

STEM

Year
1



Science

Technology

Engineering

Maths



By Miranda Mason

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Teachers' Notes

"The important thing is not to stop questioning. Curiosity has its own reason for existing."
Albert Einstein

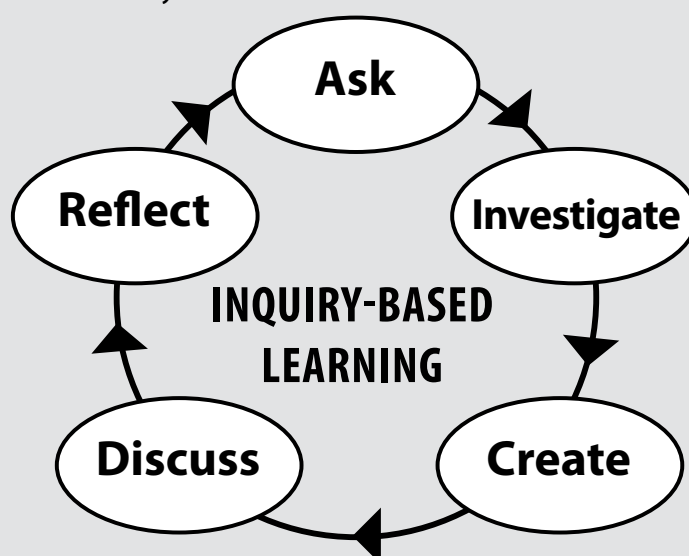
Science, Technology, Engineering and Maths are the collection of learning areas known as STEM. A particular way of thinking draws these subject areas together and encourages students to create solutions to problems. The Australian Government through the National Innovation and Science Agenda (Australian Government, Department of Education and Training, December 2015) have shone a spotlight on the importance of students having problem-solving and innovative thinking skills. They believe that the workplaces of the future will increasingly rely on students to be able to think critically and flexibly in order to address the fast-moving pace of our world.

This teacher resource supports educators by facilitating their development of inquiry-based learning in the classroom across Science, Mathematics and Technology. Literacy is also important as a General Capability and is interwoven in the tasks encouraging students to express their discoveries in a variety of ways (AC, v. 8.3, Literacy).

This resource has been designed to be completed by Year 1 students and has been broken into four main sections. The first section focuses on Science and Engineering, and asks students to consider living things and the night sky and complete a variety of challenging investigations. The content is generally outlined in the first section of the topic followed by a task to enable opportunities to put learning into practice.

The second section reviews materials, light and sound and creates opportunities for small and larger group investigations. Following on from this, the third section comprises more in-depth inquiry-based investigations. These are group tasks all centred around a particular question. The final section includes a series of shorter design investigations that require low-cost materials easily available. These could be conducted as rotations.

Enjoy the ride with your students – STEM can lead students in many unexpected directions. Working in small groups; cooperating and collaborating; practising resilience; experiencing failure when activities have unexpected results; and reflecting on what happened, are all typical STEM experiences. Encourage students to embrace the unknown and look for teaching moments to highlight. After all, according to T.S Eliot, it is perhaps the journey that is most important rather than the destination.



Curriculum Connections

This resource is linked to the Australian Curriculum and addresses key learning areas in Science, Maths, and Design and Technologies. There are links to be made also across Literacy and General Capabilities. On each activity page the predominant descriptor is included but it is important to be aware that other connections can also be made. For more detailed information regarding the Australian Curriculum please explore the website: www.australiancurriculum.edu.au

Year 1 MATHS	Year 1 SCIENCE	Year 1 Design & Technologies
<p>Recognise, model, read, write and order numbers to at least 100. Locate these numbers on a number line (ACMNA013)</p> <p>Count collections to 100 by partitioning numbers using place value (ACMNA014)</p> <p>Recognise, describe and order Australian coins according to their value (ACMNA017)</p> <p>Investigate and describe number patterns formed by skip-counting and patterns with objects (ACMNA018)</p> <p>Measure and compare the lengths and capacities of pairs of objects using uniform informal units (ACMMG019)</p> <p>Give and follow directions to familiar locations (ACMMG023)</p> <p>Identify outcomes of familiar events involving chance and describe them using everyday language such as 'will happen', 'won't happen' or 'might happen' (ACMSP024)</p> <p>Choose simple questions and gather responses and make simple inferences (ACMSP262)</p> <p>Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays (ACMSP263)</p>	<p>Living things have a variety of external features (ACSSU017)</p> <p>Living things live in different places where their needs are met (ACSSU211)</p> <p>Everyday materials can be physically changed in a variety of ways (ACSSU018)</p> <p>Observable changes occur in the sky and landscape (ACSSU019)</p> <p>Light and sound are produced by a range of sources and can be sensed (ACSSU020)</p> <p>Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE021)</p> <p>People use science in their daily lives, including when caring for their environment and living things (ACSHE022)</p> <p>Pose and respond to questions, and make predictions about familiar objects and events (ACSIS024)</p> <p>Participate in guided investigations to explore and answer questions (ACSIS025)</p> <p>Use informal measurements to collect and record observations, using digital technologies as appropriate (ACSIS026)</p> <p>Use a range of methods to sort information, including drawings and provided tables and through discussion, compare observations with predictions (ACSIS027)</p> <p>Compare observations with those of others (ACSIS213)</p> <p>Represent and communicate observations and ideas in a variety of ways (ACSIS029)</p>	<p>Identify how people design and produce familiar products, services and environments and consider sustainability to meet personal and local community needs (ACTDEK001)</p> <p>Explore how plants and animals are grown for food, clothing and shelter and how food is selected and prepared for healthy eating (ACTDEK003)</p> <p>Explore the characteristics and properties of materials and components that are used to produce designed solutions (ACTDEK004)</p> <p>Explore needs or opportunities for designing, and the technologies needed to realise designed solutions (ACTDEP005)</p> <p>Generate, develop and record design ideas through describing, drawing and modelling (ACTDEP006)</p> <p>Use materials, components, tools, equipment and techniques to safely make designed solutions (ACTDEP007)</p> <p>Use personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment (ACTDEP008)</p> <p>Sequence steps for making designed solutions and working collaboratively (ACTDEP009)</p>

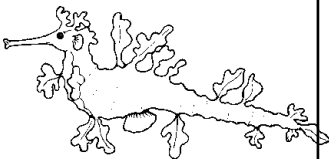
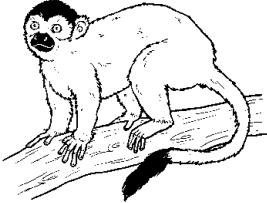
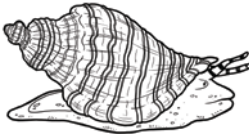
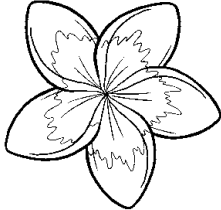

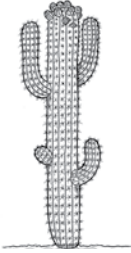
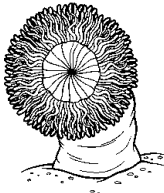
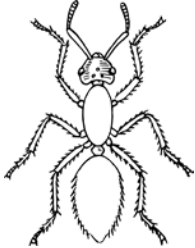

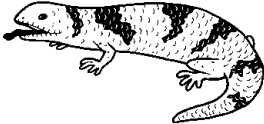

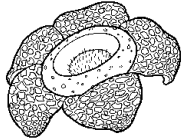
Grouping Living Things

ACTIVITY

We can sort living things into groups. Some living things belong to the plant group. Some living things belong to the animal group.



Tick to show which groups the living things belong to.

<p>seadragon</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>mammals</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>gastropods</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>frangipani</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 
<p>birds</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>cactus</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>sea anemone</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>insects</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 
<p>fungi</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>reptiles</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>molluscs</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 	<p>rafflesia</p> <p><input type="radio"/> plant <input type="radio"/> animal</p> 

What do plants need to grow? Conduct the experiment to find out.

Steps

1. Place masking tape on 5 jars and number 1-5.
2. Put cotton wool or some soil in each jar.
3. Put seed in each jar.
4. Expose each seed to different conditions (see below) and record results.



Seed	Jars	Day 5	Day 10
1	Place in a sunny spot and water.		
2	Place in the shade and water.		
3	Place in sunny spot and give no water.		
4	Place in shade and give no water.		
5	Place in a fridge and water.		

Results

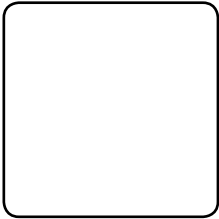
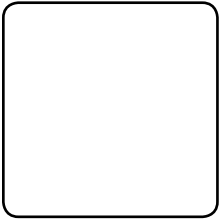
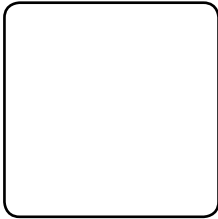
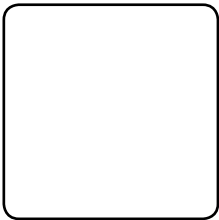
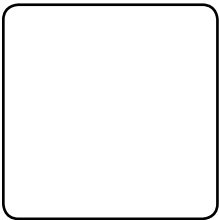
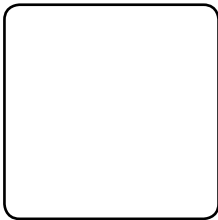
The seed that grew the best _____

The seed that did not grow _____

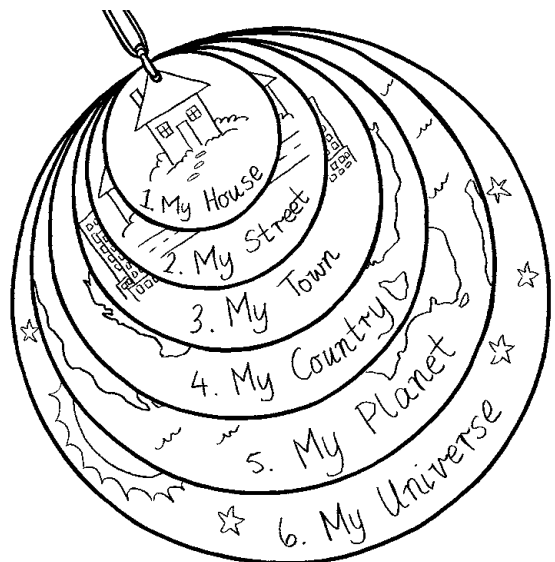
For plants to grow they need _____

It is hard to imagine, but Earth is actually very tiny compared to the rest of the Universe. There are millions of stars out there and maybe even other planets like us, still to be discovered. Astronomy is the study of stars, planets and space.

Number the places from smallest to largest. 1 = largest; 6 = smallest.

<p>My planet</p> 	<p>My house</p> 	<p>My street</p> 
<p>My country</p> 	<p>My universe</p> 	<p>My town</p> 

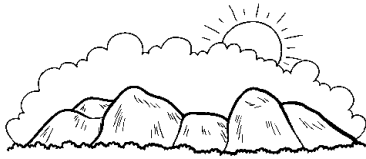
Cut out the circles on the next page. Number, label and decorate to create an *Our Place In The Sky* chain. Your key chain should show the sizes of each place in the world. Look at the picture for ideas.



Do you know the difference between natural, constructed and managed landscapes?

Task 1: Match the landscapes to the definitions.

natural
landscapes



constructed
landscapes



managed
landscapes

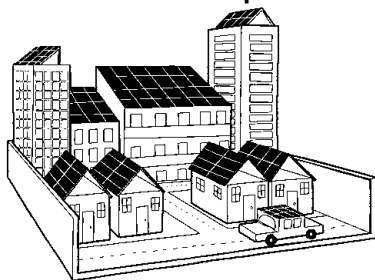


A. These places are made by people, for example: cities, buildings, roads and playgrounds.

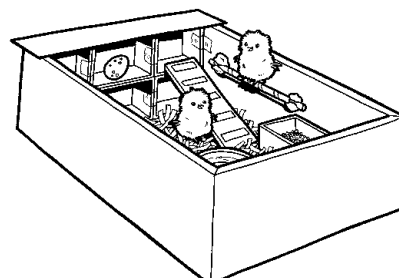
B. These are natural landscapes that people look after, for example: garden beds, lawns and backyards.

C. These places are created naturally not by people. Examples are: bushland, wetlands, deserts and lakes.

Task 2: Create a diorama of a natural, constructed or managed landscape. Look at the pictures for ideas. Work in small groups.



urban landscape



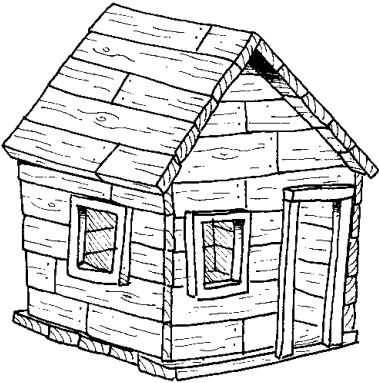
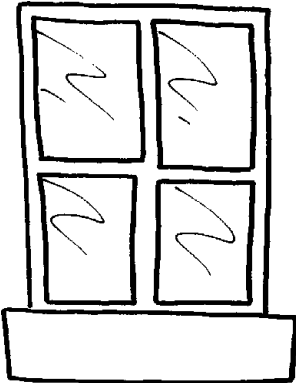
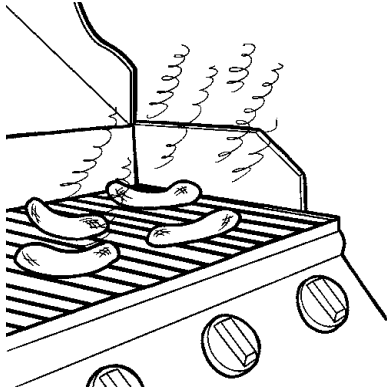
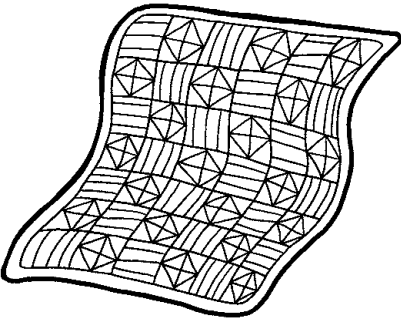
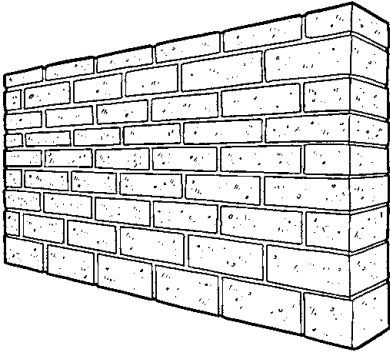
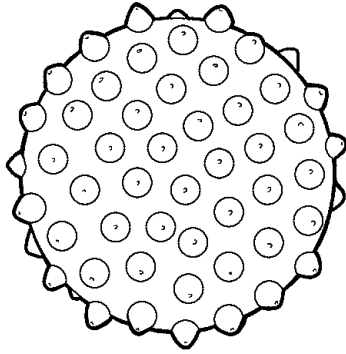
chook pen

Some materials are strong, some are flexible and some are durable. Before using a material, we should think about its properties.

Match the materials to the pictures.

Discuss why these materials are used.

wood	plastic	brick	steel	glass	cotton
------	---------	-------	-------	-------	--------

<p>cubby house</p>  <p>Material:</p>	<p>window</p>  <p>Material:</p>	<p>outdoor BBQ</p>  <p>Material:</p>
<p>quilt</p>  <p>Material:</p>	<p>wall</p>  <p>Material:</p>	<p>ball</p>  <p>Material:</p>

Challenge 3

ACTIVITY

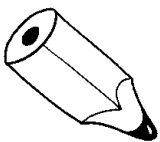
Build a tall and sturdy tower.

Materials you might need:

- newspaper
- scissors
- tape
- books
- toilet roll tubes
- kitchen roll tubes
- paddle pops
- paper
- cardboard
- string
- wire
- mesh
- blocks
- foil



Step 1 Sketch a design first.



Step 2 Build your design!

Step 3 Test it out.

Design	Height	Did it stand up?	1st or 2nd place?
Model A			
Model B			

Paper Bag Pair 1: **Reflecting Light**

Materials:

- small mirror
- squares of cardboard of different textures
- foil
- square shaped material
- torch
- sunshine

Task: Use the mirror to see if you can reflect light from the Sun or torch onto different surfaces. What do you notice? Which reflections are the brightest? Why do you think this is the case?

Two Stars and a Wish



What's going on? Light can be bounced onto different surfaces as long as they are smooth. Light reflection is important because we wouldn't be able to see without it.

Paper Bag Pair 2: **Fundraising Challenge**

Materials:

- pencil
- paper
- grocery catalogue
- calculator

Task: You would like to raise \$500 for the Koala Foundation by holding a movie night in the library. Make a plan: how much do you charge for entry? What snacks could you sell? What expenses would you have?

Two Stars and a Wish



What's going on? Organising an event is hard work. It is important to make sure all costs are covered first and then try to charge a little more to make profit to donate.