

## Australian Curriculum Links

Wind Tubes is an open-ended play activity for children of all ages. There are opportunities for it to form the basis of inquiry in several Primary and Middle School subjects. Wind Tubes initially engages students with surprise and curiosity and then leads into creative thinking, design, and working with the properties of a range of materials. The curriculum links identified below – in **Technology**, **Visual Art**, **Science** and **Critical and Creative Thinking** – are, for the most part, inherent in the process of creating and testing a flying object with little or no direction. Some learning outcomes need to be drawn out through formative questioning by a teacher or facilitator. Many outcome descriptors offer potential for extension activities both in the Children’s Gallery and on returning to the classroom. Wind Tubes also has the potential to be used as a starting point for activities across other learning areas such as **English**, **History**, **Dance** and **Music**. It could also link effectively with studies in **Sustainability** (a cross-curriculum priority) in relation to the use of recycled materials and harnessing wind as an energy source.

| Year Level              | Learning Area: Technology<br>Design and Technologies   | Learning Area: The Arts<br>Visual Art  | Learning Area:<br>Science  | General Capabilities:<br>Critical and Creative Thinking  |
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| Foundation to<br>Year 2 | <p><b>Knowledge and understanding<br/>Technologies Contexts</b></p> <p><i>Engineering principles and systems</i><br/>2.2 Explore how technologies use forces to create movement in products</p> <p><i>Materials and technologies specialisations</i><br/>2.4 Explore the characteristics and properties of materials and components that are used to produce designed solutions</p> <p><b>Processes and production skills<br/>Creating designed solutions by:</b></p> <p><i>Investigating</i><br/>2.5 Explore needs or opportunities for designing and the technologies needed to realise designed solutions</p> | <p><b>Developing understanding of practices</b><br/>2.2 Use and experiment with different materials, techniques, technologies and processes to make artworks</p> <p><b>Sharing artworks through performance, presentation or display</b><br/>2.3 Create and display artworks to communicate ideas to an audience</p> | <p><b>Science as a Human Endeavour</b></p> <p><i>Nature and development of science</i><br/>Science involves exploring and observing the world using the senses</p> <p><b>Science Inquiry Skills</b></p> <p><i>Questioning and predicting</i><br/>Respond to questions about familiar objects and events</p> <p><i>Planning and conducting</i><br/>Explore and make observations by using the senses</p> <p><i>Communicating</i><br/>Share observations and ideas</p> | <p><b>Inquiring – identifying, exploring and organising information and ideas</b></p> <p><i>Pose questions</i><br/>Pose questions to identify and clarify issues, and compare information in their world. <b>Example:</b> asking how and why certain actions and events occurred in the Wind Tubes</p> <p><i>Identify and clarify information and ideas</i><br/>Exploring patterns and similarities</p> <p><b>Generating ideas, possibilities and actions</b></p> <p><i>Imagine possibilities and connect ideas</i><br/>Build on what they know to create ideas and possibilities in ways that are new to them. <b>Example:</b> using the shape of a helicopter or parachute</p> |

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| <p><b>Foundation to Year 2 continued</b></p> | <p><i>Producing</i><br/>2.7 Use materials, components, tools, equipment and techniques to safely make designed solutions</p> <p><i>Evaluating</i><br/>2.8 Use personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment</p> |  |  | <p><i>Consider alternatives</i><br/>Identify and compare creative ideas to think broadly about a given situation or problem. <b>Example:</b> how to slow down flight of an object in Wind Tube</p> <p><i>Seek solutions and put ideas into action</i><br/>Investigate options and predict possible outcomes when putting ideas into action</p> <p><b>Reflecting on thinking and processes</b></p> <p><i>Think about thinking (metacognition)</i><br/>Describe the thinking strategies used in given situations and tasks</p> <p><i>Reflect on processes</i></p> <p><i>Transfer knowledge into new contexts</i><br/>Use information from a previous experience to inform a new idea.<br/><b>Example:</b> applying reasons for actions previously given to similar new situations</p> <p><b>Analysing, synthesising and evaluating reasoning and procedures</b></p> <p><i>Apply logic and reasoning</i><br/>Identify reasoning used in choices or actions in specific situations. <b>Example:</b> asking what course of action was most logical and why</p> <p><i>Draw conclusions and design a course of action</i></p> <p><i>Evaluate procedures and outcomes</i><br/>Evaluate whether they have accomplished what they set out to achieve</p> |
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| <p><b>Years 3 and 4</b></p> | <p><b>Knowledge and understanding Technologies Contexts</b></p> <p><i>Engineering principles and systems</i><br/>4.2 Investigate how forces and the properties of materials affect the behaviour of a product or system</p> <p><i>Materials and technologies specialisations</i><br/>4.4 Investigate the suitability of materials, components, systems, tools and equipment for a range of purposes</p> <p><b>Processes and production skills<br/>Creating designed solutions by:</b></p> <p><i>Investigating</i><br/>4.5 Critique needs or opportunities for designing and explore and test a variety of materials, components, tools and equipment and the techniques needed to produce designed solutions</p> <p><i>Producing</i><br/>4.7 Select and use materials, components, tools and equipment using safe work practices to make designed solutions</p> <p><i>Evaluating</i><br/>4.8 Evaluate design ideas, processes and solutions based on criteria for success developed with guidance and including care for the environment</p> | <p><b>Developing understanding of practices</b><br/>4.2 Use materials, techniques and processes to explore visual conventions when making artworks</p> <p><b>Sharing artworks through performance, presentation or display</b><br/>4.3 Present artworks and describe how they have used visual conventions to represent their ideas</p> | <p><b>Science as a Human Endeavour</b></p> <p><i>Nature and development of science</i><br/>Science involves asking questions about, and describing changes in, objects and events</p> <p><b>Science Inquiry Skills</b></p> <p><i>Questioning and predicting</i><br/>Respond to and pose questions, and make predictions about familiar objects and events</p> <p><i>Planning and conducting</i><br/>Participate in different types of guided investigations to explore and answer questions, such as manipulating materials, testing ideas, and accessing information sources<br/>Use informal measurements in the collection and recording of observations,</p> <p><i>Communicating</i><br/>Represent and communicate observations and ideas in a variety of ways such as oral and written language, drawing and role play</p> | <p><b>Inquiring – identifying, exploring and organising information and ideas</b></p> <p><i>Pose questions</i></p> <p><i>Identify and clarify information and ideas</i></p> <p><b>Generating ideas, possibilities and actions</b></p> <p><i>Imagine possibilities and connect ideas</i></p> <p><i>Consider alternatives</i></p> <p><i>Seek solutions and put ideas into action</i></p> <p><b>Reflecting on thinking and processes</b></p> <p><i>Think about thinking (metacognition)</i></p> <p><i>Reflect on processes</i></p> <p><i>Transfer knowledge into new contexts</i></p> <p><b>Analysing, synthesising and evaluating reasoning and procedures</b></p> <p><i>Apply logic and reasoning</i></p> <p><i>Draw conclusions and design a course of action</i></p> <p><i>Evaluate procedures and outcomes</i></p> |
| <p><b>Years 5 and 6</b></p> | <p><b>Knowledge and understanding Technologies Contexts</b></p> <p><i>Engineering principles and systems</i></p>   | <p><b>Developing understanding of practices</b><br/>6.2 Develop and apply techniques and processes when making their artworks</p>   | <p><b>Science as a Human Endeavour</b></p> <p><i>Nature and development of science</i><br/>Science involves making predictions</p>  | <p><b>Inquiring – identifying, exploring and organising information and ideas</b></p> <p><i>Pose questions</i></p>   |

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| <p><b>Years 5 and 6 continued</b></p> | <p>6.2 Investigate how forces or electrical energy can control movement, sound or light in a designed product or system</p> <p><i>Materials and technologies specialisations</i></p> <p>6.5 Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use</p> <p><b>Processes and production skills</b><br/><b>Creating designed solutions by:</b></p> <p><i>Investigating</i></p> <p>6.6 Critique needs or opportunities for designing and investigate materials, components, tools, equipment and processes to achieve intended designed solutions</p> <p><i>Producing</i></p> <p>6.8 Apply safe procedures when using a variety of materials, components, tools, equipment and techniques to make designed solutions</p> <p><i>Evaluating</i></p> <p>6.9 Negotiate criteria for success that include consideration of sustainability to evaluate design ideas, processes and solutions</p> | <p><b>Sharing artworks through performance, presentation or display</b></p> <p>6.3 Plan the display of artworks to enhance their meaning for an audience</p>  | <p>and describing patterns and relationships</p> <p><b>Science Inquiry Skills</b></p> <p><i>Questioning and predicting</i><br/>With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge</p> <p><i>Planning and conducting</i><br/>Suggest ways to plan and conduct investigations to find answers to questions<br/>Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate</p> <p><i>Communicating</i><br/>Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports</p> | <p><i>Identify and clarify information and ideas</i></p> <p><b>Generating ideas, possibilities and actions</b></p> <p><i>Imagine possibilities and connect ideas</i></p> <p><i>Consider alternatives</i></p> <p><i>Seek solutions and put ideas into action</i></p> <p><b>Reflecting on thinking and processes</b></p> <p><i>Think about thinking (metacognition)</i></p> <p><i>Reflect on processes</i></p> <p><i>Transfer knowledge into new contexts</i></p> <p><b>Analysing, synthesising and evaluating reasoning and procedures</b></p> <p><i>Apply logic and reasoning</i></p> <p><i>Draw conclusions and design a course of action</i></p> <p><i>Evaluate procedures and outcomes</i></p> |
| <p><b>Years 7 and 8</b></p>           | <p><b>Knowledge and understanding Technologies Contexts</b></p> <p><i>Engineering principles and systems</i></p> <p>8.3 Analyse how motion, force and energy, are used to manipulate and control electromechanical systems</p>  | <p><b>Manipulating and applying the elements/concepts with intent</b></p> <p>8.2 Develop ways to enhance their intentions as artists through exploration of how artists use materials, techniques, technologies and processes</p> | <p><b>Science as a Human Endeavour</b></p> <p><i>Nature and development of science</i><br/>Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people's understanding of the</p>   | <p><b>Inquiring – identifying, exploring and organising information and ideas</b></p> <p><i>Pose questions</i></p> <p><i>Identify and clarify information and ideas</i></p>   |

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| <p><b>Years 7 and 8 continued</b></p> | <p>when designing simple, engineered solutions</p> <p><i>Materials and technologies specialisations</i></p> <p>8.6 Analyse ways to produce designed solutions through selecting and combining materials, systems, components, tools and equipment</p> <p><b>Processes and production skills</b><br/><b>Creating designed solutions by:</b></p> <p><i>Investigating</i></p> <p>8.7 Critique needs or opportunities for designing and investigate, analyse and select from a range of materials, components, tools, equipment and processes to develop design ideas</p> <p><i>Producing</i></p> <p>8.9 Effectively and safely use a broad range of materials, components, tools, equipment and techniques to make designed solutions</p> <p><i>Evaluating</i></p> <p>8.10 Independently develop criteria for success to assess design ideas, processes and solutions and their Sustainability</p> | <p><b>Developing and refining understanding of skills and techniques</b></p> <p>8.3 Develop planning skills for art-making by exploring techniques and processes used by different artists</p> <p><b>Structuring and organising ideas into form</b></p> <p>8.4 Practise techniques and processes to enhance representation of ideas in their art-making</p> <p><b>Sharing artworks through performance, presentation or display</b></p> <p>8.5 Present artwork demonstrating consideration of how the artwork is displayed to enhance the artist's intention to an audience</p> | <p>world</p> <p>Science knowledge can develop through collaboration and connecting ideas across the disciplines of science</p> <p><b>Science Inquiry Skills</b></p> <p><i>Questioning and predicting</i></p> <p>Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge</p> <p><i>Planning and conducting</i></p> <p>Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed</p> <p>In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task</p> <p><i>Communicating</i></p> <p>Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate</p> | <p><b>Generating ideas, possibilities and actions</b></p> <p><i>Imagine possibilities and connect ideas</i></p> <p><i>Consider alternatives</i></p> <p><i>Seek solutions and put ideas into action</i></p> <p><b>Reflecting on thinking and processes</b></p> <p><i>Think about thinking (metacognition)</i></p> <p><i>Reflect on processes</i></p> <p><i>Transfer knowledge into new contexts</i></p> <p><b>Analysing, synthesising and evaluating reasoning and procedures</b></p> <p><i>Apply logic and reasoning</i></p> <p><i>Draw conclusions and design a course of action</i></p> <p><i>Evaluate procedures and outcomes</i></p> |
| <p><b>Years 9 and 10</b></p>          | <p><b>Knowledge and understanding Technologies Contexts</b></p> <p><i>Engineering principles and systems</i></p> <p>10.3 Investigate and make judgments on how the characteristics and properties of materials are combined with force, motion and energy to create</p>   | <p><b>Manipulating and applying the elements/concepts with intent</b></p> <p>10.2 Manipulate materials, techniques, technologies and processes to develop and represent their own artistic intentions</p> <p><b>Structuring and organising ideas into</b></p>   | <p><b>Science as a Human Endeavour</b></p> <p><i>Nature and development of science</i></p> <p>Scientific understanding, including models and theories, are contestable and are refined over time through a process of review by the scientific community</p>  | <p><b>Inquiring – identifying, exploring and organising information and ideas</b></p> <p><i>Pose questions</i></p> <p><i>Identify and clarify information and ideas</i></p> <p><b>Generating ideas, possibilities and</b></p>  |

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| <p><b>Years 9 and 10 continued</b></p> | <p>engineered solutions</p> <p><i>Materials and technologies specialisations</i></p> <p>10.6 Investigate and make judgments on how the characteristics and properties of materials, systems, components, tools and equipment can be combined to create designed solutions</p> <p>10.7 Investigate and make judgments, within a range of technologies specialisations, on how technologies can be combined to create designed solutions</p> <p><b>Processes and production skills</b><br/><b>Creating designed solutions by:</b></p> <p><i>Investigating</i></p> <p>10.8 Critique needs or opportunities to develop design briefs and investigate and select an increasingly sophisticated range of materials, systems, components, tools and equipment to develop design ideas</p> <p><i>Producing</i></p> <p>10.10 Work flexibly to safely test, select, justify and use appropriate technologies and processes to make designed solutions</p> <p><i>Evaluating</i></p> <p>10.11 Evaluate design ideas, processes and solutions against comprehensive criteria for success recognising the need for sustainability</p> | <p><b>form</b></p> <p>10.4 Plan and design artworks that represent artistic intention</p> <p><b>Sharing artworks through performance, presentation or display</b></p> <p>10.5 Present ideas for displaying artworks and evaluate displays of artworks</p> | <p>Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries</p> <p><b>Science Inquiry Skills</b></p> <p><i>Questioning and predicting</i></p> <p>Formulate questions or hypotheses that can be investigated scientifically</p> <p><i>Planning and conducting</i></p> <p>Plan, select and use appropriate investigation methods, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods</p> <p>Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data</p> <p><i>Communicating</i></p> <p>Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations</p> | <p><b>actions</b></p> <p><i>Imagine possibilities and connect ideas</i></p> <p><i>Consider alternatives</i></p> <p><i>Seek solutions and put ideas into action</i></p> <p><b>Reflecting on thinking and processes</b></p> <p><i>Think about thinking (metacognition)</i></p> <p><i>Reflect on processes</i></p> <p><i>Transfer knowledge into new contexts</i></p> <p><b>Analysing, synthesising and evaluating reasoning and procedures</b></p> <p><i>Apply logic and reasoning</i></p> <p><i>Draw conclusions and design a course of action</i></p> <p><i>Evaluate procedures and outcomes</i></p> |
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