

Marking criteria

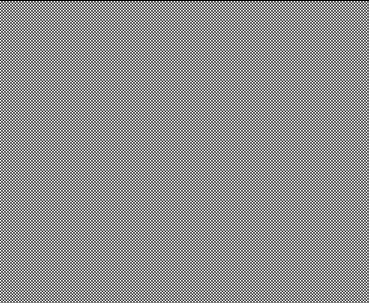
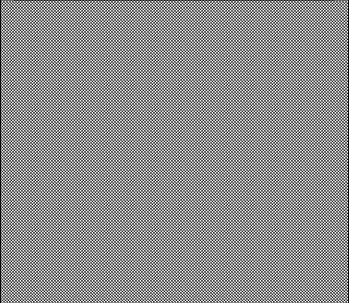
Section: Inventions

Division: Junior (7 – 8)

VELS: Level 4, progressing to level 5

Student name:

Links to VELS progression points	CRITERION	High 3	Medium 2	Low 1	NS 0
<p>VELS 4.25, 4.5</p> <ul style="list-style-type: none"> - knowledge of the function/relationship of the components of systems <p>VELS 4.25, 4.5, 4.75</p> <ul style="list-style-type: none"> - awareness of how models are used to explain scientific phenomena and processes related to matter, space, energy and/or time. - use and limitations of models and laws of science to explain scientific phenomena and processes... - group construction of a model of a device and identification of their own role in its construction - evaluation of own role in the making of a group-constructed operating model of a device, and comment on its effectiveness - understanding of different perspectives and attitudes involved in a scientific idea of issue of interest, presented through models - analysis of group effectiveness in the construction of an annotated operating model of a device, with annotations and suggestions for device refinement 	<p>Written explanation – originality Explain how the invention solves a problem and what is original or new</p>	Clear and accurate explanation of how the invention is original or new and how it solves a real problem	Clear and accurate explanation of how the invention solves a real problem but limited coverage of why it is original or new	Superficial coverage of how the invention is original or new and/or how it solves a real problem	Not done
	<p>Written explanation – scientific principles & working Explain invention clearly and accurately in terms of science behind it, how it works and the design process</p>	Clear, concise and accurate explanation of scientific principle/concept and workings of the invention in own words showing thorough understanding of the science involved.	Clear and concise explanation of scientific principle/concept and workings of the invention in own words showing good understanding of the science involved.	Basic explanation of scientific principle/concept and workings of the invention mostly in own words showing some understanding of the science involved.	Not done
	<p>Written explanation – construction details Describe how you built and tested the invention, problems encountered and how they were solved.</p>	Detailed explanation of how invention was built, problems encountered and how they were solved.	Clear explanation of how invention was built, problems encountered and how they were solved.	Basic explanation of how invention was built; may not include problems encountered and how they were solved.	Not done
	<p>Demonstration of scientific principle Invention demonstrates scientific principle(s) in illustrated, written and/or verbal expression</p>	Scientific principle is demonstrated clearly, correctly and completely	Scientific principle is demonstrated clearly and correctly but is incomplete in some aspects, or correct and complete but unclear in some aspects	Scientific principle is demonstrated superficially	Not done
	<p>Construction effort Show that you have put effort into making the invention.</p>		A working invention, well constructed, shows lots of effort, easy to operate	Poorly constructed, shows little effort, hard to operate, perhaps not working properly.	Not done
<p>VELS 4.25, 4.5, 4.75</p> <ul style="list-style-type: none"> - knowledge of the function/relationship of the components of systems - group construction of a model of a device and identification of their own role in its construction - use and limitations of models and laws of science to explain scientific phenomena and processes... - application of models and laws of science to familiar and unfamiliar situations related to matter, space, energy and/or time. 	<p>Originality and inventiveness Invention is highly original and solves a real problem</p>	Highly original or inventive and creatively solves a real problem	An original idea that uses some creative approach to solve a real problem	Original idea but lacks creative approach.	Not done

<p>VELS 4.25, 4.5, 4.75</p> <ul style="list-style-type: none"> - awareness of how models are used to explain scientific phenomena and processes related to matter, space, energy and/or time. - use and limitations of models and laws of science to explain scientific phenomena and processes... - analysis of group effectiveness in the construction of an annotated operating model of a device, with annotations and suggestions for device refinement - evaluation of own role in the making of a group-constructed operating model of a device, and comment on its effectiveness - understanding of different perspectives and attitudes involved in a scientific idea or issue of interest, presented through models 	<p>Verbal presentation Present and discuss your invention with judges.</p>	<p>Clear and accurate explanation given of principle and process of design</p>	<p>Appears to understand principle or use of invention but is not clear in all respects and/or problems in design process clearly identified.</p>	<p>Does not appear clear on the scientific principle or value of the invention</p>	<p>Not done</p>
<p>VELS 4.25, 4.5, 4.75 Science at work</p> <ul style="list-style-type: none"> - knowledge & application of basic safety procedures required for laboratory and field investigations - selection & application of appropriate safety procedures required for laboratory and field investigations - selection and application of safety procedures related to use of technical equipment in laboratory & field investigations, including risk management 	<p>Invention must be safe to operate Invention is safe to operate in a crowded area</p>	<p>Safe to operate in a crowded area, includes appropriate safety features; dangerous substances or items not used</p>			<p>Not done</p>

STS-specific & not directly related to VELS progression points

CRITERION	High 3	Medium 2	Low 1	NS 0
Written explanation – length Maximum length of four A4 pages		Within the maximum length		Not done
Size and weight of invention Model must be smaller than 0.5m x 0.5m x 0.5m and weigh less than 15 kg		Model is correct size and weight		Not done
Technical skill in construction Model is well constructed with high degree of skill	Model is very well constructed and shows high degree of skill	Model is sturdy and craftsmanship is good	Technical skill is demonstrated but craftsmanship is poor.	Not done
Ease of use Model is simple and easy to use	Simple, easy to use with little instruction required	Works with only minor coaxing and brief instruction	Difficult to use even with instructions	Not done
Resourcefulness in parts used High degree of resourcefulness demonstrated	Parts used in novel ways or high degree of resourcefulness	Parts used in novel ways but limited resourcefulness	Resourcefulness shown in some of the parts used	Not done
Export potential, promotion and protection Examine export potential, promotion methods and protecting ownership rights	Demonstrates understanding of export potential, promotion methods and protecting ownership rights	Demonstrates some understanding of export potential and/or promotion methods and/or protecting ownership rights	Demonstrates little understanding of export potential and/or promotion methods and/or protecting ownership rights	Not done
Working invention Invention is a working model		Invention is a working model		Not done
Photo of invention A photo of the invention is supplied			Photo of invention is supplied	Not done

Total score = ___ / 42