

**EBOOK CODE: REAU4054**



*Aligned with the Australian Curriculum*



# Junior Scientists

## Book 2

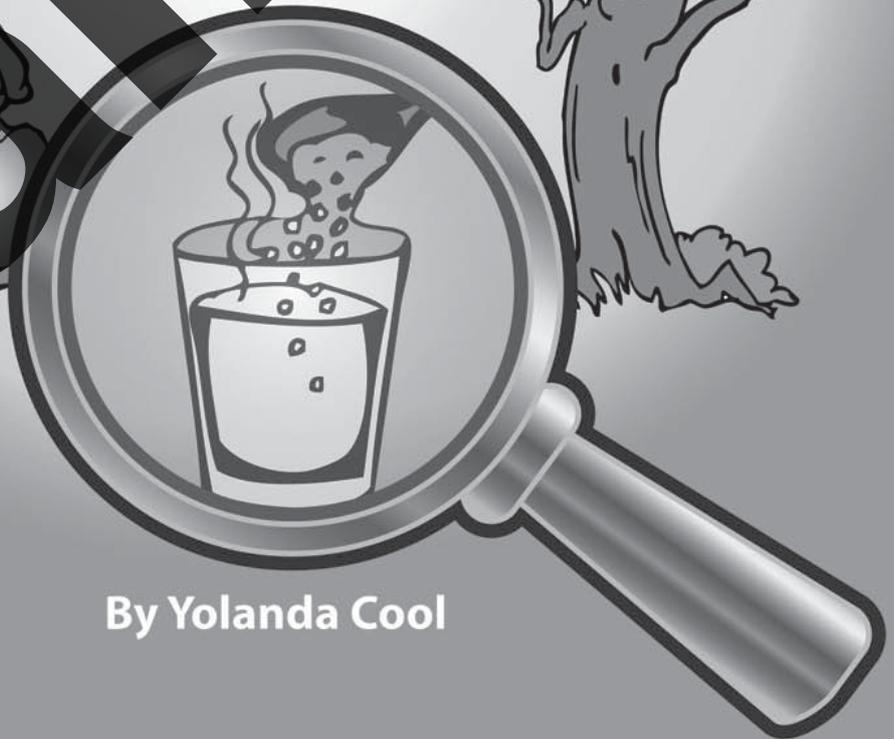
Earth & Space Sciences

Physical Sciences

Biological Sciences

Chemical Sciences

Ages 7-8 years



By Yolanda Cool

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# Teachers' Notes

*Junior Science Book 2* is the first book in a three part Science Series which helps teachers of Year 2 meet the requirements of the Australian Curriculum in their science classes.

When teaching science it is important to recognise that science is interconnected. To answer one question in biology, we can use chemistry. To understand why in physics, we can draw on earth and space science and so forth. This book helps students to make links between the four sciences by examining all four areas within one book.

Young children are naturally curious about the world around them. This book provides them with opportunities to explore the world around them by: experimenting with materials, asking questions, recording observations, investigating and reflecting, and devising new ideas/theories about how the world works.

Each activity page is paired with a page of notes for the teacher. These notes include: ideas for introducing each activity, background information, answers and possible student responses and extension activities.

This book will also help you to:

- be prepared
- encourage students to develop a deeper understanding of core concepts
- assess and observe learning
- encourage students' curiosity
- encourage students to question
- engage students through hands-on activities
- encourage reflection and documentation of experiences
- share and discuss ideas
- make boundaries, rules and expectations clear
- ensure student safety
- be flexible
- use the outdoors
- instill wonder
- foster inquiry
- encourage students to be focused and systematic in their observations and investigations
- integrate science into other areas of the curriculum

# *Australian Curriculum Links*

## **Biological Sciences**

Living things grow, change and have offspring similar to themselves (ACSSU030).

## **Chemical Sciences**

Different materials can be combined, including by mixing, for particular purposes (ACSSU031).

## **Earth and Space Sciences**

Earth's resources, including water, are used in a variety of ways (ACSSU032).

## **Physical Sciences**

A push or a pull affects how an object moves or changes shape (ACSSU033).

## **Human Endeavour: The Nature and Development of Science**

Science involves asking questions about, and describing changes in, objects and events (ACSHE034).

Sample

## ▶ Teachers' Notes

# Living and Non-Living

**Curriculum link:** recognising that living things have predictable characteristics at different stages of development.

### Important Words:

record, living, non-living, change, produce, alive, dead, move, grow, react.

### Concept:

- To differentiate between living and non-living things.

### Teaching Ideas – Sheet 1:

1. As a class come up with a definition of living things. Brainstorm all ideas on the board. (All living things use energy from their environment to breathe, move, grow, react to their environment, eliminate waste, eat and reproduce. Anything that is or has ever been alive.) Discuss exceptions, e.g. woolly mammoths and dinosaurs are non-living as they no longer exist.
2. As a class settle on a definition for non-living. Brainstorm all ideas on the board. (Anything that is not now, nor has ever been alive.)
3. Students should indicate whether the pictures show living or non-living things. As they are completing the task they should ask the following questions about each picture: Do I need air? Do I need water? Do I need food? Do I produce young?

### Teaching Ideas – Sheet 2:

1. As a class walk around the school environment and observe living and non-living things.
2. Students can record their findings on the activity sheet as they walk.
3. Back in class make a list on the board of the living and non-living things that students found in their environment.
4. Students can add to their list.
5. Discuss what they have learnt by the exercise.

### Extension Activities:

- Ask the class to draw and name five living and non-living things at home.
- Start a class word board which displays scientific terms that the students learn as they complete the activities in this book.

# ▶ Living and Non-Living 1

○ Write two sentences.

**Living things** \_\_\_\_\_

\_\_\_\_\_

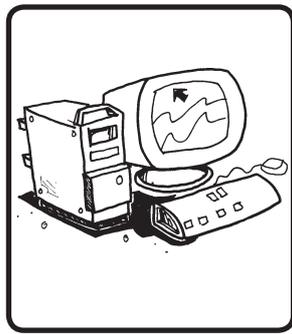
**Non-Living things** \_\_\_\_\_

\_\_\_\_\_

○ Colour the **living things** green. Colour the **non-living things** red.



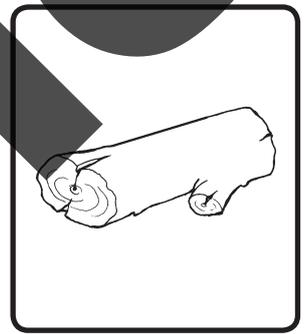
**Bird**



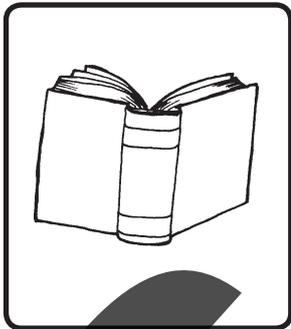
**Computer**



**Plant**



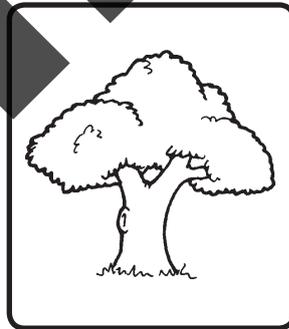
**Log**



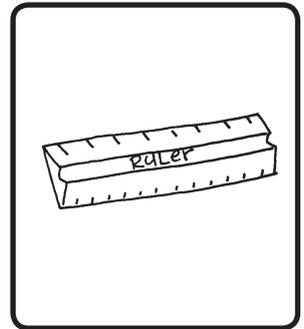
**Book**



**Boy**



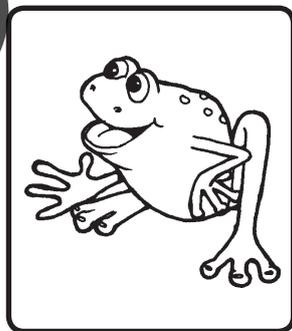
**Tree**



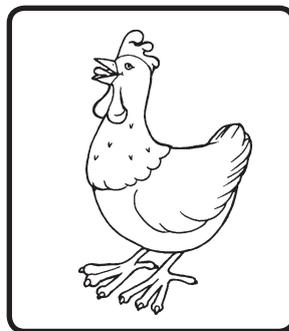
**Ruler**



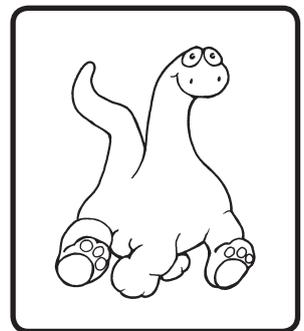
**Pot**



**Frog**



**Chicken**



**Dinosaur**

○ Point to each picture and explain to a partner how you made your decision.

**Curriculum link:** recognising that living things have predictable characteristics at different stages of development.

**Important Words:**

lifecycles, characteristics, stages, development, predictable.

**Concept:**

- Recognising that living things have predictable characteristics at different stages of development.

**Teaching Ideas:**

1. Discuss with your class how we all grow and change. As a class map predictable stages of growth, e.g. as babies we crawl, we then walk, we grow taller, we lose our baby teeth, etc. This will help them to understand how as we live we grow and change.
2. Tell them that animals grow and change like us. Explain that like humans, animals go through certain stages of growth. Tell them that a chicken for example, begins as an egg, hatches into a baby chick with yellow feathers and as it grows into a chicken, its feathers turn brown.
3. Ask them to fill in the chart which maps the stages of growth of four animals.

**Extension Activities:**

- Compare how different species begin life in different ways and develop. This could be done on a visit to your local vet/ zoo to see different animals.

# ▶ Stages of Growth

○ Use the words to show the growth stages of a frog.

**tadpoles**

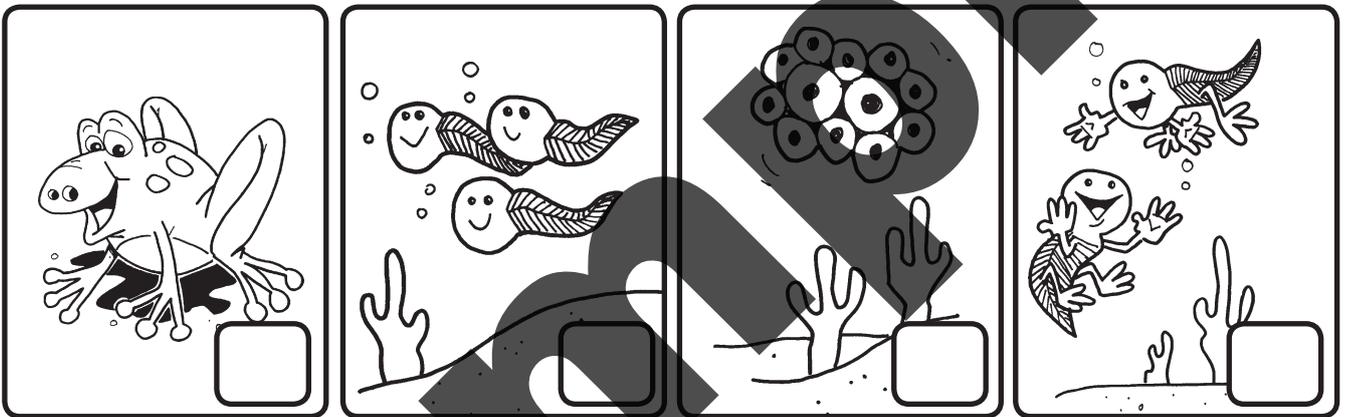
**spawn**

**frog**

**legs**

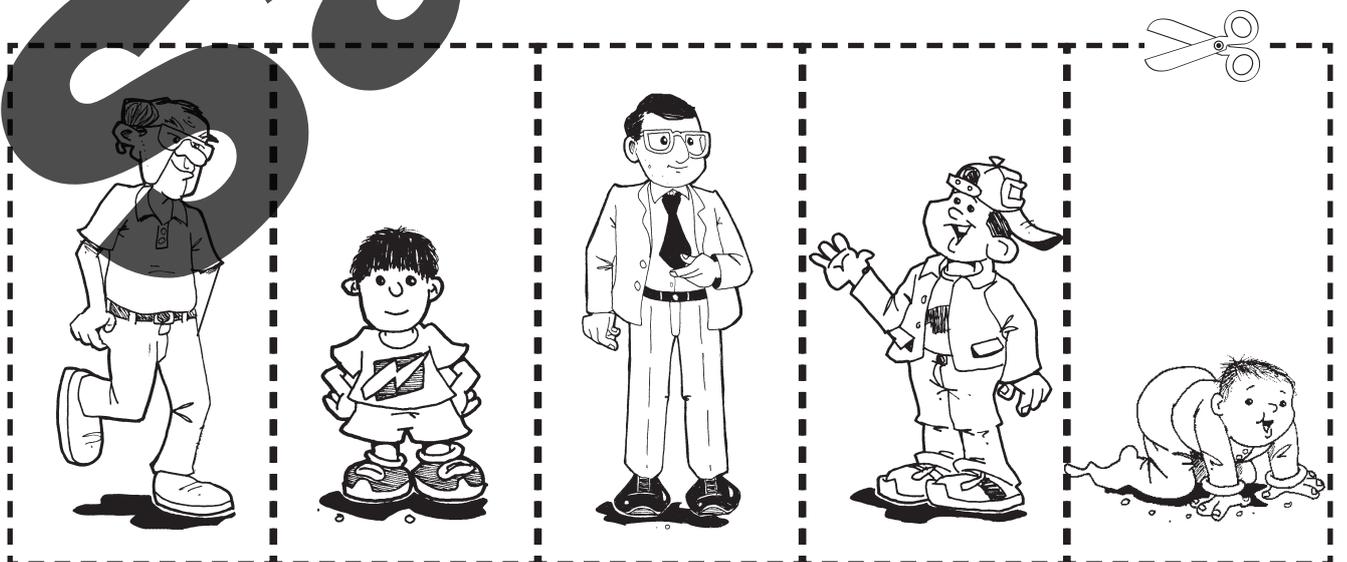
1. Frogs begin life as frog \_\_\_\_\_.
2. They then hatch into \_\_\_\_\_.
3. At 6 to 9 weeks they grow \_\_\_\_\_.
4. At 12-16 weeks, they turn into fully grown \_\_\_\_\_.

○ Number the pictures to show the correct order.



○ Look at the stages of growth that humans go through.

Cut out and glue them in order on a separate piece of paper.



# ▶ Mixing Materials 1

## Experiment:

How solids can dissolve into liquids and create a new solid.

## Materials:

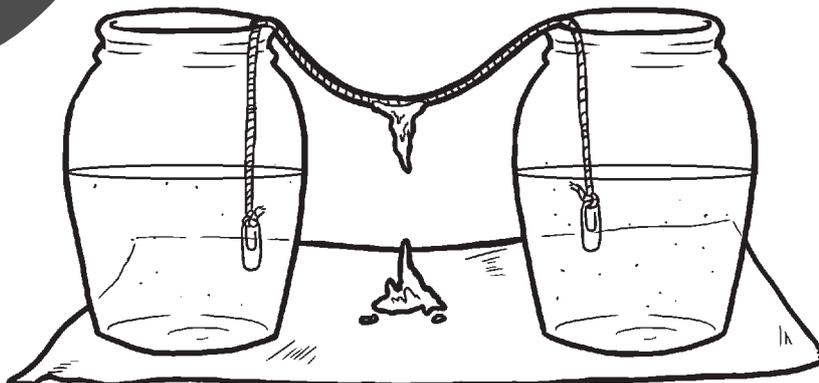
- ½ cup Epsom salts
- 1 cup hot water
- 25cm wool/yarn
- two paper clips
- two glass jars
- 30cm aluminum foil

## Process:

1. Place the two jars on the aluminum foil, with a space in the middle, in a warm place.
2. Half fill the two jars with hot water.
3. Mix Epsom salts evenly into jars and stir until they dissolve.
4. Wet the string and tie paper clips to each end.
5. Drop the string ends into each jar until the middle hangs over the aluminum foil.
6. Leave and watch the crystals form.
7. If the crystals are dripping too fast you can pull the jars apart to slow it down or push the jars together if it is going too slow.

## Test:

- *After 30 minutes check to see if you have made any stalagmites and/or stalactites (some solution will be dripping off the string).*
- *Check again in one hour, in one day and in a couple of days.*
- *Photograph your findings and present as a poster.*



## Mixing Materials 2

Record your findings from the experiment.

Time	Appearance of Stalagmites/ Stalactites	Growth of Stalagmites/ Stalactites (cm)
after 30 minutes		
after 1 hour		
after 2 hours		
after 1 day		
after ____ days		

How can other solids be dissolved into liquids?

\_\_\_\_\_

What happens to the solids in this experiment?

\_\_\_\_\_