

Science Inquiry Task

Foundation Task A Classifying Objects!

This task assesses the student's ability to classify everyday objects and toys by categorising them into different groups. Students will work in small groups to determine multiple ways of sorting the objects and justify their decisions. 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 A: Classifying Objects!

Task Summary:

This task assesses the student's ability to classify everyday objects and toys by categorising them into different groups. Students will work in small groups to determine multiple ways of sorting the objects and justify their decisions. This task assesses the inquiry skills of, 'Questioning and Predicting', 'Planning and Conducting', and 'Communicating'.

Question for investigation:

Can you sort objects into different groups?

Equipment list and preparation:

Students will be divided into groups of 3 or 4. The items needed by each group for this task are as follows:

EQUIPMENT	DESCRIPTION
A range of objects	Each group should have an equivalent set of 12 plastic, metal, wood and fabric objects, some of which are household objects or toys.
Props for sorting	Optional. E.g., hoops or trays.

Students will be asked to classify these objects into groups (e.g., type of material, soft-hard, toy/non-toy/household object) and challenged to re-classify them in a different way.

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.

Provide each group with a container of at least 12 objects with differing properties. 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 objects in this container, what can you see?” — allow students to touch and share the objects. 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 objects and probe group and individual ideas about similarities and differences.
- “Can you sort these objects into groups that are the same?” Groups arrange their objects on their table. Circulate and ask: “What is the same about the objects in this group?”

In the next part of the task, encourage students to find a different way to group the objects. 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.

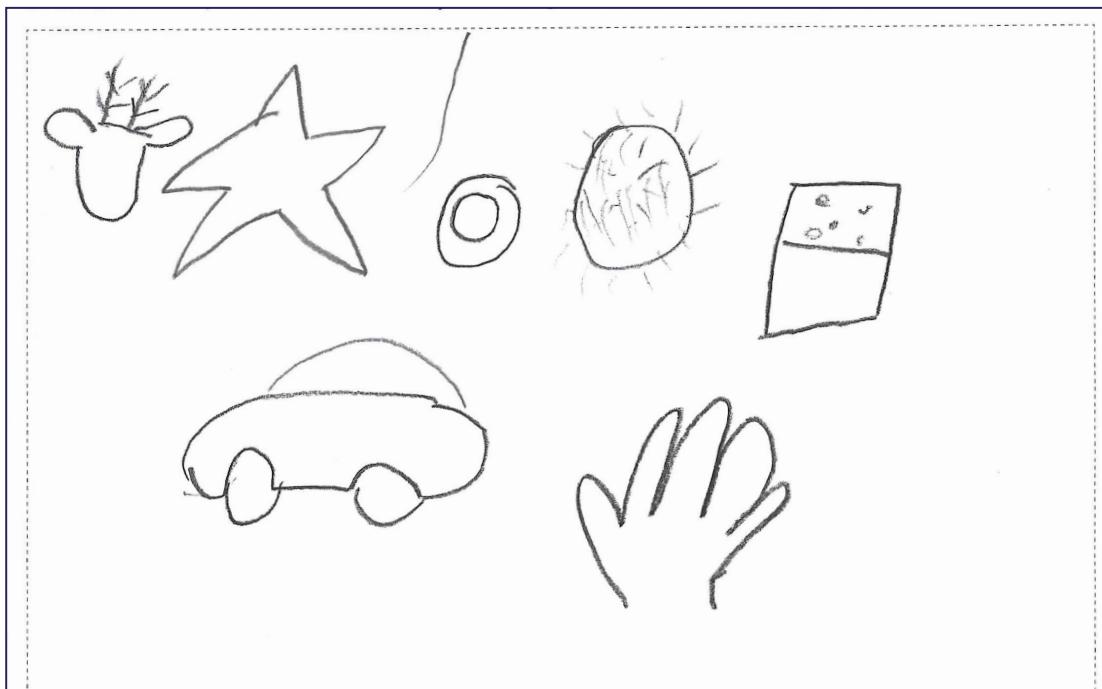
- “Can you sort them in a different way so each group has objects that are the same?” Groups rearrange the objects. Circulate and ask: “What makes them the same now?” “How are they different from the others (group/s)?”
- Ask groups and individuals — “Can you think of other ways to sort them into groups?”

Gathering evidence:

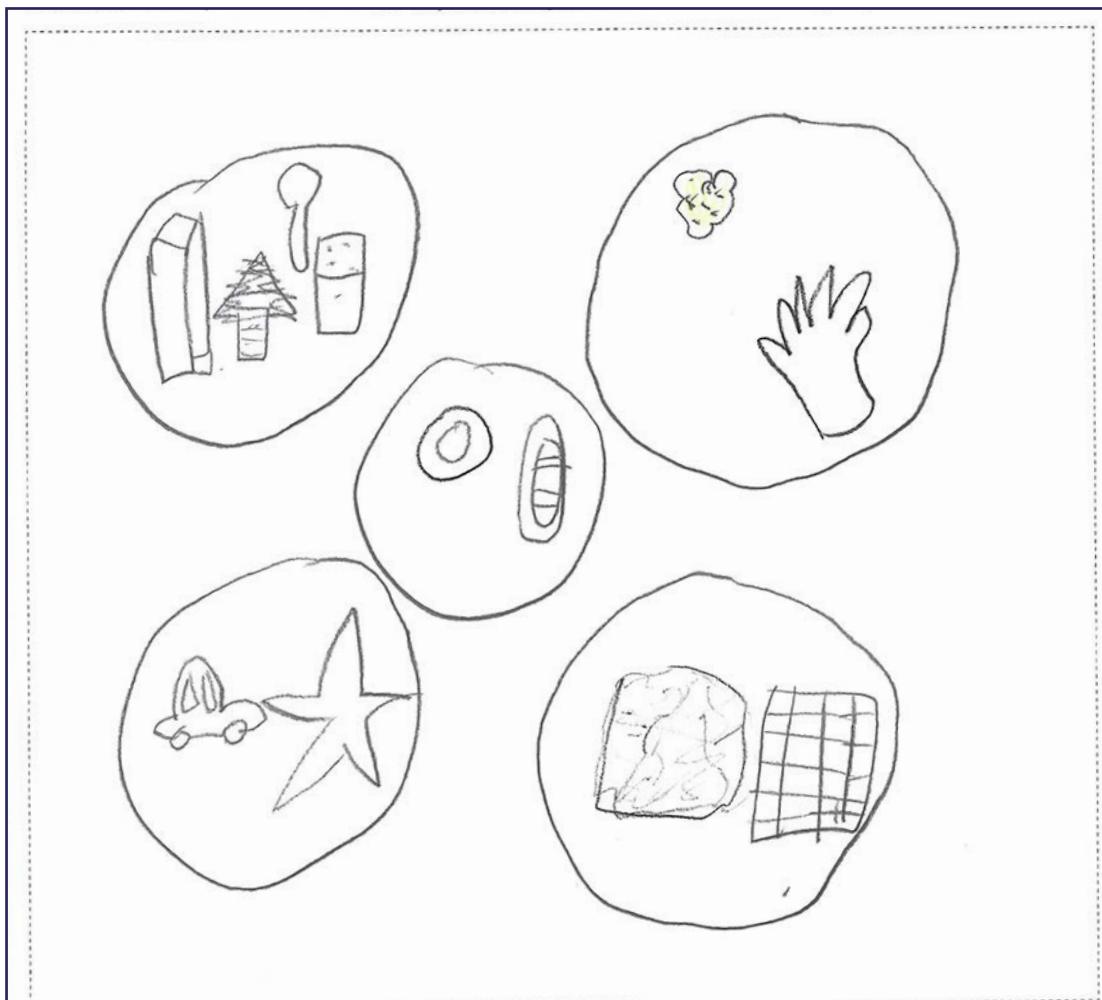
This task could assess three inquiry skills. They can be assessed using the following evidence: observation of student engagement with sorting, student responses to promoting questions, the worksheet with representations of object organisation, and student labelling. The following work samples provide 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.

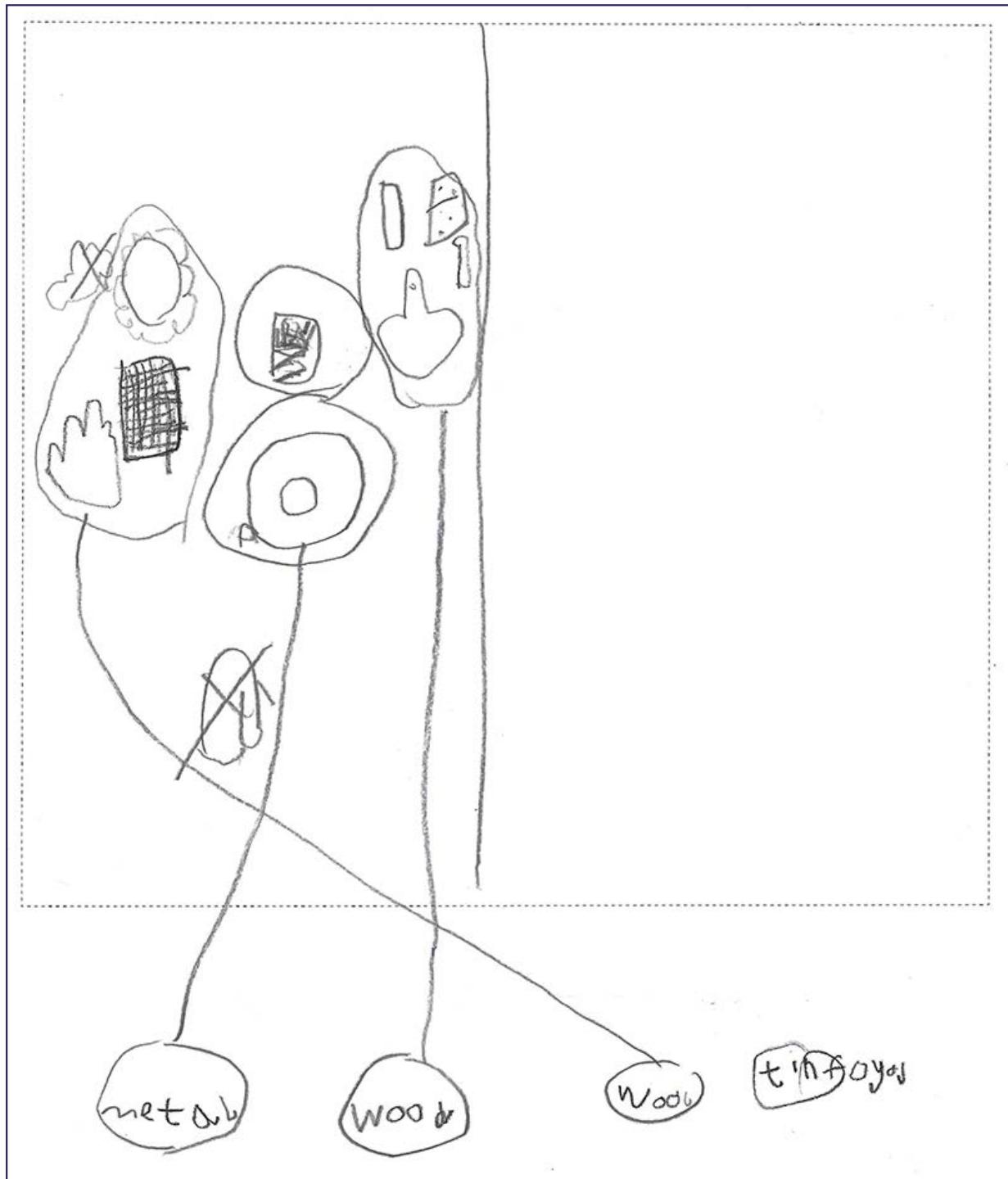
Foundation Task A: Classifying Objects!



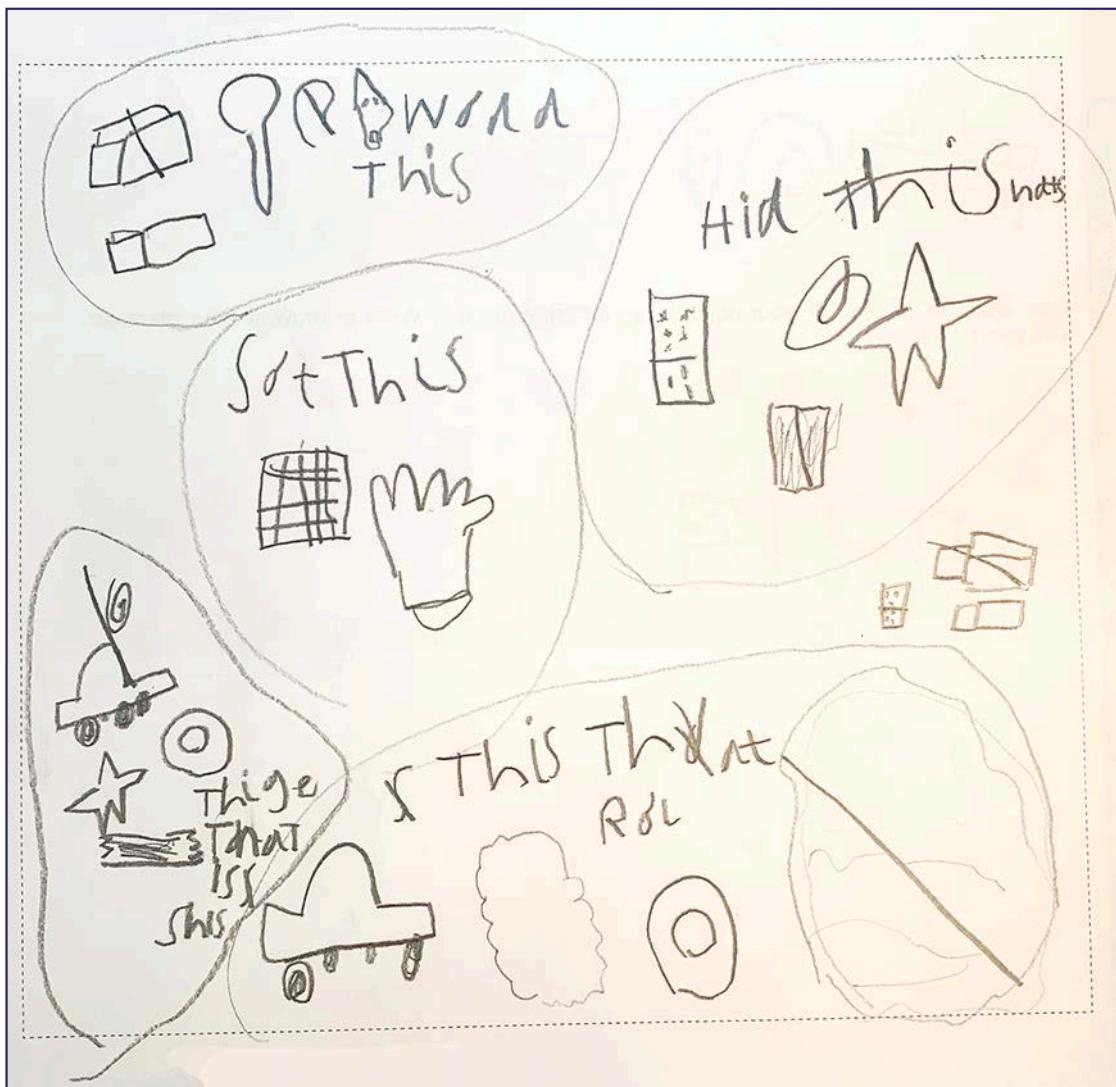
Low Has drawn objects but no clear sorting has been represented.



Medium Clear sorting of objects but missing labels.



High Distinct sorting with labels



Medium-high Sorted but with objects repeating in different groups.

Foundation Task A: Classifying Objects!

Look at the objects in your container.

- 1 Do any of the objects have anything in common?

How are some of the objects different from each other?



- 2 Can you sort your objects into groups that are the same?



- 3 Can you sort your objects in a different way this time?

Can you think of other ways to sort your objects into groups?



Foundation Task A: Classifying Objects!

Name: _____

Q1. Sort the objects into different groups. Write or draw your objects in each group. Label your groups.

Q2. How else can you sort all your objects into different groups?
Write or draw all your ideas on this page.

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		
<p><i>Has difficulty responding to questions.</i></p> <p><i>Has difficulty making predictions.</i></p> <p><i>Does not readily engage with questioning or predicting.</i></p>	<p>Responds to and poses questions, and makes predictions about familiar objects and events.</p> <p><i>Engages productively with questions about similarities and differences but lacks flexibility in organising.</i></p>	<p>Responds to questions about familiar objects and events and poses own questions.</p> <p><i>Is flexible and speculative about different ways objects are similar or different.</i></p>
Planning & Conducting		
<p>Uses limited senses to group objects.</p> <p><i>Groups objects in limited ways.</i></p>	<p>Participates in guided investigations, including making observations using the senses, to explore and answer questions.</p> <p><i>Makes observations to group objects based on common characteristics.</i></p>	<p>Under guidance, explores and makes observations to answer questions about familiar objects and events.</p> <p><i>Groups objects in multiple ways based on observations using multiple senses and knowledge of material types and properties.</i></p>

Group Scoring Template (cont.)

Communicating		
Has difficulty in describing observations. <i>Has difficulty in noticing and describing object characteristics.</i>	With guidance, represents and communicates observations and ideas about changes in objects and events. <i>Describes differences in objects in restricted, informal terms.</i>	Represent and communicate observations and ideas about changes in objects and events in a variety of ways. <i>Uses words or drawings or gestures to articulate differences and similarities flexibly, identifying objects using clear descriptive statements.</i>

Class Grid

Class Grid (cont.)