Applied Science

OCR GCE Unit G630 Materials for a Purpose

Unit Recording Sheet

Please read the instructions printed at the end of this form. **One** of these sheets, suitably completed, should be attached to the assessed work of **each** candidate.

Unit Title	**11 Materials for a Purpose**	**Unit Code**	**G630**	**Session**	Jan / June	**Year**	**2**	**0**	**0**	
Centre Name					**Centre Number**					
Candidate Name					**Candidate Number**					

Evidence of selection of materials for two specified purposes and of underlying knowledge of types and properties of materials.

Criteria			**Teacher Comment**	**Page No.**
AO1(a).1: You will produce an outline of the structures of at least one example of each of polymers and metals; **[0 1]**	**AO1(a).2:** You will produce a description, with diagrams, of the structures of at least two examples of each of polymers and metals; physical properties are stated; **[2 3]**	**AO1(a).3:** You will produce a description, with diagrams, of the structures of more than two examples of each of polymers and metals, relating their structures to physical properties. **[4 5]**	**Mark**	
AO1(b).1: You will produce an outline of the structures of at least one example of each of ceramics or glasses and composite materials; **[0 1]**	**AO1(b).2:** You will produce a description, with diagrams, of the structures of at least two examples of each of ceramics or glasses and composite materials, physical properties are stated; **[2 3]**	**AO1(b).3** You will produce a description, with diagrams, of the structures of more than two examples of each of ceramics or glasses and composite materials, relating their structures to physical properties. **[4 5]**	**Mark**	
AO2(a).1: You will produce a first case study clearly stating the purpose, suggesting, from published data, at least two alternative materials and identifying the selected material with some reason given for the choice; **[0 1]**	**AO2(a).2:** You will produce a first case study clearly stating the objectives and constraints imposed by the purpose, suggesting, from published data, at least three possible alternative materials and identifying the selected material with criteria given for the choice; **[2 3]**	**AO2(a).3:** You will produce a first case study clearly stating the objectives and constraints imposed by the purpose, suggesting, from published data, at least three possible alternative materials, identifying the selected material and fully justifying the choice. **[4 5]**	**Mark**	
AO2(b).1: You will produce a second case study clearly stating the purpose, suggesting, from published data, at least two alternative materials and identifying the selected material with some reason given for the choice; **[0 1]**	**AO2(b).2:** You will produce a second case study clearly stating the objectives and constraints imposed by the purpose, including the required properties, suggesting, from published data, at least three possible alternative materials and identifying the selected material with criteria given for the choice; **[2 3]**	**AO2(b).3:** You will produce a second case study clearly stating the objectives and constraints imposed by the purpose, including the required properties, suggesting, from published data, at least three possible alternative materials, identifying the selected material and fully justifying the choice. **[4]**	**Mark**	

Criteria			Teacher Comment	Page No.
AO2(c).1: You will produce calculations, with some assistance, of tensile stress and strain, the Young modulus and toughness from a graph of force against extension and length and cross-sectional area of sample; **[0 1 2]**	**AO2(c).2:** You will produce calculations from given equations of tensile strength and strain, the Young modulus and toughness from a graph of force against extension and length and cross-sectional diameter of sample; **[3]**	**AO2(c).3:** You will produce calculations, unaided, of tensile stress and strain, the Young modulus and toughness from a graph of force against extension and cross-sectional diameter of sample. **[4]**	**Mark**	
AO3(a).1: You will produce a report on an experiment to measure how the extension of a sample varies with tension, including plan and safety precautions, a table showing one set of results, and graph; **[0 1 2 3 4]**	**AO3(a).2:** You will produce a report on an experiment to measure how the extensions of two different samples vary with tension, including your unaided plan and risk assessment, a table showing repeat sets of results, graph and calculation of gradient; **[5 6]**	**AO3(a).3:** You will produce a report on an experiment to measure how the extensions of two different samples vary with tension, including your unaided plan and risk assessment, a table showing repeat sets of results, graph and calculation of Young modulus and comments on why your samples differ. **[7 8]**	**Mark**	
AO3(b).1: You will produce a report on your design and testing of an impact testing machine, including plan and safety precautions, a description and diagram of your method, and sample results; you use basic scientific terminology correctly; **[0 1 2 3 4]**	**AO3(b).2:** You will produce a report on your design and testing of an impact testing machine, including unaided plan and safety precautions, a description and diagram of your method, sample results and a comparison with the recognised industrial standards; your report is clear and logical and uses basic scientific terminology correctly; **[5 6]**	**AO3(b).3:** You will produce a report on your design and testing of an impact testing machine, including unaided plan and safety precautions, a description and diagram of your method, improvements from initial prototype, sample results, and an assessment of its effectiveness compared with the recognised industrial standards; your report is logical and well-structured and uses correct scientific terminology throughout. **[7 8]**	**Mark**	
AO3(c).1: You will produce a report on tests you have carried out on samples you have work-hardened, annealed and tempered and control samples; **[0 1]**	**AO3(c).2:** You will produce a report on tests you have carried out on samples you have work-hardened, annealed and tempered and control samples, including a comparison of the treated and untreated samples **[2 3]**	**AO3(c).3:** You will produce a report on tests you have carried out on samples you have work-hardened, annealed and tempered and control samples, including an evaluation of whether the treatments have produced the expected result. **[4 5]**	**Mark**	
AO3(d).1: You will produce a single set of results from each of your experiments to measure the thermal conductivity of a good conductor, the electrical conductivity of a sample of resistance wire and the specific heat capacity of a metal sample, and calculated values of thermal conductivity, electrical conductivity and specific heat capacity; **[0 1]**	**AO3(d).2:** You will produce a full set of results including repeat readings from each of your experiments to measure the thermal conductivity of a good conductor, the electrical conductivity of a sample of resistance wire and the specific heat capacity of a metal sample, and calculated values of thermal conductivity, electrical conductivity and specific heat capacity and estimated uncertainty of thermal conductivity; **[2 3]**	**AO3(d).3:** You will produce a full set of results including repeat readings from each of your experiments to measure the thermal conductivity of a good conductor, the electrical conductivity of a sample of resistance wire and the specific heat capacity of a metal sample, and calculated values of thermal conductivity, electrical conductivity and specific heat capacity, and estimated uncertainty of thermal conductivity and evaluation of your result compared to 'book' value. **[4 5]**	**Mark**	
		Total/50		

If this work is a re-sit, please tick		Session and Year of previous submission	Jan / June	2	0	0		Please tick to indicate this work has been standardised internally	

Please note: This form may be updated on an annual basis. The current version of this form will be available on the OCR website (www.ocr.org.uk).
A completed Centre Authentication form CCS160 **must** accompany the MS1 when it is sent to the moderator.

Guidance on Completion of this Form

1 **One** sheet should be used for each candidate.
2 Please ensure that the appropriate boxes at the top of the form are completed.
3 Please enter *specific* page numbers where evidence can be found in the portfolio, and where possible, indicate to which part of the text in the mark band the evidence relates.
4 Circle the mark awarded for each strand of the marking criteria in the appropriate box and also enter the circled mark in the final column.
5 Add the marks for the strands together to give a total out of 50. Enter this total in the relevant box.