

Question number	Answer	Mark
1(a)	<p>An explanation that combines identification via a judgement (maximum 2 marks) to reach a conclusion via justification/reasoning, which must be linked to the judgement (maximum 2 marks):</p> <ul style="list-style-type: none"> <li>• it is lighter/has a lower density/than steel (1)</li> <li>• so it is easier/more comfortable to wear (1)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• it is stronger (1)</li> <li>• so it is less likely to be penetrated (1)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• it is more flexible (1)</li> <li>• so it is easier/more comfortable to wear (1)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• does not (corrode/rust) (1)</li> <li>• so it will last longer (1)</li> </ul>	(4)

Question number	Answer	Additional guidance	Mark
1(b)(i)	<ul style="list-style-type: none"> <li>• calculates total surface area (1)</li> <li>• calculates volume (1)</li> <li>• calculates surface area to volume ratio (1)</li> </ul>	<p><u>Example of calculation</u></p> <p>Surface area = <math>6 \times 2 \times 2 = 24 \text{ (cm}^2\text{)}</math>  Volume = <math>2 \times 2 \times 2 = 8 \text{ (cm}^3\text{)}</math>  Surface area to volume ratio = <math>24/8 = 3 : 1</math></p> <p>Award full marks for correct numerical answer without working</p>	(3)

Question number	Answer	Mark
1(b)(ii)	<p>An explanation that combines identification – application of knowledge (1 mark) and reasoning/justification – application of understanding (2 marks):</p> <ul style="list-style-type: none"> <li>• silver nanoparticles have a much greater surface area to volume ratio than powder (1)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• silver nanoparticles have a much greater surface area than the same volume of a powder (1)</li> </ul> <p>Plus</p> <ul style="list-style-type: none"> <li>• because chemical reactions take place on the surface of the solid silver catalyst (1)</li> <li>• so there will be more frequent collisions/the rate of reaction will be faster (1)</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• So in a given time, more molecules can come together to react (1)</li> </ul>	(3)