

SAMPLE ASSIGNMENT BRIEF AND COMMENTARY

UNIT 7 - ENGINEERING THE FUTURE



Engineering

Level 1 Unit 7 Engineering the future (ENG1U7)

Sample Assignment Brief and Commentary **(Approximately fifteen hours under controlled conditions)**

Assignment Overview

Body armour is used to prevent or reduce injuries. Originally, it was mainly used by soldiers in battle. In recent times, the development of new materials and manufacturing technologies have meant that it can be used by many more people, including policemen, motorcyclists and horse riders. As new needs appear and more new materials are created, even more new types of armour are being developed.

In this assignment you will investigate the design and manufacture of body armour for a new application. Firstly, you will investigate the different materials that could be used to make the armour. Then, working as part of a team, you will investigate the use of sustainable energy resources to make the armour.

This assignment has been designed as a stand alone task for this unit.

This assignment will be taken under controlled conditions. This means that you will work under the supervision of your teacher. Where this is not possible for a task or part of a task, you will need to submit evidence from others to prove that the work is your own.

Outcomes

You will produce:

- 1 A report identifying what the armour could be made from and how it could be made
- 2 As part of a team, an information chart identifying the energy sources that could be used to make the armour
- 3 A presentation for the class, explaining how you and your team investigated the problem and explaining your recommendations

Assignment brief

You have been approached by a TV company who are planning to make a new television series. The idea behind the show is that teams of contestants will compete against each other in a 'real life' version of a combat video game. Each game will be run for 4 weeks, based on a remote island in the North Sea. For the combat, teams will be armed with high-power paintball guns.

To ensure that there are no serious injuries, the company has decided that the contestants will need to wear armour covering their whole body. Every contestant will have their own armour, tailored to their size and shape. Contestants will wear the armour for at least 12 hours per day, so it needs to be both strong and light. Any damaged armour will need to be repaired or replaced before the team can continue to the next activity – this must be done on the island, to avoid holding up filming.

The TV company have asked you to investigate what the armour could be made from and how it could be made.

The island that the show is based on does not have an electricity supply. To provide power for the workshop that will manufacture and repair the armour, a diesel-powered generator could be used. However, the diesel would need to be flown in, making the generator very expensive to run and giving safety concerns during transport. As a result, the TV company have also asked you to work as part of a team to investigate the different energy sources that could be used to power the armour workshop.

The total time allowed for assignments in this unit is approximately 15 hours. Marking of this assignment is determined by completion of the assessment grid.

You must complete the following tasks:

Task 1

(estimated time allowed: 7-8 hours)

Carry out research into the materials that could be used for the body armour and use this information to prepare a report for the TV company. The report should list a range of different materials that could be used. Some of the materials that you may want to consider include metals (e.g. steel, titanium, shape memory alloys, energy absorbent metal foams), structural composites (e.g. carbon fibre), and plastics (e.g. Kevlar). For each material, it should include:

- The main advantages and disadvantages. This should consider the weight of the armour, the strength, whether it would look good, the cost and how easy it is to repair or re-use.
- A brief explanation of the different ways that the armour could be made.
- An explanation of how it could be recycled or disposed of at the end of its usable life.
- The sources where you found the information during your research.

Your report should finish with a recommendation, with reasons, for the most suitable material and manufacturing method.

Task 2

(estimated time allowed: 4-5 hours)

This is a team activity. The team should plan and manage its activities so that all team members make an equal contribution.

Your team must investigate the different energy sources that could be used to provide power for the armour workshop and create an information chart that can be used to help the TV company make a decision. The information chart should include:

- A list of possible energy sources and a short explanation of how each of them work. This may include, for example, solar power, wind power, hydropower or bio-fuels.
- For each possible energy source, what equipment would be needed to generate power.
- The main advantages and disadvantages of each different energy source.
- How effective this method of generating power is compared to the other options.

The team should then prepare a short statement giving a recommendation, with reasons, for the energy source to be used.

Task 3

(estimated time allowed: 2-3 hours)

Using the information gathered by the group they were a member of, each team member should prepare a 5-minute PowerPoint presentation for the class. Your presentation should:

- State what you (personally) did during the team activity.
- Evaluate how effectively the team worked.
- Explain your final recommendations for the energy source for the armour workshop.

Additional Information for Teachers

Task 1 – the information in the report could be presented in a table.

Task 2 – with regards to the division of tasks by the team, one option is for each team member to investigate a different potential energy source.

Compliance to the Assessment Criteria:

- Criteria topic 1 is evidenced by Task 1.
- Criteria topic 2 is evidenced by Tasks 2 and 3 and comments on recycling and disposal options in the report for Task 1.

Commentary on Sample Assignment Brief

- Accessibility:
 - long narrative (consortia may need guidance on this), imaginative topic
- Suitability of tasks:
 - T1 asks for a list then gives it to the student
 - if a table is required (footnote) we could also provide it
 - recycling could be more clearly delineated in tasks
- Opportunity to cover assessment criteria:
 - assignment covers assessment criteria (although note comment on recycling above – you may need to high
- Balance of time:
 - seems about right. Remember though that these assignments are examples and not exemplars. Consortia will each have different requirements and issues and even AQA examples may not be suitable to their needs. You will need to consider this with the Domain Assessors
- Evidence requirements:
 - task could more specifically focus on recycling as per specification

Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of the specification.

Assessment criteria topic	Band 1	Band 2	Band 3	Mark and Comments
	The learner has:			
1 Developments in new materials and engineering technology	<p>0 to 8 marks</p> <p>Relied on easily obtainable information to describe a limited range of new materials and technologies, and their uses.</p> <p>Considered a new material or technology, and how it might be used, giving simple reasons for any choices made.</p>	<p>9 to 16 marks</p> <p>Collected and used relevant information from, a variety of sources, on new materials and technologies and their uses.</p> <p>Described the advantages of using new materials or technologies for a particular purpose; provided a valid reason for the choice made.</p>	<p>17 to 24 marks</p> <p>Produced a detailed and informative summary using a wide range of information and media; included relevant information on a wide range of new materials and technologies.</p> <p>Described the use of new materials and technologies, giving reasons for the adoption of the new material or technology; explained the advantages this adoption of new materials or technologies provides for the operation of the product.</p>	
2 Environmental issues	<p>0 to 8 marks</p> <p>Made some suggestions for energy generation or storage which were predominantly related to the limited use of a single technology.</p> <p>Mentioned sustainable systems with limited accuracy.</p> <p>Considered disposal or recycling issues.</p> <p>Made a contribution to the group's research and produced a basic evaluation of their personal performance as a team member.</p> <p>Produced a simple presentation, attempting to use some information gained by group research.</p>	<p>9 to 16 marks</p> <p>Considered a range of alternative solutions for energy generation or storage; based their choices on well informed research.</p> <p>Made choices when considering materials to ensure sustainability.</p> <p>Explained the processes used for the recycling or disposal of materials.</p> <p>Made an effective contribution to the group's research and produced an adequate evaluation of their personal performance as a team member.</p> <p>Produced an effective presentation which used some information gained by group research.</p>	<p>17 to 24 marks</p> <p>Considered and used information from a variety of sources; researched and compared several energy sources; adequately justified any decisions for the choice of energy source.</p> <p>Clearly considered alternative energy sources to ensure sustainability.</p> <p>Proposed several ways of disposing of materials at the end of their useful life.</p> <p>Made an important and effective contribution to the group's research and produced an effective evaluation of their personal performance as a team member.</p> <p>Produced a detailed and informative presentation; made good use of the information gained by group research.</p>	
Any further comments				