Modelling Seasons in a Vineyard

LESSON 2: Teacher Guide and Student Worksheets

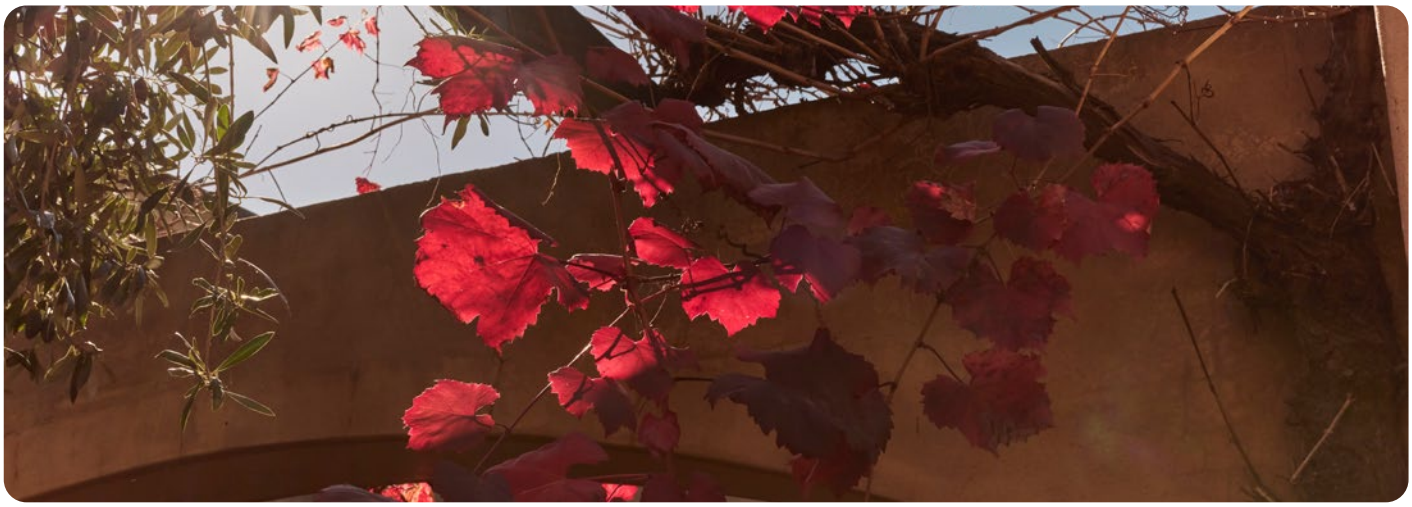


Image credit: Wine Australia

Year Level

7-8

Australian Curriculum Content

Design and Technologies

- Analyse how people in design and technologies occupations consider ethical and sustainability factors to design and produce products, services and environments (AC9TDE8K01)
- Analyse how food and fibre are produced in managed environments and how these can become sustainable (AC9TDE8K04)
- Analyse the impact of innovation and the development of technologies on designed solutions for global preferred futures (AC9TDE8K02)

Science

- Select and construct appropriate representations, including tables, graphs, models and mathematical relationships, to organise and process data and information (AC9S7I04, AC9S8I04)

Lesson Objective

Students will deepen their understanding of seasonal changes in vineyard management by constructing and presenting life-sized grapevine models that represent each season's growth stages, operations, and associated technologies. Through collaborative model-building and discussion, they will learn how seasonal vineyard practices support grapevine health, sustainable production, and optimal grape quality while exploring the influence of environmental and technological factors on vineyard management.

Lesson Overview

- Activity 2.1 - Recap Ready (20-25 minutes)
- Activity 2.2 - Modelling Seasonal Growth (40-60 minutes)
- Activity 2.3 - Group Presentations (15-20 minutes)

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ATTRIBUTION, CREDIT & SHARING

This resource was produced by Primary Industries Education Foundation Australia (PIEFA) in collaboration with Wine Australia. Primary Industries Education Foundation Australia's resources support and facilitate effective teaching and learning about Australia's food and fibre industries. We are greatful for the support of our industry and member organisations for assisting in our research efforts and providing industry-specific information and imagery to benefit the development and accuracy of this educational resource.

While reasonable efforts have been made to ensure that the contents of this educational resource are factually correct, PIEFA and Wine Australia do not accept responsibility for the accuracy or completeness of the contents and shall not be liable of this educational resource.

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Resources and Equipment

ACTIVITY 2.1 - Recap Ready

- Organic Pest Control and Pruning Techniques Behind Award Winning Wines | Gardening Australia (7:01)
- From Lesson 1 | Seasons in Australian Vineyards:
  Worksheets 1.2a - Seasons in Australian Vineyards and
  Worksheet 1.2b - Seasons in Australian Vineyards | Response.

ACTIVITY 2.2 - Modelling Seasonal Growth

- **Worksheet 2.2a - Modelling Seasonal Growth Data Sheets**
- Rulers or tape measures
- Student workbooks
- Pencils
- Sticky notes or blu tack
- Craft materials for model grapevines (e.g. cardboard, streamers, coloured paper, string, scissors, tape, glue, paper straws, pompoms, corks, tissue paper, etc.)
- Optional: digital device and printer access for completion of labels and information tags

ACTIVITY 2.3 - Group Presentations

Optional:

- Pencils
- Paper
- Blu tack

Lesson Guide

ACTIVITY 2.1 - Recap Ready

Students will consolidate their understanding of seasonal vineyard operations by reviewing and discussing key management practices, technologies, and sustainability strategies introduced in **Lesson One - Seasons in Australian Vineyards.**

a. View the Organic Pest Control and Pruning Techniques Behind Award Winning Wines | Gardening Australia (7:01).

b. After viewing the clip, facilitate a discussion about the seasonal operations that were identified throughout the video. Invite students to share their ideas about how the featured management practices could contribute to the sustainability of the vineyard. (Suggested answers page 6)

c. Organise students into four groups based on the season they explored during **Lesson One - Seasons in Australian Vineyards**.

d. Provide students with access to **Worksheet 1.2a - Seasons in Australian Vineyards** and **Worksheet 1.2b - Seasons in Australian Vineyards | Response**.

e. In their groups, students revise what they learned about their allocated season, including common vineyard operations, relevant technologies and innovations, and seasonal growth patterns.

f. Encourage groups to share their ideas on the occupations involved in vineyard management and production during the season.

ACTIVITY 2.2 - Modelling Seasonal Growth

Students will apply their knowledge of seasonal vineyard changes by constructing a life-sized model of a grapevine that visually represents their assigned season. Using labels, they will identify seasonal growth characteristics, operations, relevant technologies, and management practices that vary throughout the year.

a. Instruct students to remain in their groupings from **Activity One**. Explain that each group will construct a life-sized grapevine model showcasing the typical appearance of a grapevine in their assigned season, along with labels for the operations, technologies, and occupations they have learned about.

b. Distribute the corresponding season page (1-4) from **Worksheet 2.2a - Modelling Seasonal Growth Data Sheet** to each group (pages 7–10).

   – *Note: The data provided on this worksheet is approximate and serves as a general guide for grapevine growth and seasonal changes. In actual vineyards, these measurements can vary significantly based on factors such as the age of the vine, grape variety, regional climate, and specific vineyard management practices.*

c. Students collaborate to read the information on the worksheet, using workbooks or pieces of paper to sketch and plan their models.

d. Provide students with the materials listed on page 6. Groups use the materials provided to create a grapevine model that reflects the physical characteristics typical of their season. Remind students to consider vine height, density of leaves, grape development (if applicable), and colour variations.

ACTIVITY 2.3 - Group Presentations

Students will present and explain their grapevine models, highlighting the seasonal features, vineyard operations, technologies, and sustainability practices they have learned about.

a. Reconvene as a class and invite each group to present their model, explaining the characteristics of grapevines during their allocated season and typical vineyard operations, technologies, and sustainability practices throughout the season.

b. **Optional:** If time permits, provide students with additional sticky notes or pieces of paper and allow them to record any questions they have about seasonal changes in Australian vineyards (e.g. Why is [specific technology or operation] only used in this season? How could climate change impact the operations in this season? etc.)

c. Students attach each note to the seasonal model related to their question or wondering.

d. These can be used to guide further research in future lessons.

Answers

ACTIVITY 2.1 - Recap Ready

b) Answers will vary. Suggested points for discussion:

- Mulching with triticale straw conserves water, prevents erosion, and reduces herbicide use, enhancing environmental sustainability.
- Biodynamic composting recycles vineyard waste and enriches soil naturally, reducing chemical fertiliser needs and supporting soil health.
- Pruning techniques improve sap flow and prevent diseases, reducing the need for fungicides and supporting vine longevity.
- Companion planting of native plants attracts beneficial insects that control pests naturally, eliminating pesticide use and promoting biodiversity.
- Sustainable practices reduce vine stress, improve grape quality, and support long-term economic sustainability in the vineyard.

ACTIVITY 2.2 - Modelling Seasonal Growth

Not applicable to activity. Student answers will vary.

ACTIVITY 2.3 - Group Presentations

Not applicable to activity. Student answers will vary.

References

Gardening Australia. "Organic Pest Control and Pruning Techniques behind Award Winning Wines | Gardening Australia." YouTube, 1 June 2021, www.youtube.com/watch?v=fYT7OKdoR6s Accessed 11 Nov. 2024.

Urska. "Overview of Grapevine Structure and Function." EVineyard Blog, 30 May 2017, www.evineyardapp.com/blog/2017/05/30/overview-of-grapevine-structure-and-function/.

Spring Data Sheet

During spring, grapevines enter the budburst and flowering stages. **Budburst** is when tiny buds on the grapevines start to swell and open. This is followed by flowering, where grape bunches begin to develop. The buds develop into shoots that quickly grow, reaching around 30–60 cm in length by the end of spring. The young leaves are bright green and small at first, but they expand over the season, covering the vines in fresh, green foliage. Tiny green or white flower clusters appear, which will eventually turn into grapes.



Image credit: Wine Australia

Use the data below to construct a life-sized model of a grapevine in **spring**.

Your model should include:

- **Labels** highlighting the seasonal features of the grapevine.
- **Information tags** to explain the vineyard operations, technologies, and occupations relevant to the season. Each tag should include a title, a short description, and an image that represents the topic.

Grapevine Dimensions

Part of grapevine	Dimensions (cm)	Observation
Trunk height	100–120	–
Trunk diameter	5	Trunk colour is dark brown
Bud size	1–1.5	Bud colour is light green during spring
Shoot length	30–60	–
Leaf size and colour	5–10	Leaf colour is bright green
Flower cluster size	2-4	Flower colours are light green or white

Summer Data Sheet

By summer, grapevines are large and dense, with shoots reaching over a metre in length and broad, dark green leaves, providing shade to the growing grape bunches. Grapes vary in colour depending on the variety: green, red, purple, or black. In summer, the grapes start to change colour and ripen in a process called **veraison**, turning darker as they mature. When grapes reach peak ripeness, they are ready to harvest.



Image credit: Wine Australia

Use the data below to construct a life-sized model of a grapevine in **summer**.

Your model should include:

- **Labels** highlighting the seasonal features of the grapevine.
- **Information tags** to explain the vineyard operations, technologies, and occupations relevant to the season. Each tag should include a title, a short description, and an image that represents the topic.

Grapevine Dimensions

Part of grapevine	Dimensions (cm)	Observation
Trunk height	100–120	–
Trunk diameter	5	Trunk colour is dark brown
Shoot length	100–150	–
Leaf size	12–15	Leaf colour is deep green during summer
Grape bunch	10–12	During summer grape bunches darken in colour, turning green or red depending on the variety.

Autumn Data Sheet

In autumn, leaves on the vines start changing colour, turning shades of yellow, orange, or even red, depending on the variety and weather. The vines still stand tall, with branches often over a metre long. During this season the leaves begin to thin, and vine appears less dense than in summer.



Image credit: Wine Australia

Use the data below to construct a life-sized model of a grapevine in **autumn**.

Your model should include:

- **Labels** highlighting the seasonal features of the grapevine.
- **Information tags** to explain the vineyard operations, technologies, and occupations relevant to the season. Each tag should include a title, a short description, and an image that represents the topic.

Grapevine Dimensions

Part of grapevine	Dimensions (cm)	Observation
Trunk height	100–120	–
Trunk diameter	5	Trunk colour is dark brown
Number of canes	40–60	–
Cane length	100–150	–
Leaf size	10–12	Leaf colour turns yellow, orange or red during autumn

Winter Data Sheet

In winter, grapevines enter a dormant phase, where they drop all leaves and temporarily stop growing to conserve energy for the next season. This allows the vines to store nutrients and strengthen their roots, which supports healthy growth and quality grape production in spring. The vine appears bare, with only the trunk and main branches remaining. After pruning, a typical grapevine is usually left with two to four main canes (branches), depending on the vine training system. The pruned branches are chosen depending on their health and position on the vine. Pruning helps to remove old growth, control vine size, and manage the yield, ensuring the plant's energy is focused on producing high-quality grapes.



Image credit: Wine Australia

Use the data below to construct a life-sized model of a grapevine in **winter**.

Your model should include:

- **Labels** highlighting the seasonal features of the grapevine.
- **Information tags** to explain the vineyard operations, technologies, and occupations relevant to the season. Each tag should include a title, a short description, and an image that represents the topic.

Grapevine Dimensions

Part of grapevine	Dimensions (cm)	Observation
Trunk height	100–120	–
Trunk diameter	5	Trunk colour is dark brown
Number of canes	2–4	–
Cane length	40–50	Cane colour is grey-brown
Leaf size	–	No leaves are present