

# Growing Australia

Years 7–10 Design Technologies

Year 9 HASS – Geography

Electives: Agricultural Technology, Agriculture,  
Food Studies



**(Design Technologies; Yrs 7 & 8, ACTDEK029)**

Investigate the ways in which products, services and environments evolve locally, regionally and globally and how competing factors including social, ethical and sustainability considerations are prioritised in the development of technologies and designed solutions for preferred futures

**(Design Technologies; Yrs 9 & 10, ACTDEK041)**

Explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions

**(Geography; Yr 9, ACHGK061)**

Human alteration of biomes to produce food, industrial materials and fibres, and the use of systems thinking to analyse the environmental effects of these alterations

**(Geography; Yr 9, ACHGK062)**

Environmental, economic and technological factors that influence crop yields in Australia and across the world

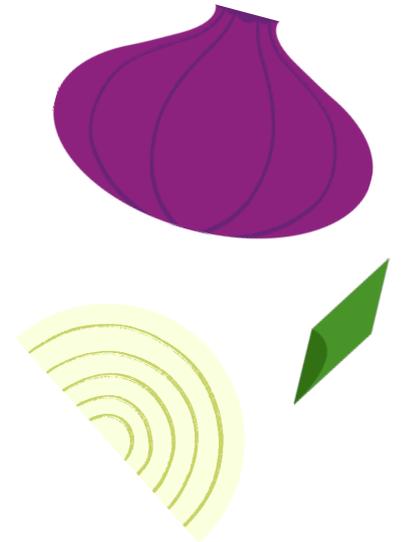
**(Geography; Yr 9, ACHGK063) – optional**

Challenges to food production, including land and water degradation, shortage of fresh water, competing land uses, and climate change, for Australia and other areas of the world

# Growing Australia

**How the continent is connected through crops and food markets**

Starting with one of the springboard videos, and using onions as a case study crop, students explore how growing regions and cities are connected by networks of transport, economics and shared regional characteristics.



**Equipment:**

(optional) a variety of onions, including red onions, brown onions, shallots and spring onions

**Duration:**

30-45 minutes

**Location:**

The classroom

**Notes:**

The tasks and discussion questions in this lesson can be completed as a group or assigned as an independent task requiring written responses, making it suitable for remote learning.

## Getting Started

🎧 Listen to **Nomcast Series 4, Onions Special #1, Soil Health.**



- Explain: onions belong to the allium family which includes bulb onions of several colours (red, brown, white), different varieties of shallots and spring onions, leeks, garlic and chives.

### Discuss:

- ❓ What are some of the foods students enjoy made of the allium fam? (E.g. onion rings, French onion soup, roasted mixed vegetables, shallots in stir-fries and curries, garlic in aioli or on bruschetta, chives as a garnish such as on a baked potato or in dips.)
- ❓ If you have brought in a variety of onions to share, let students handle them now and point out the different varieties.



## State Selectors

- Select one of the main onion-growing areas from the table below, possibly a region that is in your state or has ties to your community:

State	Onion-growing region
NSW	Riverina region
Queensland	Lockyer Valley Darling Downs St George Fassifern valley
South Australia	Adelaide Plains Southeastern SA
Tasmania	Northern Tasmania
Victoria	Sunraysia region Southwestern Victoria Gippsland
Western Australia	Carnarvon Myalup Manjimup

Source: [Onions Australia – Growing Regions](#)

## Explore:

- Students locate the region on a map and explore routes of transport between this area and the school's location.
- ? What roads, rail or other major transport systems link your school neighbourhood to this growing area?
- Students use a map to trace the main routes. Do they go straight from town to town or not? (Remind them that all highways in Australia will be after about 1960.)
- ? What landscape features require roads or rail to deviate (go around them)?
- If looking at a region with navigable or once-navigable waterways, or accessible harbours, remind students that in the past shipping would have been the most sensible transport method for heavy bulk transport.
- You may want to instruct students to find out dates for the establishment of agriculture in the area you're looking at, plus the main transport route at the time.



## Looking at the markets

- Explain to students that the main wholesale markets in Australia are where bulk quantities of fresh foods (fruit, vegetables, seeds, nuts) are sold from company to company (not to the end consumer). If you want to buy a ten-tonne truck of onions, you need to go to one of the wholesale markets.
- There are five main wholesale markets in Australia for fresh vegetables. The profiles below tell you when each market was established, useful if you are exploring how technologies such as the food production system have evolved.
- If exploring the socio-economic aspects of the food production system, note that most of these market bodies have a banking arm (current or past). Have students explore why a seasonal business such as farming would require credit and what this would mean for farming families and communities.
- Markets and their profiles:
  - ◇ Adelaide – South Australian Produce Market, Pooraka SA
    - ◇ Profile: [www.freshmarkets.com.au/members/south-australia/](http://www.freshmarkets.com.au/members/south-australia/)
  - ◇ Brisbane – Brismark, Rocklea QLD
    - ◇ Profile: [www.freshmarkets.com.au/members/brismark/](http://www.freshmarkets.com.au/members/brismark/)
  - ◇ Melbourne – Fresh State, Epping VIC
    - ◇ Profile: [www.freshmarkets.com.au/members/fresh-state/](http://www.freshmarkets.com.au/members/fresh-state/)
  - ◇ Sydney – Freshmark, Homebush NSW
    - ◇ Profile: [www.freshmarkets.com.au/members/freshmark/](http://www.freshmarkets.com.au/members/freshmark/)
  - ◇ Perth – Market West, Canning Vale WA
    - ◇ Profile: [www.freshmarkets.com.au/members/western-australia/](http://www.freshmarkets.com.au/members/western-australia/)
- The point to make is that transport networks change as human use and mode of transport changes. In the 19th Century transport shifted from ship to rail. In the 20th Century transport shifted from rail to road transport.
- ? What shift might be next? Discuss.

## Discussion and task:

- Almost all vegetables (over 90%) sold in Australia go through these five markets. Looking at the onion-growing region you explored before, what major market do onions from that region feed into?
- Task: Students suggest what transport routes would take this item from the growing region to the wholesale market and then to your local community, referring to maps (E.g. onions from Gippsland, Victoria would go to the market in Epping via these main routes: \_\_\_\_).
- Students do a rough estimation – If we buy onions in a local shop, does their route to us via one of the five main markets add to the kilometres travelled from paddock to plate, and if yes, by roughly how much? (E.g. If you live in Hobart, most onions from northern Tasmania travel to Melbourne’s market at Epping, then back to Tasmania; more than doubling the distance they travel.)
- Discuss: What are the benefits to having wholesale produce markets? (E.g. centralised purchasing, credit and marketing efforts, reduced waste and duplication of work, infrastructure and resources, lower costs, greater competition in pricing.)
- As an example of technology having an impact on the distribution system, ask students to find out when refrigerated road transport began in Australia then to find out the establishment dates for the five central wholesale markets. Have them explain to you how these two things might be related to each other. (Before reliable refrigerated transport, markets would have been smaller, more local organisations.)
- Students explain whether transport networks are an environmental, economic or technological consideration in the placement of farms.
- ❓ What is a sustainability consideration relating to the transportation of food? Is this a simple calculation of kilometres or is end-to-end carbon emissions of the production, sale and distribution of the product likely to be a more accurate calculation? Why?

- ❓ What is a social consideration relating to the transportation of food? What social benefits and issues are related to community access to fresh food? For example, is it possible for people in a food growing region to have difficulty accessing low-cost, varied fresh vegetables and fruit? How might this happen? (What can be done to change this?)

## Pay Dirt

- 👁 Re-play a one-minute segment of the **Soil Health Nomcast episode, starting at 4:00 and ending at 5:00.**



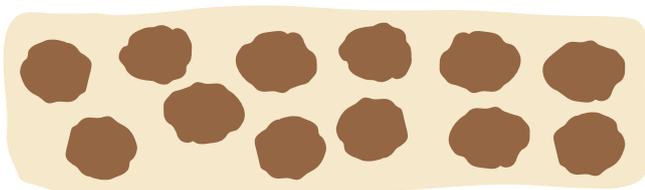
- In this segment Alice explores the ‘onion economy’ and explains the link between rich soil and an abundant (and higher value) harvest.



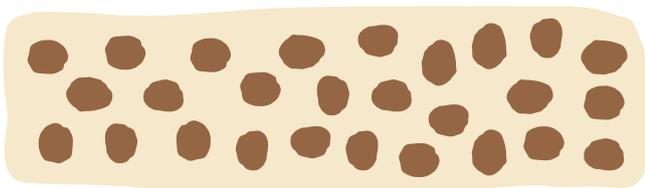
## Sand, Silt and Clay

👁 Watch this short introductory video on the composition of soil:

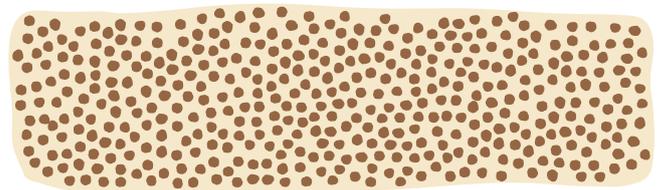
- ◇ ABC Gardening Australia – Soil Composition: [www.abc.net.au/gardening/factsheets/soil-composition/9430490](http://www.abc.net.au/gardening/factsheets/soil-composition/9430490)
- Review the web page or discuss the three main types of soil:
  - ◇ **Sandy soils** include a relatively large percentage (up to 80%) of large particles like the sand you might see at a beach. They are low in fertility and they drain quickly which means water and the water-soluble nutrients it carries can drain through out of reach of plant roots. This makes them prone to drying out unless water is regularly available. Many regions of Australia have very sandy soil, especially in WA and SA. Onions have a very shallow root system, so they can't reach down deep to get water and nutrients in sandy soil (like long carrots would).



- ◇ **Silt** is a medium-fine particle, much smaller than sand. When silt is dry, it is like dust, and can be prone to wind erosion. Silty soil can also be hydrophobic (meaning it repels water) when it is dry. If silty soil can remain moist, and has organic matter in it, it is a reasonably fertile option for growing shallow-rooted vegetables such as onions.



- ◇ **Clay** is very fine, with tiny particles that pack tightly together without much space between them for water or air to penetrate the soil. Clay is often called 'heavy' for this reason – it's difficult for roots to get through, and when clay is dry it can be almost as hard as concrete. On the plus side, clay holds a lot of nutrients, so it can be very good for vegetables as long as the grower is careful to keep the soil structure from compressing (compaction), and keeps the soil bacteria and fungi alive and kicking.



## Case Studies

Note: This task can be completed as a group or assigned as independent work leading to a written response. If you have the facilities, you may be able to substitute a hands-on growing component for this task, focusing on soil types and the key considerations growers make before planting onions as a commercial crop.

- Students choose one of the case studies below, or explore an alternative provided by you. They produce a ½ - 1-page written description or poster explaining what they have learned about soil types and onion agriculture.
  - ◇ Onion Growing Agfactsheet (PDF): [www.dpi.nsw.gov.au/\\_data/assets/pdf\\_file/0017/126305/Onion-growing-Agfact-H8.1.22.pdf](http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0017/126305/Onion-growing-Agfact-H8.1.22.pdf)
  - ◇ Growing spring onions in Western Australia: [www.agric.wa.gov.au/onions/growing-spring-onions-western-australia?page=0%2C0](http://www.agric.wa.gov.au/onions/growing-spring-onions-western-australia?page=0%2C0)
  - ◇ Soil and Landscape Grid: [www.clw.csiro.au/aclep/soilandlandscapegrid/index.html](http://www.clw.csiro.au/aclep/soilandlandscapegrid/index.html)



## Reflection

Students answer the following questions after interacting with these three activities:

- ❓ When growers look for the ideal place to begin growing a crop like onions, do they simply look for available land that is as close as possible to the largest population who will buy the product? Why or why not?
- ❓ What are at least two other aspects growers consider when choosing a site for a specific crop?
- Pair up with someone else and try to think up two completely new considerations we have NOT covered in this unit that you imagine growers in Australia take into account when choosing where to grow a specific crop. (E.g. price of land, rainfall, slope and access considerations, potential climate change, export demand, available workforce.)
- ❓ What is one change in technology (including equipment, scientific knowledge, data, and organisation of resources into processes) that you think has affected food production and transport in Australia? Explain the effect this has had in a couple of sentences.
- ❓ What is one new thing you learned in this unit or associated resources, about the way food is grown and distributed in Australia?
- ❓ What is one thing you would like to know more about?

