



LEVEL	1	2	3	4	5
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# Crabs

## THE LEARNING CONTEXT

The teacher's intended outcomes were for the students to:

- observe closely and carefully and make accurate observations
- explain the functions of parts of a crab.

The intended outcomes were aligned to the following "big ideas":

- Scientists use observations to find out about our world, and they communicate about what they find to others.
- Living organisms have structures with specific functions that help them survive.

Before going on a trip to a rocky shore (the rock pools at Whale Bay, Raglan) the students drew sketches of what they thought a crab looks like. During the trip, the students carefully observed the animals in the rock pools.

Back in class, the teacher focused the students' study on the structures and functions of the main body parts of crabs. The students investigated crab body parts using carapaces found on the shore, and they used books, pictures, and video resources to further explore the functions of crabs' body parts. The teacher used drama and role play to extend their understanding. She encouraged them to use descriptive language to record their ideas in pieces of poetic writing entitled "What Am I?"

Finally, the students completed a second drawing of a crab, labelled and described the functions of the different parts, and suggested how the parts were adapted to their environment.

## Teacher-student conversation

After William drew his second picture:

Teacher: Tell me about what the different parts do and how they work.

William: [Points to the feelers.] They smell with these. [Points to the pincers.] The pincers are used to eat food and to protect themselves. [Points to the eyes.] It helps them when they're under the sand to see where their enemies are. They're out on sticks – they stick out. [Points to the legs.] They don't have any bones in them. It scuttles on rocks, and it uses its joints to bend its legs. [Points to the shell.] Its skin is hard, so it doesn't dry out. It's skinny, so it can fit into rocks.

## REFERENCES

Ministry of Education (1993). *Science in the New Zealand Curriculum*. Wellington: Learning Media.

Ministry of Education (2001). *Birds: Structure, Function, and Adaptation*. Building Science Concepts, Book 3. Wellington: Learning Media.

## WHERE TO NEXT?

To move William towards the next learning step, the teacher could help him to focus on:

- comparing his picture to a photo of a crab, using prompts, such as:
  - "William, can you compare your crab to a photo of a crab?"
  - "What do you notice that is the same? What do you notice that is different?" (investigating in science)
- exploring the way crabs move, using role play, for example, by asking, "William, can you be a crab and show me how it scuttles?" (developing and communicating scientific understanding).

The teacher could:

- discuss "what we have learned about learning by observing" and return to William's ideas in an appropriate unit later in the year
- return to the "big idea" about structure and function in another context (for example, birds in *Birds: Structure, Function, and Adaptation*, Building Science Concepts, Book 3).

## CURRICULUM LINKS

*Science in the New Zealand Curriculum*

### Achievement Objectives

#### Level 2: Making Sense of the Nature of Science and Its Relationship to Technology

Students can use a variety of methods to investigate different ideas about the same object or event.

*Science in the New Zealand Curriculum*, page 28  
[http://www.tki.org.nz/r/science/curriculum/p28\\_29\\_e.php](http://www.tki.org.nz/r/science/curriculum/p28_29_e.php)

#### Levels 1 and 2: Developing Scientific Skills and Attitudes

**Information gathering:** Students can:

- make observations and simple measurements
- talk about their observations and measurements.

*Science in the New Zealand Curriculum*, page 45  
[http://www.tki.org.nz/r/science/curriculum/p44\\_51\\_e.php](http://www.tki.org.nz/r/science/curriculum/p44_51_e.php)

#### Level 2: Making Sense of the Living World

Students can investigate and understand the general functions of the main parts of animals and plants.

*Science in the New Zealand Curriculum*, page 56  
[http://www.tki.org.nz/r/science/curriculum/p56\\_57\\_e.php](http://www.tki.org.nz/r/science/curriculum/p56_57_e.php)



**Investigating in Science**  
**Developing and Communicating Scientific Understanding**

ACCESS THE SCIENCE EXEMPLARS ONLINE AT [www.tki.org.nz/r/assessment/exemplars/sci/](http://www.tki.org.nz/r/assessment/exemplars/sci/)

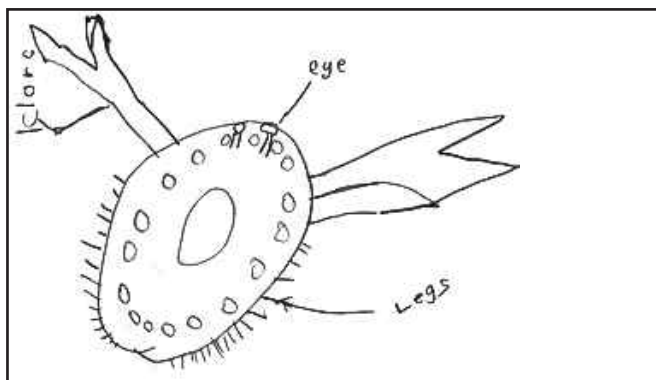
<b>LEVEL</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
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# Crabs

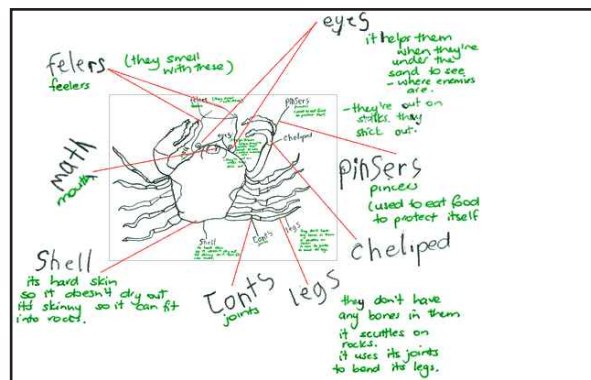
## WHAT THE WORK SHOWS

These two drawings demonstrate the understanding William gained about crabs during a rocky shore unit. The initial drawing provided a useful formative assessment to begin the teaching. It shows that William had a very basic understanding of the structure of a crab: round shell, legs sticking out the side, and eyes on stalks. His final annotated drawing shows considerable progress.

This exemplar could be used with students to develop criteria for observation or to assess their understanding of the structure and function of crabs.



William's "before" view



William's "after" view

### Progress Indicator Investigating in Science

#### Exploring a situation

William makes observations and looks for patterns and relationships, with prompting as needed.

#### Reporting

William reports on his investigation in an organised way. He describes the features of his crab, referring to his observations. (Note that crabs only have four sets of walking legs and one pair of nippers called chelipeds.)

### Progress Indicator Developing and Communicating Scientific Understanding

#### Using scientific ideas in constructing explanations

William offers explanations for his experiences using some scientific ideas. He is able to explain his observations with some understanding of the scientific ideas related to his experiences, such as the trip to the rock pools, and he uses drawing as a simple aid in his explanation.

#### Using scientific vocabulary

He uses correct labels of crabs.