

Sugar Cane

One Plant, Many Products

YEARS 5 - 8
SCIENCE, DESIGN & TECHNOLOGY, GEOGRAPHY



Primary Industries Education
Foundation Australia



CANEGROWERS

This Journal belongs to:
[insert name]



LESSON 1

ACTIVITY

Activity 1A

Answer the following question. Show your working.

1. If the average cane field is 1,000,000 m², approximately how much raw sugar could be grown based on the information above?

ACTIVITY

Activity 1B

Answer these questions about the video: "[Sugarcane - Paddock to Plate](#)".

1. Where is sugar made in the plant?
2. What do growers plant to grow sugarcane?
3. What 3 things does it need to grow?
4. What is 1 stool of sugarcane?
5. When the cane is harvested, what is it cut into?



6. What months are harvest time?

7. Why do you need to get harvested cane to the mill as quickly as possible?

8. Where do the billets go once they've been dropped at the receiving station?

9. What is used to fuel the mills boiler furnaces?

10. How are the sugar crystals separated from the molasses?

11. During refining, what is added to remove impurities?



LESSON 2

ACTIVITY

Activity 2A

1. Using paper, make an actual height illustration of a fully grown sugarcane stool.
2. Stick it on your wall and take a full length photo of you standing next to it to illustrate the difference in heights.
3. Include the photos here:



ACTIVITY

Activity 2B

1. Using this website, <https://railwayvideos.club/cane-trains/> complete the following tasks:

- Which train do you like the design of and why?
- Using a map of Queensland, mark where each of the towns and/or mills mentioned on the page are located. Make sure you label them clearly.



LESSON 3

ACTIVITY

Activity 3A

1. Find 1 recipe that you would like to try or have eaten that contains molasses.
2. Write out the recipe here.



ACTIVITY

Activity 3B

Visit a grocery store or complete this task online.

1. Find & photograph/collect images of as many molasses brands as possible.
2. Add them here:



ACTIVITY

Activity 3C

Answer the following questions:

1. What is the history of the word: bagasse?
2. What is the equivalent energy value of 1 ton of dry bagasse when used as fuel?
3. Roughly what is the percentage of cellulose in bagasse?
4. What other products can be made from bagasse?
5. How are bagasse food packaging products made?



LESSON 4

ACTIVITY

Activity 4A

1. Are the following sugar myths true or false? Why?

2. You should start at this link: sugar.org.au

- Natural sweeteners are much healthier for you than sugar.
- Sugar is as addictive as drugs.
- Sugar causes cavities in your teeth
- We need to eliminate sugar from our diet.



ACTIVITY

Activity 4B

1. Using the link below as a guide, collect photos of popular types of sugars from around the world. Try to find sugar varieties that you're not familiar with.
2. <https://www.thekitchn.com/a-complete-visual-guide-to-sugar-ingredient-intelligence-213715>
3. Add the information you find into a table below.
4. Include the sugar's name, photo, where it's popular and a short description.

Name	Photo	Where?	Description



LESSON 5

ACTIVITY

Activity 5A

1. Watch the following videos then answer the following questions.

- <https://www.abc.net.au/gardening/factsheets/mulch/9430092>
- Making sugarcane mulch: <https://youtu.be/am1M0Ou0TO8>

2. Add your answers to your Learning Journal.

- What is sugarcane mulch?
- How is it made?
- How much waste does it save?
- What value to the industry?
- How can we use it around our homes?



ACTIVITY

Activity 5B

1. Watch this video and solve the following problems: [Sugarcane Mulch in Your Garden - How to Use it and Application Rates](#)

2. Based on the video, work out how many bags of sugarcane mulch you would need to buy to cover the following gardens.

- A square garden with one side of 33m
- A circular garden with a radius of 13m
- A rectangular garden with length of 15m and a width of 12m



ACTIVITY

Activity 5C

1. Watch the [following experiment](#).
2. Try the experiment yourself and see if your results match those in the video. Maybe try using different coloured balloons.
3. Take photos of the different stages and record your results below.

4. When you've finished your experiment, make sure you dispose of the liquid in your bottles carefully.

Warning: Do not drink or taste it



ACTIVITY

Activity 5D

1. Using PowerPoint or Slides, reproduce the diagram above using images from magazines, photos or from online. Include a short description of each step of the process.
2. This link will help you:
<https://www.qld.gov.au/transport/safety/road-safety/e10-fuel/environment>
3. Add below.



ACTIVITY

Activity 5E

1. Using the Petrol Spy app (<https://petrolspy.com.au>), choose a city near you and compare the prices of E10, 94 and 98 petrol at ten different petrol stations across all parts of the city.
2. Save the data in a spreadsheet.
3. Graph your resulting data to group the E10 data, 94 data, 98 data together.
4. Which fuel was the cheapest? Buy how much on average?
5. Add your graph below.



ACTIVITY

Activity 5F

1. Read the article “Bush businesses take up call to boost hand sanitiser supplies” about how a local business was using local sugarcane to make sanitiser during the early days of the COVID pandemic.

[PDF](#)

2. Answer the following questions.

- Who are Husk Distillers and where are they based?
- What did they use as a base for the production of liquid sanitiser?
- Why did they decide to produce sanitiser instead of their usual products?
- What fragrance did they use?
- What is the name of the company founder?
- Aside from the production of sanitiser for the community, what benefits were there for the business?



ACTIVITY

Activity 5G

1. Using a real shop or online, list the ingredients to five different brands of hand sanitiser.
2. If your online shop doesn't show the ingredients, do a Google search for the "*brand name label*" and read the image.
3. (<https://shop.coles.com.au/a/national/product/dettol-instant-hand-sanitiser-pump>)
 - How many contain ethyl alcohols?
 - What do the sanitisers have in common?
 - What is different about each?



LESSON 6

ACTIVITY

Activity 6A

1. Watch these two videos and take notes about the farming methods, machines used, and what has changed / improved over time.

- Watch Video 1: <https://youtu.be/KqX4K1E8NOM> - Old footage
- Watch Video 2: <https://youtu.be/clbRdZ9x7Q4> - Cropping technology over time

2. Write a brief report that discusses the differences between early farming machinery and the technology that growers have access to now. You must cover these topics: efficiency, results, time savings, and improved crop growth.



ACTIVITY

Activity 6B

1. Watch the following three videos.

Watch <https://youtu.be/FLh4wWw76kc> - Soil moisture probes

Watch <https://youtu.be/Xtux9OqUmP8> - GPS controlled traffic systems

Watch <https://youtu.be/6qBimHNDiMs> - Drone use

2. In the three videos, we saw some technology that growers are using to manage, improve & grow better cane. Imagine you had a complete robotics and AI lab available to you and all of its scientists.

- Design the ultimate “robot cane grower” that could be used by growers within the next five years. Here is a list of sensors that you would have access to https://en.wikipedia.org/wiki/List_of_sensors
- Draw a technical diagram of your robot explaining all its features.
- List and explain what your robot does, how it does it and how that will help farmers become more efficient & produce a more sustainable and high yield crop. You can present your information as a:
 - detailed report (min 500 words),
 - or a multimedia presentation,
 - or animation

3. Add your information below & on a new page.



ACTIVITY

Extension Activity

If you have access to 3D CAD and 3D printers, create a three-dimensional model of your “robot cane farmer”. Model it using 3D CAD then slice it to send to your 3D printer.



ACTIVITY

End of Unit - Reflection

Congratulations on completing the lessons on horticulture in Australia. Hopefully you are more aware now of the very diverse industry that impacts so many people around Australia and the world, and can see how it is a constantly evolving industry looking to make the processes more efficient to benefit the environment, the people and the economy.

Please place a mark on the scale below to answer the questions.

How much did I know about protected cropping before this unit?

1 _____ 10

How much do I understand now?

1 _____ 10

How important will protected cropping be to food security in the future?

1 _____ 10

Should this be protected cropping or protected horticulture?

1 _____ 10

