tiles
 - steel
 - timber
- demonstrate
 - timber construction
 - laying and finishing paving
 - straight line bricklaying
 - wall and floor tiling: setting out, procedure and tool usage
 - mixing of mortar, grout and cement and their correct usage
 - cleaning procedures at completion of the activities
 - production of a range of surface finishes
 - oxy welding procedure: purpose, materials and equipment
 - electric arc welding procedure: purpose, materials and equipment
 - MIG welding procedure: purpose, materials and equipment
 - different types of joining methods used in building and construction
 - safe use of various portable power tools, equipment and hand tools within the building and construction industry: measuring tools, cutting tools, lifting equipment
 - non-licensed plumbing activities
 - sheet metal work, including bracing and strapping
- apply occupational safety and health (OSH) rules and regulations relating to the use of materials and processes

Systems

Structures and services

- different structures, structural components, joints and trusses
- basic on-site water supply, drainage and sewerage provision

Environment and sustainability

- cultural influences on buildings and architecture
- sustainable building and construction methods and their effect on environments

School-based assessment

The Western Australian Certificate of Education (WACE) Manual contains essential information on principles, policies and procedures for school-based assessment that needs to be read in conjunction with this syllabus.

Teachers design school-based assessment tasks to meet the needs of students. The table below provides details of the assessment types for the Building and Construction General Year 11 syllabus and the weighting for each assessment type.

Assessment table – Year 11

Type of assessment	Weighting
<p>Design</p> <p>Teachers assess research work in which students conduct and communicate an investigation. The findings can be recorded and presented in any appropriate form, such as written, graphical or multimedia, through a portfolio or journal.</p> <p>Teachers assess how students devise, develop and modify design solutions throughout the technology process.</p> <p>Types of evidence can include: design portfolio, observation checklists, evaluation tools (self or peer), journal entries, design proposal and project proposal presented using a range of communication strategies.</p>	20%
<p>Production</p> <p>Extended and manufacturing project(s) where students control, evaluate and manage processes as necessary.</p> <p>Teachers assess students' understanding, confidence and competence when using skills in building and construction processes and when managing production plans.</p> <p>Teachers also assess the manufactured product in terms of quality and finish.</p> <p>Types of evidence can include: manufactured products, building and construction tasks, journal, observation checklists and evaluation tools (self or peer).</p>	70%
<p>Response</p> <p>Students apply their knowledge and skills in responding to a series of stimuli or prompts in the following formats: verbal communications, reports/essays, tests, oral and ICT visual response.</p> <p>Types of evidence can include: verbal responses, worksheets, assignment and observation checklists.</p>	10%

Teachers are required to use the assessment table to develop an assessment outline for the pair of units (or for a single unit where only one is being studied).

The assessment outline must:

- include a set of assessment tasks
- include a general description of each task
- indicate the unit content to be assessed
- indicate a weighting for each task and each assessment type
- include the approximate timing of each task (for example, the week the task is conducted, or the issue and submission dates for an extended task).

In the assessment outline for the pair of units, each assessment type must be included at least twice. In the assessment outline where a single unit is being studied, each assessment type must be included at least once.

The set of assessment tasks must provide a representative sampling of the content for Unit 1 and Unit 2.

Assessment tasks not administered under test/controlled conditions require appropriate validation/authentication processes.

Grading

Schools report student achievement in terms of the following grades:

Grade	Interpretation
A	Excellent achievement
B	High achievement
C	Satisfactory achievement
D	Limited achievement
E	Very low achievement

The teacher prepares a ranked list and assigns the student a grade for the pair of units (or for a unit where only one unit is being studied). The grade is based on the student's overall performance as judged by reference to a set of pre-determined standards. These standards are defined by grade descriptions and annotated work samples. The grade descriptions for the Building and Construction General Year 11 syllabus are provided in Appendix 1. They can also be accessed, together with annotated work samples, through the Guide to Grades link on the course page of the Authority website at www.scsa.wa.edu.au

To be assigned a grade, a student must have had the opportunity to complete the education program, including the assessment program (unless the school accepts that there are exceptional and justifiable circumstances).

Refer to the WACE Manual for further information about the use of a ranked list in the process of assigning grades.

Appendix 1 – Grade descriptions Year 11

A	<p>Design</p> <p>Independently uses all elements of a clearly identifiable design process to devise and generate individual ideas.</p> <p>Develops solutions and processes appropriate to the specifications of the given design problem.</p> <p>Develops documentation which displays clear design progression using concept sketches that are fully annotated with appropriate terminology, showing the development of several ideas.</p> <p>Includes evidence of research into existing products and selection of materials that satisfy prescribed design criteria.</p> <p>Provides detailed working drawings, detailed lists of materials selected, a clear and logical production plan and an evaluation of construction processes and the end product against the design criteria.</p>
	<p>Production</p> <p>Independently applies correct operational procedures and effectively manages time to complete tasks on time and to an excellent standard.</p> <p>Documents accurate records of ongoing procedures and includes any modifications derived from regular evaluation of progress.</p> <p>Organises and uses appropriate tools and equipment as required to complete tasks with concern for the safety of self and others, and independently applies correct Occupational Health and Safety procedures.</p>
	<p>Response</p> <p>Clearly presents referenced research information using current and accurate terminology in a variety of suitable formats, including pictures, tables and photographs.</p> <p>Identifies and selects materials that are appropriate for a chosen application.</p> <p>Details the impact of design decisions and materials selection on society and the environment, including justified conclusions and personal interpretations.</p>
B	<p>Design</p> <p>Uses a clearly identifiable design process, which includes and explains some design issues, needs, and opportunities.</p> <p>Develops documentation which displays design progression using partially-annotated concept sketches developing ideas using appropriate terminology.</p> <p>Includes evidence of research into existing products, simple working drawings, lists of materials selected, a clear production plan and an evaluation of project processes and the end product against the design criteria.</p>
	<p>Production</p> <p>With guidance, applies operational procedures to complete tasks on time and to a high standard.</p> <p>Produces regular documentary reporting of ongoing processes as planned and takes advice and implements suggested modifications when necessary.</p> <p>Uses appropriate tools and equipment with concern for the safety of self and others, and applies correct Occupational Health and Safety procedures.</p>
	<p>Response</p> <p>Uses correct terminology in the reporting of researched information, including pictures, tables and photographs.</p> <p>Includes references for some or single sources.</p> <p>Identifies and lists materials that are appropriate for a chosen application.</p> <p>Lists several ways in which task design decisions and materials selection may affect society and the environment and includes unjustified conclusions and personal interpretations.</p>

C	<p>Design</p> <p>With assistance, uses some elements of an identifiable design process, which includes some research and investigation of similarly designed products focusing on function and cost.</p> <p>Develops documentation which shows satisfactory annotation on concept sketches with use of appropriate terminology.</p> <p>Provides some evidence of research into existing products, with some design progression towards a solution. Includes simple working drawings, lists of selected materials, a simple production plan and evaluation of the end product.</p>
	<p>Production</p> <p>With guidance, applies planned operational procedures to complete tasks to a satisfactory standard. Produces documentary reporting of major steps within the design plan and implements teacher-suggested modifications.</p> <p>Uses tools and equipment with appropriate consideration, after occasional guidance, for the safety of self and others. With teacher guidance, applies correct Occupational Health and Safety procedures.</p>
	<p>Response</p> <p>Provides reports of research information with some correct terminology, mixed with an occasional vague and irrelevant statement.</p> <p>Presents evidence of referencing.</p> <p>Lists materials that are appropriate for a chosen application.</p> <p>Lists, in general terms, ways in which task design decisions and materials selection may affect society and the environment and includes unjustified simple conclusions.</p>
D	<p>Design</p> <p>Provides limited evidence of the use of a design process or uses a highly-scaffolded design process to research features of similarly designed products in terms of function and cost.</p> <p>Develops documentation which displays little evidence of design progression, inadequate and scantily-annotated concept sketches with little or no evidence of research into existing products.</p> <p>Includes incomplete or simple sketched working drawings, lists of materials selected, a simple, poorly-sequenced production plan and a brief evaluation of the final design.</p>
	<p>Production</p> <p>With regular guidance, applies given operational procedures to complete tasks to a poor or incomplete standard, outside the time allowed, with no evidence of ongoing documentary evaluation.</p> <p>Requires close regular direction to work safely with tools and equipment.</p>
	<p>Response</p> <p>Uses limited terminology in the presentation of incomplete research information. Presents no evidence of referencing.</p> <p>Includes limited lists of materials that may be appropriate for a chosen application.</p> <p>Lists some ways in which task design decisions and materials selection may affect society and the environment, but provides few relevant conclusions.</p>
E	<p>Does not meet the requirements of a D grade and/or has completed insufficient assessment tasks to be assigned a higher grade.</p>