

## 9 8 Knowledge and Understanding - Extended GRC

<i>Learning Outcome</i>	Foundation Level (grades 6, 5)	General Level (grades 4, 3)	Credit Level (grades 2, 1)
<i>The pupil should be able to show knowledge and understanding of:</i>	The candidate can:	In addition, the candidate can:	In addition, the candidate can:
<i>1 common materials, their properties and uses;</i>	identify common materials and show knowledge of basic properties, eg by matching given materials to a list of appropriate uses;	show knowledge and understanding of properties of material, eg strength, hardness, durability, flammability, by suggesting appropriate materials for given uses;  show knowledge and understanding of the common forms in which materials are supplied, eg bars, tubes, boards, powders; <b>(deleted 1992)</b>	show detailed knowledge and understanding of properties of materials, eg by proposing and justifying the selection of materials for specified uses;
<i>2 common forms of supply and relative costs of common materials;</i>	<b>(deleted 1992)</b>	show knowledge and understanding of the relative costs of common materials;	
<i>3 manufacturing processes, their uses and applications;</i>	show knowledge of common manufacturing processes, eg by matching processes to given applications;	show knowledge and understanding of common manufacturing processes, eg by giving an outline description, or by suggesting appropriate processes for given situations;	show detailed knowledge and understanding of common manufacturing processes, eg by giving reasons for choosing a particular process;
<i>4 surface finishing;</i>	show knowledge of the basic steps in the preparation for and application of various simple finishes; state briefly why a finish is necessary;	show knowledge and understanding of surface finishing, eg by selecting appropriate finishes, or by listing in sequence the steps in preparing for and applying a finish;	show detailed knowledge and understanding of surface finishing, eg by proposing and justifying the selection of finishes;
<i>5 common hand tools, and their use;</i>	show knowledge of the use of common hand tools, eg by selecting the appropriate tool for a particular task;	show knowledge and understanding of the use of common hand tools, eg by suggesting appropriate hand tools for given uses;	show detailed knowledge and understanding of the use of common hand tools, eg by describing clearly how they may be adjusted;
<i>6 common machine tools and equipment, and their use;</i>	show knowledge of the use of common machine tools and equipment, eg by selecting the appropriate tool for a particular task;	show knowledge and understanding of the use of common machine tools and equipment, eg by suggesting appropriate machine tools or equipment for given uses; <b>(deleted 1992)</b>	show detailed knowledge and understanding of the use of common machine tools and equipment, eg by describing clearly how they may be adjusted;
<i>7 the specification of hand tools and hardware, for the purpose of purchase or selection;</i>	<b>(Deleted 1992)</b>		give a technical description, such as required for purchasing of common tools and items of hardware, eg files, screws, hack-saw blades
<i>8 the process of designing;</i>	show a basic knowledge of the process of designing, eg by arranging the steps of a simple design process;	show knowledge and understanding of the process of designing eg by preparing a design specification for a given situation;	show detailed knowledge and understanding of the process of designing, eg by explaining how a designer might tackle one particular aspect of a brief;
<i>9 the principal factors which influence design;</i>	show a basic knowledge of the factors which influence design, eg by identifying obvious design faults;	show knowledge and understanding of the factors which influence design, eg by giving reasons for making a choice from given alternatives;	show detailed knowledge and understanding of the factors which influence design, eg by appraising a given product in terms of function, proportion, appearance, economics or ergonomics.
<i>10 the stages of planning for manufacture;</i>	show a basic knowledge of planning procedures, eg by arranging the principal steps in a sequence of operations, or by completing a simple cutting list from a given drawing;	show knowledge and understanding of the stages of planning for manufacture, eg from a working drawing, plan a sequence of operations required for the manufacture of an artefact, or produce a cutting list of the materials required for an artefact;	
<i>11 safe working practices.</i>	show knowledge of safe working practices.	show knowledge and understanding of safe working practices.	

**9 9 Designing - Extended GRC**  
Learning Outcome

*The pupil should be able to:*

	Foundation Level (grades 6, 5)	General Level (grades 4, 3)	Credit Level (grades 2, 1)
	With frequent guidance, the candidate has produced a design folio which includes where appropriate:	With occasional guidance, the candidate has produced a design folio which includes where appropriate:	Showing in most cases independence, the candidate has produced a design folio which includes where appropriate;
<i>1 compile a design folio giving regard to overall structure and presentation;</i>	evidence of limited structuring and presentation;	evidence of effective structuring and presentation;	evidence of effective structuring and impressive visual impact;
<i>2 communicate information and ideas by means of sketches and drawings;</i>	simple sketches or drawings, principal dimensions where necessary;	detailed sketches or drawings, and dimensions;	well presented sketches or drawings showing dimensions and intricate detail;
<i>3 communicate information and ideas in writing using an appropriate technical vocabulary;</i>	information and ideas simply recorded in writing;	information and ideas clearly recorded in writing;	information and ideas logically sequenced and clearly recorded in writing;
<i>4 analyse a problem, situation or need to identify relevant restrictions and design considerations;</i>	evidence of investigation resulting in the identification of obvious restrictions;	evidence of investigation resulting in the identification of relevant restrictions and design considerations;	evidence of detailed investigation resulting in the identification of relevant restrictions and design considerations;
<i>5 prepare a design specification of the requirements to be met;</i>	a functional specification;	a design specification listing functional and aesthetic requirements;	a detailed design specification;
<i>6 investigate ideas for solutions to meet the specification;</i>	elementary investigation of possible solutions to meet the specification;	investigation of ideas for solutions, varying in concept or in construction;  investigation into suitability of materials and manufacturing methods;	investigation of ideas for solutions showing creative input;  investigation into choice of materials, costs and manufacturing methods; ergonomics and aesthetics;
<i>7 justify the decisions taken in arriving at a chosen solution;</i>	basic reasons for the choice of one solution;	reasons for decisions taken in arriving at a chosen solution;	well argued reasons for decisions taken in arriving at a chosen solution;
<i>8 plan the manufacture of the chosen solution;</i>	a sequence of the principal operations;  a list of the component parts;	a sequence of operations for manufacture;  a cutting list of the materials required;	a detailed sequence of operations for manufacture;  cutting list of the materials required;
<i>9 evaluate the solution.</i>	a simple statement as to the functional suitability of the solution;  a statement of problems encountered in manufacture.	a statement commenting on the success or otherwise of the design and manufacture of the artefact;  a statement suggesting improvements, if applicable.	a well argued evaluation of the final product in terms of the original specification.

**9 10 Practical Abilities - Extended GRC**

*Learning Outcomes*

*The pupil should be able to:*

	Foundation Level (grades 6, 5)	General Level (grades 4, 3)	Credit Level (grades 2, 1)
<i>1 display craftsmanship in constructing and assembling artefacts;</i>	With frequent guidance in organisation and planning, and showing due regard to safety, the candidate has produced work which demonstrates attainment of an acceptable though modest standard of craftsmanship.  In this work there is evidence of:	With occasional guidance in organisation and planning, and showing due regard to safety, the candidate has produced work which demonstrates attainment of a good standard of craftsmanship.  In this work there is evidence of:	Showing in most cases independence, initiative, good organisation, careful planning, and due regard to safety, the candidate has produced work which demonstrates attainment of a very good standard of craftsmanship.  In this work there is evidence of:
<i>2 measure and mark out accurately;</i>	sufficient accuracy in measurement, shaping and construction to produce serviceable results;	sufficient accuracy in measurement, shaping and construction to produce functionally sound results generally free from significant faults;	accuracy in measurement, shaping and construction, producing functionally sound and aesthetically pleasing results generally free of faults;
<i>3 use hand tools, machine tools and equipment skilfully and safely;</i>	some skill in the use of hand tools, machine tools and equipment;	skill in the safe use of hand tools, machine tools and equipment;	precision in the use of hand tools, machine tools and equipment;
<i>4 perform manufacturing processes skilfully and safely;</i>	some skill in carrying out manufacturing processes;	skill in carrying out manufacturing processes;	a high degree of skill in carrying out manufacturing processes;
<i>5 demonstrate appropriate finishing skills.</i>	production, where appropriate, of finished surfaces free from gross blemishes;  In assessing Practical Abilities the degree of difficulty of the tasks attempted and the amount of work done must be taken into account.	production, where appropriate, of well prepared and competently finished surfaces;  In assessing Practical Abilities the degree of difficulty of the tasks attempted and the amount of work done must be taken into account.	production, where appropriate, of well prepared surfaces finished to a very good standard.  In assessing Practical Abilities the degree of difficulty of the tasks attempted and the amount of work done must be taken into account.