MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

Supporting literacy development in Agricultural and Horticultural Science

Ākonga in Agricultural and Horticultural Science are expected to interpret the many representations used in agriculture and horticulture as well as understanding socio-scientific issues relating to primary industries.

The 2007 New Zealand Curriculum specifically acknowledges the importance of literacy in the key competencies related to language, symbols and text. Through Agricultural and Horticultural Science, ākonga can learn to:

- extend their use of language, symbols, and text to include industry-specific and context-dependent terminology
- develop their understanding of mātauranga Māori concepts that may be accessed through te reo Māori
- make sense of information from a variety of media and develop skills in discerning appropriate sources of information and advice.

Key competencies related to Thinking, Relating to others and Participating and contributing, that have a focus on literacy, include the need to:

- extend critical thinking through considering the questions that Agricultural and Horticultural Science addresses
- develop opinions and justify them with evidence
- problem-solve in real-life agricultural and horticultural contexts, and reflect on their progress
- explore the consequences of management practices within real-life agricultural and horticultural contexts
- acknowledge and explore multiple perspectives that apply to agricultural and horticultural issues.

The NCEA Literacy standards are composed of a reading and writing strand, each of which have their own Big Ideas. These are unpacked by the Significant Learning statements, which have a connection with the key competencies and capabilities identified above. Learners of Agricultural and Horticultural Science need to critically interpret information, and have the ability to identify and understand a point of view and to evaluate evidence presented. Ākonga need to be able to write with a clear structure.

The Literacy Pedagogy Guide (LPG) for Agricultural and Horticultural Science below takes the Big Ideas and Significant Learning and poses two questions:

- *What does literacy look like in Agricultural and Horticultural Science?*
- *What can I do as a kaiako of Agricultural and Horticultural Science?*

The LPG is not exhaustive, but illustrative of small but effective steps that any teacher of the Agricultural and Horticultural Science strand can target, trial and ultimately embed in their teaching practice.

Agricultural and Horticultural Science Literacy Pedagogy Guide

Reading

	Significant Learning	What can this look like in Agricultural and Horticultural Science?	What can I do as a teacher of Agricultural and Horticultural Science?
Big Idea 1: Learners make sense of written texts	Ākonga use: » a processing system to decode and comprehend text. Readers develop expertise in using sources of information and comprehension strategies to make sense of text. » knowledge of text structures and features. Readers develop their knowledge of text features and use this to navigate and understand texts. » vocabulary knowledge. Successful comprehension depends on understanding most of the meanings of the words in the text.	Written and visual sources of information include: » instructions » packaging information » planting schedules » articles » diagrams, charts and graphs » observations » weather reports » clips » investigations » maps. Information from a range of sources needs to be analysed, including primary industries and scientific and consumer perspectives. Subheadings are important signposts of content. Agricultural and Horticultural Science requires knowledge of specialised vocabulary. The interpretation of abstract terms or phrases such as 'market factors' is required. The meaning of terms in Agricultural and Horticultural Science can differ from everyday use, for example, 'stratification' and 'nursery'. Within Agricultural and Horticultural Science texts there is a combination of high frequency words, academic words (which can be found in the Academic Word List or AWL) and discipline specific words.	Unpack infographics with ākonga, analyse their purpose and evaluate their effectiveness. See: Science Learning Hub | Understanding infographics and Science Learning Hub | Using infographics. Model how to skim text to get an idea of the content, for example, a native seed collection and propagation guide – use guide questions such as: » What is the text about in general? » What do the headings tell me? » What information is provided in any symbols, diagrams or charts? Model how to scan the text to locate and extract specific information, for example, from a seed packet. Encourage the reading of instructions as a pair-reading task – ākonga support each other's understanding by checking for understanding of the text, for example, interpreting the instructions for the use of fertiliser. Support ākonga to scan by providing questions as cues, and demonstrating the analysis of subheadings. Other examples of text this can be done with include: » growing guides » pasture composition » nutrient management Pair reading can be used for tasks to ensure that the interpretation of instructions through: the clarification of what is required at each step the meaning of any terminology is understood.

		There are three tiers of vocabulary to focus on: » Everyday or high frequency words which ākonga must have a knowledge of. These make up the majority of texts. » AWL words are frequent and important across all learning areas. (See the Academic Word List). » Discipline-specific vocabulary (or technical words) which are less frequent and important within a subject or learning area.a	Share and analyse examples of common text types with ākonga, for example, text detailing the process and safety practices required for using potting mix, which could be supported with a diagram for clarity of meaning. Use a graphic organiser (a framework of the structure and content) to support ākonga to make predictions about the text, to make notes and to summarise information. A graphic organiser can also be used as a guide for structuring and writing text, for example, a main idea with an explanation and supporting evidence. Use concept frames to develop understanding of the technical meaning of a word. These can also be used to contrast the everyday and technical meanings of a word by doing a concept frame for each. To support ākonga to build their vocabulary within Agricultural and Horticultural Science, they can: » circle the words they don't know » underline words they have some understanding of » predict/identify which words are necessary for the topic » predict/identify which words are useful for this and other subjects. Co-construct lists of topic specific vocabulary with ākonga, and revisit these often. A good place to begin is directing learners to the NCEA Glossary for Agricultural and Horticultural Science. Share the Academic Word List (AWL) in the form of Sublists of the Academic Word List. This can assist ākonga in understanding word families and spelling, or consciously build word families when ākonga encounter a useful AWL word. An example of this is: » distribute (distributed, distribution, redistributed) » evaluate (evaluates, evaluation, re-evaluate) » interpret (interpreted, misinterprets)

Big Idea 2: Learners read critically	Ākonga: » develop a critical awareness that enables them to consider who wrote a text, for whom, why, and whether it may have purposes that are not immediately apparent.	Authors have different purposes. Ākonga need to build knowledge of how common Agricultural and Horticultural Science text types are structured. These include but are not limited to: » Procedural texts which are instructional – they provide a set of actions and a sequence e.g. methods, instructions. » Informative texts which provide information; they include descriptions and explanations e.g. background information related to plant species and ideal growing conditions. » Persuasive texts that present a point of view or justification as an argument within the text. An example of this is an analytical exposition that justifies trialling a new technique of stock management such as the use of a stand-off pad or shelter, with supporting evidence.	Support learners to scan the text for clues as to author, text type, purpose, and intended audience, by: » unpacking vocabulary, phrasing and identifiers for each text type to determine the purpose of a text e.g. to describe a process, inform or persuade » scanning the details of diagrams, charts and graphs to interpret representations » identifying elements of a text type, e.g. statement of the main idea, claims to elaborate on a main idea and evidence to support the claims, for an argument text. Support learners to read text closely by: » identifying argument indicators, for example, 'thus', 'hence' and 'so' » recognising any emotive vocabulary » identifying and evaluating the validity of claims by analysing supporting evidence » analysing reader-oriented features e.g. 'you' and 'we'. When engaging in structured critical questioning of texts, it is important to consider any cultural conflict this may present. For example, some learners may prefer less formal discussion structures for inquiry. Use alternative ways of developing critical exploration of texts. For example, use Talanoa methodology which encourages the sharing of thoughts, feelings and perceptions of those speaking. This is particularly relevant to culturally significant content, for example, when discussing the cultural, historical and economic value of potatoes such as taewa.

Big Idea 3: Learners read for different purposes	Ākonga: » are clear about their purpose for reading and have appropriate strategies to meet that purpose » understand and use ideas in texts » locate and evaluate the ideas and information within and across a range of print and digital texts to meet their purpose.	Ākonga identify their purpose for reading and use a skim and scan approach to determine the usefulness of the text. Ākonga are able to select which texts require closer reading or provide access to useful data. Ākonga understand the ideas within a text. Ākonga are able to evaluate the reliability of sources and make decisions about the accuracy of any claims, the authority behind and/or bias within sources. Ākonga are able to interpret written texts as well as those that are multimodal such as graphs or charts. Multimodal texts work in partnership to make meaning.	Discuss with ākonga and model how to read texts they encounter. Students need to ask questions before, during and after they have read a text. For example when ākonga are investigating the requirements for planting in line with Maramataka or the Māori Lunar Calendar. Support ākonga to predict content from titles and draw on prior knowledge. A KWL chart can support this. You could use public information from Statistics NZ: Agriculture to practice the use of these charts. Develop ākonga strategies for reading visual texts, for example, Describe / Analyse / Interpret / Justify. Use an Inquiry Chart to focus on the location and extraction of key information in different texts and synthesise across different texts. An inquiry chart is an excellent tool for looking at a range of information in a critical way. When guiding ākonga in the use of an I-chart ask whether each source provides: » An answer to the question/s? » Uses specific evidence to support this answer? Use an evaluation strategy to assess the value of source information. At a junior level, use 3 elements of the Rauru Whakarare Evaluation Framework, emphasising mana (authority), māramatanga (content), and whakapapa (background) as the basis, at senior level you can then broaden this to include orokohanga (origin) and aronga (lens).

Writing

	Significant Learning	What can this look like in Agricultural and Horticultural Science?	What can I do as a kaiako of Agricultural and Horticultural Science?
Big Idea 1: Learners write meaningful texts for different purposes and audiences.	Learners: » use strategies within a writing process to plan and create texts » select content, text structure and language choices appropriate to purpose and audience » select and use vocabulary that is specific to their topic, purpose and audience » revise and edit their work.	The writing process for ākonga includes planning for writing at multiple levels. When planning, ākonga need to consider content, structure and language choice. The planning and use of strategies results in decisions being made that demonstrate their developing agricultural or horticultural knowledge and understanding. The writing process should be iterative to allow for monitoring and review. The text type selected should be based upon the audience and purpose of the writing itself. Types of texts include those that are informative or persuasive or procedural, and include: Informative texts include: » reports » chronicles » explanations. Reports are a factual description of a scientific process or a descriptive report about the strategies to manage risk. Recounts of events may differ depending on purpose, audience, and context. Chronicles involve written text created over time, for example a weather record or a schedule of operations for upcoming work to be completed. Explanations include a process being sequentially explained or a causal explanation. Persuasive texts include: » analytical expositions » discussions » justifications.	Encourage learners to create written records of ideas, notes, discussion points and questions which they can call on for later use. Model this behaviour in the classroom, for example, when a question arises in the flow of discussion, record it to revisit in the discussion or through further research. Provide opportunities to discuss ideas in pairs or with small groups before students write. Prepare ākonga for writing after the discussion. Discussion is a way to help them find the words or clarify their meaning, for example, when discussing calf rearing good practice. With ākonga, identify the audience and purpose for each piece of writing. Use some of these questions. Provide sentence starters or phrasing examples to support ākonga with delivering their ideas. Provide ākonga with opportunities to plan their writing with templates that match the text type, for example, the process for recording the production cycle for producing fawns or a crop of turnips. Provide ākonga with a 3x3 writing structure for drafting their garden log entry, for example, writing a log entry which would include three paragraphs with three sentences in each paragraph: » Paragraph 1 – Describe what was done » Paragraph 2 – Describe weather conditions » Paragraph 3 – Detail harvesting Generate word families with ākonga. This is useful for those terms that appear most frequently within agriculture or horticulture, as well as those that appear across curriculum areas (Academic Word List).

		Analytical expositions argue a point with supporting evidence or that a specific course of action should be taken. Discussions consider two or more perspectives before making a decision. Justifications challenge or debate a point of view. Procedural texts include: » procedures » procedural recounts. Procedures instruct someone how to do something. Procedural recounts aim to retell the methods of a process which may be experimental. Vocabulary knowledge involves conceptual understanding of abstract nouns, a confident knowledge of academic word families, an understanding of word patterns such as collocations, and an understanding of how register, purpose, and audience affect word choice. For example, when discussing the natural environment within te ao Māori, Taiao provides a more developed understanding.	Use tools such as concept frames to deepen learners' conceptual understanding. Provide or co-construct ākonga checklists to revise and edit their work.

Big Idea 2: Learners use written language conventions appropriately to support communication.	Ākonga: » develop their expertise in sentence construction, grammar, punctuation, spelling, word choice.	Features of written language conventions include: » sentence construction, organisation and phrasing e.g. Agricultural and Horticultural Science specific nouns, compound nouns, precise verbs and collocations » grammar choices » the use of punctuation to clarify meaning » the understanding that word knowledge includes accurate spelling for ease of communication » word choice impacts the meaning and tone of a text. The use of Agricultural and Horticultural Science specific nouns such as: » general nouns » nouns related to crops » nouns related to livestock » nouns related to productive land.	Scaffold ākonga to write increasingly specific noun phrases by adding adjectives (premodifiers) before the head noun and phrases or clauses after the head noun (postmodifiers). An example of this is “the rich (premodifier) biological properties (head noun) of the soil (post modifier)”. Introduce word families including nouns, verbs, adjectives and adverbs, for example, product, production, productive, productively. Discuss Collocations. Explain that particular pairs of words in Agricultural and Horticultural Science are natural in expression versus an unnatural expression. An example of this is “nutrient loss” rather than “nutrient disappearance”. Generate or co-construct lists of topic specific vocabulary, particularly those that are difficult to spell. Provide learners with a focused glossary of terms. Introduce learners to some of the relevant terms from the academic word lists to support their writing. With ākonga, evaluate the usefulness of words for present or future learning. Consider words for use, across learning areas i.e. words from the Academic Word List such as conditions, produce, exposure. Draw ākonga attention to the function of different punctuation marks. Demonstrate the clarity punctuation provides in the simple sentences required for a garden log or weather record. Encourage ākonga to read aloud and re-read their writing to ensure that their written statements match their intended message. Encourage ākonga to mark words for later checking. Checking can be for spelling or the intended meaning.