



STAGE 1

Sonny the Sustainability Scout Schools Challenge

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Science and Technology

STAGE 1

This unit provides opportunities for students to work mathematically in collecting, analysing and representing data. Students use literacy skills in interviewing, collaborating and communicating proposed water, waste and energy efficiency strategies. The unit integrates Stage 1 outcomes and content from the Science and Technology K-6 Syllabus.

Duration (recommended): 10 x weeks (1 x lesson per week)

This unit draws on strategies and resources contained in the K-6 Syllabus.

Unit overview

In this program, students will engage in a range of opportunities to develop and practise their research, analysis, and communication skills, with a particular emphasis on identifying water, waste and energy efficiency strategies. Students will engage in a range of activities about sustainability, the world's resources and communicate questions, opinions and information in relation to the things they have learned about.

Goals

Through studying Science and Technology students explore scientific and technological concepts and gain knowledge and understanding of the world. They develop skills in conducting scientific investigations and designing and producing solutions through learning about the Living World, Material World, Physical World, Earth and Space, and Digital Technologies.

Strategies

Physical World: What are the different forms of energy around us and how can we detect them?

Earth and Space: What are Earth's resources and how do we use and care for them?

Digital Technologies: What is data and how can we store and represent it?

Outcomes

ST1-1WS-S - Observes, questions and collects data to communicate and compare ideas

ST1-10ES-S - Recognises observable changes occurring in the sky and on the land and identifies Earth's resources

ST1-2DP-T – Uses materials, tools and equipment to develop solutions for a need or opportunity

ST1 – 9PW-ST – Investigates how forces and energy are used in products

Assessment overview

Evidence of student learning can be gathered through:

- Activities engaging students in the use and conservation of Earth's resources
- Activities engaging students in identifying water, waste and energy efficient strategies
- Activities engaging students in identifying water, waste and energy terminology
- Students ability to communicate their findings

SKILLS FOCUS:

Working Scientifically: Processing and analysing data, communicating

Design and Production: Identifying, researching and planning, producing and implementing, testing and evaluating

ACTIVITY ONE - CREATIVE OPPORTUNITY


Content	Teaching, learning and assessment	Resources
<p>Stage 1 of the Physical World strand focuses on the identification of light, sound and heat energy, and how they are sensed and produced. Stage 1 of this strand allows students to further develop their understanding of forces and energy and how these can be used for specific purposes in products.</p> <ul style="list-style-type: none"> Explore how technologies use forces to create movement in products (ACTDEK002) <p>SysT ⚙️</p> <ul style="list-style-type: none"> Design and develop a product that uses one or more forms of energy to create change <p>DesT SysT ⚙️ 👤 ⭐</p>	<p>Wind energy is a renewable source of energy. Wind energy is expected to play a critical role in Australia's future energy mix. In this activity, children will learn about how wind turbines work.</p> <p>As a class discuss wind energy:</p> <ul style="list-style-type: none"> What does wind do? (Can it makes leaves in the trees move etc) What are the different forms of energy around us how can we detect them? How can wind create energy? What a wind turbine? How would you make one? <p>Show students the video 'How to Build a Wind Turbine'.</p> <p>Students then create their wind turbines.</p> <p>Discuss the basic operation of a renewable wind turbine and then discuss some of their observations.</p> <ul style="list-style-type: none"> If the wind turbine is taller – more energy is generated because wind intensity increases the higher you go Longer the blades the better, but this means you must build your turbine higher More wind = more energy 	<p>Activity Sheet 1: How to make a Paper Wind Turbine</p> <p>How to Build a Wind Turbine Video: https://sustainable.tamworth.nsw.gov.au/watch/</p> <p>Materials:</p> <ul style="list-style-type: none"> 2 x A4 pieces of paper Pen or Pencil Scissors Ruler

ACTIVITY TWO - THE WATER CYCLE

Content	Teaching, learning and assessment	Resources
<p>Investigate how the water cycle works Aus Curriculum – ACSSU002, ACSHE013, ACSIS014, ACSIS011, ACSIS233, ACSIS012</p> <p>Stage 1 Earth and Space – use and conservation of Earth’s resources</p> <ul style="list-style-type: none"> Identify and explore the use of a variety of Earth’s resources including water and soil (ACSSU032) 	<p>In Science we refer to resources as plants, animals, water and energy, found in the natural environment.</p> <p>Inquiry Question: What are earth’s resources and how do we use and care for them?</p> <p>Focus on water Once we use water, it is never really gone. It just changes its form as it moves around the earth, into the atmosphere and back down to earth again. Nature’s way of recycling.</p> <p>Water forms, dissipates, and forms again in a cycle called the water cycle. Being a cycle there is no start and end, however for the purpose of these activities let’s start at the collection point – or the Earth’s oceans which cover three-quarters of earth.</p> <p>Class Activity:</p> <ol style="list-style-type: none"> Complete the water cycle in a bag experiment using the worksheet provided. Students will design an A4 poster demonstrating the water cycle. <p>Water Cycle Experiment: Start this experiment in the morning so you have plenty of time to observe what happens.</p> <ol style="list-style-type: none"> Pour some water into the zip-lock bag – around 2 tablespoons. Seal the bag closed – ensuring there’s enough air inside. Tape the bag to a window in a sunny spot. Observe the zip-lock bag throughout the day and discuss what has happened. <p>Class Discussion – what’s happening? You should be able to watch water change state as it heats up in the model. When the sun shines on the water and heats it, it will turn into a gas called water vapor which rises. This is called evaporation. When the sun stops shining on the water and it cools, the water vapor turns back into tiny liquid water droplets. This is called condensation. When the water droplets are heavy enough they will run down the bag, like rain. This is called precipitation.</p>	<p>Activity Sheet 2: The Water Cycle</p> <p>Materials:</p> <ul style="list-style-type: none"> Clear zip-lock bag Tablespoon Water Rubber band Tape




ACTIVITY THREE - RUBBISH BIN SORT

Content	Teaching, learning and assessment	Resources
<p>Stage 1 Earth and Space – use and conservation of Earth’s resources</p> <ul style="list-style-type: none"> Plan and implement strategies considering conservation of resources to address sustainability and to meet personal and/or community needs, for example: (ACTDEK001) <p>DesT Syst </p> <ul style="list-style-type: none"> Turning off dripping taps Turning off unnecessary lights Reusing/recycling campaigns 	<p>Using the right rubbish bin is important to make sure that we look after the Earth’s environment. If too much rubbish goes to the tip, it’s bad for the environment.</p> <p>Recycling can be tricky, so it’s important to really think about what bin we put our rubbish in every day.</p> <p>Class Activity:</p> <ol style="list-style-type: none"> Using the worksheets provided, students will cut out the rubbish items and sort them into the correct coloured bin and stick them on the page. Discuss what items should go into what bin. Discuss what might happen if we don’t put the rubbish in the right bin. Discuss why one item didn’t belong in any of the bins. What item was it and why? <p>Teacher notes: Explain to students about the correct way to recycle household batteries. Batteries can be taken to; a local Council office or tip or some local businesses.</p> <p>If we put household batteries in any of our bins (Green, Yellow or Red), they end up in a compaction truck that squishes up the waste and batteries can react and cause a fire in the back of a truck. Truck drivers then have to empty out the whole load and the fire department must come to put out the fire. It created a big environmental mess to clean up.</p> <p>Understanding what can and can’t go in each bin will help reduce waste in our landfills.</p> <p>Teacher discussion point: Sonny has a friend called Curby. Curby has a new recycling program which collects things like soft plastics and coffee capsules from the community using the existing yellow recycling bin. So, while things like chip packets can still go in the red lid bin, you can now collect all these types of plastics and place them in a bag, tag them with a special tag and pop them in the yellow lid bin to be recycled. This rubbish will then be recycled into something new! You can find more information on Curby here: www.curbyit.com/about-us/</p>	<p>Activity Sheets 3: Rubbish Bin Short</p> <p>Materials:</p> <ul style="list-style-type: none"> Glue Stick Scissors



ACTIVITY FOUR - SONG AND DANCE

Content	Teaching, learning and assessment	Resources
<p>Stage 1 Earth and Space – use and conservation of Earth’s resources</p> <ul style="list-style-type: none"> Plan and implement strategies considering conservation of resources to address sustainability and to meet personal and/or community needs, for example: (ACTDEK001) <p>DesT Syst </p> <ul style="list-style-type: none"> Turning off dripping taps Turning off unnecessary lights Reusing/recycling campaigns 	<p>Show students the Introduction to Sonny video and learn the Sonny and Skye Song and Dance video.</p> <p>Sing the chorus of the song with students. Encourage them to participate in the song orally and through physical movement by following the moves in the video.</p> <p>Following the song and dance session, engage in class discussion about some of the ways we can be sustainable always.</p> <ul style="list-style-type: none"> Like putting boxes and bottles in the yellow bin Turning off the lights for rooms you’re not in Making sure your shower is short and sweet Turning off the taps when you brush your teeth <p>Discuss other sustainability initiatives students identify</p>	<p>Activity Sheet 4: Song & Dance</p> <p>Sonny and Skye Song and Dance Videos:</p> <p>https://sustainablesonny.tamworth.nsw.gov.au/watch/</p>

ACTIVITY FIVE - WORD MATCH



Content	Teaching, learning and assessment	Resources
<p>Stage 1 Earth and Space – use and conservation of Earth’s resources</p> <ul style="list-style-type: none"> Plan and implement strategies considering conservation of resources to address sustainability and to meet personal and/or community needs, for example: (ACTDEK001) <p>DesT Syst </p> <ul style="list-style-type: none"> Turning off dripping taps Turning off unnecessary lights Reusing/recycling campaigns Identify and explore the use of a variety of Earth’s resources including water and soil (ACSSU032) <p></p>	<p>Sometimes we read and hear words that we don’t understand about energy on TV, in the news and when we talk with our parents and friends.</p> <p>This activity is about getting familiar with some frequently used energy words and what each type of energy does.</p> <p>Using the activity sheet provided, students will match the energy related words by drawing a line between two connecting words. When students are finished, they can colour in the pictures.</p> <p>At the end of the activity discuss as a class:</p> <ul style="list-style-type: none"> What words did we connect? How do these sources of energy create power for us to use at home and at school? What types of energy sources do you have at home? What happens when the sun creates energy? <p>Teacher notes: Sun generates heat – when the sun shines on a solar panel it heats them up and the machines turn this heat into electricity to power our homes.</p> <ul style="list-style-type: none"> How can wind create energy? <p>Teacher notes: Wind can move things – when there is enough wind high up in the sky where the wind turbines are, the speed of the wind pushes the big propeller round and round and these propellers make electricity.</p>	<p>Activity Sheet 5: Word Match</p> <p>Word Match Answers:</p> <p>Wind – Turbine Solar – Panel Sun – Heat Light – Switch Electricity – Power Clean – Energy Climate – Change Recharge - Battery</p>

ACTIVITY SIX - SHARING IS CARING GAME

Content	Teaching, learning and assessment	Resources
<p>Stage 1 Earth and Space – use and conservation of Earth’s resources</p> <ul style="list-style-type: none"> Plan and implement strategies considering conservation of resources to address sustainability and to meet personal and/or community needs, for example: (ACTDEK001) <p>DeST Syst </p> <ul style="list-style-type: none"> Turning off dripping taps Turning off unnecessary lights Reusing/recycling campaigns Identify and explore the use of a variety of Earth’s resources including water and soil (ACSSU032) <p></p>	<p>The focus of this activity is to provide students with a basic understanding of how many people share the water in our supply system and how important it is not to waste our water.</p> <p>In Australia we are very lucky to have water that we can drink straight out of the tap or bubbler. Many people around the world cannot do this, as their water is not clean enough to drink. In Tamworth, we have people whose job it is to make sure clean water comes out of our taps every day. But we need to make sure that we don’t waste water, because so many of us need to share it.</p> <p>We’re going to play a little game to demonstrate how our water supply works.</p> <p>For this activity, the cup is to be treated as a dam or another type of water reservoir. The students are various water users who all use water from the same source.</p> <p>How to play (think egg and spoon race style):</p> <ol style="list-style-type: none"> Split the class into teams. Half the team lines up on one end of the race zone, and the other team lines up at the other end. The race zone should be around 25 metres. The first student holds the cup of water in one hand, and places their other hand behind their back. They will then travel across the race zone to the next teammate – trying not to spill too much water from the cup! When the student reaches their other teammates, they pass the cup of water using one hand and the next student relays the cup of water and so on. Keep going until all students have run with the cup of water. <p>This activity is a race, but it’s not necessarily about the team who finishes the fastest – it’s about the team who finishes the race with the most water left over in their cup.</p> <p>At the end of the race, discuss why they think some students had more water in their cup than others?</p> <ul style="list-style-type: none"> Which team finished with the most water in their cup? Why do you think this team has the most water left over? What do you think we could do to ensure more water stays in the cup at the end of the race? 	<p>Activity Sheet 6: Sharing is Caring</p> <p>Outdoor Activity to Materials:</p> <ul style="list-style-type: none"> Paper Cups Water Hat and sunscreen <p>Additional activity – Colour in the Tamworth Water Cycle on Activity Sheet 6.</p>



ACTIVITY SEVEN - LITTER DETECTIVES

Content	Teaching, learning and assessment	Resources
<p>Stage 1 Earth and Space – use and conservation of Earth's resources</p> <ul style="list-style-type: none"> Plan and implement strategies considering conservation of resources to address sustainability and to meet personal and/or community needs, for example: (ACTDEK001) <p>DesT Syst </p> <ul style="list-style-type: none"> Turning off dripping taps Turning off unnecessary lights Reusing/recycling campaigns <ul style="list-style-type: none"> Identify and explore the use of a variety of Earth's resources including water and soil (ACSSU032) <p></p>	<p>The purpose of this activity is to role play as a 'Litter Detective' and conduct a grid search of the playground in a designated area, for example in the lunch area after a break period.</p> <p>Students will participate in small groups, each in a designated area.</p> <p>Depending on the school's individual space availability, teachers can allocate a defined area per group, i.e. 2m x 2m location, for the students to then investigate.</p> <p>Using the worksheet provided work out whether your school is a high litter, low litter or no litter school and which area has the most litter!</p> <p>Ensure you have the right resources and follow your schools' procedures to clean up the litter after the activity is completed.</p> <p>Discuss some ways to reduce litter in the playground. Students to share their litter reducing strategies from home.</p>	<p>Activity Sheet 7: Litter Detectives</p> <p>Materials:</p> <ul style="list-style-type: none"> Clipboards or something to lean on Hat and sunscreen



ACTIVITY EIGHT- MAKE YOUR OWN RAIN GAUGE

Content	Teaching, learning and assessment	Resources
<p>Stage 1 of the Physical World strand focuses on the identification of light, sound and heat energy, and how they are sensed and produced. Stage 1 of this strand allows students to further develop their understanding of forces and energy and how these can be used for specific purposes in products.</p> <ul style="list-style-type: none"> Explore how technologies use forces to create movement in products (ACTDEK002) <p>SysT ⚙️</p> <ul style="list-style-type: none"> Design and develop a product that uses one or more forms of energy to create change <p>DesT SysT ⚙️ 👤 ⭐</p>	<p>The purpose of this activity is to increase students' awareness of the frequency of rain and how much falls. Students will be encouraged to discuss ideas about how they can be more waterwise and why we should be waterwise, especially during times of low rainfall and drought.</p> <p>This activity includes creating a recycled rain gauge to measure rainfall. Students can be encouraged to leave their gauges at school in different locations, and as a class check them at the same time each day. This could then become a regular class discussion about how much rain each has captured, and why some may have more than others.</p> <p>Rain from the gauges can then be used to water any classroom or school plants.</p>	<p>Activity Sheet 8: Make a Rain Gauge</p> <p>Materials:</p> <ul style="list-style-type: none"> Scissors Permanent Marker Sticky Tape Ruler Empty 2L plastic bottle <p>Teachers will need to help cut the plastic.</p>

ACTIVITY NINE - LITTER FREE LUNCH

Content	Teaching, learning and assessment	Resources
<p>Stage 1 Earth and Space – use and conservation of Earth’s resources</p> <ul style="list-style-type: none"> Plan and implement strategies considering conservation of resources to address sustainability and to meet personal and/or community needs, for example: (ACTDEK001) Turning off dripping taps Turning off unnecessary lights Reusing/recycling campaigns Identify and explore the use of a variety of Earth’s resources including water and soil (ACSSU032) <p>DesT Syst </p>	<p>There is often a disconnect between students and waste. Students are encouraged to create a personal connection with their contribution to the waste generated at school and going to landfill.</p> <p>The purpose of this activity is to create awareness around lunchbox waste and ask students to look at ways they can reduce this waste.</p> <p>Some schools or classes choose to implement the children’s suggested changes for a period of time i.e. (a one-week challenge and they do a review of the lunch boxes each day on the waste in the lunchbox each day and discuss the changes and observations at the end).</p> <p>This activity is NOT a look at nutritional value of foods or anything to do with healthy lunch boxes, it is purely to look at the waste being generated from lunch boxes.</p> <p>Notes: We are mindful that there are occasions where some students don’t have lunchboxes of food and teachers will be aware of students in this situation. This is not about shaming students. If there are cases where students are in this situation, a solution could be to get students to pair up and review one lunchbox rather than two.</p> <p>If students have lunch orders, this activity can still be undertaken but it will focus on the waste that lunch orders generate within the school canteen or students could be paired up with a student with a lunchbox so that the activity is consistent for the class.</p> <p>Steps:</p> <ol style="list-style-type: none"> Discovery Day – Review lunchbox initially to look at the waste that is in the lunchbox. (Sheet 1) Optional – Implement a class challenge to see if students and parents can help reduce the amount of waste being generated in lunchboxes for a week. <p>Facilitate a class discussion around alternatives to single use plastics. For example, rather than glad wrap or zip lock bags for sandwiches and snacks what else could be used? Eg. Reusable containers or where containers aren’t available, foil is a better alternative to plastic wrap.</p> <p>Discuss that rather than buying individual packets of snacks, with individual packaging ie Shapes or Tiny Teddy’s - urge parents/guardians/carers to buy a large box and place the snack in reusable tupperware containers.</p>	<p>Activity Sheet 9: Litter Free Lunchbox Review</p> <p>Activity Sheet 9: Litter Free Lunchbox Class Challenge</p> <ul style="list-style-type: none"> Litter Free Lunchbox Challenge A5 flyer Litter Free Lunchbox Challenge A4 poster

ACTIVITY TEN - USING OUR ENERGY FOR GOOD

Content	Teaching, learning and assessment	Resources
<p>Stage 1 Earth and Space – use and conservation of Earth’s resources</p> <ul style="list-style-type: none"> Plan and implement strategies considering conservation of resources to address sustainability and to meet personal and/or community needs, for example: (ACTDEK001) <ul style="list-style-type: none"> Turning off dripping taps Turning off unnecessary lights Reusing/recycling campaigns Identify and explore the use of a variety of Earth’s resources including water and soil (ACSSU032) <p>DesT Syst </p>	<p>Forming good energy habits helps save money and reduces the impact on the environment.</p> <p>Wasting energy can mean high electricity bills and increased pollution. This can be both air and water pollution.</p> <p>Using the worksheets provided, students will form an understanding of how to reduce energy waste and improve their energy habits.</p> <p>Two step sequence.</p> <p>Step One:</p> <ul style="list-style-type: none"> Count how many lights are in the classroom and write this number down on your Energy worksheet Discuss how energy can be saved in the classroom. Students to think about their own energy too. How do they get more energy (sleep which is akin to turning off the lights). <p>Step Two:</p> <ul style="list-style-type: none"> Draw/design a sticker that can remind you, your family and your friends to switch off the lights when rooms are empty. Students can use coloured paper and craft materials to bring their sticker design to life. 	<p>Activity Sheet 10: Using our Energy for Good</p> <p>Materials:</p> <ul style="list-style-type: none"> Craft materials Scissors Glue Coloured paper