# Geography elective – primary production



This resource has been designed to support geography teachers by providing a range of tasks based on syllabus content. Tasks can be incorporated into context driven teaching and learning programs in full or can be used to supplement existing programs. All content is textbook non-specific to ensure equity.

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## Content focus

The patterns, functions and issues associated with primary production. The content provides opportunities for students to investigate learning across the curriculum content including Aboriginal and Torres Strait Islander histories and cultures, Asia and Australia’s engagement with Asia, and Sustainability.

### Outcomes

* **GEE5-1** explains the diverse features and characteristics of a range of places, environments and activities
* **GEE5-4** assesses the interactions and connections between people, places and environments that impact on sustainability
* **GEE5-5** accounts for contemporary geographical issues and events that impact on places and environments
* **GEE5-6** explains how perspectives of people and organisations influence a range of geographical issues
* **GEE5-8** acquires and processes geographical information by selecting and using appropriate and relevant geographical tools for inquiry
* **GEE5-9** communicates geographical information to a range of audiences using a variety of strategies and geographical tools

[Geography Elective 7–10 Syllabus](https://educationstandards.nsw.edu.au/wps/wcm/connect/b800c80e-721c-4924-ad9a-83428697372c/geography-elective-years-7-10-syllabus-2019.pdf?MOD=AJPERES&CVID=) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2019.

## Learning sequence 1 – primary production

**Teacher note:** in this unit, students will be introduced to the concept of primary production. For the research activity, students should be assigned one of the primary production methods listed in Table 1. While introductory resources have been provided, students should be encouraged to research the method of production from a variety of perspectives in accordance with the [Controversial Issues in Schools policy](https://education.nsw.gov.au/policy-library/policies/pd-2002-0045).

Some concepts and words will need to be explicitly taught as the unit progresses. A capacity matrix for unit vocabulary has been provided at the end of the unit for students to track progress.

### Content

Students:

* investigate the nature and spatial distribution of primary production, for example:
* identification of different types of primary production and associated characteristics: agriculture (intensive, extensive, subsistence, commercial); mining (open-cut, underground, drilling); fishing (driftnet, longline, aquaculture) and forestry (selective logging, clear-felling, plantation farming)
* analysis of global patterns of agricultural, mining, fishing and forestry production

### Learning activities

* Write a one-sentence definition of primary production, based on [Primary production activities](https://www.ato.gov.au/business/primary-producers/primary-production-activities/?anchor=Plantandanimalcultivation#Plantandanimalcultivation) and [Collins Dictionary.com](https://www.collinsdictionary.com/dictionary/english/primary-producer#:~:text=a%20person%20or%20an%20organization,Collins%20English%20Dictionary.).
* Hold a class discussion on the following question: ‘How is primary production relevant to my day-to-day life?’
* In small groups investigate the specific primary production type that you have been assigned from the list in Table 1. Possible resources may include: [Intensive vs Extensive farming (2:41)](https://www.youtube.com/watch?v=6vyTNWjV_Xs); [Difference between Subsistence and Commercial Farming](https://keydifferences.com/difference-between-subsistence-and-commercial-farming.html%22%20%5Cl%20%22%3A~%3Atext%3DSubsistence%20and%20Commercial%20farming%20are%2Care%20grown%20for%20trading%20purpose.); [Digging deeper: Mining methods explained](https://www.angloamerican.com/futuresmart/stories/our-industry/mining-explained/digging-deeper-mining-methods-explained); [Methods of fishing](https://ourworldindata.org/fish-and-overfishing%22%20%5Cl%20%22methods-of-fishing); and [Logging](https://en.wikipedia.org/wiki/Logging). The research should include
* a description of the primary production method
* identification of key characteristics of the primary production approach
* ways in which this method is different to other primary production approaches in the sector
* examples of where this approach is used in the world and suggestions for this global pattern.
* Use the research to create an overview to educate your class about the primary production method in a gallery walk. The information may be presented in a creative manner of your choice, for example a cartoon, a poster, a short video or a role play.
* Conduct a gallery walk to view the displays of all groups. Summarise your thoughts into the [See-Think-Wonder](http://pz.harvard.edu/resources/see-think-wonder) table provided as you consider the following questions
* What do you see?
* What does it make you think about?
* What does it make you wonder?

Table – primary production approaches, see-think-wonder

|  |  |  |  |
| --- | --- | --- | --- |
| Primary production method | See | Think | Wonder |
| intensive agriculture |  |  |  |
| extensive agriculture |  |  |  |
| subsistence agriculture |  |  |  |
| commercial agriculture |  |  |  |
| open-cut mining |  |  |  |
| underground mining |  |  |  |
| drill mining |  |  |  |
| driftnet fishing |  |  |  |
| longline fishing |  |  |  |
| aquaculture |  |  |  |
| forestry – selective logging |  |  |  |
| forestry – clear felling |  |  |  |
| forestry – plantation farming |  |  |  |

* At the end of the gallery walk, all team members from each primary production sector, that is agriculture, mining, fishing and forestry, will take turns to sit on a panel in front of the class to complete the following
* answer questions the class may have about that sector
* make a one-minute presentation on how the method of primary production is good for the planet or its people. At the end of each panel, the class will vote on the best method of primary production for the sector.

## Learning sequence 2 – role of primary production

**Teacher note:** in this unit, students will investigate the importance of primary production. They will also explore how primary production is changing, for example through involvement of multinationals and new technologies which are changing the operation of primary production. Additional resources for this unit may be NSW Department of Primary Industries, ‘[The Yabby unit](https://www.nswdpi-schools-program.com/yabby-unit)’ and ‘[Farming for the 21st Century](https://www.nswdpi-schools-program.com/farming-for-the-21st-century).’

### Content

Students investigate the importance of primary production across a range of scales, for example:

* description of the importance of primary production to the local, national and global community
* analysis of current trends in primary production, eg the changing role of technology
* examination of the involvement of multinationals in primary production
* prediction of future patterns of primary production at different scales

### Learning activities

* Conduct a class brainstorm in person or using a [Google Jamboard](https://app.education.nsw.gov.au/digital-learning-selector/LearningTool/Card/593#.Yh13vqfBbWE.link) on the following questions
* Why is primary production important to you, to Australia and to the world?
* Will primary production become more or less important over time?
* In groups of 3, assign each group member to research the importance of primary production on one of the following scales: a small local community; Australia; or the global community. After the research has been completed, discuss the research with your group and collaboratively create a [Triple Venn Diagram](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/599#.Ys-Lh4B5QV8.link) showing the importance of primary production across the 3 scales. Useful resources may include

* [Australian food industry products](https://www.awe.gov.au/abares/data/infographics-and-maps%22%20%5Cl%20%22australian-food-industry-products)

* [Overview of the primary sector](https://www.daf.qld.gov.au/strategic-direction/datafarm/overview-primary-industry-sector%22%20%5Cl%20%22%3A~%3Atext%3DQueensland%27s%20primary%20industries%20%28agriculture%2C%20fisheries%2Cto%20nearly%20200%20destinations%20worldwide.)

* [Australia has a big role to play in feeding the world](https://theconversation.com/australia-has-a-big-role-to-play-in-feeding-the-world-43648)

* [Primary sector of the economy](https://en.wikipedia.org/wiki/Primary_sector_of_the_economy)
* Use the websites provided below, as well as school resources, to research ways that primary production in the agricultural sector may change over time. Use this research to write brief responses to each of the following questions
* Who may own the farms of the future?
* How might the day-to-day operation of farms change?
* Will there be impacts resulting from climate change or other global issues like disease that have to be managed?
* How will new technology be used to increase yields and respond to challenges?
* Resources to assist with this task

* [Climate change impacts and adaptation on Australian farms](https://www.awe.gov.au/abares/products/insights/climate-change-impacts-and-adaptation%22%20%5Cl%20%22future-changes-in-climate-could-make-conditions-tougher-for-australian-farms)
* [Farms are adapting well to climate change, but there’s work ahead](https://theconversation.com/australian-farmers-are-adapting-well-to-climate-change-but-theres-work-ahead-164860#:~:text=Farmers%20have%20been%20adapting&text=After%20controlling%20for%20climate%2C%20farm,gain%20in%20the%20cropping%20sector.)
* [The Future of Farming (12:28)](https://www.youtube.com/watch?v=Qmla9NLFBvU)
* [Australians Turn to Vertical Farming (3:07)](https://www.youtube.com/watch?v=uDN3xGsnIRw)
* [Advanced Agriculture Planting Technology (6:38)](https://www.youtube.com/watch?v=fKhWW0RTD-4&t=2s)
* [World first: Robot-run farm to harvest 30,000 heads of lettuce daily](https://futurism.com/world-first-robot-run-farm-harvest-30000-heads-lettuce-daily)
* [How America’s food giants swallowed the family farms](https://www.theguardian.com/environment/2019/mar/09/american-food-giants-swallow-the-family-farms-iowa)
* [The intersection of agriculture and business](https://www.theaustralianfarmer.com/the-intersection-ofagriculture-and-business)

* [Who owns Australia’s farms 2021: Top 10 by value](https://gofarmaustralia.com.au/news/who-owns-australias-farms-2021/)
* Use the research from the last activity to complete the following activities summarising the ways that primary production is changing in agriculture
* Complete a visual representation of a ‘typical’ family farm before and after likely changes. For example, the representation may show a cartoon of the key features of the family farm in the year 2020, compared to a farm in 2080.
* Complete a one-paragraph description of the changes highlighted by the before and after cartoon.
* Reflect on what you have learnt about the importance of primary production and the ways that this may change in future. Use the following sentence stems to write 2 sentences about how your thinking has changed as a result of studying this unit
* I used to think …
* Now I think …

## Learning sequence 3 – investigative study

**Teacher note:** schools are encouraged to select primary industries for this case study based on student interest and relevance to the cohort. Resources are available for a virtual farm tour at [Tocal Virtual Farm](https://www.tocal.nsw.edu.au/farm-and-facilities/tocal-farms/virtual-farm). Activities at this site may be able to be adapted by teachers to suit the needs of their cohort.

### Content

Students select at least ONE activity relating to primary production operating at a local, regional or global scale. Students:

* investigate the nature and characteristics of the selected primary production in operation
* description of its location at a local, regional or global scale
* examination of the characteristics of the primary production
* description of the relevant geographical processes
* investigate the impact of the primary production
* examination of environmental, social and economic impacts of the activity
* discussion of strategies to achieve sustainability
* investigate contemporary issues related to the primary production
* identification of relevant contemporary issues
* analysis of one contemporary issue including the perspectives and influence of individuals, groups and governments in relation to the issue

### Learning activities

**Teacher note:** in this case study, we explore the agricultural industry producing macadamias in NSW and Queensland. Because of the risk of nut allergies and anaphylaxis it is advised that nuts are not provided for tasting by students. If this industry is not suitable for your class or context, other industries may be studied. For example, there are resources on dairy farming at ‘[Dairy farming into the future (13:54)](https://www.youtube.com/watch?v=A27a8noPmQo&list=PL4OaBCdO34bCQWxby08qt00Aa3-A7htEb).’

* Use [Australian Macadamias’ fun facts](https://www.australian-macadamias.org/consumer/an-australian-legend/fun-facts-and-free-e-books/), [Macadamia production](https://www.dpi.nsw.gov.au/stories/macadamia-production), [Taste.com.au](https://www.taste.com.au/search-recipes/?pub%5B0%5D=&q=macadamia) to complete the following
* draw a macadamia tree and label the fruit
* explain one other use of macadamias, for example, in beauty products.
* The macadamia holds a special connection for Aboriginal Peoples, especially those of the Gumbaynggirr Nation, Bundjalung Nation, Yugambeh Country, Kabi Kabi Peoples, Jinibara Peoples and the Butchulla People. Use [Australian Macadamias’ The macadamia legend](https://www.australian-macadamias.org/consumer/an-australian-legend/the-macadamia-legend/), to complete the following
* mark on a [map of Australia](https://commons.wikimedia.org/wiki/File%3AAustralia_states_blank.png), the location and extent of each of the groups of Aboriginal Peoples with a long connection to macadamias
* identify at least 2 Aboriginal Peoples’ names for the macadamia
* create a [narrative comic](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/559#.Yh7D3v07E5U.link), illustrating the main events in the ‘Legend of Baphal’. The comic should explain how the macadamia came to be known as baphal by the Butchulla people.
* Use ‘[An Australian Legend: History and Industry](https://www.australian-macadamias.org/consumer/an-australian-legend/history-and-industry/)’ to explain in one paragraph the historical origins of the commercial macadamia industry.
* Use ‘[Growing and Processing Macadamias’](https://www.australianmacadamias.org/industry/about-growers/growing-processing-macadamias) and ‘[About the macadamia industry’](https://www.australianmacadamias.org/industry/about/about-the-macadamia-industry) to complete the following
* identify where macadamias are grown in Australia and across the world
* explain the growing conditions that lead macadamias to be grown in these locations
* describe the economic and social value of this industry, for example export income, jobs, replacing sugar cane as consumer demand changes
* select one of the growing region case studies in ‘[About the Macadamia Industry,’](https://www.australianmacadamias.org/industry/about/about-the-macadamia-industry) and use this to identify and describe specific benefits of this industry to the region.
* Use the research conducted into the macadamia industry to complete a [Step Inside](http://www.pz.harvard.edu/resources/step-inside) activity assuming the persona of a macadamia. First create a cartoon character of a macadamia on paper or using technology like [Adobe Animate](https://app.education.nsw.gov.au/digital-learning-selector/LearningTool/Card/51?clearCache=f3e06407-1717-f0fd-c272-c4a1461e80bc). Then write 4 thought bubbles near your character, using the following sentence stems
* I am a macadamia …
* In Australia, I grow in …
* I love growing where I do because …
* I am great for local regions because …
* The hard shell of the macadamia helps with resistance to pests. However, other interventions are also needed at times. Use [Australian Macadamia Society: Sustainability](https://www.australianmacadamias.org/industry/about-growers/sustainability) and your own research to create a short video in [iMovie](https://app.education.nsw.gov.au/digital-learning-selector/LearningTool/Card/617?clearCache=f997e9e5-cb35-f3ee-243f-4396dd56e587#.Yh7HLB6xlTM.link) on one sustainable pest management practice in the industry. Ideas may include the Trichogramma wasp or native barn owls. The video should be entertaining and include an overview of
* what pest the response helps with
* how the practice works
* whether the approach is sustainable and better than other options.

**Teacher note:** prior to this activity, students will need to be provided with a scaffold for a report. They should be instructed that the report will need an introduction or executive summary and then 4 main headings, including: real estate requirements; planning for planting; seasonal activities; and risks. Finally, the report will need a conclusion. Students have been provided with resources to get them started, and will also need internet access to conduct their own research.

* Darren and Melinda are from Sydney and would love to move to the North Coast of NSW to start a macadamia farm. They have enough money to buy 100 acres, and would like your advice on what’s involved in running a macadamia farm. Complete the following research and present this in a report for the couple (remember, a report has an introduction, headings in the body and a conclusion).
* Darren and Melinda will need to brief the real estate agent on what type of land they will need to buy. Prepare a one paragraph brief for the real estate agent explaining the characteristics of the land such as
* soil
* drainage
* average annual rainfall
* average, maximum and minimum temperatures.
* The couple will also need to prepare and plan before the trees are planted. In 1–2 sentences, identify and describe 3 actions that will need to be undertaken before the trees are planted. You may like to consider
* clearing the land
* planting windbreaks
* installing irrigation.
* Darren and Melinda need to know how much work they will have to do in each season. They will need you to design a complete crop calendar illustrating the steps in growing macadamias from planting the trees to harvesting the nuts. Actions to consider may be
* planting
* pruning
* weed control
* pest management
* harvesting
* irrigating.

Table – crop calendar

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task | Summer – December to February | Autumn – March to May | Winter –June to August | Spring –September to November |
|  |  |  |  |  |

* Darren and Melinda would also like to know the financial risks associated with this business venture. You should provide them with a concept map that summarises risks. Examples to consider may include
* the cost of equipment needed
* risks from weather and climate, for example droughts, floods, frost
* risks from their lack of agricultural knowledge
* pests
* 4-5-year period with no income.
* Resources for this task

* [‘So you want to grow your own macadamia tree?’](https://www.australian-macadamias.org/consumer/so-you-want-to-grow-your-own-macadamia-tree-here-are-6-things-you-should-consider/%22%20%5Cl%20%22%3A~%3Atext%3DAs%20they%20are%20native%20to%2Cor%204%20years%20after%20planting.)
* [AgricSite.com, Macadamia Nut farming](https://agricsite.com/harvesting-macadamia-nuts/)
* [Macadamia Planting and Preparation](https://farm4fashion.wordpress.com/2019/02/21/macadamia-planting-and-preparation/)
* [Macadamia tree planting preparation (11:14)](https://www.youtube.com/watch?v=o4uAlpTFHfI)
* [Macadamia nuts – farm to factory (4:13)](https://www.youtube.com/watch?v=Yyg7aeIK8mI)

#### Contemporary issues related to production

**Teacher note:** macadamias are pest resistant and tend to have few controversial issues associated with their production. We have chosen water use as an example of a contemporary issue as this will increasingly become a concern for all primary production activities. Other alternatives for study as a contemporary issue may be increasing homogeny of the crop across Northern NSW, growth of macadamias at the expense of other food crops, and loss of native species of macadamia.

* Your small team has been asked to research the water footprint of different agricultural industries in Australia to determine which should be allowed to continue in our potentially dry climate in future. Your task is to research whether macadamia production should be allowed to continue in Australia. Use the scaffold provided to record at least 10 useful ideas from the research. Resources to get started on this task may include: [Do we have enough water for all our macs?](https://themacadamia.co.za/2018/10/23/do-we-have-enough-water-for-all-our-macs/) and [Water Use on Australian Farms](https://www.abs.gov.au/statistics/industry/agriculture/water-use-australian-farms/latest-release%22%20%5Cl%20%22%3A~%3Atext%3DIn%202019-20%2C%203.8%20million%2Cfor%20grapevines%20%28down%201%25%29).

Table – media research

|  |  |
| --- | --- |
| Source | Big idea(s) |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

* Your teacher will provide the class with a continuum line on the question of whether or not macadamia production should be allowed to continue in Australia. At one end will be 100% in support of this, in the middle will be neutral and at the other end will be 100% against macadamia production. After completing your research, place your team position on the continuum. Your group should be prepared to share your decision and justify this to the class.
* Use what you have learnt about macadamia cultivation, and its impact on sustainability, to write a one paragraph response to the following statement: ‘Discuss whether macadamia production should be allowed to continue in Australia.’

## Primary production – concepts and glossary of terms capacity matrix

* Key classification
* information – recall basic facts or heard of this before
* knowledge – can explain and know what it means
* know-how – can draw connections between this geographical term or concept and relate to other concepts or situations
* wisdom – can use the term or concept in new contexts or teach others.
* Shade or tick information, knowledge, know-how and wisdom as you progress with your understanding of the geographical concept or term. At the end of the learning sequence reflect on your progress and discuss with your teacher if you observe any areas where you can improve.

Table – glossary word list

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Glossary word or concept | Information | Knowledge | Know-how | Wisdom |
| primary production |  |  |  |  |
| agriculture |  |  |  |  |
| forestry |  |  |  |  |
| climate |  |  |  |  |
| topography |  |  |  |  |
| land use |  |  |  |  |
| capital |  |  |  |  |
| labour force |  |  |  |  |
| catchment |  |  |  |  |
| sustainability |  |  |  |  |
| intensive agriculture |  |  |  |  |
| extensive agriculture |  |  |  |  |
| subsistence agriculture |  |  |  |  |
| commercial agriculture |  |  |  |  |
| open cut mining |  |  |  |  |
| driftnet fishing |  |  |  |  |
| longline fishing |  |  |  |  |
| aquaculture |  |  |  |  |
| selective logging |  |  |  |  |
| clear-felling |  |  |  |  |
| plantation farming |  |  |  |  |
| homogeny |  |  |  |  |
| agribusiness |  |  |  |  |
| wind break |  |  |  |  |
| drainage |  |  |  |  |
| financial risk |  |  |  |  |
| economic |  |  |  |  |
| social |  |  |  |  |

## Assessment task – launching a new primary industry in NSW

**Teacher note:** when using this task, ensure it is placed on the school template and follows all assessment requirements. It is also important that students do not complete the task on a primary production case study that has been completed in class, for example macadamia growing.

### Outcomes

* **GEE5-1** explains the diverse features and characteristics of a range of places, environments and activities
* **GEE5-4** assesses the interactions and connections between people, places and environments that impact on sustainability
* **GEE5-9** communicates geographical information to a range of audiences using a variety of strategies and geographical tools

### **Syllabus content**

* investigate the nature and characteristics of the selected primary production in operation
* investigate the impact of the primary production

### Group video task

* Working in a small group you will make a video presentation of about 5 minutes. This can be done in [iMovie](https://app.education.nsw.gov.au/digital-learning-selector/LearningTool/Card/617?clearCache=f997e9e5-cb35-f3ee-243f-4396dd56e587#.Yh7HLB6xlTM.link).
* The purpose of the video will be to present to a state government panel who are considering investing in industries that benefit the state of NSW. Your aim is to obtain financial support to launch a new primary industry in a specific region of NSW. The industry can be agriculture, fishing, mining or forestry. Your first task is to select a region of NSW that interests you and then select an industry that is not currently conducted in this location.
* Your presentation must
* include a map of NSW showing the specific region of NSW where you will be launching the industry. Make sure you remember border, orientation, legend, title and scale (BOLTS)
* explain why this activity is likely to succeed in this location, for example soil, topography, climate, transport links, markets, processing plants, water sources or labour. You should also justify your choice of location by comparing the features and characteristics of the chosen location with at least one location where this primary industry is currently being conducted
* describe the day-to-day activities involved in growing or producing the product. This should include a visual representation of the seasonal activities
* assess one impact on sustainability that may cause locals in your chosen region to resist the new primary industry and explain one solution to this sustainability concern
* summarise the reasons why this industry should be provided with funding and assistance. This may include overview of potential social, environmental or economic benefits to the region.

### Marking criteria

Table – marking criteria

|  |  |
| --- | --- |
| Criteria | Mark |
| * Demonstrates extensive knowledge and understanding of places and environments
* Assesses the impact of this industry on sustainability and comprehensively explains the potential social, environmental or economic impacts of this industry
* Displays sophisticated skills to select, acquire and process complex geographical information
 | A |
| * Demonstrates thorough knowledge and understanding of places and environments
* Assesses the impact of this industry on sustainability and explains the potential social, environmental or economic impacts of this industry
* Displays high level skills to select, acquire and process geographical information, using a range of strategies to communicate effectively
 | B |
| * Demonstrates sound knowledge and understanding of places and environments
* Displays sound knowledge of sustainability impacts and other social, economic or environmental impacts of this industry
* Displays sound skills to select, acquire and process geographical information, and uses strategies to communicate effectively
 | C |
| * Demonstrates basic knowledge and some understanding of places and environments
* Displays basic knowledge of the social, environmental or economic impacts of this industry
* Displays basic skills to select, acquire, process and/or communicate geographical information
 | D |
| * Demonstrates elementary knowledge of places and environments, and identifies some geographical processes and influences that form and transform them
* Identifies some aspects of impacts of this industry
* Displays elementary skills to select, acquire, process and/or communicate geographical information
 | E |

## References

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