Science Inquiry Task

Foundation Task B
Classifying Plant Parts!

This task requires students to critically observe different parts of plants (e.g. different leaves, flowers, stems, etc) and determine multiple ways of arranging the plant parts into different groups. The task assesses their ability to classify the plant parts and explain their reasoning. This task assesses the inquiry skills of, 'Questioning and Predicting', 'Planning and Conducting', and 'Communicating'.

Science Inquiry Assessment – An Introduction to the SIAs

Science inquiry is increasingly recognised as a critically important aspect of a science education. Students need not only to be introduced to the concepts of science through which we understand the world, but also to the inquiry practices through which science has investigated and established this knowledge. For students to be literate in interpreting and using science in their lives, they need to be aware of how science operates. This is increasingly important in these times of unlimited access to social media and the fake news that can be promoted.

Often, with practical activities in science, the focus is on illustrating concepts without special attention to developing investigative practices. Even with activities where students develop their own inquiries or aspects of these, the particular inquiry practices are often neither independently focused on nor assessed, reducing the opportunity to systematically develop students' capabilities with inquiry.

These inquiry assessment tasks have three aims:

1. *To help teachers and students clarify the meaning of different aspects of science inquiry practices; what these involve and how they might be recognised and assessed as a progression. They can help develop for teachers a language to discuss science inquiry practices and outcomes.*
2. *To provide the tools for assessing student inquiry at different points in the primary years. These can be used to track student inquiry learning over time.*
3. *To provide exemplar inquiry activities that can develop students' inquiry practices in contexts that engage their interest. These can be used to stimulate the development of further inquiry activities in a range of topics.*

Using the tasks:

The tasks are designed to be used independently of curriculum units, matched to different year levels and covering a range of inquiry practices.

However:

- *They can be matched to curriculum topics by utilising them flexibly at different year levels. Most could be adapted to focus on skills at higher or lower levels.*
- *Tasks are designed to focus on three of the science inquiry skills. However, they can be adapted to focus on other skills and, depending on the assessment processes used, one or two skills might be of particular focus. For the Grade 6 tasks, rubrics are produced for all 5 inquiry skills but teachers would preferably choose from these rather than attempt to track them all.*
- *Assessment can involve multiple data sources: field notes as students' work on tasks; notes on student productions; students' answers to questions; and presentations of group reports.*
- *The tasks and advice to teachers assume that teachers interact with students to scaffold their inquiries but make judgments about the extent of support needed. Similarly, they are group tasks but students report individually, so that judgments need to be made about the role of each student in a group.*
- *The tasks are designed around activities that are intrinsically captivating for students, but this depends on teachers constructing a narrative to bring these to life. For this, open questioning and introductory discussions to provide ways into the activity are important.*
- *Teachers need to make judgments about the nature and specificity of the introductory discussions to support students to the point where they can productively engage with the tasks. The support for students may be at this whole class level, but during the tasks also tailored to particular students and groups so that ideally each student works at their own level. This support might be through targeted questioning, modelling, or suggestions and encouragement to pursue specific directions.*
- *Prior to engaging with the tasks teachers need to be clear about its purposes and the levels of student inquiry practices that could be encouraged/engaged with. Students will of course come up with surprising and inventive ideas, and care should be taken to not constrain these possibilities.*

Foundation Task B: Classifying Plant Parts!

Task Summary:

This task requires students to critically observe different parts of plants (e.g. different leaves, flowers, stems, etc) and determine multiple ways of arranging the plant parts into different groups. The task assesses their ability to classify the plant parts and explain their reasoning. This task assesses the inquiry skills of, 'Questioning and Predicting', 'Planning and Conducting', and 'Communicating'.

Question for investigation:

Can you sort plant parts into different groups?

Equipment list and preparation:

Students will be divided into small groups. The items needed by each group for this task are as follows:

	EQUIPMENT	DESCRIPTION
	A range of objects	12 objects per group, including different types of leaves, flowers, stems, and fruit/nuts.

Ensure there are multiple ways of grouping — for example, green leaves and stems, colourful flowers, brown nuts.

Conducting the task:

Included in the online materials are PowerPoint slides that can be used to introduce and guide the students through the assessment. Students perform the investigation in groups but report individually.

Give each group a container of the plant parts. Make note of individual student responses on a prepared sheet during the task. The following questions can be used as prompts to guide students through the task.

- "Look at the plant parts in this container, what can you see?" — allow students to touch and share the plant parts. Circulate and probe the language of individual students.
- "Can you see some that are the same and some that are different?" — encourage students to feel and describe the plant parts and probe group and individual ideas about similarities and differences.
- "Can you sort these plant parts into groups that are the same?" Groups arrange their plant parts on their table.
- "Circulate and ask: "What is the same about the plant parts in this group?"
- "Can you sort them in a different way so each group is the same?" Groups rearrange the plant parts
- Circulate and ask "What makes them the same now?" "How are they different from the others (group/s)?"
- Ask groups and individuals — "Can you think of other ways to sort them into groups?"

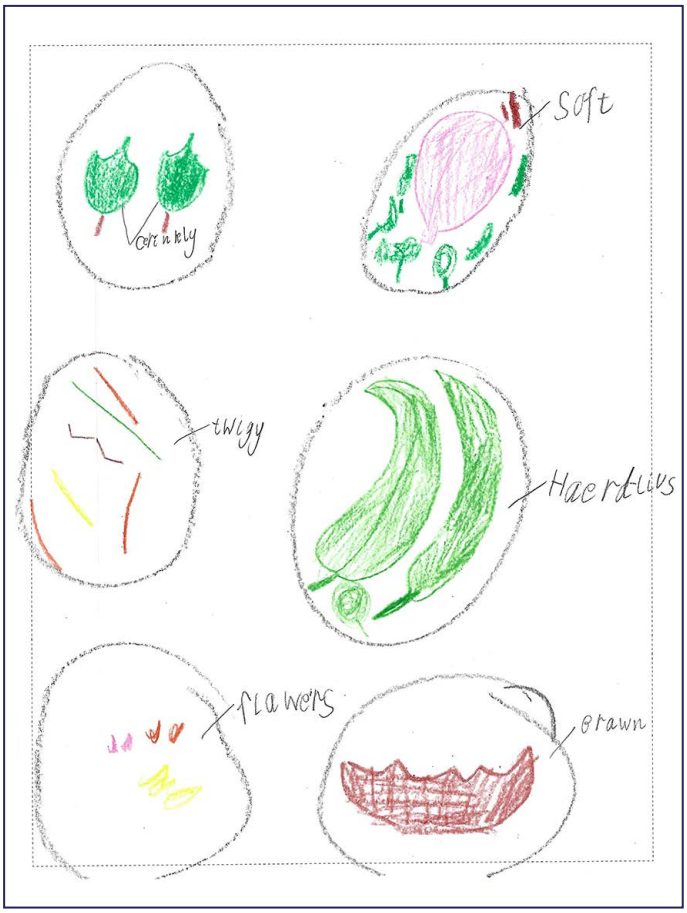
In the next part of the task, encourage students to find a different way to group the plant parts. You might model how this could be done by arranging objects on the floor and asking for ideas about how to sort in different ways.

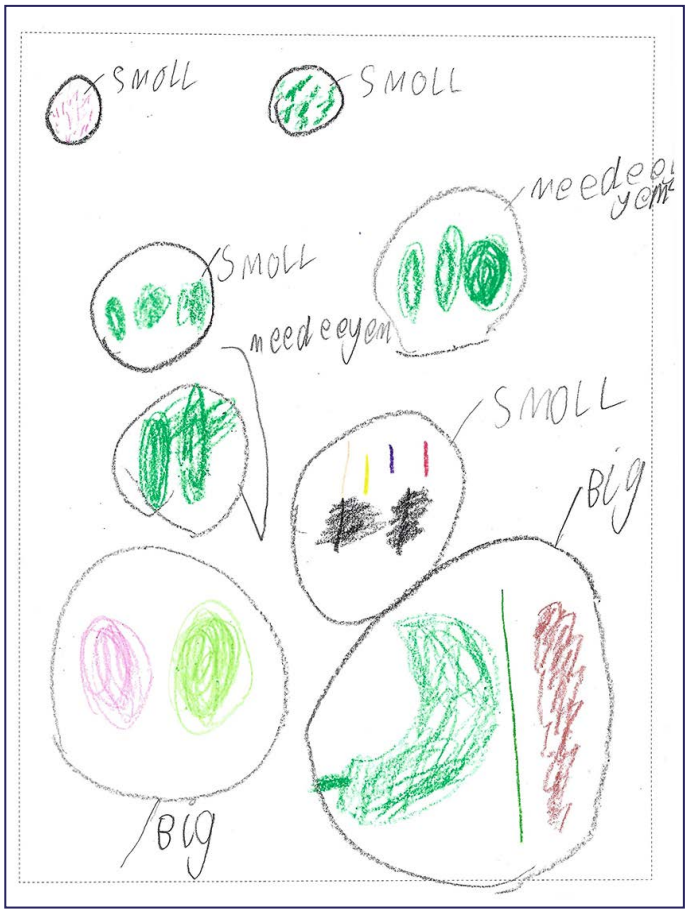
Gathering evidence:

This task could assess three inquiry skills. They can be assessed using the following evidence: observation of student engagement with sorting, students' responses to questions — such as verbal responses, actions, and gestures that describe the properties of the plant parts and the basis for the way the student has grouped them; the worksheet with representations of plant part organisation, and student labelling. The following work samples provide examples of student achievement at three levels.

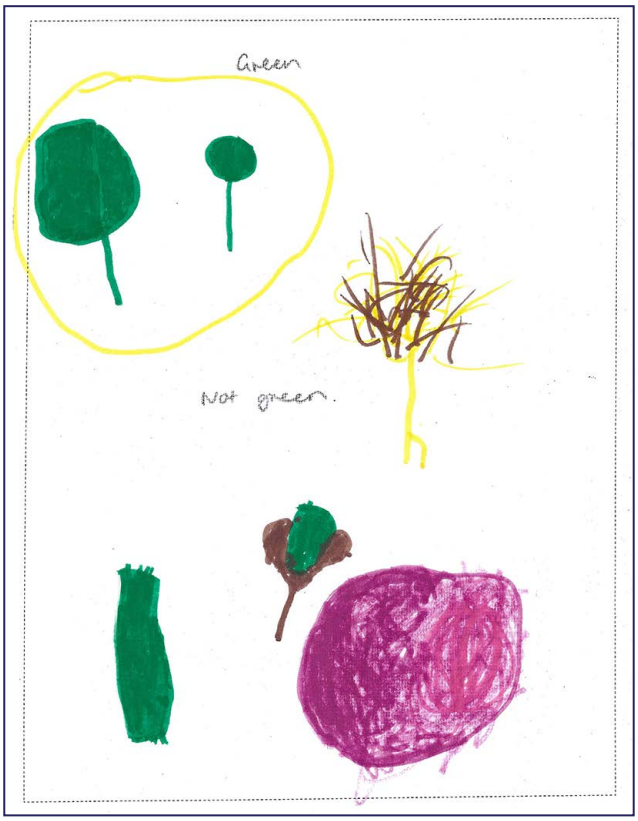
There are two (2) scoring options for the inquiry task. The Group Scoring Template rubric is designed to assess the skills observed by each group. The Class Grid rubric is to record the skills of each student within the class.

Foundation Task B: Student Work Samples





Medium-high Shows flexibility in sorting and acknowledgement of plant characteristics.



Low-medium Minimal and inconsistent sorting.

POWERPOINT SLIDE

Foundation Task B: Classifying Plant Parts!

Look at the objects in your container.

1. Do any of the plant parts have anything in common?
   How are some of the plant parts different from each other?

2. Can you sort your plant parts into groups that are the same?

3. Can you sort your plant parts in a different way this time?
   Can you think of other ways to sort your plan parts into groups?

STUDENT WORKSHEET

Foundation Task B: Classifying Plant Parts!

Name:

Q1. Can you sort the plant parts into groups? Write or draw your plan parts in each group. Label your groups.

Q2. Can you now sort your plant parts into different groups? Label your groups.

Group Scoring Template

Choose the appropriate outcome/s to focus your assessment on. It may be possible to assess three outcomes for some students or you may choose to use two or one outcome to assess the entire class. *Suggested use:* student initials and notes can be recorded in the space for each outcome/level.

Victorian Curriculum Level F–2		
Beginning	**Working Toward**	**Achieved (F–2)**
Questioning & Predicting		
Does not readily engage with questioning or predicting	Actively joins in exploration of familiar objects and events. *Engages productively with questions about similarities and differences but lacks flexibility in organising.*	Responds to questions about familiar objects and events and poses own questions. *Speculates about possible ways plant parts are similar or different.*
Planning & Conducting		
Uses limited senses to group objects. *Groups plant parts in limited ways.*	Actively observe, explore and manipulate. *Makes observations to group plant parts based on common characteristics.*	Participate in guided investigations, including making observations using the senses, to explore and answer questions. *Groups plant parts in flexible ways based on observations using multiple senses and some sense of plant structures.*

Group Scoring Template (cont.)

Communicating		
Has difficulty in describing observations. *Has difficulty in noticing and describing plant part characteristics.*	Use both general terms and simple, scientific vocabulary to begin to describe their activities and observations. *Describes differences in plant parts in restricted, informal terms.*	Represent and communicate observations and ideas about changes in objects and events in a variety of ways. *Articulates differences and similarities flexibly, identifying plant parts in clear descriptive statements.*

Class Grid

Student Name	Victorian Curriculum Level F–2								
	Questioning & Predicting			Planning & Conducting			Communicating		
	Beginning *Does not readily engage with questioning or predicting.*	**Working Toward** Responds to and poses questions, and makes predictions about familiar objects and events. *Engages productively with questions about similarities and differences but lacks flexibility in organising.*	**Achieved (F-2)** Responds to questions about familiar objects and events and poses own questions. *Is flexible and speculative about different ways objects are similar or different.*	**Beginning** Uses limited senses to group objects. *Groups plant parts in limited ways.*	**Working Toward** Participates in guided investigations, including making observations using the senses, to explore and answer questions. *Makes observations to group plant parts based on common characteristics.*	**Achieved (F-2)** Under guidance, explores and makes observations to answer questions about familiar objects and events. *Groups objects in multiple ways based on observations using multiple senses and knowledge ot material types and properties*	**Beginning** Has difficulty in describing observations. *Has difficulty in noticing and describing object characteristics.*	**Working Toward** With guidance, represent and communicate observations and ideas about changes in objects and events. *Describes differences in objects in restricted, informal terms.*	**Achieved (F-2)** Represent and communicate observations and ideas about changes in objects and events in a variety of ways. *Uses words or drawings or gestures to articulate differences and similarities flexibly, identifying objects using clear descriptive statements.*

Class Grid (cont.)

	Questioning & Predicting	Planning & Conducting	Communicating