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| C:\Users\NELBATOORY\Desktop\2353_NSWED_STEM_LOGO.pngUNIT OVERVIEW In this unit students participate in project based learning to test hypotheses and solve problems through the combination of Science, Technology, Engineering and Mathematics. Students will gain hands on experience working as part of a team to design, create and test prototypes while developing their critical thinking and problem solving skills. Additionally, students will present their findings within the school community. | |
| OUTCOMESScience K-10 SC4-4WS identifies questions and problems that can be tested or researched and makes predictions based on scientific knowledge  SC4-5WS collaboratively and individually produces a plan to investigate questions and problems  SC4-6WS follows a sequence of instructions to safely undertake a range of investigation types, collaboratively and individually  SC4-7WS processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions  SC4-9WS presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations  SC4-10PW describes the action of unbalanced forces in everyday situations  SC4-11PW discusses how scientific understanding and technological developments have contributed to finding solutions to problems involving energy transfers and transformations  SC5-5WS produces a plan to investigate identified questions, hypotheses or problems, individually and collaboratively Mathematics K-10 MA4-1WM communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA5.1-2WM selects and uses appropriate strategies to solve problems  MA4-3WM recognises and explains mathematical relationships using reasoning  MA4-7NA operates with ratios and rates, and explores their graphical representation  MA5.2‑8NA solves linear and simple quadratic equations, linear inequalities and linear simultaneous equations, using analytical and graphical techniques  MA5.3-7NA solves complex linear, quadratic, simple cubic and simultaneous equations, and rearranges literal equations Technology 4.1.1 applies design processes that respond to needs and opportunities in each design project  4.1.3 identifies the roles of designers and their contribution to the improvement of the quality of life  4.2.1 generates and communicates creative design ideas and solutions  4.2.2 selects, analyses, presents and applies research and experimentation from a variety of sources  4.3.1 applies a broad range of contemporary and appropriate tools, materials and techniques with competence in the development of design projects  4.3.2 demonstrates responsible and safe use of a range of tools, materials and techniques in each design project  4.4.1 explains the impact of innovation and emerging technologies on society and the environment  4.6.1 applies appropriate evaluation techniques throughout each design project | Participants Year 7 Excel Group Unit Structure 3 periods per cycle  (a minimum of 200 minutes per fortnight)  Designated STEM Lessons |
| Metalanguage Variable, control, valid, reliable, data, graph, hypothesis, observation, inference Aboriginal and Torres Strait Islander histories and cultures The program provides students with opportunities to learn about how Aboriginal and Torres Strait Islander peoples have developed and refined knowledge about the world through observation, making predictions, testing (trial and error), and responding to environmental factors within specific contexts. |

**General Capabilities:** (See Teaching and Learning Program to identify links to General Capabilities)

Learning Across the curriculum used in this document are from the Board of Studies Teaching and Educational Standards (BOSTES) NSW <http://syllabus.bostes.nsw.edu.au/mathematics/mathematics-k10/learning-across-the-curriculum/>

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| **Cross-curriculum priorities** | |
| AHC-ICON-Aboriginal Torres Strait Islander histories-300dpi | Aboriginal and Torres Strait Islander histories and cultures |
| A-ICON-Asia Australias engagement with Asia-300dpi | Asia and Australia’s engagement with Asia |
| S-ICON-Sustainability-300dpi | Sustainability |
| **General capabilities** | |
| CCT-ICON-critical creative thinking-300dpi | Critical and creative thinking |
| EU-ICON-ethical understanding-300dpi | Ethical understanding |
| ICT-ICON-300dpi | Information and communication technology capability |
| IU-ICON-intercultural understanding-300dpi | Intercultural understanding |
| L-ICON-literacy 300dpi | Literacy |
| N-ICON-numeracy-300dpi | Numeracy |
| PSC-ICON-personal social capability-300dpi | Personal and social capability |
| **Other learning across the curriculum areas** | |
| WE-work and enterprise-300dpi | Work and enterprise |

| OUTCOMES | CONTENT | OUTLINE OF TEACHING & LEARNING ACTIVITIES | RESOURCES | REGISTRATION |
| --- | --- | --- | --- | --- |
| Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA5.1-2WM - selects and uses appropriate strategies to solve problems  MA4-3WM - recognises and explains mathematical relationships using reasoning Technology 4.1.3 -identifies the roles of designers and their contribution to the improvement of the quality of life  4.2.1 - generates and communicates creative design ideas and solutions | * the nature of the work of designers as individuals and as collaborators * use a variety of methods to generate creative design ideas for each design project | Introductory lessons (2 lessons)  1. Introduce the project *To Infinity & Beyond* (S, M). This outlines the goals and the specifications of the project. 2. Team formation: due to the size of the class, students will be placed in groups of 4. Each member of the group will then be assigned roles and responsibilities (S, M). These roles are explicitly outlined to ensure that all students participate equitably and have specific responsibility for aspects of the project. 3. Demonstration of a water rocket (TE) 4. Informal discussion of the design of the rocket components, including the design cycle. (TE) | * [Project outline](https://drive.google.com/open?id=1JYtB7ojoAng6HZ57iCgWnqs2DupWrdf6GVmyIsWm1yc) * Role statements * Portfolio information * Design cycle handout |  |
| Science K-10 SC4-10PW - describes the action of unbalanced forces in everyday situations  SC4-11PW - discusses how scientific understanding and technological developments have contributed to finding solutions to problems involving energy transfers and transformations Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA5.1-2WM - selects and uses appropriate strategies to solve problems  MA4-7NA - operates with ratios and rates, and explores their graphical representation Technology 4.2.1 - generates and communicates creative design ideas and solutions | PW1 Change to an object's motion is caused by unbalanced forces acting on the object. (ACSSU117)   1. identify changes that take place when particular forces are acting   Solve a range of problems involving ratios and rates, with and without the use of digital technologies (ACMNA188) CCT-ICON-critical creative thinking-300dpi   * communication methods including * oral presentations * digital presentations | Flight Information lesson (forces, aerodynamics, balance, weights etc.)  1. Outline the expectations of the project (what is created and submitted, including technology). Identify the success criteria for the project and how this project integrates into the student's current subjects. 2. Introduction to key ideas involved (forces, aerodynamics, balance, flight, load, projectiles, launching etc.). This is a jigsaw activity where each group is assigned a key idea. Each group researches the concept (using the chromebooks and iPads). They provide a min-presentation (using technology) to the rest of the class (approximately 5 minutes for each group). Each group is to collect information from each presentation and compile the information about each concept. | * Excellent resource to be used throughout unit – [Flight.pdf](https://drive.google.com/open?id=0B2boDvSS5L5gZHE5VFJncVNIMms) * Projectile motion handout * Terminology handouts * Chromebooks/iPads |  |
| Science K-10 SC4-5WS - collaboratively and individually produces a plan to investigate questions and problems Mathematics K-10 MA4-7NA - operates with ratios and rates, and explores their graphical representation | WS5.1 Students identify data to be collected in an investigation by:   1. identifying the purpose of an investigation   WS5.2 Students plan first-hand investigations by:   1. identifying in fair tests, variables to be controlled (held constant), measured and changed   Solve a range of problems involving ratios and rates, with and without the use of digital technologies (ACMNA188) CCT-ICON-critical creative thinking-300dpi | Scientific Method part 1 – Planning an experiment  1. Scientific method introduction 2. Each group to identify the aim of their project i.e. longest flight time, distance rocket travelled, height achieved. 3. Identifying the independent and dependant variables in an experiment. 4. Variables outlined for rocket launch (volume and inclination). | * Potential resources which may be used for this content: * PPT - [Reliability, Validity & accuracy.ppt](https://drive.google.com/open?id=0B2boDvSS5L5gckViTEFKSmpFVlU) * W/S [- Paper Planes Variables Questions.doc](https://drive.google.com/open?id=0B2boDvSS5L5gQ1V2alliUVA1UkU) * W/S – [Variables\_notes.doc](https://drive.google.com/open?id=0B2boDvSS5L5gdjA4SzI5bHh3ZFU) * W/S – [Intro Variable practice.doc](https://drive.google.com/open?id=0B2boDvSS5L5gRnBhcHFoRlRjbHM) * W/S - [A Variable Way to Practice Variables wks.doc](https://drive.google.com/open?id=0B2boDvSS5L5gTkROSjh1Q3ZHWkk) * W/S - [3 Practice experiments to identify parts wkst.doc](https://drive.google.com/open?id=0B2boDvSS5L5gTlNCQWRaZHNXRW8) * W/S - [indinvestgdlns-checklist.doc](https://drive.google.com/open?id=0B2boDvSS5L5gWnhnUGlPQ1FzQms) * W/S - [scimethodpuzzle.doc](https://drive.google.com/open?id=0B2boDvSS5L5gNy1NLWV4cWZHLTA) * W/S - [Simpsons Scientific Method.pd](https://drive.google.com/open?id=0B2boDvSS5L5gSEN6SnREN3pob00)f and [Answer sheet](https://drive.google.com/open?id=0B2boDvSS5L5gdW5VSGJvTlAtTG8) |  |
| Science K-10 SC4-11PW - discusses how scientific understanding and technological developments have contributed to finding solutions to problems involving energy transfers and transformations  SC4-4WS - identifies questions and problems that can be tested or researched and makes predictions based on scientific knowledge Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols Technology 4.2.2 -selects, analyses, presents and applies research and experimentation from a variety of sources | PW1 Change to an object's motion is caused by unbalanced forces acting on the object. (ACSSU117)   1. identify changes that take place when particular forces are acting 2. predict the effect of unbalanced forces acting in everyday situations   WS4 Students question and predict by:   1. making predictions based on scientific knowledge and their own observations (ACSIS124, ACSIS139)  * use effective research methods to identify needs and opportunities and locate information relevant to the development of each design project | AEO Presentation & ICT exploration (2 lessons)  1. Group 1: Linking projectile motion to culture e.g. spears, woomera and boomerangs. AEO to connect *To Infinity Beyond*  to cultural aspects. Explicitly outline the links between culture and forces involved. Practical experimentation with boomerangs. Students are then to predict the effect of unbalanced forces acting in everyday situations. This can be trialled with the boomerangs. 2. Group 2: A ‘how to’ use all ICT available, to extend students to use ICT beyond current applications (iPad's, iMovie, chromebooks, CAD, filming). The filming techniques and considerations (i.e. for video quality) need to be explicitly outlined. Students are then to have an orientation of the launch equipment, including safety considerations.     NB: This will be a split lesson with group 1 with the AEO and then with TAS, group 2 with TAS and then AEO. | * Boomerangs * Chromebooks & iPads * Launch equipment & basic prototype |  |
| Science K-10 SC4-7WS - processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions  SC4-9WS - presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA5.1-2WM - selects and uses appropriate strategies to solve problems  MA4-3WM - recognises and explains mathematical relationships using reasoning  MA4-7NA - operates with ratios and rates, and explores their graphical representation Technology 4.2.2 -selects, analyses, presents and applies research and experimentation from a variety of sources  4.4.1 - explains the impact of innovation and emerging technologies on society and the environment | WS7.1 Students process data and information by:   1. accessing information from a range of sources, including using digital technologies   WS7.2 Students analyse data and information by:   1. checking the reliability of gathered data and information by comparing with observations or information from other sources   WS9 Students communicate by:   1. presenting ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (ACSIS133, ACSIS148)   Solve a range of problems involving ratios and rates, with and without the use of digital technologies (ACMNA188) CCT-ICON-critical creative thinking-300dpi   * research methods * use effective research methods to identify needs and opportunities and locate information relevant to the development of each design project * identify solutions to other similar needs and opportunities * explain the impact of innovations and emerging technologies on society and the environment including new ICTs | Research (designs) and history  1. In groups research the history of rocketry with a presentation to the group. Include the date, purpose of the rocket, the result and a picture of the rocket. What are the positive and negative impacts of rocketry on society? Then have them evaluate it with respect to their own project. The research assignment must meet the minimum requirement, outlined in the handout. 2. Use this information to support the design of their own rockets i.e. design implications, safety and data collection. | * Weblinks - [History of Rocketry.doc](https://drive.google.com/open?id=0B2boDvSS5L5gQ3lpUDU5LWowWWs) * W/S - [Rocket-Ship-Milestones.doc](https://drive.google.com/open?id=0B2boDvSS5L5gcVlrakR3NzU3NjQ) * Notes – ‘[As specialist retailers of space toys’.doc](https://drive.google.com/open?id=0B2boDvSS5L5gRm11TVJ1ZU5BY3c) * [Lesson\_Plan--Flying\_Through\_Time.pdf](https://drive.google.com/open?id=0B2boDvSS5L5genY1VGFRUWVUeVk) |  |
| Science K-10 SC4-4WS identifies questions and problems that can be tested or researched and makes predictions based on scientific knowledge  SC4-5WS - collaboratively and individually produces a plan to investigate questions and problems  SC4-7WS - processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions Mathematics K-10 MA4-7NA - operates with ratios and rates, and explores their graphical representation | WS4 Students question and predict by:   1. identifying questions and problems that can be investigated scientifically (ACSIS124, ACSIS139) 2. making predictions based on scientific knowledge and their own observations (ACSIS124, ACSIS139)   WS5.2 Students plan first-hand investigations by:   1. collaboratively and individually planning a range of investigation types, including fieldwork, experiments, surveys and research (ACSIS125, ACSIS140) 2. outlining a logical procedure for undertaking a range of  investigations to collect valid first-hand data, including fair tests   WS5.3 Students choose equipment or resources for an investigation by:   1. selecting equipment to collect data with accuracy appropriate to the task (ACSIS126, ACSIS141)   WS7.2 Students analyse data and information by:   1. proposing inferences based on presented information and observations | Scientific Method part 2 – Planning an experiment  1. Scientific method continued 2. Hypothesise - flight time/ distance. 3. Students write a plan for how results will be collected. 4. Discuss observations and inferences | * W/S – [scimethodwkst.doc](https://drive.google.com/open?id=0B2boDvSS5L5gQVNSSEhjZEdJWE0) * W/S - [Writing a good hypothesis practice wkt.doc](https://drive.google.com/open?id=0B2boDvSS5L5gc2I3RlFoOC1ITVE) * W/S - [Experimental Design Disaster wks.doc](https://drive.google.com/open?id=0B2boDvSS5L5gWExQd0hhNklLVGs) * W/S - [Making Inferences half page wks.doc](https://drive.google.com/open?id=0B2boDvSS5L5gTGo4cWlnOFcwNTg) * W/S - [Overall review LS1.doc](https://drive.google.com/open?id=0B2boDvSS5L5gRVJSaFNLMllDdnc) |  |
| Science K-10 SC4-5WS - collaboratively and individually produces a plan to investigate questions and problems Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA5.1-2WM - selects and uses appropriate strategies to solve problems  MA4-3WM - recognises and explains mathematical relationships using reasoning Technology 4.1.1 -applies design processes that respond to needs and opportunities in each design project  4.2.1 -generates and communicates creative design ideas and solutions | WS5.3 Students choose equipment or resources for an investigation by:   1. identifying suitable equipment or resources to perform the task, including safety equipment and digital technologies  * design processes * communication methods including * drawings, sketches and models * written reports * sketch, draw and model to aid design development | Designing  1. Introduction of the design process. Discuss with students the importance of the design cycle in the development of their own projects, how does this help? 2. In groups design your rocket with detailed descriptions and annotated drawings. This includes identifying the materials used and also measurements. All team members to be actively involved in the design process. 3. Choose equipment/materials to be used. Specifically outline the reasons for choosing the materials and also outline the benefits of the chosen materials (create a material list that includes properties etc). | * Design process handout * Materials properties list |  |
| Science K-10 SC5-5WS - produces a plan to investigate identified questions, hypotheses or problems, individually and collaboratively Technology 4.3.2 - demonstrates responsible and safe use of a range of tools, materials and techniques in each design project | WS5.3 Students choose equipment or resources for an investigation by:   1. assessing risks and addressing ethical issues associated with these methods (ACSIS165, ACSIS199)  * the safe and responsible use of materials, tools and techniques in each design project * use tools, materials and techniques in a responsible and safe manner in each design project. | Safety lesson with equipment  1. Outline the safety implications of both the use of tools and equipment during construction (including chemical safety) and the launch itself. 2. Detailed orientation to the workshop and the tools that are available for use during the project. Safety concerns and precautions are also highlighted along with a ‘how to’. | * Introduction and orientation of workshop |  |
| Science K-10 SC4-7WS - processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA5.1-2WM - selects and uses appropriate strategies to solve problems  MA4-3WM - recognises and explains mathematical relationships using reasoning  MA4-7NA - operates with ratios and rates, and explores their graphical representation  MA5.2-8NA - solves linear and simple quadratic equations, linear inequalities and linear simultaneous equations, using analytical and graphical techniques  MA5.3-7NA - solves complex linear, quadratic, simple cubic and simultaneous equations, and rearranges literal equation | WS7.1 Students process data and information by:   1. using a range of representations to organise data, including graphs, keys, models, diagrams, tables and spreadsheets 2. extracting information from diagrams, flowcharts, tables, databases, other texts, multimedia resources and graphs including histograms and column, sector and line graphs   Solve a range of problems involving ratios and rates, with and without the use of digital technologies (ACMNA188) CCT-ICON-critical creative thinking-300dpi  Substitute values into formulas to determine an unknown (ACMNA234)   * solve equations arising from substitution into formulas   + substitute into formulas from other strands of the syllabus or from other subjects to solve problems and interpret solutions (Problem Solving)   Rearrange literal equations   * change the subject of formulas, including examples from other strands and other learning areas | Lesson on distance, speed, nets/ developments etc.  1. Focus on the mathematics required during the project. This includes rearranging formulas, substituting into formulas, rates, ratios, distance, speed, time, conversion of units and other calculations required. 2. Graphing and tabulating tools are also explored, including graphing results and presenting information visually. | * W/S - [Motion WS.doc](https://drive.google.com/open?id=0B2boDvSS5L5gYzBFOFBrUTM4X28) * W/S - [Hookworm graph.doc](https://drive.google.com/open?id=0B2boDvSS5L5gUTJuTGw5cUlaQWM) * Examples of how to rearrange formulas |  |
| Science K-10 SC4-7WS - processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA5.1-2WM - selects and uses appropriate strategies to solve problems  MA4-3WM - recognises and explains mathematical relationships using reasoning  MA4-7NA - operates with ratios and rates, and explores their graphical representation Technology 4.2.2 -selects, analyses, presents and applies research and experimentation from a variety of sources | WS7.1 Students process data and information by:   1. using a range of representations to organise data, including graphs, keys, models, diagrams, tables and spreadsheets 2. extracting information from diagrams, flowcharts, tables, databases, other texts, multimedia resources and graphs including histograms and column, sector and line graphs   Solve a range of problems involving ratios and rates, with and without the use of digital technologies (ACMNA188) CCT-ICON-critical creative thinking-300dpi  Investigate, interpret and analyse graphs from authentic data (ACMNA180) L-ICON-literacy 300dpi   * experimentation and testing of design ideas | Lesson on distance, speed, nets etc.  1. Focus on projectile motion including graphing applications. (Full flight) 2. Graph projectile motion 3. Activity to determine the altitude of a rocket | * W/S [Practice graph with temperature of cans wkst.doc](https://drive.google.com/open?id=0B2boDvSS5L5gSGZYb1NwTlNuZkU) * W/S [All about graphs and practice wkst.doc](https://drive.google.com/open?id=0B2boDvSS5L5gWmJrVGdmTXhVMzA) * ACTIVITY – [ElementaryAltitudeFinder.doc](https://drive.google.com/open?id=0B2boDvSS5L5geUtLQjA5Q2YxY0k) |  |
| Science K-10 SC4-6WS - follows a sequence of instructions to safely undertake a range of investigation types, collaboratively and individually Mathematics K-10 MA4-3WM - recognises and explains mathematical relationships using reasoning  MA4-7NA - operates with ratios and rates, and explores their graphical representation Technology 4.3.1-applies a broad range of contemporary and appropriate tools, materials and techniques with competence in the development of design projects  4.3.2 - demonstrates responsible and safe use of a range of tools, materials and techniques in each design project | WS6 Students conduct investigations by:   1. assembling and using appropriate equipment and resources to perform the investigation, including safety equipment   Solve a range of problems involving ratios and rates, with and without the use of digital technologies (ACMNA188) CCT-ICON-critical creative thinking-300dpi   * risk management strategies * responsible behaviour in working environments * Work Health and Safety practices * the safe and responsible use of materials, tools and techniques in each design project | Designing and creating rocket (including launching device and timing devices)  1. In teams begin constructing the rocket. All team members to be involved. 2. Correct any design faults as construction proceeds. Record any modifications during construction. | * Workshop * Materials * Chromebooks * iPads |  |
| Science K-10 SC4-6WS - follows a sequence of instructions to safely undertake a range of investigation types, collaboratively and individually Mathematics K-10 MA4-7NA - operates with ratios and rates, and explores their graphical representation Technology 4.6.1 - applies appropriate evaluation techniques throughout each design project | WS6 Students conduct investigations by:   1. collaboratively and individually conducting a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (ACSIS125, ACSIS140) 2. following the planned procedure, including in fair tests, measuring and controlling variables (ACSIS126, ACSIS141) 3. recording observations and measurements accurately, using appropriate units for physical quantities 4. performing specific roles safely and responsibly when working collaboratively to complete a task within the timeline 5. assessing the method used and identifying improvements to the method (ACSIS131, ACSIS146)   Solve a range of problems involving ratios and rates, with and without the use of digital technologies (ACMNA188) CCT-ICON-critical creative thinking-300dpi   * developing criteria for success as a tool for assessing design development and production * ongoing evaluation of design ideas and decisions | 1st Trial Launch, Reflect/refine/ redesign (2 lessons)  1. Teams trial their design and record results. 2. Evaluate the launch including any adjustments to design and launch (e.g. angle). In teams reflect on the design and success of the launch. Record results and reflection of first launch for possible modifications. 3. Redesign elements of the rocket to improve design. Documentation of these is vital. 4. Analyse preliminary results. Compare this to the original project outline and the success criteria. | * Launching device & air compressor * Measuring devices * iPads |  |
| 2nd Trial Launch, Reflect/refine/ redesign (2 lessons)  1. Teams trial their design and record results 2. Evaluate the launch including any adjustments to design and launch (e.g. angle). In teams reflect on the design and success of the launch. Record results and reflection of the launch for possible modification 3. Redesign elements of the rocket to improve design. Documentation of these is vital. 4. Analyse preliminary results. Compare this to the original project outline and the success criteria. | * Launching device & air compressor * Measuring devices * iPads |  |
| FINAL Launch  1. Final launch. Invite Principal, AEO, publicity officer, Director, media and P and C. (Letter of invitation). Guests to choose a “People’s choice award” recipient. 2. Launch final design and record results. |  |  |
| Science K-10 SC4-9WS - presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols Technology 4.2.1 - generates and communicates creative design ideas and solutions | WS9 Students communicate by:   1. using appropriate text types in presentations, including a discussion, explanation, exposition, procedure and recount L-ICON-literacy 300dpi  * communication methods including * drawings, sketches and models * written reports | Scientific Method part 3 – Writing a scientific report  1. Identify correct format for writing a scientific report 2. Identify type of results which are presented in a scientific report. 3. ACTIVITY – Elasti launcher – mission to mars | * W/S - [Draft Scientific Report.doc](https://drive.google.com/open?id=0B2boDvSS5L5gYlZXMW52ck56TU0) * [Thinking Metrically wkst.doc](https://drive.google.com/open?id=0B2boDvSS5L5gQ1doQklOcm1yQ2s) * [HS\_MissionToMars.doc](https://drive.google.com/open?id=0B2boDvSS5L5gcWVqTEhwMXlmcU0) |  |
| Science K-10 SC4-7WS - processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions  SC4-9WS - presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols Technology 4.2.1 - generates and communicates creative design ideas and solutions | WS7.1 Students process data and information by:   1. summarising data from students' own investigations and secondary sources (ACSIS130, ACSIS145) 2. using a range of representations to organise data, including graphs, keys, models, diagrams, tables and spreadsheets 3. applying simple numerical procedures, eg calculating means when processing data and information, as appropriate   WS7.2 Students analyse data and information by:   1. checking the reliability of gathered data and information by comparing with observations or information from other sources 2. constructing and using a range of representations, including graphs, keys and models to represent and analyse patterns or relationships, including using digital technologies as appropriate (ACSIS129, ACSIS144) 3. using scientific understanding to identify relationships and draw conclusions based on students' data or secondary sources (ACSIS130, ACSIS145)   WS9 Students communicate by:   1. constructing and using a range of representations to honestly, clearly and/or succinctly present data and information including diagrams, keys, models, tables, drawings, images, flowcharts, spreadsheets and databases 2. constructing and using the appropriate type of graph (histogram, column, sector or line graph) to express relationships clearly and succinctly, employing digital technologies as appropriate  * use a design folio to record and reflect on design ideas and decisions | Results- create/edit videos and portfolio  1. Teams work collaboratively to edit their footage and to collate/create/complete their portfolios. 2. Analyse data and present in a scientific format | * presentation requirements document |  |
| Science K-10 SC4-9WS - presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations Mathematics K-10 MA4-1WM - communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols  MA5.1-2WM - selects and uses appropriate strategies to solve problems  MA4-3WM - recognises and explains mathematical relationships using reasoning Technology 4.2.1 - generates and communicates creative design ideas and solutions | WS9 Students communicate by:   1. presenting ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (ACSIS133, ACSIS148) 2. constructing and using a range of representations to honestly, clearly and/or succinctly present data and information including diagrams, keys, models, tables, drawings, images, flowcharts, spreadsheets and databases 3. constructing and using the appropriate type of graph (histogram, column, sector or line graph) to express relationships clearly and succinctly, employing digital technologies as appropriate  * communication methods including * drawings, sketches and models * written reports * oral presentations * digital presentations * communication methods suitable for specific audiences including * users and clients * technical experts * peers | Presentations  1. Teams to finalise findings and scientific report. 2. Teams will then need to work together to develop a means to present their project, including findings, modification and design considerations. Outline of minimum requirements handed out and discussed. All students to be involved, as per their roles. 3. Teams to present their work (including findings) to the rest of the class. The mode of presentation is up to each individual team (use of technology will be encouraged and supported). 4. Presentation to include process of rocket design, testing and summary of final results, including graphical representation of data, and improvements for a future design. | * presentation requirements document |  |
| Whole school presentation (assembly)  1. The final presentations will take place with special guests, including the Curriculum Advisor, Principal, parents and the community. 2. Guests to review the presentations using the handout. |  |  |
| EVALUATION | | | | |



