




Germinate

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Assessment description	Category
Children use their senses to observe the germination of seeds. They organise their observations and discuss their findings.	Multimodal
	Technique
	Experimental investigation and observation record
Context for assessment	Alignment
<p>Children investigate the germination of seeds and develop understanding of the basic needs of plants in the germination process.</p> <p>Children:</p> <ul style="list-style-type: none"> plan the investigation with their teacher use their senses to make observations organise their data in an observation diary make a presentation of their findings. 	<p><i>Australian Curriculum v7.2,</i> Foundation Year Science Australian Curriculum content and achievement standard ACARA — Australian Curriculum, Assessment and Reporting Authority: www.australiancurriculum.edu.au</p> <p><i>Prep Year Science standard elaborations</i> available at: www.qcaa.qld.edu.au/downloads/p_10/ac_sci_prep_se.docx</p>
	Connections
	<p>This assessment can be used with the QCAA Australian Curriculum resource titled <i>Prep Year unit overview — Science exemplar</i>: www.qcaa.qld.edu.au/prep-science-resources.html</p>
	Definitions
	<ul style="list-style-type: none"> Senses: hearing, sight, smell, touch and taste Observable: that which can be seen, heard, felt, tasted or smelled either directly by an individual or indirectly by a measuring device
In this assessment	Assessment materials
<ul style="list-style-type: none"> Teacher guidelines Task-specific standards — continua Task-specific standards — matrix Sample response — My seed diary Assessment resource — PowerPoint slides Assessment resource — Subject-specific words Assessment resource — Photo story sample Assessment resource — Investigation set-up Assessment resource — Investigation method Assessment resource — Individual observation record 	<ul style="list-style-type: none"> Bean seeds Germinating trays (egg cartons/plates) Cotton wool or kitchen sponge Spray bottle containing water Magnifying glass Possible additional resources: pencils, clay, play dough camera, computer

Teacher guidelines

Identify curriculum

Content descriptions to be taught		
Science understanding	Science as a human endeavour	Science inquiry skills
Biological sciences <ul style="list-style-type: none"> Living things have basic needs, including food and water ACSSU002 	Nature and development of science <ul style="list-style-type: none"> Science involves exploring and observing the world using the senses ACSHE013 	Questioning and predicting <ul style="list-style-type: none"> Respond to questions about familiar objects and events ACSIS014 Planning and conducting <ul style="list-style-type: none"> Explore and make observations by using the senses ACSIS011 Processing and analysing data and information <ul style="list-style-type: none"> Engage in discussions about observations and use methods such as drawing to represent ideas ACSIS233 Communicating <ul style="list-style-type: none"> Share observations and ideas ACSIS012
General capabilities (GCs) and cross-curriculum priorities (CCPs) This assessment may provide opportunities to engage with the following GCs and CCPs. Refer also to the Resources tab on the Prep Year Science curriculum and assessment page: www.qcaa.qld.edu.au/prep-science-resources.html		
<div>  Literacy  Numeracy  ICT capability </div>		
Achievement standard This assessment provides opportunities for children to demonstrate the following highlighted aspects.		
By the end of the Foundation year, students describe the properties and behaviour of familiar objects. They suggest how the environment affects them and other living things. Students share observations of familiar objects and events.		
Source: ACARA, The Australian Curriculum v7.2, www.australiancurriculum.edu.au .		

Sequence learning

Suggested learning experiences

This assessment leads on from the learning experiences outlined in the QCAA's Prep Year Science plan. The knowledge, understanding and skills developed in the exemplar unit will prepare children to engage in this assessment.

- See *Prep Year unit overview* — Science exemplar: www.qcaa.qld.edu.au/prep-science-resources.html (under Curriculum > Planning templates and exemplars > Unit overviews)

Adjustments for needs of learners

To make adjustments, teachers refer to learning area content aligned to the child's chronological age, personalise learning by emphasising alternate levels of content, general capabilities or cross-curriculum priorities in relation to the chronological age learning area content. The emphasis placed on each area is informed by the children's current level of learning and their strengths, goals and interests. Advice on the process of curriculum adjustment for all children and in particular for those with disability, gifted and talented or for whom English is an additional language or dialect are addressed in *Australian Curriculum* — *Student Diversity* materials.

For information to support students with diverse learning needs, see:

- Queensland Curriculum and Assessment Authority materials for supporting children with diverse learning needs www.qcaa.qld.edu.au/10188.html
- Australian Curriculum Student Diversity www.australiancurriculum.edu.au/StudentDiversity/Student-diversity-advice
- The *Melbourne Declaration on Educational Goals for Young Australians* www.curriculum.edu.au/verve/_resources/national_declaration_on_the_educational_goals_for_young_australians.pdf
- The *Disability Standards for Education* www.ag.gov.au.

Develop assessment

Preparing for the assessment

Learning experiences in preparation for the assessment could include:

- **Exploring and making observations about the world**
 - Identify which senses are used to explore different situations.
 - Practise using senses to observe the world in detail.
 - Use senses to make comparisons, e.g. 'Which one is longer?'
 - Use own experiences to identify the needs of living things.
 - Investigate the needs of living things in a range of situations.
 - Respond to questions about living things.
 - Use senses to explore the needs of living things and to make observations.
 - Use tools to help make observations about things in the local environment, e.g. using a magnifying glass.
 - Develop understandings about the basic needs of all living things.
 - Recall ideas using collage, clay, play dough, digital photo story, drawing and/or writing.
- **Developing subject-specific vocabulary**
 - Use words that relate to the topic of plant growth.
 - Create a word wall to describe words for senses.
 - Create a picture glossary, e.g. germinate, grow, seeds, stem.
 - Continue to add to word wall and picture glossary throughout the unit/assessment.

- **Representing observations using scientific diagrams**

- Discuss the difference between a scientific diagram (what you see) and drawing to express an idea (art).
- Practise recording (drawing/labelling/writing) what is seen.
- Practise organising and sequencing representations.
- Share observations and ideas about living things through discussions and drawings.
- Use words that relate to the topic of plant growth.
- Practise using the language of comparison.

Implementing

Throughout the investigation use the *Assessment resource — Subject-specific words* and the picture glossary to support the use of context-specific words. Add words as necessary.

Prior to implementation

Before implementing the assessment the teacher will need to:

- trial the bean seeds to make sure they will germinate
- soak the seeds overnight prior to the investigation
- consider storage.

Note: *Assessment resource — Investigation set-up* includes photos of how to set up the materials for the investigation.

Section 1. What are we going to do?

Child's role

Contribute to class discussion answering the questions:

- What are we going to do?
- Why are we going to observe seeds germinating?
- What materials will we use?
- What set-up will we use?
- How will we observe?
- What senses will we use?
- How will we represent our findings?

Teacher role

- Prepare the resources for the investigation including:
 - selecting a bright area for seed trays without direct sunlight
 - reminding children not to taste seeds as they may have been treated with chemicals (however, edible seeds can be purchased from a food store).
- Initiate and lead a class discussion to outline the assessment activity.
- Set up the context of the assessment through discussion (PowerPoint slides 2–5)
- Discuss the materials that will be used and the different ways the investigation could be set up (PowerPoint slides 6–7, *Assessment resource — Investigation set-up*).
- Discuss what and how children will observe. Introduce the idea that you can keep some seeds dry so that they can be compared with the wet seeds. (PowerPoint slides 8–10).
- Explain the purpose and structure of the seed diary. Model how they record their observations: What is the same? What is different?
- Discuss how they might communicate their overall findings. Options include:
 - collage
 - clay or play dough
 - digital photo story (*Assessment resource — Photo story sample*)
 - drawing and/or writing.
- Evaluate if children have a clear understanding of the task.

Section 2. Carrying out the investigation	
<p>Child's role</p> <p>Collaborate with teacher for a discussion on observing and recording.</p> <p>On day 1:</p> <ul style="list-style-type: none"> • Feel the seeds. • Use a magnifying glass to look carefully at the seeds. • Represent (draw, label and write) what the seeds look like in your seed diary. • Talk to others about what you observe. • Follow the instructions of the teacher to set-up the materials and equipment for the investigation. • Water the seeds. <p>On days 3, 5 and 7:</p> <ul style="list-style-type: none"> • Observe and represent how the seeds have changed in your seed diary. • Compare wet seeds with dry seeds. • Use senses to identify changes in colour, size, shape. • Talk to others about what you observed. • Water the seeds. 	<p>Teacher role</p> <ul style="list-style-type: none"> • Using your knowledge of the children's personalities and abilities, place children in groups. • Provide all the required equipment and materials. • Give the children directions for setting up the investigation, ensuring all children understand how the equipment is to be assembled. • Monitor safe practices during the set-up of the investigation. • Model how to observe seeds (PowerPoint slide 10). • Revisit how to record observations. Reinforce that children need to draw exactly what they see (PowerPoint slides 11–13). • Discuss and model what children need to record in their 'My Seed Diary'. • Outline that observations must be made at regular intervals, e.g. in the morning every second day and discuss what needs to happen if the cotton wool and seeds are dry. <p>Gathering evidence of what children know and can do</p> <ul style="list-style-type: none"> • Use individual discussions with children to gather evidence for an observation record. • Ask children what senses they are using. • Focus on comparing the watered seeds on the cotton wool with the dry seeds. • Discuss why changes may have occurred.
Section 3. Presentation of overall findings	
<p>Child's role</p> <ul style="list-style-type: none"> • Choose a way of presenting your information. • Recall the sequence of the seed germinating. • Respond to: <ul style="list-style-type: none"> – Tell me about your seed. – What happened along the way? – What senses did you use? 	<p>Teacher role</p> <ul style="list-style-type: none"> • Remind children of the investigation question: How do seeds change when we water them? • Support children to recall the sequence of the observations made during the duration of the investigation. (PowerPoint slide 14, <i>Assessment resource — Photo story sample</i>). • Children choose how to present their work but will need to respond to the prompts: <ul style="list-style-type: none"> – Tell me about your seed. – What happened along the way? – What senses did you use?

Make judgments

When making judgments about the evidence in children's responses to this assessment, teachers are advised to use the task-specific standards provided. The development of these task-specific standards has been informed by the Queensland Year Prep Year standard elaborations. See www.qcaa.qld.edu.au/downloads/p_10/ac_sci_prep_se.docx.

The Queensland standard elaborations for Science

The Queensland Year Prep Year standard elaborations for Science are a resource to assist teachers to make consistent and comparable evidence-based A to E (or the Early Years equivalent) judgments. They should be used in conjunction with the Australian Curriculum achievement standard and content descriptions for the relevant year level.

The Queensland Science standard elaborations provide a basis for judging *how well* children have demonstrated what they know, understand and can do using the Australian Curriculum achievement standard.

The Australian Curriculum achievement standards dimensions of Understanding and Skills are used to organise the Queensland Science standard elaborations.

The valued features of Science drawn from the achievement standard and the content descriptions for Understanding dimension and Skills dimension are organised as:

- Science understanding & Science as a human endeavour
- Science Inquiry Skills.

Task-specific standards

Task-specific standards give teachers:

- a tool for directly matching the evidence of learning in the response to the standards
- a focal point for discussing children's responses
- a tool to help provide feedback to children.

Task-specific standards are not a checklist; rather they are a guide that:

- highlights the valued features that are being targeted in the assessment and the qualities that will inform the overall judgment
- specifies particular *targeted aspects* of the curriculum content and achievement standard
- aligns the valued feature, task-specific descriptor and assessment
- allows teachers to make consistent and comparable on-balance judgments about children's work by matching the qualities of children's responses with the descriptors
- clarifies the curriculum expectations for learning at each of the five grades (A–E or the Early Years equivalent)
- shows the connections between what children are expected to know and do, and how their responses will be judged and the qualities that will inform the overall judgment
- supports evidence-based discussions to help children gain a better understanding of how they can critique their own responses and achievements, and identify the qualities needed to improve
- encourages and provides the basis for conversations among teachers, children and parents/carers about the quality of children's work and curriculum expectations and related standards.

Task-specific valued features

Task-specific valued features are the discrete aspects of the valued features of Science targeted in a particular assessment and incorporated into the task-specific standards for that assessment. They are selected from the Queensland Science standard elaborations valued features drawn from the Australian Curriculum achievement standard and content descriptions.

Task-specific valued features for this assessment

The following table identifies the valued features for this assessment and makes explicit the understandings and skills that children will have the opportunity to demonstrate. This ensures that the alignment between what is taught, what is assessed and what is reported is clear.

Australian Curriculum achievement standard dimensions	Queensland standard elaborations valued features	Task-specific valued features
Understanding dimension	Science Understanding & Science as a Human Endeavour	Sections 2 and 3 Description of the sequence of seed germination
Skills dimension	Science Inquiry Skills	Sections 1, 2 and 3 <ul style="list-style-type: none">• Responses to questions about making and recording observations• Making accurate observations about changes to the seed over 7 days• Sharing observations about how seeds change when watered

The task-specific standards for this assessment are provided in two models using the same task-specific valued features:

- a matrix
- a continua.

Matrix and continua

Task-specific standards can be prepared as a matrix or continua. Both the continua and the matrix:

- use the Queensland standard elaborations to develop task-specific descriptors to convey expected qualities in children's work — A to E (or the Early Years equivalent)
- highlight the same valued features from the Queensland standard elaborations that are being targeted in the assessment and the qualities that will inform the overall judgment
- incorporate the same task-specific valued features, i.e. make explicit the particular understanding/skills that children have the opportunity to demonstrate for each selected valued feature
- provide a tool for directly matching the evidence of learning in the child's response to the standards to make an on-balance judgment about achievement
- assist teachers to make consistent and comparable evidence-based A to E (or the Early Years equivalent) judgments.

Matrix

The matrix model of task-specific standards uses the structure of the Queensland standard elaborations to organise the task-specific valued features and standards A to E (or the Early Years equivalent). The task-specific descriptors of the standard described in the matrix model use the same degrees of quality described in the Queensland standard elaborations.

Teachers make a judgment about the task-specific descriptor in the A to E (or the Early Years equivalent) cell of the matrix that best matches the evidence in the child's responses in order to make an on-balance judgment about how well the pattern of evidence meets the standard.

The matrix is a tool for making both overall on-balance judgments and analytic judgments about the assessment. Achievement in each valued feature of the Queensland standard elaboration targeted in the assessment can be recorded and feedback can be provided on the task-specific valued features.

Continua

The continua model of task-specific standards uses the dimensions of the Australian Curriculum achievement standard to organise task-specific valued features and standards as a number of reference points represented progressively along an A to E (or Early Years equivalent) continuum. The task-specific valued features at each point are described holistically. The task-specific descriptors of the standard use the relevant degrees of quality described in the Queensland standard elaborations.

Teachers determine a position along each continuum that best matches the evidence in the child's responses to make an on-balance judgment about achievement on the task.

The continua model is a tool for making an overall on-balance judgment about the assessment and for providing feedback on task-specific valued features.

Use feedback



Feedback to children	<p>Evaluate the information gathered from the assessment to inform teaching and learning strategies. Focus feedback on the child's personal progress and the next steps in the learning journey.</p> <p>The task-specific standards for this assessment can be used as a basis for providing feedback to children.</p> <p>Offer feedback that:</p> <ul style="list-style-type: none"> • gives children opportunities to ask follow up questions and share their learning observations or experiences • emphasise continuous progress relative to their previous achievement and to the learning expectations — avoid comparing a child with their classmates.
Resources	<p>Hattie, J and Timperley, H 2007 'The Power of Feedback', <i>Review of Educational Research</i>, Vol. 77, No.1, pp. 81–112.</p> <p>For guidance on providing feedback, see the professional development packages titled:</p> <ul style="list-style-type: none"> • <i>About feedback</i> www.qcaa.qld.edu.au/downloads/p_10/as_feedback_about.docx • <i>Seeking and providing feedback</i> www.qcaa.qld.edu.au/downloads/p_10/as_feedback_provide.docx

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Purpose of assessment: Participate in an investigation to answer the question: how do seeds change when we water them?

Understanding dimension		Skills dimension	
Science Understanding & Science as a Human Endeavour		Science Inquiry Skills	
Sections 2 and 3 Description of the sequence of seed germination		Sections 1, 2 and 3 <ul style="list-style-type: none">Responses to questions about making and recording observationsMaking accurate observations about changes to the seedSharing observations about how seeds change when watered	
 ◀ <u>Clear</u> description <u>with links to science knowledge</u> of the sequence of seed germination	 ◀ <u>Response to questions</u> about making and recording observations <u>Making of accurate observations</u> about changes to the seed Sharing of observations about how seeds change when watered <u>using relevant scientific terminology</u>	A	
		B	
		C	
		D	
		E	
◀ Description of the sequence of seed germination	◀ Sharing of observations about how seeds change when watered		
◀ <u>Directed statements</u> about seed germination	◀ <u>Directed</u> sharing of observations about how seeds change when watered		

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Purpose of assessment: Participate in an investigation to answer the question: how do seeds change when we water them?

			Applying (AP)	Making connections (MC)	Working with (WW)	Exploring (EX)	Becoming aware (BA)
Understanding dimension	Science Understanding & Science as a Human Endeavour	Sections 2 and 3 Description of the sequence of seed germination	Clear description with links to science knowledge of the sequence of seed germination	Description with links to science knowledge of the sequence of seed germination	Description of the sequence of seed germination	Guided description of the sequence of seed germination	Directed statements about seed germination
		Sections 1, 2 and 3 <ul style="list-style-type: none"> Responses to questions about making and recording observations Making accurate observations about changes to the seed Sharing observations about how seeds change when watered 	<ul style="list-style-type: none"> Response to questions about making and recording observations Making of accurate observations about changes to the seed Sharing of observations about how seeds change when watered using relevant scientific terminology 	<ul style="list-style-type: none"> Response to questions about making and recording observations Making of observations about changes to the seed Sharing of observations about how seeds change when watered using linked scientific terminology 	Sharing of observations about how seeds change when watered	Guided sharing of observations about how seeds change when watered	Directed sharing of observations about how seeds change when watered



Germinate

Prep Year Australian Curriculum: Science



Queensland
Government



Queensland Curriculum
& Assessment Authority

For all Queensland kindergartens

What are we going to do?

We are going to observe seeds germinating.



Why are we going to observe seeds germinating?



The question we will answer

How do seeds change when we water them?



We will:

- use our senses to observe a seed germinate
- record what we observe
- recall what happened.

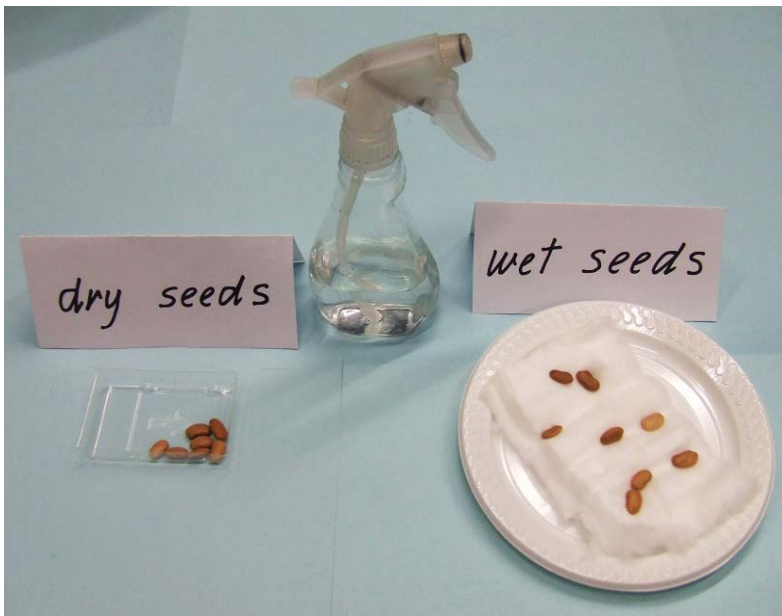


What materials will we use?



Setting up the investigation

Which set-up will your group use?
Why?



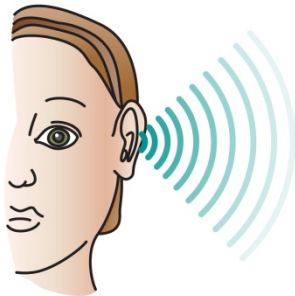
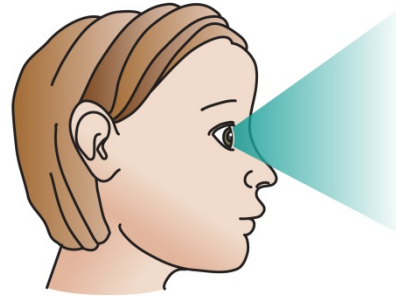
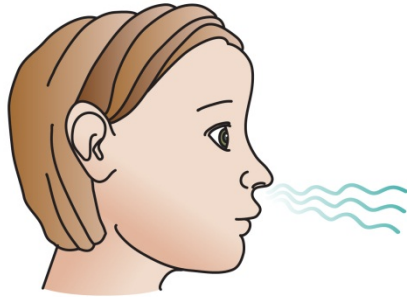
How will we observe?

Compare dry seeds with wet seeds.



What has changed?

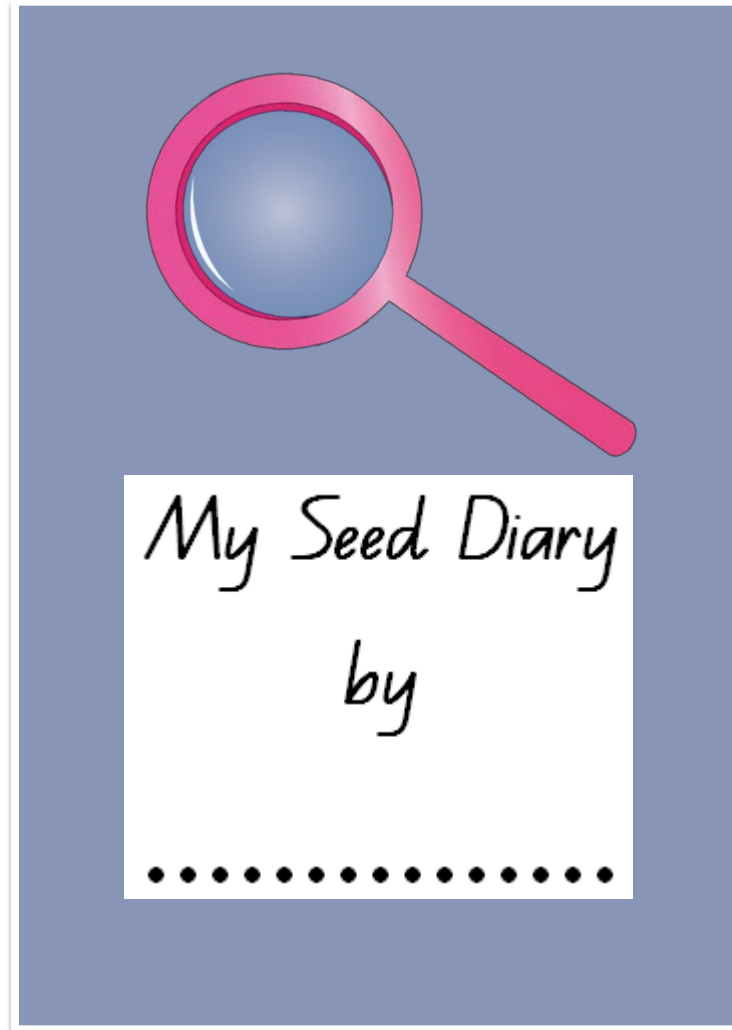
What senses will you use?



Observe seeds



Record observations



When will we observe?

Day

Day

Day



Day

Choose how to recall what happened

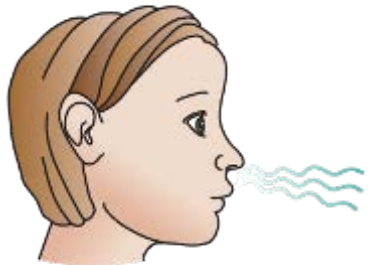

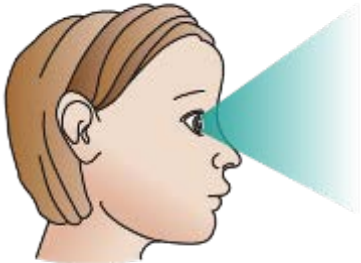



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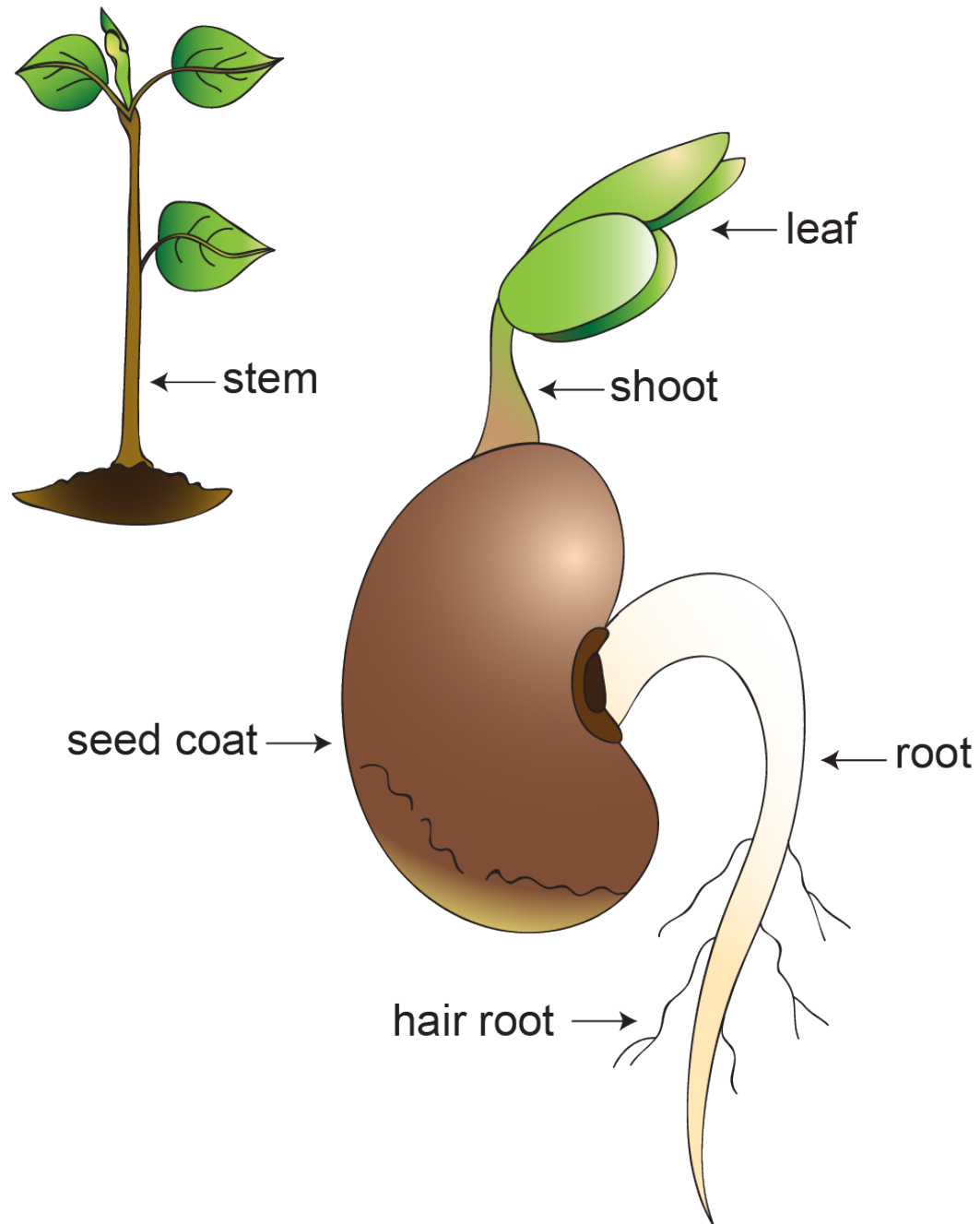
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Subject-specific words

Senses words

			
smell	listen	look	feel
sweet stink	quiet loud	bigger cracked	soft hard

Seed words

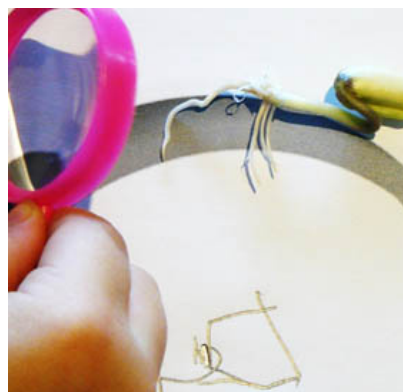


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Photo story sample

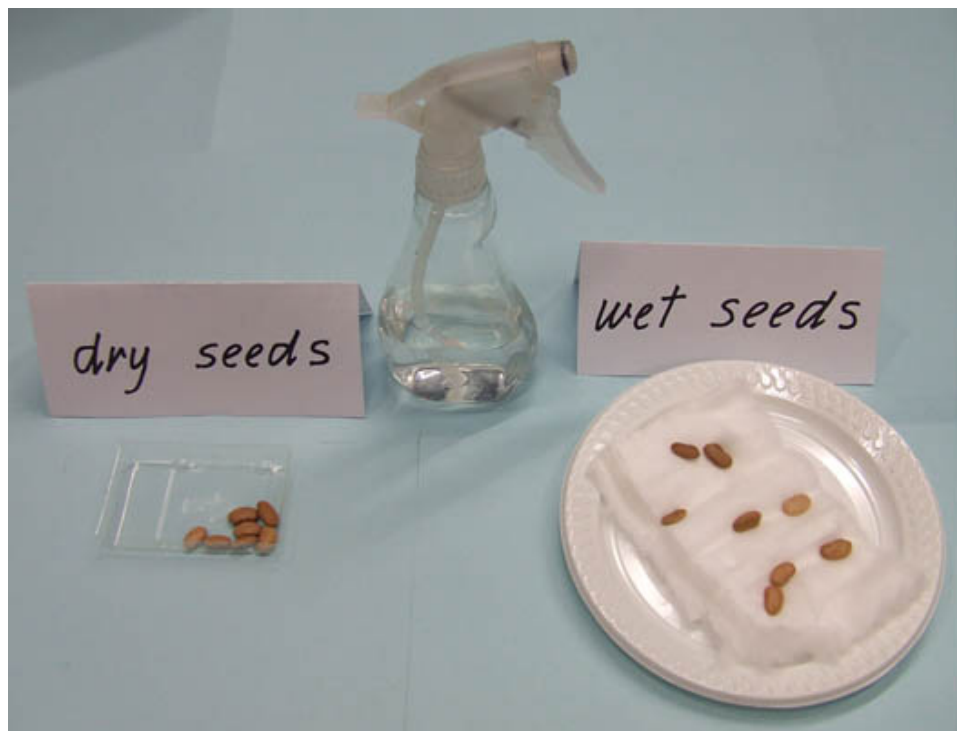
My photo story, by Pat



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Investigation set-up



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Investigation method

This method has been developed with limited resources required.

Materials and equipment

Per group:

- a container for germinating seeds, e.g. egg carton, saucer, plate
- cotton wool or a kitchen sponge for growing seeds on
- 3–4 soaked bean seeds
- spray bottle containing water
- magnifying glass.

Possible additional resources:

- pencils
- clay
- play dough
- camera
- computer.

Prior to implementation

Prior to implementing the assessment the teacher will need to soak the seeds overnight.

Method

1. The night before the experiment place the class set of bean seeds in a bowl that is deep enough to allow them to be covered in water.
2. Add enough warm water to the bowl of beans to ensure they are completely covered.
3. On the day of the investigation, guide children to:
 - gather their equipment: egg carton/saucer/plate, cotton wool/sponge, soaked bean seeds
 - put the cotton wool/sponge on the saucer/plate and place the bean seeds on top
 - use the spray bottle containing water to soak the cotton wool or sponge that the seeds will germinate on.
4. Every second day, guide children to make and record observations about the bean seed growth and to add water if necessary to the cotton wool or sponge.
5. Repeat Step 4 for 7 to 10 days.

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Individual observation record

Name:

Stage	Science Understanding Science as a Human Endeavour	Science Inquiry Skills			
	Biological sciences Identifies the relationship of water to the sequence of seed germination Nature and development of science Explains how senses are used to observe germinating seeds	Questioning and predicting Responds to questions when comparing seeds to find out what has changed	Planning and conducting Using senses, makes observations about changes in seeds	Processing and analysing data and information Engages in discussion about and draws, labels and/or writes to represent observations	Communicating Shares observations and ideas with others
Preparing					
Day 1					
Day 3					
Day 5					
Day 7					
Presentation comments					

Teachers use the observation record to collect evidence of children's learning, then match the evidence to the descriptions in the task-specific matrix or continua when making an AP to BA judgment.