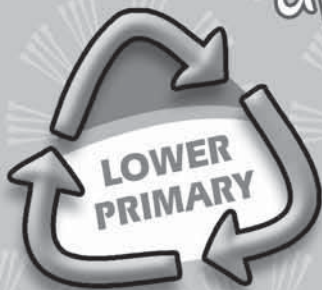




# ACTIVATE YOUR STUDENTS

*An inquiry-based learning  
approach to sustainability*

Sharon Rushton



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# Introduction

This series has been designed to help you activate your students and get them involved in their environment.

By nurturing an environmental awareness in our students we encourage the development of lifelong learning through relevant acquisition of skills. By actively investigating environmental issues, students:

- \* achieve a sense of moral ownership for and pride in the world around them
- \* build on their own interests and develop their own activities
- \* question the validity of existing information
- \* model appropriate methods for gathering data and information and analysing it
- \* actively seek reinforcement for the skills they develop
- \* achieve satisfaction for a job well done.



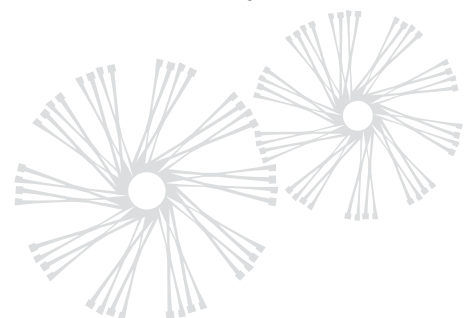
## Learning approaches

Learning as it is applied to today's curriculum is progressive and developmental. The tasks become more complex and the knowledge increasingly refined. As students progress through the stages of learning they are seen to be moving towards their desired goals and achievements. The productive opportunities to learn and do that are featured in this series allow students to progress from one level to the next in a continuous, coherent way.

**Problem-based learning** is a pedagogical approach that involves the whole class of students in planning and establishing their own learning through a unit of their own choosing. The environmental problem is identified through a range of general topics such as *water* or *animals in the garden*. Questions are then used to identify the problem that will be explored and observed, and possible solutions proposed.

For example:

1. Identify an environmental area for study  
*Creatures in our school's garden.*
2. Define a problem to study and observe  
*Is our school's garden a healthy place for garden creatures?*
3. List the objectives for study  
*Observe and report on the health of our school's garden.*
4. List the methods for observation  
*Counting, listing, mapping, etc.*
5. List the materials needed for observation.
6. Suggest possible solutions  
*How can we attract garden creatures back into our garden?*
7. Present the results of the study  
*How will we present our findings to our school and our community?*



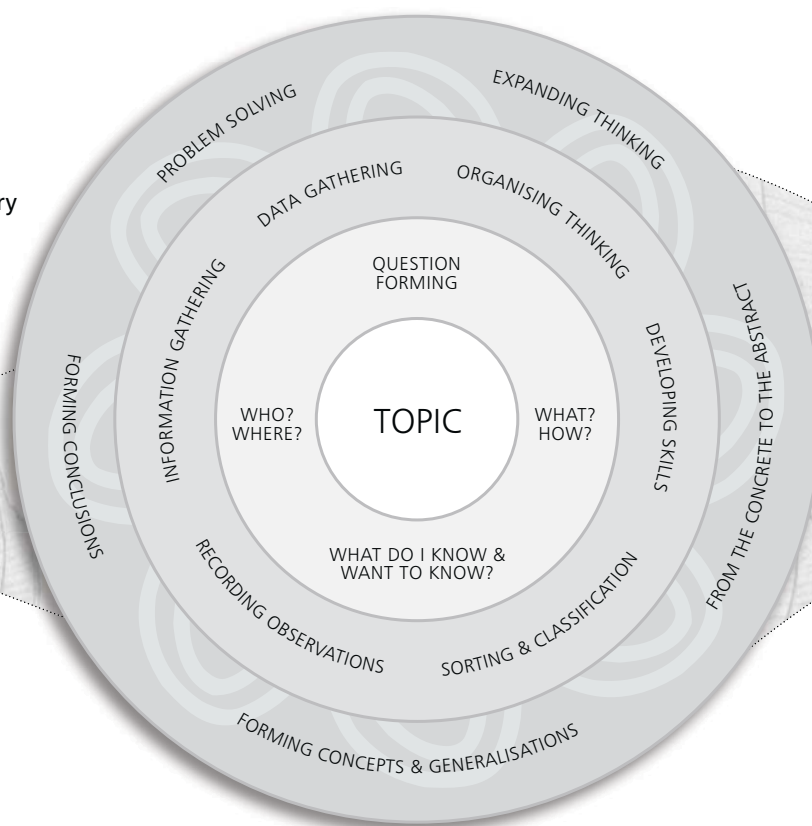
**Inquiry-based learning** is a practical approach to learning that involves students forming their own questions about a topic and then exploring their answers. Question-forming is part of the plan; problem-solving is part of the outcome.

Inquiry-based learning encourages ownership and responsibility as students actively search for and construct knowledge and its meaning through a variety of research

methods and resources. As part of this process students encounter challenging and conflicting ideas and can begin to transfer what they have learnt to new circumstances.

Like concentric circles, the influence of their environment becomes stronger as children grow and become interested in finding out more – from their immediate focus on themselves, to their homes, their communities and eventually their world.

➤ The ripple effect of inquiry learning



## Activate your students

Each book in this series incorporates three units, based on different environmental issues, which have been proposed according to syllabus guidelines and the outcomes of national curriculum profiles. The series recognises that the communication skills of speaking, listening, reading, writing and spelling are fundamental to each learning domain, and should be incorporated into the daily lesson planning of each unit.

The three lower primary units are:

- \* Creatures in the garden
- \* A close look at plants
- \* Underwater communities

These units have been developed as a guide for broader unit planning. By having the basic structure provided, the teacher is then encouraged to build a more detailed and involved unit and carry this over to further thematic units of choice. The suggested inquiry can be used as a whole-class investigation, with students determining their own independent inquiry alongside this model.

Each unit is structured to follow these important steps in problem-based and inquiry-based learning:

# Creatures in the garden

## Teacher planning guide

Insects and other creepy-crawlies form a practical and rewarding inquiry-based unit. They provide a perfect opportunity for hands-on, close-up study – for as little as an hour or as long as a season.

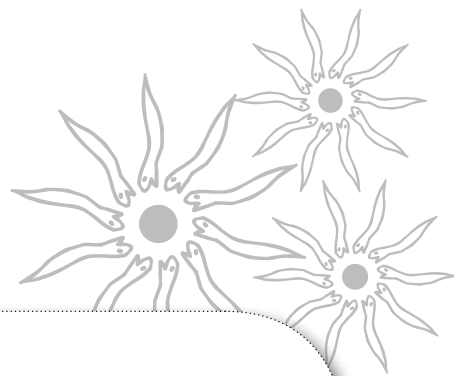
When it comes to gardens at school or at home, children can be encouraged to stop and observe any creature they come across. However, they must also be encouraged to practise good safety methods when handling or collecting bugs.



### Resource kit

- white cardboard
- butterfly net
- large glass or clear plastic jars for collecting and observing
- small aquariums for observing
- bug tanks and ant farms that can be purchased commercially
- bugs that can be purchased at the local pet store such as crickets, mealworms or beetle larvae, giant cockroaches and silkworms
- gloves
- tweezers
- magnifying lenses
- low-powered microscope with digital attachment for TV viewing
- digital camera with macro lens

A good way to collect a variety of bugs is to lay a white sheet of cardboard under a low branch of a bush or tree. Tap the branch a few times with a stick. This will knock the insects that live there onto the white card. Different types of plants will yield different types of bugs. There are also many types of small creatures under the mulch or rotting debris in our gardens. A moist garden will produce different animals from a dry one.



### Quick tips

- Demonstrate to students the proper handling of all garden creatures.
- Use gloves when collecting and handling.
- Return all creatures to the place where they were found.
- Keep creatures no longer than the hours school is in session unless a particular insect is used for life-cycle observation or colony behaviour.
- Make sure the container used for observation has adequate air flow, moisture and food if needed.

## Stimulate

Our garden creatures include some unusual animals, including giant insects, which can be used to stimulate the students and introduce the unit. It's up to you to grab your students' attentions by turning them on and tuning them in. Give them a hands-on experience and let them use their senses to pique their interest.

Some sources for experiences with live creatures are:

- \* local pet stores that carry large insects for pets, such as giant cockroaches, or insects and their larvae as food for reptiles
- \* a demonstration of collection equipment purchased from a toy store, such as the vacuum bug gun
- \* an excursion to a museum or zoo that has a live insect exhibit
- \* visuals such as posters, charts, computer software, audio-visuals
- \* a walk through the school's gardens where creature activity can be observed and recorded.

### **The giant cockroach**

Giving students a hands-on experience of touching and looking closely at a large insect, such as the giant cockroach, will pique their natural curiosity and actively engage them in the unit. Class discussion will establish knowledge they already have, let students share their knowledge and establish some things they want to know more about.

1. Pass the cockroach around so that all students have the opportunity to touch.
2. Let students listen. Does it make any noise at all?
3. Encourage students to look at all parts of the insect. What do they see?
4. Encourage them to use all of their senses except taste.
5. Other slow-moving creatures that can be used in a similar way are snails, giant earthworms, stick insects, praying mantises and others indigenous to your region.

### **Further suggestions**

- Let students examine an exoskeleton, such as that of the large beetle or cockroach. Ask how insect and human skeletons differ.
- Examine snails in the garden. Discuss: Are they pests? Are they part of the natural order of things? What are some good things about snails? What are some bad things?
- Purchase some crickets from the pet store. Let students listen to and describe the sound they make. Locate where an insect's ears are.

See Activities 1.1 (p 15) and 1.2 (p 16)

# What do we know about gardens?

Soon we will be walking through our school's gardens but first we need to prepare ourselves for our journey. Let's talk about what we expect to find in our gardens.

- 1 In the box, draw a picture of one kind of creature you think will be living there.



SAMPLE ONLY - NOT FOR USE

- 2 List words that will describe that creature.

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- 3 Share your picture with others in the class.
- 4 What are some things you will expect to see besides your garden creature?

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