

Unit A511

The task for this unit is for the candidate to produce a prototype product, capable of being evaluated, and a concise portfolio of work to support the designing and modelling process.

Candidates **must** select one of the following themes as a starting point for the task.

Centres are permitted to contextualise the theme and starting point appropriately to reflect centre or community resources, and access to local business and industry that may add realism to the candidates' work.

Teachers are required to ensure that candidates do not pursue the same 'theme' for their work as submitted or intended for submission for Unit A513.

Teachers must mark the task using the marking criteria provided in Appendix B (Unit A511) of this specification.

In order to design and make their prototype product skilfully, candidates should refer to the content of Unit A514 and use designing, planning, making, materials, tools, equipment and process as appropriate.

Theme	Starting point
Model vehicles	Drive systems, chassis and steering, electronic control. Separate systems within the vehicle can be assigned to individual team members.
Animated charity boxes	Providing dynamic visual/audible feedback to the user when money is inserted.
Animated movement	Mechanical models which climb, swim or walk; they can also be used in competitions.
Travel	Games and entertainment for use during travel.
'Flash from trash'	Scrap-heap challenge, re-use materials to revive and refresh a product from another era. Could also be used with vehicles or mechanical movement.
Sport	Timing devices, count down and data collection to improve personal or team performance.
Security	Personal security devices, locking devices, alarms.
Weather	Recording temperature, sunlight, rainfall, detecting black-ice , providing greenhouse information.
Music	Musical instruments, tuning devices.
Numbers	Improving and developing board game, random number generator, counting devices.
Holding devices	Clamping materials when using power tools.
Test rigs	Testing wear in a mechanism eg drawer runners
Transport of goods	Conveyor control systems, sorting systems, moving heavy loads.

Basic ability	Demonstrates ability	Works competently with independence
<p>Creativity</p> <ul style="list-style-type: none"> • Make simple/limited links between principles of good design and technological knowledge, showing limited awareness of the user. • Identify one or two trends in existing solutions and use this understanding in a design context. <p style="text-align: right;">[0 - 3]</p>	<p>Creativity</p> <ul style="list-style-type: none"> • Identify associations linking principles of good design and technological knowledge, relating products to users' needs. • Demonstrate the significance of research that identifies trends in existing solutions; interpret and apply this understanding in a design context. <p style="text-align: right;">[4 - 7]</p>	<p>Creativity</p> <ul style="list-style-type: none"> • Identify complex associations linking principles of good design and technological knowledge, relating products to users' needs and wants. (AO1) • Demonstrate and understand the significance of trends in existing solutions; reinterpret and apply this understanding in imaginative ways. (AO1) <p style="text-align: right;">[8 - 10]</p>
<p>Designing</p> <ul style="list-style-type: none"> • Demonstrate a limited response to a brief and produce a simple specification for a prototype. • Produce one or two simple design ideas using a limited range of strategies. <p style="text-align: right;">[0 - 4]</p>	<p>Designing</p> <ul style="list-style-type: none"> • Demonstrate an appropriate response to a brief and produce a suitable specification for a prototype product as a result of analysis. • Produce creative ideas and communicate these by using appropriate strategies. <p style="text-align: right;">[5 - 10]</p>	<p>Designing</p> <ul style="list-style-type: none"> • Demonstrate an appropriate and considered response to a brief and produce a detailed specification for a prototype product as a result of analysis. (AO2) • Produce creative and original ideas by generating, developing and communicating designs using appropriate strategies. (AO2) <p style="text-align: right;">[11 - 14]</p>

Basic ability	Demonstrates ability	Works competently with independence
<p>Making</p> <ul style="list-style-type: none"> Plan and organise activities: <ul style="list-style-type: none"> Select and use appropriate materials Select and use hand and machine tools as appropriate to realise the prototype. Work safely to assemble, construct and finish materials and components as appropriate to generate a prototype. Use workshop/design studio facilities as appropriate to realise the prototype. <p>[0 - 6]</p> <ul style="list-style-type: none"> Demonstrate a simple understanding of how to solve technical problems as they arise. <p>[0 - 1]</p> <ul style="list-style-type: none"> Simply record the making of the prototype using notes and/or photographic evidence. <p>[0 - 1]</p>	<p>Making</p> <ul style="list-style-type: none"> Plan and organise activities: <ul style="list-style-type: none"> Select and use appropriate materials Select and use hand and machine tools as appropriate to realise the prototype. Work effectively and safely to assemble, construct and finish materials and components as appropriate to achieve a good quality prototype. Choose and use workshop/design studio facilities as appropriate to realise the prototype. <p>[7 - 13]</p> <ul style="list-style-type: none"> Demonstrate a practical understanding and ability in solving some technical problems as they arise. <p>[2 - 3]</p> <ul style="list-style-type: none"> Record key stages involved in the making of the prototype; provide notes and photographic evidence. <p>[2 - 3]</p>	<p>Making</p> <ul style="list-style-type: none"> Plan and organise activities: <ul style="list-style-type: none"> Select and use appropriate materials. (AO1/AO2) Select and use hand and machine tools as appropriate to realise the prototype. (AO1/AO2) Work skilfully and safely to assemble, construct and finish materials and components as appropriate to achieve a high quality prototype. (AO2) Assess and apply knowledge of the workshop/design studio facilities as appropriate to realise the prototype. (AO1/AO2) <p>[14 - 20]</p> <ul style="list-style-type: none"> Demonstrate a practical and thorough understanding and ability in solving technical problems effectively and efficiently as they arise. (AO2) <p>[4]</p> <ul style="list-style-type: none"> Record key stages involved in the making of the prototype product; provide comprehensive notes and photographic evidence. (AO2) <p>[4]</p>
<p>Critical evaluation</p> <ul style="list-style-type: none"> Give a limited evaluation of the modelling and prototyping process. There will be little or no use of specialist terms. Answers may be ambiguous or disorganised. Errors of spelling, punctuation and grammar may be intrusive. <p>[0 - 2]</p>	<p>Critical evaluation</p> <ul style="list-style-type: none"> Give an evaluation of the making process. Reflect on how to improve the modelling and prototyping process. There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There may be occasional errors in spelling, punctuation and grammar. <p>[3 - 5]</p>	<p>Critical evaluation</p> <ul style="list-style-type: none"> Critically evaluate the processes involved in designing and making the prototype. (AO3) Reflect and suggest modifications to improve the modelling and prototyping process. (AO3) Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar. <p>[6 - 8]</p>