Future Food Education Modules

Teacher's Guide Years 5-6

Casey Cornucopia
Local produce as you've never experienced before

BUNJIL PLACE

Postdining

Casey Cornucopia

Educational Modules

Future Foods

Bunjil Place have teamed up with multi-sensory experience designers, Post Dining, to develop four "Future Food" modules based on the themes of Casey Cornucopia, exploring the food systems of the Casey region.

The modules encourage students to consider issues of food security in building a sustainable future. They will be encouraged to incorporate design thinking, scientific analysis and the creative arts to reimagine food systems and what we put on our plates!

The four modules for year levels 1-8 include:

1. Food Waste
2. Water Footprint of foods
3. Future Proteins
4. Local Native Foods.

We hope you enjoy this adventure into our culinary future...

Bon voyage!

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Module One: Food Waste

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Year 5-6 Future Food Education

Module 1:
Food Waste

This module has an accompanying powerpoint

Curriculum Links

Cross Curriculum Priorities Sustainability

Year 5 Content

HASS | Skills | Concluding & Decision Making | AC9HS5S06: propose actions or responses to issues or challenges and use criteria to assess the possible effects

Year 5-6 Content

DESIGN & TECHNOLOGIES | Knowledge and understanding | Technologies context: Food and fibre production; Food specialisations | AC9TDE6K04: explain how the characteristics of foods influence selection and preparation for healthy eating

DESIGN & TECHNOLOGIES | Processes and production skills | Evaluating | AC9TDE6P04: negotiate design criteria including sustainability to evaluate design ideas, processes and solutions

SCIENCE | Science a human endeavour | Use and influence of science | AC9S5H02: investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions

Learning Objectives

To introduce food technology, and focus on how food technology can help reduce food waste

Learning Outcomes

- Explain the technology that goes into making our food, with a particular focus on food waste
- Identify the environmental impacts of food waste
- Find ways to reduce food waste at home/in the classroom

Module 1:
Food Technology

SLIDE 1
1-2 min

Introduce Learning Objectives:
To introduce food technology, and focus on how food technology can help reduce food waste.

Outcomes: I will be able to:

- Explain the technology that goes into making our food, with a particular focus on food waste;
- Identify the environmental impacts of food waste;
- Find ways to reduce food waste at home/in the classroom

SLIDE 2-4
8-10 min

Introduce Food Technology:
"Technology designed to increase the effectiveness of food production, harvest, preparation, and waste disposal"

ACTIVITY: Think about your favourite food

- Ask students to close their eyes and think about their favourite food. LEADING QUESTIONS: Was this around 100 years ago? Do they think it will be around 100 years from now? What technologies might have gone into making this food?

Whole class discussion:

- Ask students to discuss favourite foods with the class, picking out a few different types of technologies that went into creating them;
- Give examples of what types of technology go into making our food: Farming technology, Packaging technology, Storage technology, Cooking technology;
- Think about how some of this technology we might take for granted now, and what technology we might imagine into the future...

Module 1:
Food Technology

SLIDE 5-8
5 min

Deep Dive: Food Waste

There are many different types of food technology, but today we are going to focus on reducing waste.

Environmental impact of food waste:

- Australia wastes 7.3 million tonnes of food each year;
- This is the equivalent of 13000 Olympic sized swimming pools, OR one in five shopping bags ending up in the bin;
- This food is not all produced from our homes however, but is a result of waste from farming, food industry and household waste.

Why should we think about reducing food waste?

- If food scraps end up in landfill they are trapped without air among general waste - this can lead to the production of greenhouse gases. This affects climate change.

SLIDE 9-10
2 min

How can food technology help us to reduce food waste?

- One example designed for chefs in large kitchens, like restaurants, or hospital kitchens, is a technology called Winnow;
- It is a computer than can weigh food going into the bin, and use a camera to identify what kind of food it is;
- It can tally which foods are being wasted and how much it costs;
- Chefs can then order less of those foods, to save waste and money.

Module 1:
Food Technology

SLIDE 11
2 min

Introduce activity: COOK, COMPOST, or, CREATE.
Let's start with a game... We're going to go through a few slides and for each one I'm going to call-out cook, create or compost and you can put your hands up if you think you know what the answer is.

SLIDE 12-14
5 min

Q: BANANA PEEL A: COOK
Sometimes we throw away food that we can actually eat!

Edible scraps that could be used to make another meal or snack include:

- Green leaves of carrots and beetroot leaves & stems
- Potato peel, carrot peel, banana peel, pumpkin skin
- Pumpkin seeds
- Stems of broccoli and cauliflower
- Bones of chicken

Q: What could you make from these ingredients?

- Carrot leaf pesto
- Whole of beetroot dip, or wash and add leaves to salads
- Banana peel curry or banana peel 'bacon'
- Soups or stocks
- Crispy Pumpkin skin chips

Eating skins of fruits and vegetables has the benefit of being very high in fibre - for good gut health!

Module 1:
Food Technology

SLIDE 15-17
5 min

Q: EGG SHELLS A: COMPOST

- Composting is a natural process where organic material decays with help from microorganisms such as bacteria, worms and fungi;
- These micro-organisms in the soil break down the the food scraps and turns them into a form of nutrients that plants can absorb through their roots.

QUESTION:
Did you know your kitchen and garden waste bin gets composted by the Casey Council?
Additional info on food recycling in Casey Council:
https://www.casey.vic.gov.au/rubbish-recycling-food-waste

SLIDE 18-19
5 min

Q: CELERY ENDS A: CREATE

Many plants can be regrown at home from food scraps such as a seed or a top.

- Has anyone tried re-growing food from scraps? If so, what did you grow?

Vegetables you could re-grow from scraps:

- Spring onions re-grow quickly by putting the white bottoms with roots in a glass of water;
- Root vegetables like carrots and beetroot tops (the part you cut off where the leaves sprout from) will re-sprout new edible green if placed semi-submerged in water;
- Cos lettuce, bok choy, celery, leeks all re-grow if the bottom is placed in water on a windowsill;
- Avocado seeds can also be sprouted from a glass of water - but it can take 10-15 years until you get a tree large enough to produce more avocados!

Module 1:
Food Technology

SLIDE 20
15 min

<u>Reducing food waste at home</u>

In table groups, find 3 ways you can reduce waste in your own homes. Write these on your worksheets (attached below).

BONUS

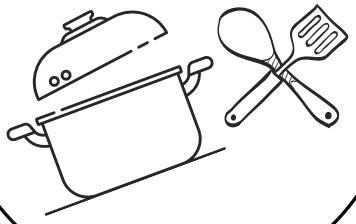
<u>Grow celery on windowsill in classroom</u>

Place celery bottoms in a recycled glass jar, filled with water - leave on the windowsill in the sun and watch the tops re-grow! Toothpicks may help to keep the celery in place. This can also be done with spring onions, root vegetables and herbs!

Group names:

How can you reduce food waste at home?

Cook



Some food scraps I could cook with are:

_____

_____

_____

_____

Create

Some food scraps I could re-grow to create more food are:

_____

_____

_____

_____

Compost

Some food scraps I could compost at home or in the council's Kitchen and Garden bin are:

_____

_____

_____

_____

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Module 2: Water Footprint

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Year 5-6 Future Food Education

Module 2:
Water Footprint

This module has an accompanying powerpoint

Curriculum Links

Cross Curriculum Priorities Sustainability

Year 5 Content

SCIENCE | Science understanding | Biological sciences | AC9S5U01: examine how particular structural features and behaviours of living things enable their survival in specific habitats

Year 5-6 Content

SCIENCE | Science a human endeavour | Use and influence of science | AC9S5H02: investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions

DESIGN & TECHNOLOGIES | Knowledge and understanding | Technologies context: Food and fibre production; Food specialisations | AC9TDE6K04: explain how the characteristics of foods influence selection and preparation for healthy eating

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Learning Objectives

To recognise that different foods have varying water footprints

Learning Outcomes

- Define water footprint
- List foods with a low water footprint
- Describe what factors affect a food's water footprint

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Module 2:
Water Footprint

SLIDE 1
2 min

Introduce Learning Objectives:
To recognise that different foods have varying water footprints

Outcomes: I will be able to:

- Define water footprint
- List foods with a low water footprint
- Describe what factors affect a food's water footprint

SLIDE 2-4
5-8 min

Q: Has anyone heard of water footprint before?
"The water footprint of a product is the volume of freshwater used to produce the product measured over the full supply chain."

DISCUSS: Who can think of where water might be needed in order to produce food?

- When we talk about the water footprint of a food, we think about the amount of water that it takes to grow, farm and process the food;
- e.g. water for plants to grow, water for animals to drink, water to wash machinery, water to wash abattoir, water to wash produce.

Deep Dive:
Water footprint is made up of green, blue and grey water.

- Green water: rain water;
- Blue water: surface and groundwater reservoirs (irrigation water);
- Grey water: fresh water used to dilute any pollution created during the production process.

Module 2:
Water Footprint

SLIDE 5
2 min

Environmental Impact:

Food production uses a lot of water:

- Around half of water used for food production around the world is used on beef cattle and dairy cattle;
- Most of the total volume of water (98%) refers to the water footprint of the feed for the animals.

Reference: https://waterfootprint.org/en/water-footprint/product-water-footprint/water-footprint-crop-and-animal-products/

SLIDE 6-8
15 min

Activity: Which food product has the highest footprint?

- In table groups ask students to rank Beef, Chicken, Kangaroo and Chickpeas in order of Highest - Lowest water footprint.
- Choose a table to share their answers and ask what went into their reasoning.

Reveal answers & ask students to write CORRECT answers on their worksheets:

1. Beef (15400L of water per 1 kilo of beef)
2. Chicken (4300L per 1 kilo)
3. Kangaroo (~3000L per 1 kilo) (estimates as figures haven't been measured)
4. Chickpea (1300L per 1 kilo)

Module 2:
Water Footprint

SLIDE 8-10
5 min

Explore high water footprint:

- Farmed animals require farmed feed AND drinking water to live;
- 98% of water footprint for farmed animals comes from the water footprint of their feed!
- Cows require more food and more water because they are significantly larger than chickens.

SLIDE 11-14
5 min

What makes a LOW water footprint?
Overall, plants need less water than animals as they get most of their energy from the sun rather than other plants.

Other foods with low water footprint

- Fruits and vegetables
- Grains and cereals like oats, wheat for bread
- Legumes like baked beans, chickpeas, lentils
- Eggs

Exception: nuts have a high water footprint as these trees and crops require a lot of water

Why do Kangaroos have a lower water footprint than other large animals and other red meats?

- Kangaroos rely on native scrub, hence, farmers do not have to grow feed for them. They also typically eat less than livestock;
- They are adapted to a dry climate - they don't need a lot of water as their intestines reabsorb water passing through their body. Other livestock do not do this;
- Can go months without drinking any water at all.

Ask students to complete their worksheets

Name:

Eating for the planet: Choosing a low water footprint

Number these protein foods from 1 (lowest water footprint) to 4 (highest water footprint)

Kangaroo

Chicken

Chickpeas/ lentils

Beef

Draw or name 6 other foods with a low water footprint

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Module 3: Future Proteins

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Y5-6 Future Food Education Modules

Module 3:
Future Proteins

This module has an accompanying powerpoint

Curriculum Links

Cross Curriculum Priorities Sustainability

Year 5 Content

SCIENCE | Science understanding | Biological sciences | AC9S5U01: examine how particular structural features and behaviours of living things enable their survival in specific habitats

Year 6 Content

SCIENCE | Science understanding | Biological sciences | AC9S6U01: investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions

Year 5-6 Content

DESIGN & TECHNOLOGIES | Knowledge and understanding | Technologies context: Food and fibre production; Food specialisations | AC9TDE6K03: explain how and why food and fibre are produced in managed environments

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Learning Objectives

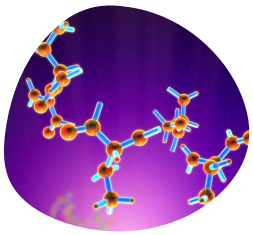
To identify alternative, sustainable proteins (edible insects)

Learning Outcomes

- Know what foods are high in protein
- Know why protein is important for health
- Identify and name some edible insects

Module 3:
Future Proteins

SLIDE 1
2 min



Introduce Learning Objectives:
To identify alternative, sustainable proteins (edible insects)

Outcomes: I will be able to:

- Know what foods are high in protein
- Know why protein is important for health
- Identify and name some edible insects

SLIDE 2-7
15 min

What is protein? Why is protein important?
"Protein is an essential nutrient. It is commonly found in animal foods, but is also found in plants such as nuts and legumes."

ACTIVITY: Think about your favourite protein rich food...

- Ask students to put their hands up and name some foods in the protein food group.
- You can use foods from previous module as an example (kangaroo, chickpea, chicken, beef)

Ask students if they know why protein is important?

- For growth!
- Build and keep strong muscles;
- To help our body produce enzymes and hormones;
- For structure: bones, skin, hair, nails.

Module 3:
Future Proteins

SLIDE 8-11
5-7 min

ACTIVITY: "Who Am I" game

Explain that you will read out a list of "Who am I" questions. Students asked to raise their hand and guess what the alternative protein source might be.

Who Am I #1: Crickets

1. I am an excellent source of protein that does not need to be refrigerated;
2. I can be eaten whole or ground up into a powder;
3. I am small and usually brown in colour;
4. My exoskeleton is rich in a fibre and calcium;
5. I chirp loudly in the evening;
6. I feed on grasses and plants;
7. I'm a cricket!

More about edible crickets:

- Crickets are an excellent source of protein - ground cricket powders contain around 65% protein;
- Once roasted they keep for about 6 months at room temperature before going off;
- Whether eaten whole or ground, the exoskeleton is consumed, which is why crickets are an excellent source of calcium;
- The exoskeleton is also rich in a fibre which helps to feed the healthy bacteria in your gut.

Module 3:
Future Proteins

SLIDE 12-15
10 min

Who Am I #2: Mealworms

1. I contain 50-70% protein;
2. I am delicious and crunchy when roasted;
3. I am very small, and I have a long brown body;
4. If you don't eat me, I will turn into a beetle;
5. You might have seen me as feed for reptiles, chickens or as fishing bait, but humans can eat me too!
6. I live on the ground and like dark places;
7. I am a mealworm!

More about edible mealworms:

- Mealworms are the larval form of the darkling beetle, and are commonly used as feed for reptiles, chickens or as fishing bait. But are we missing out?!
- They are really high in protein, between 50-70% when roasted. In comparison, chicken, beef and pork contain 20-30% protein. Mealworms also contain small amounts of most other minerals and vitamins necessary for humans.
- As with all insects, mealworm's outer skin is an important prebiotic fibre for gut health - something you won't find in any animal meats. Prebiotic foods are not absorbed into our gut, but instead provide a food source for the healthy bacteria living in our gut.

Mealworms as Space food?

Mealworms are very suitable for "closed-loop farming" systems - which is something we need to consider for humans to live in space! They are very efficient at turning plant feed into protein; can eat many different waste sources that humans cannot digest; get all the moisture they need from plant foods; AND the small amount of waste they excrete (called frass) is an excellent fertiliser for plants and can be recycled back into the closed-loop system!

Module 3:
Future Proteins

SLIDE 16
8 min

<u>Why eat bugs?</u>
Around the world people have been eating insects for centuries. By introducing insects as a sustainable protein source in Australia, we're not ahead of the times, we're actually behind!

Insects require far less land, water and feed than livestock to produce the same amount of food. Crickets for example, are 20 times more efficient at converting food to protein than cows. Insects can be raised almost anywhere, require very little space, and can even be raised at home and fed table scraps and weeds from the garden. They also reproduce within weeks - much faster than animals. They are also delicious!

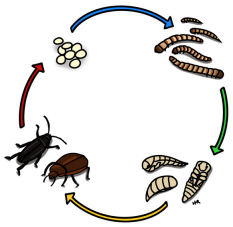
As our population increases and demand for protein rises, bugs are one way we can meet our protein needs in a sustainable way.

SLIDE 17
1 min

<u>WARNING - DO NOT GO AND EAT BUGS YOU FIND IN THE GARDEN. THESE ARE NOT SAFE TO EAT. ONLY EAT BUGS IF THEY HAVE BEEN COOKED BY AN ADULT AND ARE BEING SERVED AS FOOD.</u>

Module 3:
Future Proteins

SLIDE 18 BONUS ACTIVITIES



Grow your own mealworm farm:

- You will need some layered containers, at least two with a mesh bottom;
- Start with meal worms sourced from a pet shop in one layer;
- Once the mealworms progress through each stage of the cycle you will end up with a layer for worms, pupae and beetles;
- Keep in a dark environment and watch the cycle of life!

For more info visit: https://bugible.com/2018/03/20/how-to-farm-your-own-mealworms/

Offer your students edible insect tastings:
Purchase some snack crickets or mealworms from Circle Harvest: https://circleharvest.com.au/

Name:

Future proteins

Name two reasons why protein is essential for our health?

1. _____

2. _____

2. List 4 protein foods in each box that come from:

Animals	Plants

3. Two future proteins are:

_____ + _____

4. How many countries eat insects regularly? _____

5. How many edible insect species are there? _____

6. Farming insects is good for the planet because

_____

_____

_____

WARNING: DO NOT eat bugs you find yourself

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Module 4: Native Foods

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Y5-6 Future Food Education Modules

Module 4:
Native Foods

Click on icon for Powerpoint link

Curriculum Links

Cross Curriculum Priorities Aboriginal and Torres Strait Islander Histories and Cultures

Year 5 Content

HASS | Knowledge & Understanding | History | AC9HS5K02: the impact of the development of British colonies in Australia on the lives of First Nations Australians, the colonists and convicts, and on the natural environment

HASS | Skills | Interpreting, analysing and evaluating | AC9HS5S03: evaluate information and data in a range of formats to identify and describe patterns and trends, or to infer relationships

Year 6 Content

SCIENCE | Science understanding | Biological sciences | AC9S6U01: investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions

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Learning Objectives

To identify the Country we are on, and the foods native to the local environment

Learning Outcomes

- Identify Indigenous place names
- Understand the local environment
- Name and identify local native flora and fauna

Module 4:
Native Foods

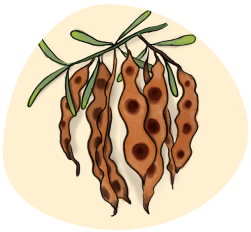
SLIDE 1
2 min

Introduce Learning Objectives:
To identify the Country we are on, and the foods native to the local environment.

Outcomes: I will be able to:

- Identify Indigenous place names;
- Understand the local environment;
- Name and identify local native flora and fauna.

SLIDE 2-3
10 min



Q: What do we mean by native food?
Native foods are flora (plants) and fauna (animals) that grow naturally in Australia.

Questions:

- Has anyone tried any native foods?
- Do you remember where you tried them?
- Does anyone know the names of any native foods?

Examples
Top images: lemon myrtle, wattleseed, bush lime
Bottom images: saltbush, quandong, bush tomato

Module 4:
Native Foods

SLIDE 4
10 min

Why are native foods not more common?

- For 60,000 years before European settlement the Casey district was the the land of the Bunurong and Wurundjeri people;
- When European people moved to Australia, they started clearing and farming the land in their own way, and forced Aboriginal people to stop speaking their language and culture;
- A lot of the knowledge about native foods was lost.
- Today, very little of the original landscape is left due to farming, building cities and suburbs - so there aren't many places for native foods to grow;
- The Bunurong people still play an active role in the protection, preservation and awareness of their culture, heritage and environment through the Bunurong Land Council Aboriginal Corporation.

Reference:
https://www.casey.vic.gov.au/caseys-history#:~:text=Aboriginal%20settlement,for%20the%20Aboriginal%20Protectorate%20Station.

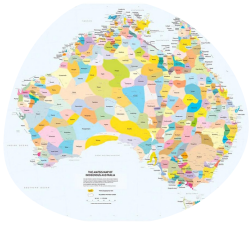
SLIDE 5-8
15 min

ACTIVITY:

1. Hand out a map outline of Australia (handout below);
2. Ask students to draw in and name all the states and territories using the screen as a guide;
3. Add in the traditional Countries of the Casey region.

Module 4:
Native Foods

SLIDE 5-8
15 min



ACTIVITY CONT:

Show the original Aboriginal map of Australia:

- Each group had a different language and knew in depth about their own local climate and landscape;
- They passed knowledge down generation to generation and looked after their Country;
- By caring for the plants and animals, there was always enough food to go around. Where we live in Casey is the traditional land of the Bunurong/Boon Wurrung and Wurundjeri people.

4. Write the traditional Aboriginal Countries of the Casey region on the worksheet.

SLIDE 9
5 min

What grows on Bunurong/Boon Wurrung & Wurundjeri Country?

- Water: we are near the beaches - seafood such as eels & mussels were found here;
- Plants: inland, plants such as wild yams, and plant roots, native spinach grew;
- Land animals: birds eggs, kangaroos and possums.

BONUS ACTIVITY

Purchase some native food samples and offer the students to try: https://melbournebushfood.com.au/

Module 4:
Native Foods

SLIDE 10
10 min

ACTIVITY: Draw a chocolate lily onto your map

"Chocolate Lily (aka. Nodding Chocolate Lily, Dichopogon strictus) gets its name from its chocolate scented flowers. Its bush food value, however, comes mainly from its juicy tubers, which can be eaten raw or cooked. This species is found in grassland, woodland and forest regions of New South Wales, South Australia, Queensland, Western Australia, Tasmania and Victoria."
https://tuckerbush.com.au/chocolate-lily-arthropodium-strictum/

Bonus: Why draw plants?

Through looking closer at plants and taking the time to get to know them better, we also get to know the world around us that much better.

What country do you live on?

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These Future Food Education modules have been designed for Casey Cornucopia by Post Dining.

Postdining

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We design multi-sensory experiences that reimagine the relationship between people, food and the environment. Our designs take the form of immersive performances, exhibitions, workshops, events and festival programming. For Arts Industry, Corporate and Educational groups.

Learn more about Post Dining here!