

## Nuclear-Powered Submarine Propulsion Challenge – Marking Rubric

<b>School Name:</b> _____	<b>Date:</b> _____
<b>Team Name:</b> _____	<b>Marker's Name:</b> _____
<b>Home-Schooling:</b> Yes / No (Circle)	

Achievement standards <i>Key Knowledge and Skills</i>		5	4	3	2	1	MARK
		Well Above Level	Above Level	At Level	Below level	Well Below Level	
<b>Part A</b>	<b>1. Compare the diesel-electric with the nuclear-powered propulsion system and address their capabilities.</b>	Clear, informative, and highly detailed response that compares the features of the diesel-electric propulsion system and nuclear-powered propulsion system, as well as provides images with annotations.	Clear, informative, and highly detailed response that compares the features of the diesel-electric propulsion system and nuclear-powered propulsion system.	Clear and informative response that identifies that compares the features of the diesel-electric propulsion system and nuclear-powered propulsion system.	Basic response that identifies the features of the diesel-electric propulsion system and nuclear-powered propulsion system. An attempt is made to communicate the differences.	Insufficient evidence provided to identify features of the diesel-electric propulsion system and nuclear-powered propulsion system.	
	<b>2. Outline the operational factors of both submarine propulsion systems (e.g. submarine speed, noise pollution, endurance, repairs and maintenance, etc).</b>	Clear, informative, and highly detailed response that identifies multiple operational factors of both nuclear and diesel-electric powered submarines. Links multiple factors using images.	Clear, informative, and detailed response that identifies multiple operational factors of both nuclear and diesel-electric powered submarines.	Clear, and detailed response that identifies multiple operational factors of both nuclear and diesel-electric powered submarines.	Basic response that identifies some operational factors of both nuclear and diesel-electric powered submarines.	Response attempts to identify some operational factors of both nuclear and diesel-electric powered submarines.	
	<b>3. Outline the safety factors of both submarine propulsion systems.</b>	Clear, informative, and highly detailed response that outlines multiple safety factors of both nuclear and diesel-electric powered submarines.	Clear, informative, and detailed response that outlines multiple safety factors of both nuclear and diesel-electric powered submarines.	Clear, and detailed response that outlines multiple safety factors of both nuclear and diesel-electric powered submarines.	Basic response that describes safety factors of both nuclear and diesel-electric powered submarines.	Response attempts to describe safety factors of both nuclear and diesel-electric powered submarines.	
	<b>4. From your learnings, describe potential future uses of nuclear-powered propulsion (e.g. uses in the aerospace industry).</b>	Generate and design outstanding original ideas using more than two visual representations.  Exhibit sophisticated thinking and creativity of future view.	Generate and design appropriate ideas using more than two visual representations.  Display progressive thinking and creativity, reaching a solution.	Generate and design satisfactory ideas. Utilise one appropriate graphic representations.  Demonstrate satisfactory thinking and creativity.	Generate and design vague ideas. Limited use of appropriate graphic visualisation.  Minimal evidence of creativity.	No attempt to generate and design ideas. No evident use of visualisations.  Restricted to no evidence of creativity.	
<b>Part B</b>	<b>1. With the aid of an animated diagram, demonstrate how the nuclear reactor is used to power a nuclear-powered submarine.</b>	Highly visually effective and engaging, utilising automation technology to exceptionally demonstrate how a nuclear reactor is used to power a nuclear-powered submarine.	Visually effective and engaging, utilising automation technology to notably demonstrate how a nuclear reactor is used to power a nuclear-powered submarine.	Visually effective, utilising automation technology to demonstrate how a nuclear reactor is used to power a nuclear-powered submarine.	Basic visual effectiveness and utilisation of automation technology to minimally demonstrate how a nuclear reactor is used to power a nuclear-powered submarine.	Insufficient evidence to suggest understanding of how a nuclear reactor is used to power a nuclear-powered submarine.	
	<b>2. Explain the processes in your animation, including the nuclear fission process and the principles of submarine propulsion.</b>	Outstanding interpretation of physics, utilisation of calculations, descriptive material, and advanced use of physics terminology.  More than two visual prompts used for explainer material.	Excellent interpretation of physics, utilisation of calculations, descriptive material, and good use of physics terminology.  Use of visual prompts for explainer material.	Good interpretation of physics, and calculations, and use of physics terminology.  Use of visual prompts for explainer material.	General interpretation of physics, and some use of physics terminology.  Limited use of visual prompts for explainer material.	Ineffective interpretation of physics, and no use of physics terminology.  No use of visual prompts for explainer material.	
<b>TOTAL</b>							<b>/30</b>