

ACTIVE EARTH

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Our wandering continents ★★</p> <p>Did you know that the Earth's landmasses are continually moving? Do you know why? Research the following questions: What is the theory of plate tectonics? What is Pangea? Is the Earth's surface stable and stationary now? Was it ever in the past? Will it be stable in the future? Which ocean is growing in size? Which is shrinking? Why this is occurring? Provide a 1 page report to your teacher. To get you started - Find the 'Teachers Domain' website on the Internet and search for <i>Plate Tectonics: an Introduction</i>.</p>		
<p>2. The world's most devastating tsunami ★★</p> <p>At the time of printing this card, the 26 December 2004 tsunami, which originated off the east coast of Sumatra, was the most devastating recorded history. Find out more about this tsunami by doing some research. How long did it take to reach the east coast of Australia? How long did it take to reach the west coast of Australia? How long did it take to reach the south coast of Australia? How long did it take to reach the north coast of Australia? To get you started - Find the 'Teachers Domain' website on the Internet and search for <i>Tsunami: an Introduction</i>.</p>		
<p>3. Tsunami detection buoys ★★</p> <p>What are tsunami detection buoys? How do they work? How are they used in oceans around the world? They are designed to detect tsunamis in time to warn people of an incoming tsunami. Find out more about these buoys by doing your research for <i>tsunami detection buoy map</i>. Look carefully at the map and answer these questions. Which countries have tsunami detection buoys in place? How many buoys existed before the Indonesian tsunami on 26 December 2004? How many are there now? Write a short statement about why you think the Indonesian tsunami affected the number of detection buoys now in place. Fill in the map and highlight the buoys that existed before the earthquake; and any that you think will not be working. Provide research into a 1 page report for your teacher.</p>		
<p>4. Liquefaction: What an action! ★★</p> <p>What happens to sandy or fine-grained soils when an earthquake shakes them up? What can happen to the buildings on these types of soils? To find out you will need a metal or heavy plastic pan (at least 9cm deep), sand, water, a smooth brick and a rubber mallet. Fill the pan with sand. Put it on a flat surface and then pour in water to just below the surface of the sand. Wriggle the brick into the sand so it stands like a tall building. Very gently and repeatedly tap the side of the pan with the rubber mallet and observe what happens to the sand and the brick. Show your teacher your model and explain what you did, your results and what you found out.</p> <p>For ★★ bonus star - Find out about the liquefaction that occurred during the 2010 and 2011 Christchurch earthquakes. Give a detailed explanation to your teacher.</p>		
<p>10. Why is it so? ★★</p> <p>Australia has had very few earthquakes. Research and make a poster to show why this is so. (Referring to Activity 1 will help you.)</p>		

SAMPLE ONLY

AERONAUTICS

Read this before you start: This card gets you to make and test models of objects that move through the air. You will be asked to do an Internet search to find a model to make. Alternately, find models to make in books from home or your school or local library. Each time you find a model you want to make show your teacher first to have them approve it before you begin. You may ask an adult to help interpret model-making instructions, help 'launch' your model or help record your observations.

ACTIVITIES

1. Parachutes ★★

Find instructions to make a model parachute by doing an Internet search for *parachute*. The parachute should fall slowly and straight. (If it does not fall slowly and straight, make a new one and test it again.) Make a poster about the parachute you made. Include the instructions you used to make it.

SAMPLE ONLY

Find instructions to make a model glider by doing an Internet search for *glider*. Make a poster about the glider you made. Include the instructions you used to make it.

Find instructions for making a glider by doing an Internet search for *glider*. Make a poster about the glider you made. Include the instructions you used to make it.

9. Rockets ★★★

Rockets must be carefully designed and constructed so that they do not fall back to Earth just after they are launched. Find a template and instructions for making a simple model rocket that uses a paper tube and a drinking straw. Do an Internet search for *straw and paper rockets*. Build and launch your rocket. Launch it three times and record the distance it travels each time. Find the average. Think of one change you could make to your rocket that might increase the distance it will travel? Test it. Provide a detailed report on the building of your rocket, the tests you performed, your predictions, your results and what you found out about rockets.

For ★★ bonus stars - Rocket stability is an important issue for rocket scientists. Do some research on Centre of Mass (COM) and Centre of Pressure (COP) and write a 1 page report on their importance to rocket stability.



ANIMALS

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Do ants prefer cheese or sugar? ★★ Design an experiment to find out! Show your teacher your design for approval before you begin. After you have completed your experiment present your results as a table and bar graph and write a few paragraphs on what you found out.</p>		
<p>2. Try to get an ant lost ★★ Like most other animals, ants remember where they are, where they are going and how to get there. Like other animals it is also possible for ants to get lost! Will an ant get lost if you block its path to a food source? (For this experiment you might like to use a jar with a lid and a small amount of honey. Put something sweet (e.g. a little honey) into the lid from a jar and put it on a surface. Put an ant on the surface and observe its path. Put something in the way for the ants to find the honey and return to the nest to inform other ants. When many ants have found the food source, remove the obstruction and observe what happens.)</p>		
<p>3. Can a cat get lost? ★★ Do cats get lost? Design an experiment to find out. Show your experiment design to your teacher for approval before you begin. Present your data and findings as a poster or PowerPoint presentation.</p>		
<p>4. Can a dog get lost? ★★ Do dogs get lost? Design an experiment to find out. Show your experiment design to your teacher for approval before you begin. Present your data and findings as a poster or PowerPoint presentation.</p>		
<p>5. Can a rabbit get lost? ★★ Do rabbits get lost? Design an experiment to find out. Show your experiment design to your teacher for approval before you begin. Present your data and findings as a poster or PowerPoint presentation.</p>		
<p>6. Can a hamster get lost? ★★ Do hamsters get lost? Design an experiment to find out. Show your experiment design to your teacher for approval before you begin. Present your data and findings as a poster or PowerPoint presentation.</p>		
<p>7. Can a mouse get lost? ★★ Do mice get lost? Design an experiment to find out. Show your experiment design to your teacher for approval before you begin. Present your data and findings as a poster or PowerPoint presentation.</p>		
<p>8. Can a guinea pig get lost? ★★ Do guinea pigs get lost? Design an experiment to find out. Show your experiment design to your teacher for approval before you begin. Present your data and findings as a poster or PowerPoint presentation.</p>		
<p>9. Can a goldfish get lost? ★★ Do goldfish get lost? Design an experiment to find out. Show your experiment design to your teacher for approval before you begin. Present your data and findings as a poster or PowerPoint presentation.</p>		
<p>10. Can a turtle get lost? ★★ Do turtles get lost? Design an experiment to find out. Show your experiment design to your teacher for approval before you begin. Present your data and findings as a poster or PowerPoint presentation.</p>		
<p>11. Coral ★★ Do some research on the kinds of animals that make the coral that forms the Great Barrier Reef. Present your findings as an illustrated poster for display in your classroom or school.</p>		
<p>12. Five birds ★★ Select five birds from your neighbourhood. Identify each kind (species) of bird and research their nesting habits. Present your findings as a small booklet with a page dedicated to each bird.</p>		
<p>13. Five fish ★★ Use reference books and/or the Internet to research the appearance, habitat and food preferences of five different kinds of fish. Present your findings as a small booklet with a page dedicated to each fish.</p>		

SAMPLE ONLY

ASTRONOMY

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Australian aboriginal astronomy ★★★</p> <p>Indigenous societies around the world were our first astronomers. For example, Australian Aboriginal people used features in the sky to find direction, tell time, to make weather forecasts and also as seasonal calendars. Use the Internet and library books to find out more about the observations made by these early Australian astronomers and the uses to which they put their observations. You might be able to find out about these features – the Emu in the sky, the Canoe in Orion and Banumbirr. Write a 2 page illustrated report on your findings.</p>		
<p>2. Testing astrology ☆☆☆</p> <p>Astrology claims that a person's birth star or Zodiac sign is important in determining their personality. Here's one way to test that claim. You will need a horoscope and the birthdates of all Prime Ministers. What kind of horoscope do you think will have the greatest effect on the personality of a Prime Minister? Write a report on your findings.</p>		
<p>3. The constellation of the hour ☆☆☆</p> <p>Write a report on the constellation of the hour for each hour of the day. Use a map of the sky to find out which constellation is visible at each hour. Write a report on the constellation of the hour for each hour of the day. Use a map of the sky to find out which constellation is visible at each hour. Write a report on the constellation of the hour for each hour of the day. Use a map of the sky to find out which constellation is visible at each hour.</p>		
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<p>12. Astronomy event ☆☆☆</p> <p>Find out about a recent or upcoming astronomy event that might be of interest to your school community. Write a short news item about this event for the school's newsletter or website or design a poster to display at your school.</p>		
<p>13. Shooting stars ☆</p> <p>Many people have seen 'shooting stars' in a clear night sky. We know that they are meteors 'burning up' as they enter the Earth's atmosphere. Find out and describe the phenomenon that causes a meteor to burn up. Give a verbal report to your teacher.</p>		

SAMPLE ONLY

BIODIVERSITY

Read this before you start: Activities marked with ▲ require some caution. You might need to take particular safety measures when doing some of these activities like protecting yourself from adverse reactions when touching some plant parts e.g. leaves. You could be allergic to particular plants, whilst some plants might host stinging creatures such as spiders, bees and wasps. You also may need an adult to accompany you.

ACTIVITIES	Number of hours/minutes	Teacher's mark
<p>1. Biodiversity ☆☆☆</p> <p>What is biodiversity? Australia is one of the most biodiverse countries in the world. Write and perform a short play to inform your class (or create a poster).</p>		
<p>2. Heirloom vegetables ☆☆☆</p> <p>What are heirloom vegetables? Write and perform a short play to inform your class (or create a poster).</p>		
<p>3. Invasive species ☆☆☆</p> <p>What are invasive species? Write and perform a short play to inform your class (or create a poster).</p>		
<p>4. Bush medicines ☆☆☆</p> <p>Aboriginals and Torres Strait Islanders traditionally made use of many different kinds of plants for medicinal purposes. Find out about some of the kinds of plants they used. For each kind of plant find out how they used it and what it was used to treat. To get you started – Try an Internet search for <i>Aboriginal bush medicines</i>. Create a presentation about what you found out.</p>		
<p>5. Jobs in biodiversity ☆☆☆</p> <p>Make a list of 10 jobs involved with biodiversity. Select one job and find out what someone in that job does and what kind of skills and education they need. Write a job description for that job.</p>		
<p>6. My favourite native animal ☆☆☆</p> <p>Create an illustrated poster or pamphlet about your favourite native animal. Describe its appearance and where it lives. Find out if it has any interesting behaviors, such as alarm calls or breeding routines. Describe any threats to its survival.</p>		
<p>7. Invasive species ☆☆☆</p> <p>What are invasive species? Write and perform a short play to inform your class (or create a poster).</p>		
<p>8. Heirloom vegetables ☆☆☆</p> <p>What are heirloom vegetables? Write and perform a short play to inform your class (or create a poster).</p>		

SAMPLE ONLY

CHEMISTRY

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Glowstick science ★★</p> <p>Have you ever wondered how glowsticks work? You'll need a glowstick, a glass of iced water, 3 tablespoons of table salt and a freezer. Observe and take note of what happens to the glowstick after you do each of the following six steps: 1) Follow the instructions on the glowstick's packet. 2) Place one half of the glowstick into the iced water for a few minutes. 3) Remove the glowstick, add the salt to the water, stir and then replace the glowstick for a few minutes. 4) Remove the glowstick from the water. 5) Warm the glow stick in your hands. 6) Put the glowstick in the freezer overnight. Take it out in the morning. Write a 1 page report on your six observations.</p> <p>For ★ bonus star - Research and include in your report on what happens inside the glowstick.</p>		
<p>2. Rust - the vital ingredients ★★★</p> <p>What are the vital ingredients for iron and steel to rust? Design a fair test using steel wool, water and salt.</p>		
<p>8. Make your own paint ★★</p> <p>Take a small piece of cardboard and cut out a square about 10cm x 10cm. Use a ruler to draw a grid on the cardboard. Use a black plastic bag (the size and shape of a sandwich bag) to make a paint palette. Cut the bag out and seal the top. Put the bag into a large bag, sandwich between two sheets of paper. Use a rolling pin to crush the chalk as finely as possible. Add the powder to the water and use the pop stick to mix. Add the white craft (S) and mix. Add more water, a teaspoon at a time, until you have a thick paint. Use your paint to make a picture. You can store your paint in a small container with a lid.</p> <p>For ★★ bonus stars - Research and report on the basic chemicals in paint and which kind the chalk powder, water and craft glue represent.</p>		
<p>9. First 20 elements song ★★</p> <p>Did you know that all the materials on Earth are made from just over 100 basic building blocks called elements and that chemists have arranged these into a special table called the Periodic Table? Chemists find it very useful to learn this arrangement. You can learn the order of the first 20 elements by creating your own song or doing an Internet search for a <i>twenty elements song</i>. Sing the song to your teacher.</p>		
<p>10. Tom Lehrer's elements song ★</p> <p>Learn a song about the first 102 elements in the periodic table. (You are allowed to sing along with the singer.) In 1959 American Tom Lehrer wrote the song, 'The Elements' when only 102 were known. Find the song by doing a web search for <i>Tom Lehrer's elements song</i> and practise singing along with Tom. When you are ready, arrange for your teacher to listen to you.</p> <p>For ★★ bonus stars - Research and report on the properties and uses of five elements. Use a poster format.</p>		

SAMPLE ONLY

ELECTRICITY

Read this before you start: Activities marked with a ⚡ need to be done on days when there is low humidity. Do these activities during your dry season.

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. ⚡ <i>Bulb trick</i> ☆</p> <p>Do this activity at night in a darkened room. You will need a fluorescent tube or a low energy bulb and an inflated balloon. Hold the bulb in one hand and rub it energetically through your hair. (Your hair needs to be clean and dry.) Hold the bulb in the other hand. Bring the balloon close to the bulb and observe what happens. Tell your teacher what you found out.</p> <p>For ☆ <i>bonus star</i> - Find out how a fluorescent tube works and draw a diagram to explain how it works.</p>		
<p>2. ⚡ <i>A hairy experiment</i> ☆</p> <p>Draw a circuit diagram for a simple electric circuit. Use a battery, a bulb, a switch and some connecting wires. Make the circuit work. Now add a comb to the circuit. What happens? Try to explain what you see.</p>		
<p>3. <i>Battery or cell</i> ☆</p> <p>Scientists are referring to different things when they use the terms battery and cell. Explain the difference between them.</p> <p>4. <i>Fruit or vegetable battery</i> ☆☆</p> <p>Make a working battery from a piece of fruit or vegetable that will operate a low voltage LED clock or a battery clock (e.g. the one on your classroom wall might be suitable). To get you started – Try an Internet search for <i>fruit battery</i> or <i>vegetable battery</i>. Show your teacher your working battery. You will need to know the difference between a cell and a battery.</p> <p>For ☆ <i>bonus star</i> - Provide a scientific explanation for why your battery worked. (You may use a library book or the Internet to help you.)</p> <p>For ☆☆ <i>bonus stars</i> - Show your teacher a working electric circuit containing two different types of fruit or vegetable batteries.</p> <p>5. <i>History of electricity in Australia</i> ☆☆</p> <p>Create a PowerPoint presentation (of at least ten slides) or draw a cartoon strip (at least one page) about the history of electricity in Australia.</p>		

SAMPLE ONLY

ENERGY

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Forms of energy ★★ Scientists refer to different types of energy e.g. light, heat, sound, electrical, magnetic, kinetic (moving) and chemical. Create a poster or PowerPoint presentation that describes each type of energy.</p>		
<p>2. Renewable and non-renewable energy ★★★ What is meant by the terms 'renewable energy' and 'non-renewable energy'? Find some Australian examples for each. What are the benefits and disadvantages of each? Create a poster, PowerPoint presentation or pamphlet about what you found.</p>		
<p>3. Energy transfer ★★ Energy is constantly transferring between things. Investigate energy transfer by using a tennis ball or similar-sized rubber ball. Drop the ball from a height of 100 cm and measure the time it takes to reach the ground. Repeat the experiment from a height of 200 cm and 300 cm. Record your results in a table.</p>		
<p>4. Energy transfer ★★ Investigate energy transfer by using a tennis ball or similar-sized rubber ball. Drop the ball from a height of 100 cm and measure the time it takes to reach the ground. Repeat the experiment from a height of 200 cm and 300 cm. Record your results in a table.</p>		
<p>5. Energy transfer ★★ Investigate energy transfer by using a tennis ball or similar-sized rubber ball. Drop the ball from a height of 100 cm and measure the time it takes to reach the ground. Repeat the experiment from a height of 200 cm and 300 cm. Record your results in a table.</p>		
<p>6. Energy transfer ★★ Investigate energy transfer by using a tennis ball or similar-sized rubber ball. Drop the ball from a height of 100 cm and measure the time it takes to reach the ground. Repeat the experiment from a height of 200 cm and 300 cm. Record your results in a table.</p>		
<p>7. Energy transfer ★★ Investigate energy transfer by using a tennis ball or similar-sized rubber ball. Drop the ball from a height of 100 cm and measure the time it takes to reach the ground. Repeat the experiment from a height of 200 cm and 300 cm. Record your results in a table.</p>		
<p>8. Energy transfer ★★ Investigate energy transfer by using a tennis ball or similar-sized rubber ball. Drop the ball from a height of 100 cm and measure the time it takes to reach the ground. Repeat the experiment from a height of 200 cm and 300 cm. Record your results in a table.</p>		
<p>9. Energy transfer ★★ Investigate energy transfer by using a tennis ball or similar-sized rubber ball. Drop the ball from a height of 100 cm and measure the time it takes to reach the ground. Repeat the experiment from a height of 200 cm and 300 cm. Record your results in a table.</p>		
<p>10. Solar hot water system ★★★ Build a working model of a solar hot water system using everyday materials.</p>		
<p>11. Colour matters ★★★ Design and perform a fair test that demonstrates that different colours absorb different amounts of solar radiation. Write a brief report that includes what you did, your table of results and what you found out.</p>		
<p>12. Energy converting devices ★ Find and mount on a chart pictures of six different energy-converting devices. Under each picture state the main energy conversion(s) that takes place in that device.</p>		

SAMPLE ONLY

ENTOMOLOGY

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Living places and food types ☆</p> <p>Make a list of fifteen different places where insects live or spend some time or make a list of fifteen food sources used by insects.</p>		
<p>2. Different kinds ☆</p> <p>Make a list of ten different kinds of insects from your local area.</p> <p>For ☆ bonus star - Name the Order to which each insect belongs. For ☆ bonus star - Add another ten different kinds.</p>		
<p>3. Under cover ☆☆☆</p> <p>Place a piece of damp carpet, hessian or cardboard on the soil in a grassy area. Cover it with a plastic sheet and cover carefully and note the animals (insects) that come out. To help you identify them, use the following key:</p> <p><i>Bioch...</i></p>		
<p>4. Rotting meat ☆☆☆</p> <p>Place a piece of meat, the remains of a chicken carcass or a beef or lamb bone in a suitable outdoor place. (You might need to anchor it with something like a couple of small tent pegs.) Visit your sample at least daily for two to three weeks and use your science notebook to record the types of insects on it. You might even be able to record or estimate their numbers. Also record how the sample appears to change. Show your teacher your observations.</p>		
<p>14. A food source ☆☆☆</p> <p>Throughout history humans have used insects as a food source. Research why humans use insects for food. Also, research either three kinds of insects eaten as part of traditional Aboriginal or Torres Strait Islander diets or eaten in Asia or Africa. Here are some Internet search words to get you started – <i>edible insects, insects as food</i>.</p>		
<p>15. In our homes ☆☆☆</p> <p>Create an identification chart of five kinds of insects (other than mosquitoes, midges, cockroaches or ants) that inhabit our houses and can cause damage to our homes, food or clothes. Your chart should include illustrations, identification details (e.g. size), a brief description of the insects' food source and the damage the insects cause.</p>		

SAMPLE ONLY

HOME CHEMISTRY

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Perfect yoghurt ★★</p> <p>Yoghurt is easy to make. You'll need ½ cup skim milk powder, about 1½ cups of lukewarm water, 1 tablespoon of natural set yoghurt, a hand whisk, a small pottery or crockery bowl and a small hand towel. Mix the milk and water and then mix in the yoghurt. Cover the bowl and leave in a warm place until the yoghurt is the thickness you'd like (4–5 hours in a warm climate), and then refrigerate it. How does it compare with your favourite brand? Prepare a poster on what you did, your results and what you found out.</p> <p>For ★★ bonus stars - Experiment to find out which other kinds of yoghurt can be used to start the yoghurt-making process. Present your information on your poster.</p>		
<p>2. Fruit jelly science ★★</p> <p>Did you know that some kinds of fruits also contain pectin? Pectin is a natural thickener found in the cell walls of many fruits. Chop up some fruit into small pieces (about 1 cm cubes) and put them in a small bowl. Add a few drops of lemon juice to the fruit. This will help to break down the pectin in the fruit. Add a small amount of water to the fruit and mix well. Strain the mixture through a fine sieve into a clean bowl. Add a small amount of sugar to the mixture and mix well. Pour the mixture into a clean container and allow it to set. How does the mixture compare with commercial fruit jelly? Prepare a poster on what you did, your results and what you found out.</p>		
<p>3. Make your own household cleanser ★★</p> <p>You can make your own cleansers using common household chemicals. They can work well, and be safer and cheaper than commercial ones. Find a recipe to make a cleanser for cleaning one of the following – hand basin, toilet, stainless steel sink or wooden or tile floor. Show it to your teacher to check that it is safe to make. Make it up and put it into a suitable container. Be sure to label what's in the container. Try out your cleanser. How does it compare with the bought cleanser? Keep a photographic record on what you did and what you found out.</p>		
<p>10. Plop and fizz! ★★★</p> <p>When you drop an Alka-Seltzer® (or similar antacid) tablet into water a chemical reaction releases carbon dioxide (CO₂) causing the water to fizz. Can you make Alka-Seltzer® fizz faster or slower by changing the temperature of the water?</p> <p>Put 250 mL of cold tap water and a thermometer in a glass. Note down the temperature of the water. Drop an Alka-Seltzer® tablet into the water and use a stopwatch to time how long it takes for the tablet to completely dissolve. Repeat the trial three times to make it a fair test. Repeat the experiment using water of at least five different temperatures (hot to icy cold). Present your findings on a graph or in a table.</p>		

SAMPLE ONLY

HORTICULTURE AND AGRICULTURE

Read this before you start: Activities marked with **▲** require some caution. You might need to take particular safety measures when doing some of these activities, like protecting yourself from adverse reactions when touching some plant parts e.g. leaves. You could be allergic to particular plants whilst some plants might host stinging creatures such as spiders, bees and wasps.

ACTIVITIES	number of stars earned	teacher's initials and date
<p>1. What's the difference? ☆ Explain the difference between the terms 'horticulture' and 'agriculture'.</p>		
<p>2. ▲ Pruning ☆☆☆ Research how to prune a particular shrub or tree. Find an adult who knows something about pruning and ask them to show you how to do it. Write a short report on your findings.</p>		
<p>3. Research a job ☆ Research a job in horticulture or agriculture. Find out what the job involves, the skills needed, and the qualifications required. Write a short report on your findings.</p>		
<p>4. Research an Australian agricultural or horticultural invention other than the stump jump plough or the combine harvester. Describe the invention and then write a brief explanation of why (or why not) this invention has been useful.</p>		
<p>5. Seed collection ☆ Make a display collection of seeds from ten different types of food. (Try not to buy the seeds, rather collect the seeds from things you eat e.g. an orange.) Name each seed in your collection.</p>		
<p>6. Declare it! ☆ We have strict plant and animal quarantine regulations in Australia to prevent unwanted diseases and pests. Imagine you are going on a trip to South East Asia and want to bring back some souvenirs that you hope that customs won't confiscate. Make a list of the kinds of souvenirs that might not be cleared by customs. Try an Internet search for <i>Australian quarantine and inspection service</i> and then look for <i>What can't I take into Australia?</i></p>		
<p>7. Landscaped park ☆☆ Survey a landscaped park in your local area and observe the use made of plants for screening, shelter, colour, scent, shade and attracting wildlife. Make a bird's eye sketch of the park and mark on it the various kinds of plants and the purpose you think those plants have.</p>		

SAMPLE ONLY

INDIGENOUS SCIENCE

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Indigenous food science ★★</p> <p>Can you identify the plants that the following foods come from? 1) A small rainforest fruit, pink in colour that is rich in vitamin C. It makes a nice jam. 2) A large green cone that drops in January or February, and contains fifty or more nuts. They can be ground up to make a tasty pesto. 3) The tuberous underground bulb of a wetland plant can be eaten after it is cooked. The seeds and stems can be eaten raw. Choose one of these and describe, in a 1 page report, how Indigenous Australians prepare it for eating. Include illustrations.</p>		
<p>2. Macrozamia - a poisonous but rich food source ★★</p> <p>Indigenous Australians worked out methods to remove the poisons from plants so they were safe to eat. In a map of Australia, mark in the distribution of the various species of <i>Macrozamia</i>. List the names of the Indigenous Australians who lived where the <i>Macrozamia</i> was found. Describe the methods they used to treat the <i>Macrozamia</i> for eating.</p> <p>For ★★ bonus stars -</p>		
<p>3. Rock art</p> <p>How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used. How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used.</p>		
<p>4. Rock art</p> <p>How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used. How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used.</p>		
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<p>6. Rock art</p> <p>How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used. How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used.</p>		
<p>7. Rock art</p> <p>How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used. How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used.</p>		
<p>8. Rock art</p> <p>How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used. How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used.</p>		
<p>9. Rock art</p> <p>How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used. How do you think the rock art was made? List the materials you think were used. How do you think the rock art was used? List the places you think it was used.</p>		
<p>9. Who was David Unaipon? ★</p> <p>Prepare a brief biography that informs your fellow students about this famous Indigenous Australian scientist. His life information should include where and when he lived and why he is famous in the scientific world. Many Australians carry an image of him in their wallets – why?</p>		
<p>10. Astronomy ★</p> <p>Indigenous Australians had their own way of describing the night sky. Do an Internet search for <i>Wergaia planisphere</i> to find an Indigenous version of a planisphere, based on the astronomical traditions of the Boorong people in Victoria. Use it to find Indigenous constellations and also to find out when these constellations might appear in the night sky. List some similarities and differences in the ways that European and Indigenous Australian astronomers described the night sky.</p>		
<p>For ★★ bonus stars - The Boorong people knew that when the mallee fowl constellation, Neilloan, set just after sunset the eggs of the mallee fowl were ready to be collected. There are many other similar examples to be found about the relationship between the position of certain stars in the sky and natural events on Earth. Use information from either library books or the Internet to prepare a presentation on one such relationship.</p>		

SAMPLE ONLY

OCEANS

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Oceans - climate and weather ★★</p> <p>Find out how oceans affect the climate and weather on our Earth. Why is this influence so great? Write a 1 page report on what you have found out.</p>		
<p>2. Shark attack ★★</p> <p>Why do sharks occasionally attack humans? What can we do to minimise our chance of being attacked by a shark? Find scientific answers to those questions, and then create an informative poster for swimmers.</p>		
<p>3. Desalination plants ★★</p> <p>What is a desalination plant? How do they work? Where are they located? Research to answer these questions. Give your teacher a presentation on your findings.</p>		
<p>4. Flooding ★★</p> <p>Research the causes of flooding in coastal areas. How can we prevent flooding? Write a report on your findings and create a poster to educate others.</p>		
<p>5. Oil Spills ★★</p> <p>Research the causes of oil spills in the ocean. How can we prevent oil spills? Write a report on your findings and create a poster to educate others.</p>		
<p>6. Marine Mammals ★★</p> <p>Research the different types of marine mammals. How do they survive in the ocean? Write a report on your findings and create a poster to educate others.</p>		
<p>7. Coral Reefs ★★</p> <p>Research the different types of coral reefs. How do they survive in the ocean? Write a report on your findings and create a poster to educate others.</p>		
<p>8. Ocean Pollution ★★</p> <p>Research the different types of ocean pollution. How can we prevent ocean pollution? Write a report on your findings and create a poster to educate others.</p>		
<p>9. Ocean Conservation ★★</p> <p>Research the different types of ocean conservation. How can we conserve the ocean? Write a report on your findings and create a poster to educate others.</p>		
<p>10. Oceanography ★★</p> <p>Research the different types of oceanography. How do oceanographers study the ocean? Write a report on your findings and create a poster to educate others.</p>		
<p>11. Ocean Resources ★★</p> <p>Research the different types of ocean resources. How can we use ocean resources sustainably? Write a report on your findings and create a poster to educate others.</p>		
<p>12. Ocean Biodiversity ★★</p> <p>Research the different types of ocean biodiversity. How do we maintain ocean biodiversity? Write a report on your findings and create a poster to educate others.</p>		
<p>13. Wine and the Park ★★</p> <p>Research the history of wine and the park. How do they relate to each other? Write a report on your findings and create a poster to educate others.</p>		
<p>14. Earth's water ★★</p> <p>97.2% of all the water on Earth occurs as salt water and the rest (2.8%) as fresh water. The 2.8% of water that is fresh water can be further broken down – 2.4% is locked up as ice; 0.4% occurs underground; 0.05% occurs as surface fresh water in lakes and rivers etc whilst 0.01% occurs as water in soil and air. Create an illustrated, accurate and interesting way of depicting these percentages. Ask your teacher to approve your method before you begin.</p>		
<p>15. Carbon dioxide ★★★</p> <p>Human activity on Earth is producing increasing quantities of carbon dioxide. Find out what effect this has on the ocean and the plants and creatures living in it. Negotiate with your teacher about how you will present your findings.</p>		

SAMPLE ONLY

PLANTS

Read this before you start: Activities marked with ▲ require some caution. You might need to take particular safety measures when doing some of these activities like protecting yourself from adverse reactions when touching some plant parts e.g. leaves. You could be allergic to particular plants, whilst some plants might host stinging creatures such as spiders, bees and wasps.

ACTIVITIES	number of stars earned	teacher's initials and date
<p>1. ▲ <i>Leaf collection</i> ★★★</p> <p>Make a collection of pressed leaves from ten different kinds of trees or shrubs. Use a digital camera to take a photo of each leaf as well as a photo of a typical leaf from that plant. Ask your teacher to download <i>Collecting and Preserving</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p>		
<p>2. <i>Grass</i> ★★</p> <p>Use a digital camera to take a photo of a grass blade. Ask your teacher to download <i>Grass</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>3. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>4. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>5. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>6. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>7. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>8. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>9. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>10. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p> <p>11. <i>Weeds</i> ★★</p> <p>Use a digital camera to take a photo of a weed. Ask your teacher to download <i>Weeds</i> activity to assist you in recording the next to its mounted specimen. Display your collection in a display case.</p>		
<p>12. ▲ <i>More on weeds</i> ★★★</p> <p>Make a list of the weeds considered to be Australia's twenty worst by doing an Internet search for <i>Australian weeds of national significance</i>. Then find out which of these are found in your local area. (See the For ★★ bonus stars - section in the previous activity to find a weed identification tool to help you.) Use all the information you have found out to create an informative presentation suitable for your school website, school newsletter or a bulletin board in your library or local community centre.</p>		
<p>13. <i>Spices</i> ★★</p> <p>For each of these spices—turmeric, vanilla, black pepper, star anise, cinnamon, ginger, nutmeg, cardamom and chilli—find the part of the plant that is used and the part of the world where these spices originated. Create a poster, pamphlet or PowerPoint presentation to show what you have found out. Include map of the world to indicate the place of origin of each spice.</p>		

SAMPLE ONLY

POLAR SCIENCE

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Where did Antarctica come from? ★★ Did you know that Antarctica hasn't always been at the South Pole? Your task is to find out where it has been and you will need to provide evidence for this. Give your teacher an illustrated 1 page report about what you found out. To get you started – Try an Internet search for <i>Origins of Antarctica</i>.</p>		
<p>2. Antarctica and the Arctic ★★ What differences are there between Antarctica and the Arctic? Do some research and find out about their physical differences and how their flora and fauna differ. Negotiate with your teacher on how you will present your findings.</p>		
<p>3. Earth's Poles ★★ Did you know that there are two kinds of North and South Poles? Do some research and find out about the differences between the poles. Support your findings with evidence.</p>		
<p>4. Polar Regions ★★ Do some research and find out about the differences between the polar regions. Support your findings with evidence.</p>		
<p>5. Polar Regions ★★ Do some research and find out about the differences between the polar regions. Support your findings with evidence.</p>		
<p>6. Polar Regions ★★ Do some research and find out about the differences between the polar regions. Support your findings with evidence.</p>		
<p>7. Polar Regions ★★ Do some research and find out about the differences between the polar regions. Support your findings with evidence.</p>		
<p>8. Polar Regions ★★ Do some research and find out about the differences between the polar regions. Support your findings with evidence.</p>		
<p>9. Polar Regions ★★ Do some research and find out about the differences between the polar regions. Support your findings with evidence.</p>		
<p>10. Polar Regions ★★ Do some research and find out about the differences between the polar regions. Support your findings with evidence.</p>		
<p>11. Antarctic krill ★★ Do you know that many animals in the southern ocean depend either directly or indirectly on small crustaceans called krill as a food source? Do some research to answer the following questions. What are krill and what do they need to live? Why are they so important to penguins and southern ocean animals? Why have krill populations decreased dramatically? What do scientists think has caused this? Why might climate change further reduce krill populations? Use your answers to write a 1 page report on Antarctic krill.</p>		
<p>12. Penguins, polar bears and climate change ★★ Choose either penguins (from Antarctica) or polar bears (from the Arctic) and research the following questions. Is climate change already affecting this animal? Will this affect increase? What is the evidence? To get you started – Try an Internet search for <i>penguins and climate change</i> or <i>polar bears and climate change</i>. Write a brief magazine article on your findings. For ★★ bonus stars - Conduct research for both animals and compare them in your magazine article.</p>		
<p>13. Hearing loss in Inuit males ★★ Did you know that lifestyle changes have led to hearing loss in Inuit males? (The Inuit are indigenous people who live in the Arctic.) Do some research to find out why this is happening. Do a 3 minute illustrated talk to your class about this problem. Include a diagram or two showing the part of the ear that is affected.</p>		

SAMPLE ONLY

SCIENCE AND THE ENVIRONMENT

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Understanding waste management ★★</p> <p>Use rubber gloves to bury a mixture of rubbish scraps including vegetable peelings, paper, plastic wraps and cans in a bucket filled with damp soil. Leave the bucket for four or five weeks and then examine. Record the differences that you observe in the rubbish scraps. Prepare a presentation that demonstrates what you did, the changes you observed in the rubbish with 'before' and 'after' burial images and your conclusions about the types of waste materials that can be 'recycled' through burial.</p>		
<p>2. Waste management - efficient recycling ★★★</p> <p>How much rubbish does your household produce each week? How much of it is recycled? Separate and place all recyclable material in separate waste bins? Describe the changes that you can cut down on what enters and leaves your household.</p> <p>a) recyclable. Then make a list of the types of waste that are not recycled.</p> <p>b) ways in which you can reduce the amount of waste that your household produces.</p> <p>3. Bonus stars - Write a poem about the Australian environment as you saw it. Find out what the different types of houses are used for. Write down the descriptions of the availability in Australia. Search the Internet for the most recent news stories of 'droughts' or 'flooding rains' in Australia. Include a description of their effects on the people.</p> <p>4. Bonus stars - Are you the next David Elwick Mackellar? Write a poem about the Australia you know!</p> <p>5. Bonus stars - What are the effects of ENSO (El Niño and the Southern Oscillation). Write a summary of the possible effects on the climate of the ENSO event.</p>		
<p>8. Pesticides ★★★</p> <p>What is meant by the term 'pest'? Do you find many pests in your environment? How do you get rid of pests? Pesticides are found in many homes. They include chemicals such as insect sprays, garden sprays, and flea collars. Write a list of those found in your home (or your local supermarket). List the active chemical present and any precautions that should be taken. Try and look at more than four different products.</p> <p>⚠ All pesticides contain poison and should be handled with care.</p> <p>For ★★ bonus stars - There are traces of pesticides in the Great Barrier Reef especially in inshore areas. How did they get there? Is this a problem? Research and write a report, flow chart or PowerPoint that identifies how the pesticides got to the Barrier Reef and predict some problems that the pesticides could cause if they are not controlled.</p> <p>For ★★ bonus stars - (Years 8-10) - Enjoy reading? Perhaps you'd like to find a copy of Rachel Carson's book <i>The Silent Spring</i> to find out why people were worried about the effects of pesticides in the 1960s. Do we have to worry about such issues in the 21st century? Discuss this book with your teacher.</p>		

SAMPLE ONLY

SIGHT, LIGHT AND COLOUR

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Eye chart ☆☆ Use the Internet to find answers to these questions: What is a Snellen eye chart? How is it used to test vision? Explain the terms 20/20, 20/40 and 20/60 eye vision. Print a Snellen eye chart from the Internet. Use the chart to test your vision in each eye. Test the vision of two other people. (You will need to attach your chart to a wall and mark a line 6m away from the wall as the place to stand to do the test.) Use a table to record the results for each person. Show your teacher your explanations, test results and your chart.</p>		
<p>2. Thread the needle ☆ Find out how the use of only one eye affects your ability to judge depth. You will need a needle, a pencil, a piece of plasticine, a paper clip 'side on'. Hold the pencil at arms length with both eyes. Write a paragraph</p>		
<h1 style="font-size: 100px; opacity: 0.5;">SAMPLE ONLY</h1>		
<p>3. Colours ☆☆ Scientists and artists talk about 'the' primary colours. It is often causes confusion. Scientists are referring to the primary colours of light whilst artists are referring to the primary colours of pigments. What are the three primary colours that each group use? Why do they each use different colours? Create a poster or PowerPoint presentation that explains each system.</p>		
<p>For ☆ bonus star - Use the three primary pigment paints and create a display that shows the result of mixing two of them at a time and the result for mixing all three together. For ☆ bonus star - Ask your teacher to go to the <i>Exploratorium</i> website, find the three little pigments activity and print off a set of overhead projector acetate sheets of the images provided. On the overhead projector align the cyan, magenta, yellow and black images in various combinations. Each time record what you see.</p>		
<p>4. Mixing light ☆☆ Turn your TV on and use a magnifying glass to look closely at the screen. What do you see? How are your observations linked to the primary colours of light? How does the TV screen make the colours you see in its pictures e.g. different shades of green or red or yellow? How does it make black and white? Have a discussion with your teacher on what you found out.</p>		

SOUND SCIENCE

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Our ears ★ How do our ears work? Make a labelled diagram that shows the parts of our ear and how the different parts enable us to hear.</p>		
<p>2. Hearing devices ★★ Explain the difference between a hearing aid and a cochlear implant. Find out how each works and which type of hearing problem each is designed to help. Create an illustrated poster that shows what you found out.</p>		
<p>3. Make a cup speaker ★★★★★ Make a simple speaker from a wire coil, a headphone plug, and a foam cup. To get you started – Try an Internet search for <i>cup speaker</i>. For ★★ bonus stars – Find out how a speaker works and how it is made.</p>		
<p>11. Musical instrument of a year? Design and perform an experiment to find out. You will need a tuning fork or an anemometer. A cup suspended inside will hold a thermometer. Explain to your teacher your experiment design before you begin. Report on what you did, your results and what you found out.</p>		
<p>12. Gum leaf ★★ Australia's Aboriginal peoples used the gum leaf as a musical instrument. Learn to play a tune by blowing on a gum leaf. To get you started – Try an Internet search for <i>how to play a gum leaf</i>. Write some instructions to help someone play a tune on a gum leaf. Explain how the air must be blown to make a sound, how a low and high note is made and how soft and loud sounds are made. Show your teacher your instructions and demonstrate them using your gum leaf.</p>		
<p>13. MP3 players ★★ Create an illustrated poster about how sounds are recorded and played back on MP3 players. For ★★ bonus stars - Find out how gramophones and record players worked and compare them with MP3s.</p>		
<p>14. Hearing loss ★★ Rock musicians and other people who work in loud environments can suffer from hearing loss. Find out about this problem and how it can be avoided or prevented. Design a bumper sticker encouraging rock musicians to protect their ears from damage.</p>		

SAMPLE ONLY

SPACE SCIENCE

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. A space mission ★★★ Select a past or present mission conducted by a space agency such as NASA (National Aeronautics and Space Administration) or ESA (European Space Agency). Find the mission's goals and some information it has discovered (news reports might be useful). Find the date that the mission's probe was launched. Provide a PowerPoint or an illustrated report on your findings.</p>		
<p>2. Rocket fuels ★★ Over the history of space science, the types of fuels used in rockets have changed. Use the Internet to research different types of rockets and the fuels that have been used to get the rockets into space. For ★ bonus star - Fuels take up room in a rocket or space craft. Which type of fuel are best and why? Write your findings.</p>		
<p>3. Write...</p>		
<p>4. Space weather Research the effects of solar storms on Earth's atmosphere and on satellites in orbit. Write a report on how solar storms affect our lives. For ★ bonus star - All human-made spacecraft are controlled by radio signals from Earth. Predict the impact of a solar storm on management of these spacecraft on the Earth's surface.</p>		
<p>5. Space intermissions ★★ NASA's Dawn spacecraft left Earth in 2007 and has travelled approximately 188 million kilometres away from Earth. In July 2011, it began the first extended visit to a large asteroid, Vesta. Do an Internet search for <i>NASA's Dawn spacecraft</i> to find out about this mission. Draw up a map to show the path that this spacecraft has taken. What do scientists hope to achieve with this mission? For ★ bonus star - Some people would argue that such a space flight is a waste of time. Do you agree or disagree? In 1 page outline the reasons why you agree or disagree.</p>		
<p>6. History of space exploration ★★★ Research, design and construct a presentation that traces the history of space exploration. To get you started: Do you think the invention of flight was the beginning of the space exploration era? Did the space exploration era begin with the invention of the jet engine? You could focus on either manned or unmanned space expeditions or flights near the Earth or those through the Solar System.</p>		

SAMPLE ONLY

TECHNOLOGY, DESIGNING AND ENGINEERING

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Cave communication ★★</p> <p>You are part of a team which is exploring a large cave system. The cave has many twists, turns and tunnels. Echoes make it difficult to understand the leader's instructions which are: Go forward; Go back; Turn right; Turn left; Stop and Emergency. Design and record a communication method using a torch light. The method you create must be capable of transmitting several communications in short sequence without confusion e.g. Go forward... Turn left... Go forward. Show your teacher your method and demonstrate it.</p> <p>For ★★ bonus stars - In the cave system it is impossible for the last person in the team to see the leader's torch. The torch can be used to shine a light and appraise a device that the leader could shine their signals onto so that the last person can see the leader's torch. Design and construct a device to accommodate at least one bend. <i>You may work in a team of 2-4 students for this activity.</i></p>		
<p>2. Make a box ★★★</p> <p>Recycle an old rectangular box. Design and construct a new box that is stronger and more functional than the original. Show your teacher your model and demonstrate it.</p>		
<p>11. Design a bridge ★★★</p> <p>Design and construct a bridge to span a 1m gap between two tables. Use as few materials as possible, but choose between plastic drinking straws, paper or LEGO® Technic or similar construction materials. Your bridge should be able to support the heaviest possible mass in the middle – test it and record the greatest mass. Show your teacher your model, a photo or video of your model or a detailed sketch. <i>You may work with a partner for this activity.</i></p>		
<p>12. Comparing bridges ★★★</p> <p>Compare the strength of different bridge designs by making three different bridges to span a gap of 15cm, each one using one A4 sheet of paper and 20cm of sticky tape. Test each bridge by increasing a load (e.g. blocks or weights) until it collapses, then weigh the load. Record what you did, your observations and your conclusions.</p>		
<p>13. Pedal bin ★★</p> <p>Examine the operating mechanism of a pedal operated rubbish bin. Using LEGO® Technic or similar construction materials, design and construct a different method of opening a rubbish bin. The bin must be easy to empty. Show your teacher your model, a photo or video of your model or a sketch.</p>		

SAMPLE ONLY

THE HUMAN BODY

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. <i>What's your area?</i> ★</p> <p>The surface area of a human lung is equal to a tennis court. However, the skin is the largest organ in the human body. Do some research and find a way to calculate the surface area of YOUR skin. Find a sporting field to compare the area of your skin so that you can complete the following sentence: My surface area is equal to the size of a _____.</p>		
<p>2. <i>Organ systems</i> ★★★</p> <p>Make a model (2D or 3D) of one of the organ systems of the body to demonstrate its structure and also label it (you can label all the organ systems in the human body). You can use pencil and paper to make labels for your model. For example, macaroni makes a good intestine or blood vessel! Once you have finished your model, present it to your class.</p>		
<p>3. <i>Your busy skin</i> ★★</p> <p>Did you know that your skin is the largest organ in your body? It covers about 2 square metres of your body. Your skin is also very busy. It has many different jobs to do. Write down five things that your skin does for you.</p>		
<p>4. <i>Handprints</i> ★★</p> <p>Handprints are unique to each person. They are like fingerprints. You can use your handprints to identify people. Write down the names of the people whose handprints you have collected. How many different handprints did you find? How many of the same handprints did you find? Write down the names of the people whose handprints you found. How many of the same handprints did you find? Write down the names of the people whose handprints you found.</p>		
<p>5. <i>Nails</i> ★★</p> <p>Nails grow from the tips of our fingers and toes. They are made of a hard protein called keratin. They protect the tips of our fingers and toes from injury. They also help us to grip things. Write down the names of the people whose nails you have collected. How many different nails did you find? How many of the same nails did you find? Write down the names of the people whose nails you found.</p>		
<p>6. <i>Disease</i> ★★</p> <p>A disease is an abnormal condition affecting the human body. Diseases can be caused by many different factors including other animals, fungi, bacteria and viruses invading the body. Do an Internet search for <i>human parasite</i> and find one example of a parasite that can harm humans. Design and make a poster that describes and illustrates the life cycle of the parasite, how and when it can infect a human, what disease symptoms it causes and how the disease it causes can be cured.</p>		
<p>10. <i>On the outside looking in</i> ★★</p> <p>Health care professionals have a large range of methods to 'look inside' a person without actually cutting them open. In fact non-invasive medical procedures are now quite common. Do an Internet search for <i>non-invasive medical procedure</i>. You can either develop a time-line to show changes and improvements in non-invasive medical procedures. For each procedure, identify the information that it provides for a doctor on the patient's health. or choose one modern non-invasive medical procedure, describe how it works and what it is used for. Prepare a presentation for your class to tell them about the information you have gathered.</p>		

SAMPLE ONLY

TOOLS, TOYS AND MACHINES

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Simple machines ★</p> <p>Research the topic 'simple machines' and list the six different types. Show your list to your teacher.</p>		
<p>2. Simple machine collection ★★</p> <p>Make a collection of the six different types of simple machines. Label each item in your collection according to the correct name for the simple machine it represents. The six items must fit into a shoebox. Display your collection in your classroom. To get you started, try to think of everyday examples for the six kinds of simple machines.</p>		
<p>3. Take it apart ★★</p> <p>Take apart a broken moving toy or small kitchen appliance. Take a picture of each simple machine you find. ⚠ If that is not possible, take a picture of the broken toy or appliance. Write a short explanation of how each simple machine works.</p>		
<p>4. Bonus stars - Find out why your toy moves the way it does. Provide your teacher with either a written or oral explanation of why it behaves the way it does. Try to include scientific terms such as stored (potential) energy, moving (kinetic) energy, twisting (rotational) force and gravity.</p>		
<p>5. Rocking or rolling toy ★★</p> <p>Design and make a rocking or rolling toy from simple materials. Refine the design to make it rock for as long as possible. Demonstrate your working toy to your class.</p>		
<p>12. Whirligig (crank toy) ★★</p> <p>A whirligig is a toy that turns rotary motion into up and down (vertical) motion. Find instructions for making a whirligig (crank toy) by doing an Internet search for <i>Museum Victoria make a whirligig</i>. Make your whirligig and show your class how it works.</p> <p>For ★★ bonus stars - Create a small illustrated poster that shows the difference between a crank and a cam. Include an everyday example for each. Does the toy you made act as a crank or a cam?</p>		

SAMPLE ONLY

WATER

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Water pollutants ★★</p> <p>What types of pollutants can be found in rivers, dams and lakes? Where do these pollutants come from? What effects can they have on water quality? How can the pollution be prevented? Find the answers to these questions and make a table that shows what you have discovered.</p>		
<p>2. Water purification ★★</p> <p>Why is the water supplied to Australian households purified? How is the water supply in your local area purified? Write a report on your findings.</p> <p>For ★ bonus star - Include in your report two ways in which people in countries with a high population density can conserve water.</p> <p>For ★ bonus star - Find out about a warning issued by the EPA in 2007 and what the warning was and what advice was given.</p>		
<p>3. Capillary action ★★</p>		
<h1 style="font-size: 100px; opacity: 0.5;">SAMPLE ONLY</h1>		
<p>4. Water droplets ★★</p> <p>Design and conduct an experiment to determine how many drops of water from a medicine dropper it would take to fill a container with 1L of water. You will actually be counting every drop. Show your design to your teacher for approval before you begin. Record your results and your estimate of the number of drops in a litre of water.</p>		
<p>5. Water adhesion and absorption ★★</p> <p>Water adheres (sticks) to and is absorbed into some fabrics better than others. Design and conduct a fair test to determine how well water adheres to and is absorbed by various fabrics. Some fabrics to consider are – wool and silk (animal fibres), cotton and linen (plant fibres), nylon, polyester and rayon (synthetic fibres). Show your teacher your test design before you begin. Record your results in table and write a paragraph about what you have found out.</p>		
<p>13. Bottled water ★★★</p> <p>People spend lots of money buying bottles of water, but why not use tap water? Find out about 'blind trials' and design a test to compare the taste of tap water with a couple of different brands of bottled water. Find out which water your friends really prefer. Show your teacher your design for approval before you begin. Record your results in table and write a paragraph about what you have found out.</p>		

WEATHER AND AIR

Read this before you start: In some of these activities, you will make and use models to explain the science of weather and air. You will be asked to do an Internet search to find a model to make. Alternately, find models to make in books from home or your school or local library. Each time you find a model you want to make show your teacher first to have them approve it before you begin.

ACTIVITIES	Number of stars earned	Teacher's initials and date
<p>1. Demonstrate that air takes up space ★ Do an Internet search for <i>air takes up space experiment</i>. Select an experiment to do. Try it out then demonstrate and explain it to your teacher or class.</p>		
<p>2. Demonstrate that air is not weightless ★★ Do an Internet search for <i>air has mass experiment</i>. Select an experiment to do. Try it out then demonstrate and explain it to your teacher or class.</p>		
<p>3. Indigenous seasonal calendars (Australia) ★★ Australia's Indigenous communities have developed seasonal calendars over thousands of years. Search the Australian Government's Bureau of Meteorology (BOM) website for <i>Indigenous weather knowledge</i>. Select a seasonal calendar and answer these questions: What is the Indigenous name for the calendar and what country does the calendar cover? How many seasons did the Indigenous peoples for this area describe? For each season – What are the Indigenous and English names for it? What months does it cover? What are the physical features of that time of the year? What other features did the Indigenous peoples associate with this season? How did they respond to this season? Create an illustrated poster outlining what you have found out. For ★ bonus star - Describe how the European seasonal calendar we use differs from the indigenous one you discussed.</p>		
<p>10. Southern Oscillation Index ★★ Weather reports regularly refer to the Southern Oscillation Index (SOI). Find out what it is, how it is measured and the kind of weather patterns it helps to predict. Also, find out what kind of weather is associated with La Niña and El Niño and how they are related to the SOI. (The Australian Government's Bureau of Meteorology (BOM) website is a good place to look.) Create a poster or 1 page report on what you have found out. For ★ bonus star - search the BOM website to find the SOI archives from 1876 to the present. Study the SOI archive table and pick – 1. A year for which the SOI indicates the year would have been dry. 2. A year for which the SOI indicates the year would have been a wet. 3. A year where the SOI indicates that a change from El Niño to La Niña has occurred. For each task copy and paste the data into a table and give the table a title.</p>		

SAMPLE ONLY