

# Science Inquiry Task

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## Level 2 Task A

### Growth of Plants!

This task assesses the student's ability to carefully analyse and carry out a series of measurements. Students will measure the growth of plants over a set time, as shown through provided photos. They will then be able to record and represent their data using tables, drawings and graphs. This task focuses on the inquiry skills of 'Planning and Conducting', 'Recording and Processing', and 'Analysing and Evaluating'.



# Science Inquiry Assessment – An Introduction to the SIAs

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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.*

## Level 2 Task A: Growth of Plants!

### Task Summary:

This task assesses the student's ability to carefully analyse and carry out a series of measurements. Students will measure the growth of plants over a set time, as shown through provided photos. They will then be able to record and represent their data using tables, drawings and graphs. This task focuses on the inquiry skills of 'Planning and Conducting', 'Recording and Processing', and 'Analysing and Evaluating'.

### Question for investigation:

Can you measure how the height of a plant changes over time?

### Equipment list and preparation:

To complete this task, students will need:

	EQUIPMENT	DESCRIPTION
	Plant images	Use the images of the spring onions re-growing over 6 days (measured on day 0, 3 and 6). For this investigation actual plants are not required. In fact Scientists often use photographs to collect data about changes over time.
	Grid/graph paper	Optional. May be provided for representing data in graphical form.

Students are provided the images of the plant re-growing over 6 days. Students measure and record the plant height for each image (day 0, 3, 6). Discussion about how to determine the height will be needed for days 3 and 6 as their is no obvious or single plant height.

### 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 may conduct the investigation in groups, however they should report individually.

The following questions and prompts can be used to guide students through the task and their worksheets:

\* What changes do you notice in the plant as it re-grows from day 0, to day 3, to day 6?

Encourage students to use the blocks (informal measures) to measure the height of each plant for each day.

\* How will we record the height of the plant on each day?

With prompting, students suggest using a table.

*Q1. Record the measurement for the height of the plant as it grows over 6 days.*

Then ask the students to consider what happens to the plant as it re-grows from day 0 to day 6. The change in height (measurement) is usually recorded in a graph. Use class discussion to encourage students to consider representing their data in a graph.

*Q2. In the space below, write or draw what happens to the plant's height over time.*

If you are assessing the Analysing and Evaluating outcome students will need to compare their results with others. Teachers may facilitate students to share their data. Measurements with information measures may be difficult to compare. If rulers are used then comparison is easier. This could be a good time to discuss the value of formal measures.

Compare your measurements with others

*Q3. Why have different groups got slightly different measurements?*

Engage students with discussion about measurement and invite them to record their thoughts on the worksheet.

*Q4. What are some other ways you can measure the growth of a plant?*

### Gathering evidence:

Can students record the measurement of the height using formal or informal measures? Can students interpret in centimetres and what about half centimeters? Can students present their measurements logically using— text, tables, graphically, or pictorially? Can students ask questions and postulate about their measurements and the validity of the data to reflect the growth of the plant?

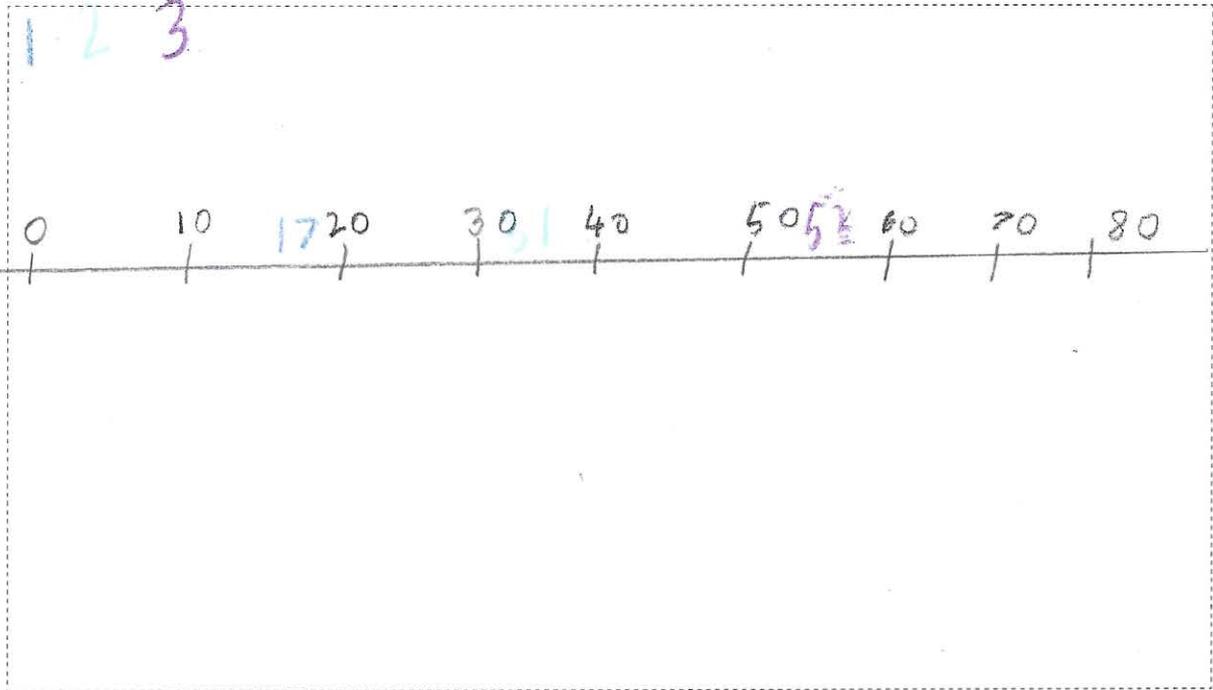
There are two (2) scoring options for the inquiry task. The Group Scoring Template rubric is designed to assess the skills observed by each group. The Class Grid rubric is to record the skills of each student within the class.

## Level 2 Task A: Student Work Samples

These student work samples were produced using different plant growth images. Students were also provided with a ruler (formal measures) to use.

Measure how tall the plant is at different times. You can use the ruler in the photo.

Copy the table from the board in the box below.

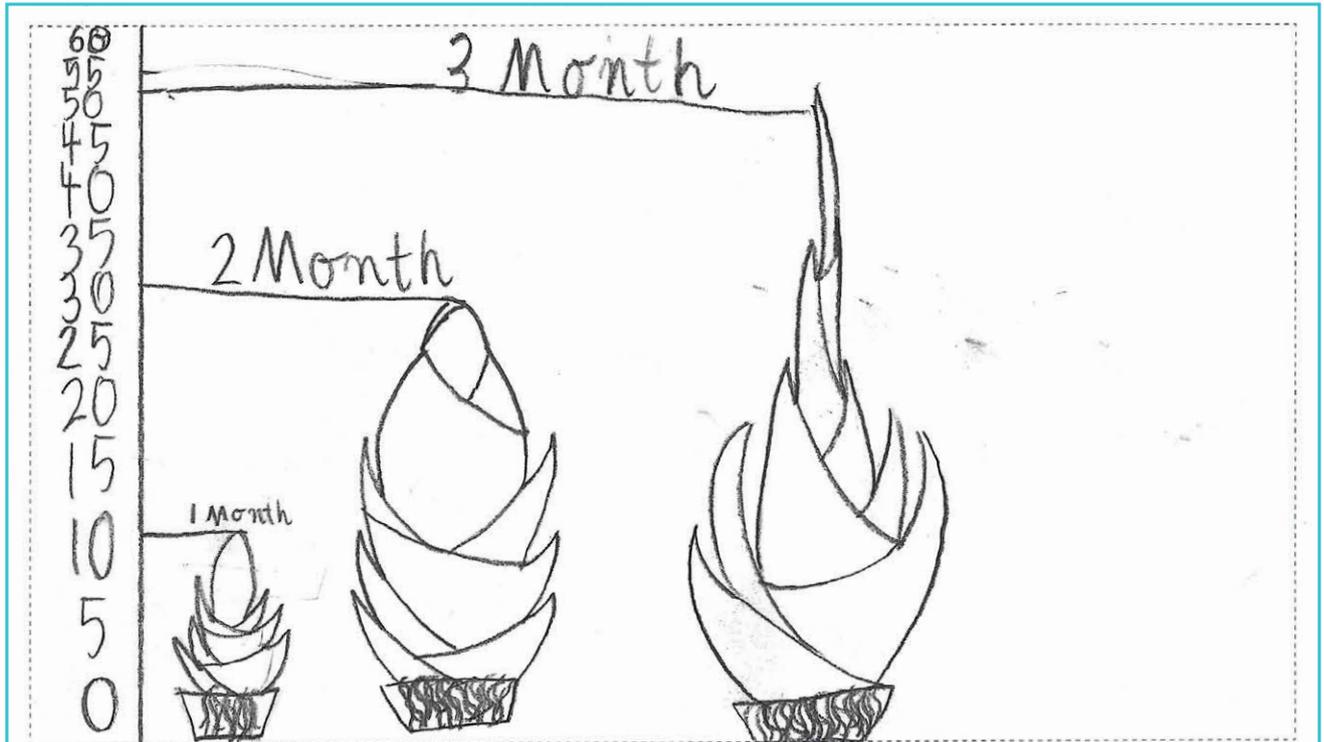


Record the age and height of the plant into the table.

In the space below, write or draw what happens to the plant's height over time.

~~It grows quick~~  
 1 month was 17 cm  
 2 month was 31 cm  
 3 month was 52 cm

**Low** Does not process the data in a table or as a summary over time.



Record the age and height of the plant into the table.

In the space below, write or draw what happens to the plant's height over time.

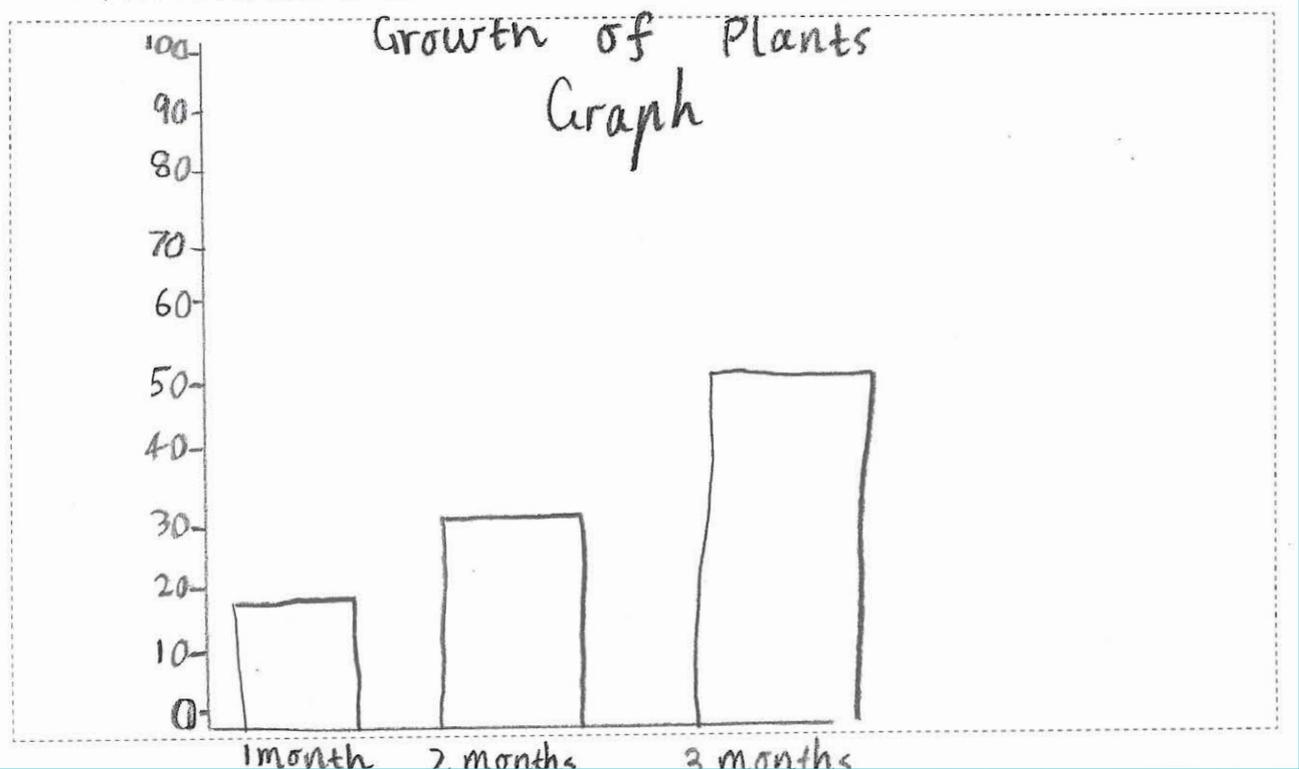
The plants grew 20 CM  
apart

**Medium-high** Clearly represents data and summarises pattern of change.

Time	Height
1 month	17.5 cm
2 months	31 cm
3 months	53 cm

Record the age and height of the plant into the table.

In the space below, write or draw what happens to the plant's height over time.



**Medium-high** Shows command of table and graphical conventions but has not included an interpretation of the pattern of change.

## Level 2 Task A: Growth of Plants!

Measure the height of the plants as they re-grow over 6 days.

- 1 What do the photos show about the plant?
- 2 How could we measure how the plants have grown over time?
- 3 Compare your measurements with others. Are they the same?
- 4 Why have different groups got slightly different measurements?

Day 0



Day 3



Day 6



## Level 2 Task A: Growth of Plants!

Name: 

Measure how tall the plant is at different times. You can use the blocks or a ruler.

Q1. Record the measurement for the height of the plant as it grows over 6 days

Large empty dashed box for recording measurements.



Day 0



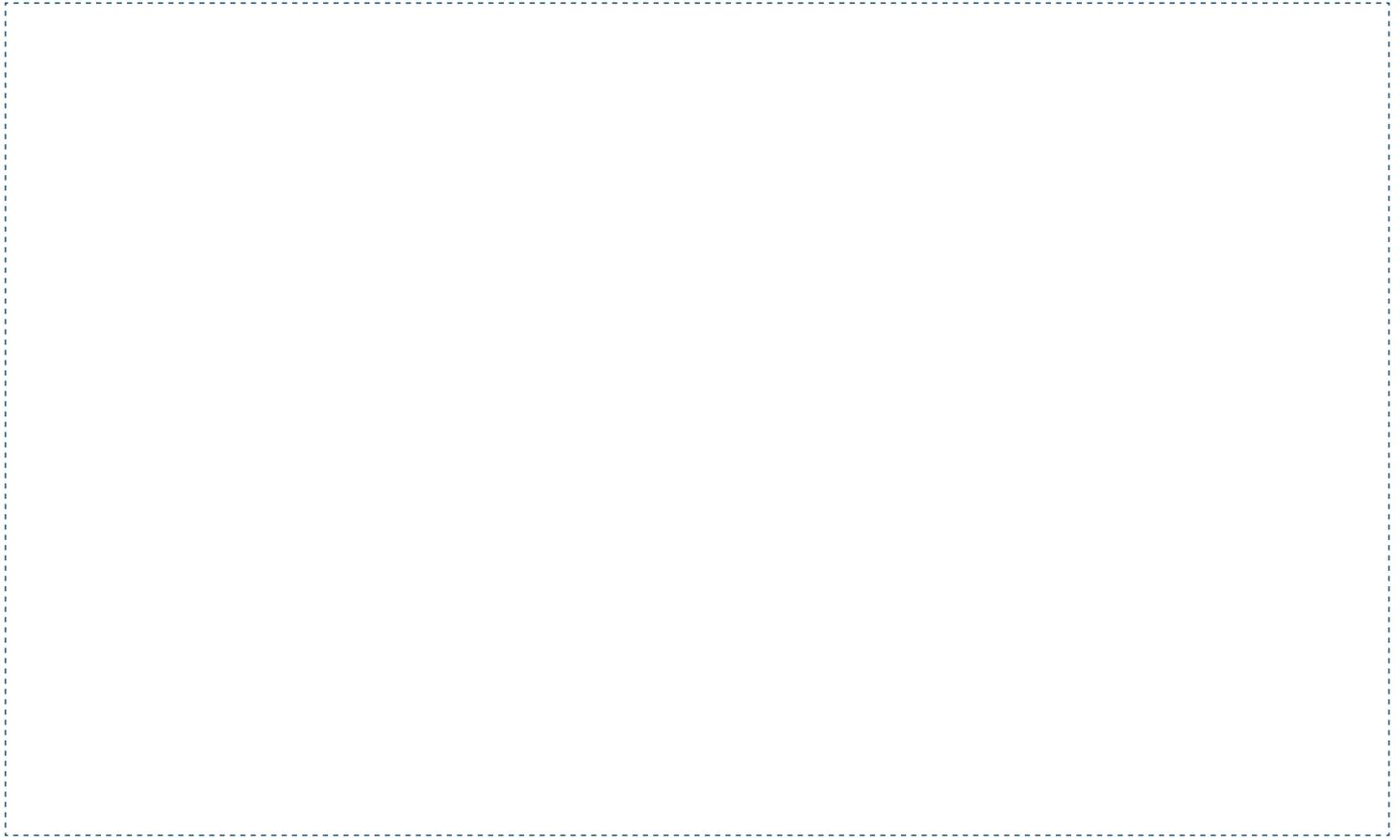
Day 3



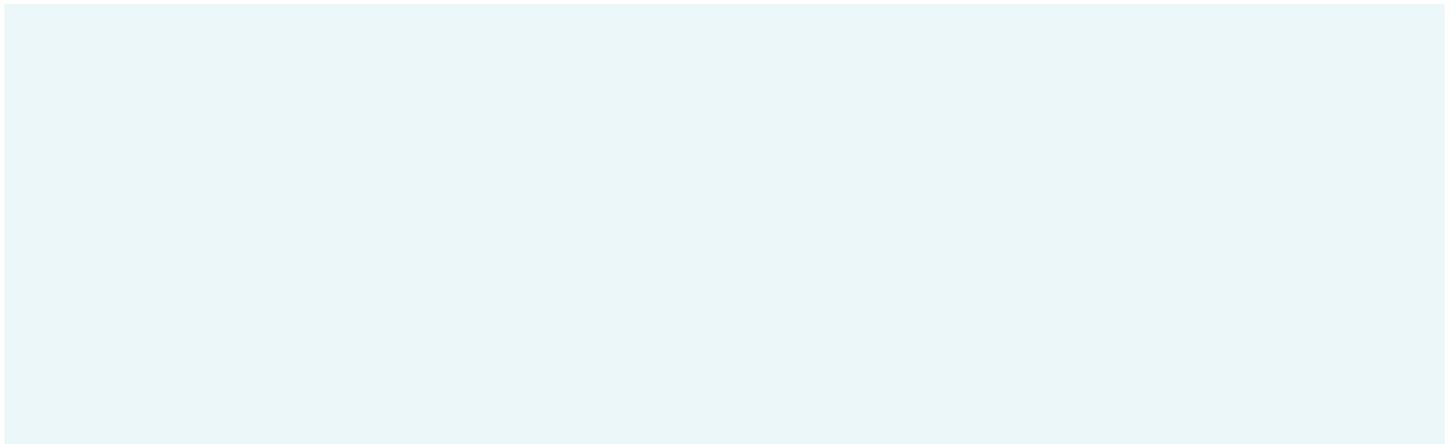
Day 6

**Communicate your results**

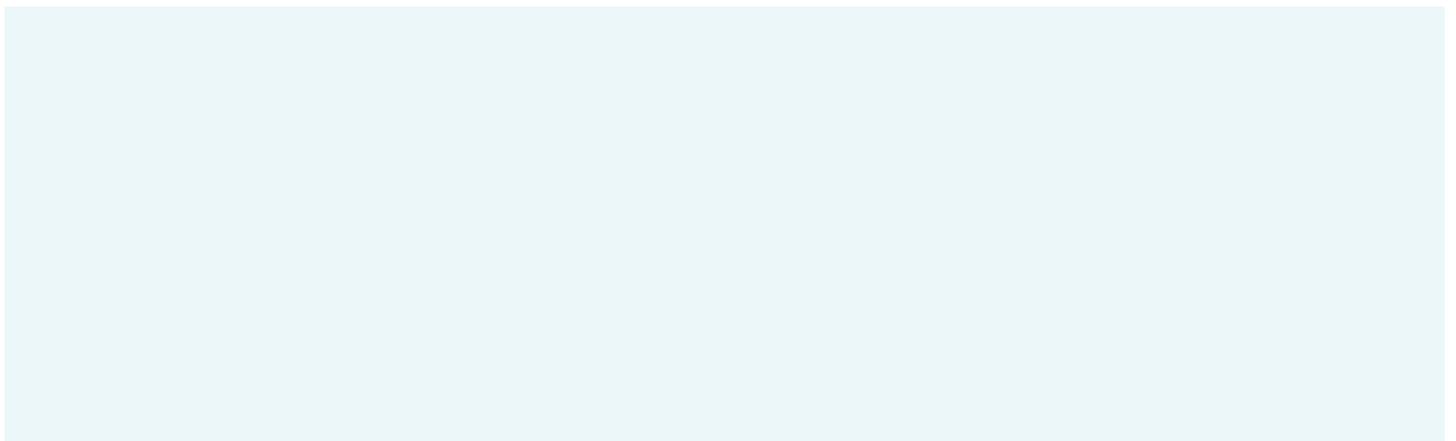
Q2. In the space below, write or draw what happens to the plant's height over time.

**Compare your measurements with others**

Q3. Why do some students have different measurements for the height of the plant on different days?



Q4. What are some other ways you can measure the growth of a plant?



# 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 Foundation-2		
Working Toward	Achieved (F-2)	Exceeded (3-4)
<b>Planning &amp; Conducting</b>		
<p>With significant support, participate in guided investigations including making observations using the senses.</p> <p><i>Follows instructions to measure and record plant heights.</i></p>	<p>Participate in guided investigations, including making observations using the senses, to explore and answer questions.</p> <p><i>Competently measures plant height. With support, suggests other measures of plant growth (width, weight, leaf count, use of other measurement devices ... )</i></p>	<p>Suggest ways to plan and conduct investigations to find answers to questions and consider the elements of fair tests.</p> <p><i>Competently and accurately measures plant height. Suggests considered and appropriate measurement procedures.</i></p>
<b>Recording &amp; Processing</b>		
<p>With guidance, use informal measurements and follows methods to sort information.</p> <p><i>Orders photographs and, with guidance, uses measures and constructs a table.</i></p>	<p>Use informal measurements in the collection and recording of observations. Use a range of methods, including drawings and provided tables, to sort information.</p> <p><i>Uses informal measures and drawings, and competently enter data in the table. With support, competently sets up the table and enters data. With support, represents the growth using drawings or a simple graph.</i></p>	<p>Use formal measurements in the collection and recording of observations.</p> <p>Use a range of methods, including tables and column graphs, to represent data and to identify patterns and trends.</p> <p><i>Competently sets up the table and enters data. Represents the growth using drawings or a simple graph and comments on the growth pattern.</i></p>

## Group Scoring Template (cont.)

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### Analysing & Evaluating

With support, compare observations and predictions with those of others.  
*Notices some variation in measurements and ideas.*

Compare observations and predictions with those of others.  
*Identifies variation in measurements and ideas.*

Compare results with predictions, suggesting possible reasons for findings. Reflect on an investigation, including whether a test was fair.  
*Identifies and suggests a variety of reasons for variations in measurements and ideas about growth pattern.*



