

# Unit planner template

School Name:	Unit title: Windmills	KLA(s): Technology- Design	Year level(s): 3/4	Duration of unit: 5 weeks
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## Identify curriculum

Design and Technologies: Knowledge and Understanding	Design and Technologies Processes and Production Skills
Investigate how forces and the properties of materials affect the behaviour of a product or system(ACTDEK011) <ul style="list-style-type: none"> <li>deconstructing a product or system to identify how motion and forces affect behaviour, for example in a puppet such as a Japanese bunraku puppet or a <b>model windmill with moving sails</b></li> </ul>	Evaluate design ideas, processes and solutions based on criteria for success developed with guidance and including care for the environment. (ACTDEP017)
General Capabilities	Cross-curriculum Priorities
<b>ICT Capabilities Locate, generate and access data and information</b>	<b>Cross Curriculum Priority: Sustainability</b> Sustainability considers the “ongoing capacity of Earth to maintain all life” and the impacts of human endeavours have on the earth that affect future generations

## Develop assessment

## Make judgments

Type of assessment	What will be assessed	When it will be assessed	Purpose of assessment	Assessable elements
<b>Formative:</b> Observing students’ responses to questioning  Monitoring work on model  <b>Summative</b> Individual Worksheet – windmill parts Group Worksheet- sustainability	Knowledge and understanding of how wind affects the motion of a windmill.  Process of evaluating how wind power can be used to care for the environment.  Make choices for a sustainable future.	Weeks 1-5- Formative  week 3- Summative  week 5- Summative	<ul style="list-style-type: none"> <li>Provide information about students’ progress so that planning can be made for future learning</li> <li>Provide students with information about their progress and help them to make improvements</li> <li>Provide through summative assessment a students’ level of achievement by the end of the unit</li> </ul>	<ul style="list-style-type: none"> <li>Students understanding of how motion and force affect a windmill</li> <li>students understanding of how the use of wind power can provide for a sustainable future</li> </ul>

## Sequence learning

Learning experiences and teaching strategies	Adjustments for needs of learners	Resources
<p><b>Week 1</b>            Begin with a stimulus image of old and new wind power to facilitate a brainstorming KWL chart of what the students know about wind energy.            watch clip 1- and add information to the KWL chart.            Students make a model wind mill to see how the wind affects the moving sails. This site gives the instructions for this investigation <a href="http://www.education.com/science-fair/article/engineering_windmill/">http://www.education.com/science-fair/article/engineering_windmill/</a>. Students will not be considering which materials are the best to use but will see that if they blow on the wind sails they will turn and bring the paper clip up. This may be done individually or in pairs.            This windmill will be used in the next lesson to test the best places to catch the wind.</p> <p><b>Week 2</b>            Students in groups investigate wind energy looking at different sites and making notes of the different parts of the windmills (wind turbines)– example sites are included on website for students to do this investigation. Students will take their windmills made previously outside to see which would be the most suitable spots to be turned by the wind.</p> <p><b>Week 3</b>            Begin session with KWL chart – filling in what students have learnt about wind power.            Individual Assessment. Students are to draw a windmill and explain how the parts work to produce energy. (see task sheet 1).</p> <p><b>Week 4</b>            Begin with class brainstorming on what is caring for the environment. (extra stimulus clip included at the bottom of web page if needed).            clip to stimulate student investigation into whether wind power will have a sustainable future            Class discussion on how wind power is used now to help the environment and if it can be used in a sustainable future.            Discuss some of the possible problems as seen in the clip.            Students to work in pairs to investigate how using wind energy can provide for a sustainable future, - worksheet to guide their investigation using web sites as suggested in resources. Students can use other websites that they find to deepen their understanding.</p> <p><b>Week 5</b>            Students continue to investigate wind power and fill in worksheet. (see task sheet 2).</p>	<p>In the individual assessment students who want to investigate further can make a water wheel and investigate water power.</p> <p>Those students who have difficulty writing may have their answers scribed.</p> <p>Resources provided are suitable for diverse learners (some include audio and visual or animations while others require students to read the material)</p> <p>During the sustainability assessment students are working in pairs to provide peer support.            Higher level students can investigate deeper into caring for the environment through the use of wind power.</p>	<p>clip 1 introduction to wind power</p> <p>site explain how to make windmills and water mills  <a href="http://www.education.com/science-fair/article/engineering_windmill/">http://www.education.com/science-fair/article/engineering_windmill/</a>            Materials needed to make the windmill</p> <ul style="list-style-type: none"> <li>Construction paper</li> <li>Printer paper</li> <li>Plastic straws</li> <li>String</li> <li>Paperclip</li> <li>Tape</li> <li>Scissors</li> <li>Glue</li> <li>Wooden skewers</li> <li>Hole punch</li> </ul> <p>Sites for how wind turbines work  <a href="https://vimeo.com/13759005">https://vimeo.com/13759005</a>  <a href="http://energy.gov/eere/wind/animation-how-wind-turbine-works">http://energy.gov/eere/wind/animation-how-wind-turbine-works</a>  <a href="https://prezi.com/fwfjhxmlifcr/how-windmills-work/">https://prezi.com/fwfjhxmlifcr/how-windmills-work/</a></p> <p>work books            task sheet 1</p> <p>Clip 2- wind power sustainability            Sites discussing pros and cons of wind power (see website) also below is another site  <a href="http://energy.gov/eere/wind/advantages-and-challenges-wind-energy">http://energy.gov/eere/wind/advantages-and-challenges-wind-energy</a>  <a href="http://www.conserve-energy-future.com/pros-and-cons-of-wind-energy.php">http://www.conserve-energy-future.com/pros-and-cons-of-wind-energy.php</a></p>

**Use feedback**

## Ways to monitor learning and assessment

## Formative:

Monitor students through questioning and give feedback to students as to their understanding throughout lessons.

Monitor students to see that they are working with partners to see that the students are collaborating effectively. Provide verbal feedback

## Summative:

Mark students work and give feedback on how the students could improve next time.

<b>Learning Area: Technology: Design and Technologies- Rubric</b>					
<b>Description:</b>	Students are to investigate wind power through windmills and consider how the use of wind power can provide a sustainable future				
<b>Criteria</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
Design and Technologies Knowledge and Understanding  Investigate how wind power can move wind mills to produce power	Students were able to label the windmill correctly.  Students explained in detail how wind powers the windmill and where to place windmills and why this is the best position.	Students were able to label the windmill correctly.  Students explained in detail how wind powers the windmill and explains where to place the windmills	students were able to label the windmill correctly.  Students are able to explain how wind powers the windmill and where to place windmills	students were able to label some parts correctly.  Students are able to explain how wind powers the windmill or where to place the windmill.	students were unable to label parts correctly.  Students were unable to explain how wind powers the windmill or where to place the windmill.
Design and Technologies Process and Production skills.  Evaluate wind power to see how to care for the environment.	Students were able to give more than 4 good ideas for wind power and more than 4 problems with wind power.	Students were able to give 4 good ideas for wind power and 4 problems with wind power.	Students were able to give 3 good ideas for wind power and 3 problems with wind power.	students gave 1 or 2 good ideas for wind power and problems with wind power.	Students were unable to give any good ideas for wind power or problems with wind power.
Sustainability: consider the ongoing impact of wind power has on a sustainable future	Students were able to give detailed ideas as to how wind energy could be used for a sustainable future. ( more than 3 ideas)	Students were able to include a number of ideas of how wind energy could be used for a sustainable future. ( at least 3 ideas)	Students were able to give some ideas of how wind energy could be used for a sustainable future (at least 2 ideas)	Students gave a limited response to how wind energy could be used for a sustainable future (at least 1 idea)	Students were unable to give a response to how wind energy could be used for a sustainable future.



Task Sheet 1: **Student Name** \_\_\_\_\_

*Draw a windmill. Include and label the 3 main parts of a wind turbine- blades, rotary shaft and generator. At the bottom of the page include written details as to where are the best places are to put wind mills and how the wind powers the windmill.*



Student Names \_\_\_\_\_

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## Investigation into Wind Energy Sustainability

List at least 3 reasons why wind energy is a good idea to use to care of the environment.

List at least 3 reasons why wind energy is a problem.

What can be done to help wind energy be more sustainable in the future?

