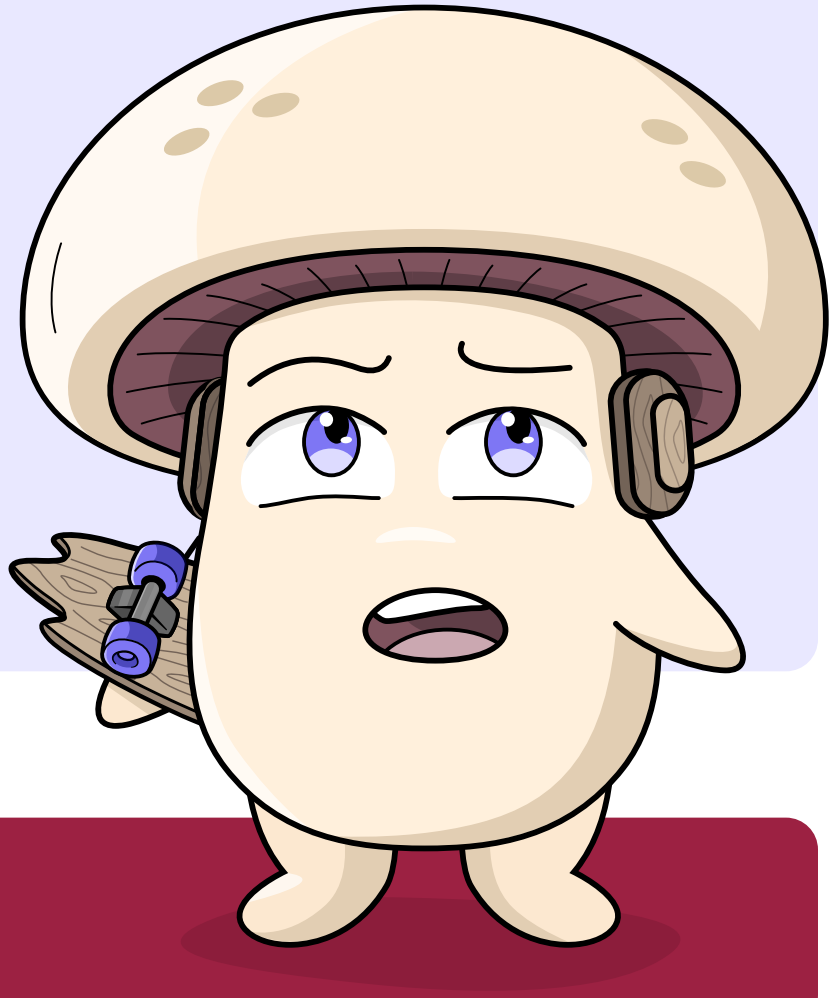
Mini Mushroom Growers

A fungi program for schools

Teacher Guide

Year 3 - 4

Use this Year 3 - 4 teacher guide in conjunction with the supporting resource pack to seamlessly explore and access all lesson materials.



Proudly brought to you by:

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Australian Mushroom Growers' Assoc.

Hort Innovation MUSHROOM FUND

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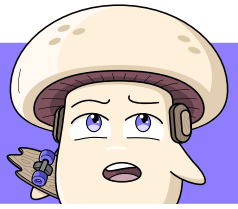


Overview

Welcome to the Mini Mushroom Growers program, brought to you by the Australian Mushroom Growers' Association. This Australian Curriculum Version 9.0 aligned resource has been designed for students from Foundation to Year 6 to explore the biological nature of fungi, understand the nutritional value of mushrooms, and gain hands-on experience in growing and cooking healthy food. The program centres on *Agaricus bisporus* mushrooms, being the primary mushrooms consumed by Australians: white button, swiss brown, portobello, flat and cup mushrooms.

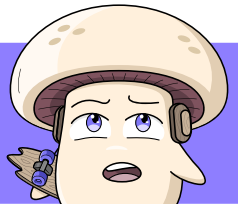
Program resources for each stage, Foundation - Year 2, Year 3 -4, Year 5 -6 include: a teacher guide and corresponding student-facing slide deck of supporting resources. All lesson materials and links will be contained in the easy to navigate, sequential powerpoint which can seamlessly be used on interactive whiteboards or class devices. A student digital interactive has been designed to supplement the program and reinforce student's learning.

Lesson Structure

Each teacher guide consists of five comprehensive lessons to cater to varying student abilities, offering hands-on activities and engaging interactive resources. Lesson content can be tailored to meet the specific needs of students. Each of the lessons within the Mini Mushroom Growers program has been designed around the areas of - mushroom: *classification, nutrition, and consumption*. Whilst it is recommended to complete all five lessons in sequence, each can be taught in isolation.

The student-facing resource packs include lesson slides to assist with lesson preparation, and content is provided in a sequential, easy-to-follow format. Instructions on how to use the supporting powerpoint as a whole class, in small groups or with individual devices are included in each teacher guide. **Please download and view in powerpoint**.

The student digital interactive, based around the Mini Mushroom Growers program key messages will supplement the program's content and resources allowing students to learn, check their understanding and apply their learning. It is recommended that students complete the game after the lesson.



Summary of key messages

The content of the Mini Mushroom Growers program has been based on current research and Australian mushroom industry-recommended findings:

Mushroom classification

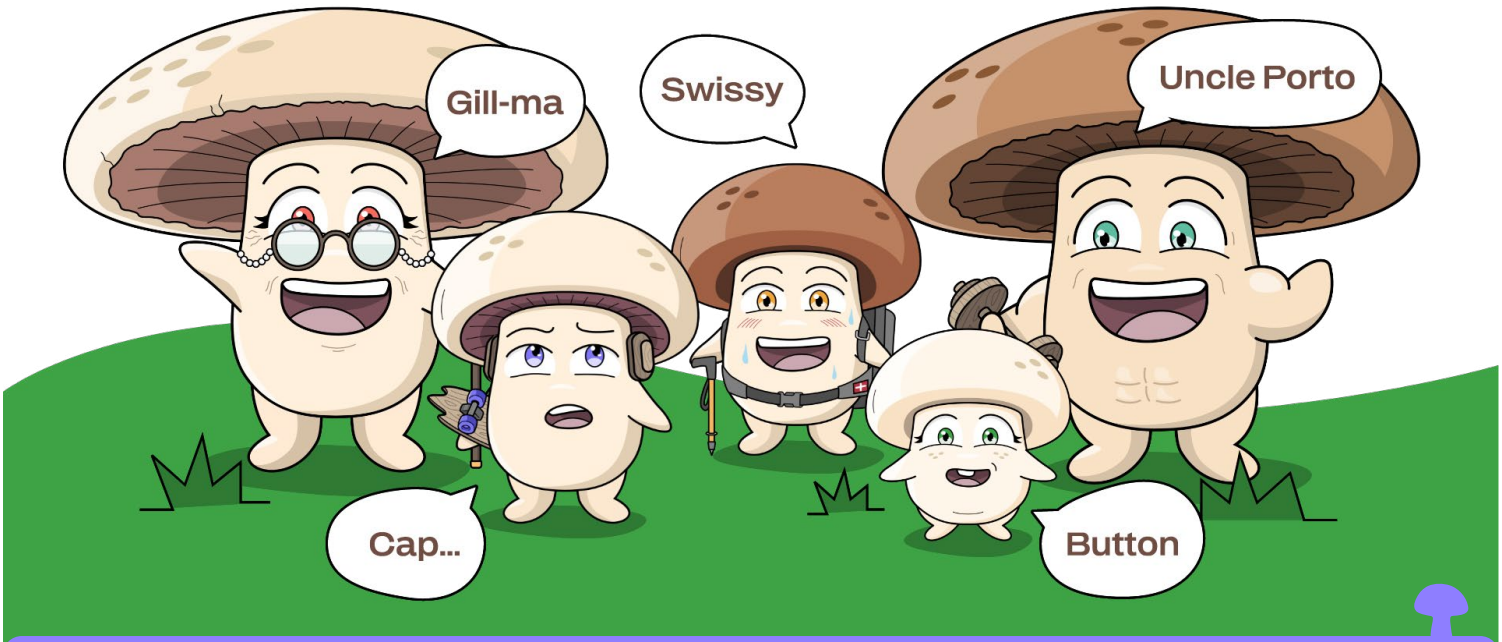
Mushrooms are fungi and not a vegetable, and grow in a unique way.

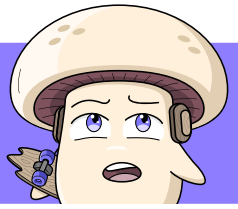
Mushrooms are a superfood

Fungi have a unique combination of nutrients and are vital to our diets.

Mushroom consumption

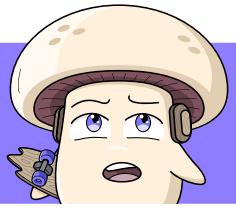
Students grow, harvest and cook their own mushrooms.





Level	Year 3
Learning Area	Science
Strand	Content Descriptors
Science understanding: Biological sciences	AC9S3U01 compare characteristics of living and non-living things and examine the differences between the life cycles of plants and animals
Learning Area	Health and Physical Education
Personal, social and community health: Making healthy and safe choices	AC9HP4P09 interpret the nature and intention of health information and messages, and reflect on how they influence personal decisions and behaviours

Level	Year 4
Learning Area	Science
Strand	Content Descriptors
Science understanding: Biological sciences	AC9S4U01 explain the roles and interactions of consumers, producers and decomposers within a habitat and how food chains represent feeding relationships
Learning Area	Health and Physical Education
Personal, social and community health: Making healthy and safe choices	AAC9HP4P10 investigate and apply behaviours that contribute to their own and others' health, safety, relationships and wellbeing



Level	Year 3 and 4
Learning Area	**Design and technologies**
Knowledge and understanding: Technologies context Food and fibre production; Food specialisations	AC9TDE4K03 Describe the ways of producing food and fibre.
Knowledge and understanding: Technologies context Food and fibre production; Food specialisations	AC9TDE4K04 Describe the ways food can be selected and prepared for healthy eating.

Cross-Curriculum Links

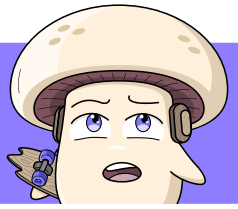
Sustainability

Systems SS1:
All life forms, including human life, are connected through Earth's systems (geosphere, biosphere, hydrosphere and atmosphere) on which they depend for their wellbeing and survival.

Systems SS2:
Sustainable patterns of living require the responsible use of resources, maintenance of clean air, water and soils, and preservation or restoration of healthy environments.

General capabilities

- Critical and Creative Thinking
- Personal and Social Capability



Lesson information

Assessment options

Choose from the following options: as needed.

Assessment for learning

- Monitor understanding in class discussions and questioning.

Assessment as learning

- Teacher observations and teacher feedback through tracking sheets.

Assessment of learning

- Collect work samples, assessment tasks, self and peer assessment
- Use the student digital interactive to assess students' learning.

Differentiation

Differentiation will be embedded in each lesson to ensure:

- **Support** for students
- **Structural changes** such as scaffolding to assist students
- **Extension** to encourage students to build upon their learning.

Connecting home and school

- Communicate with families that their child is participating in the Mini Mushroom Growers program.
- If applicable, add Mini Mushroom Grower themed tasks to class homework activities.
- Classroom lessons will be connected to real life experiences through key messages, vocabulary, conversation starters and fun activities.
- Share Recipes - Australian Mushroom Growers. Encourage families to visit the website for more recipes that you can cook with the family at home.

Lesson overview

Lesson 1: Mushrooms are fun-guys

Lesson Overview

In this lesson, students will learn that mushrooms (fungi) are different to plants and vegetables and belong to a separate biological kingdom.

Learning Intention

In this lesson, we will learn about different kinds of *Agaricus bisporus*, their parts and the lifecycle of a mushroom. We will also investigate how mushrooms grow in the wild and the dangers of foraging.

Success Criteria (suggested)

I will know I am successful when I can:

- Describe what a mushroom is and how it is different from a plant.
- Identify some of the main parts of a mushroom (like the cap, stem, and gills).
- Explain that mushrooms have a lifecycle, just like other living things.
- Understand that wild mushrooms can be dangerous and that I should only eat mushrooms bought from a shop.

Guiding Questions

- What do you know about mushrooms?
- Are mushrooms plants?
- How are mushrooms different from plants?
- What do plants need to grow?

Vocabulary

- Cap
- Ecosystem
- Forage
- Foraying
- Fungi
- Gills
- Hyphae
- Mushroom
- Mycelium
- Pinning
- Spawn
- Spores
- Stem
- Veil

Differentiation

Support:

- Provide students with pre-labelled diagrams or flashcards of mushroom parts (cap, stem, gills) and the stages of the mushroom lifecycle.
- Pair students up with a supportive 'buddy' during activities.

Challenge:

- Dangers of Foraging – Foray, don't Forage! Students create posters to educate peers on the dangers of foraging.
- Using different mushrooms e.g. buttons, cups and flats, students cut them open to view the gills and see if they make spores. Use flat mushrooms to make spore prints.

Resources

To complete all activities in this lesson, you will need:

- Year 3 -4 Supporting Resource Pack
- Student pre survey
- Videos:
  - How Plants Grow for Kids | Learn about photosynthesis and what plants need to grow strong
  - Fungi: Why Mushrooms Are Awesome | Biology for Kids

Lesson 1: Content

Introduction

Student pre survey:

As a class, complete the AMGA student pre survey.

Class KWL - [What I know, What I want to know, what I learnt].

- Show students a real mushroom purchased from the supermarket or an image of a mushroom. Ask: 'What do you notice about this? What does it feel like? Where might it grow?'
- Ask the guiding question: What do you know about mushrooms? Record student responses on the K [What I know] section of the KWL chart.
- View the facts and the images of the *Agaricus bisporus* mushrooms - button, cup, flat, swiss, portobello. On the W [What I want to know] section of the KWL chart, record what students know about each of the mushrooms.
- At the end of the unit students will complete the L 'What I learnt' component.

Body

What do plants need to grow?

- Think-Pair-Share. Ask students: What do they need to grow? Record students' shared responses.
- Students watch the video and complete the video quiz How Plants Grow for Kids | Learn about photosynthesis and what plants need to grow strong
- Following the video, as a class list and discuss the core things plants need to grow and an interesting fact they have learnt.

Are mushrooms plants?

- As a class use an image of a plant and a mushroom to investigate and complete the comparison chart.
- Option: you may choose to use a real mushroom and a plant cutting to complete the activity.

Mushrooms' role in the ecosystem.

- As a class watch the video Fungi: Why Mushrooms Are Awesome | Biology for Kids and discuss how mushrooms are different

from plants. Compare the facts to the responses that were recorded in the class comparison chart.
- Share the fascinating fungi facts.

Lifecycle of a mushroom

- Use the information in the supporting resource pack to review the parts of a mushroom and the stages in the mushroom lifecycle.
- Students create an infographic on the stages in the mushroom lifecycle.

Conclusion

Don't touch! Don't eat!

Review the key messages around the dangers of foraging for mushrooms.

- **Not all mushrooms are safe to eat:** Explain that some mushrooms found in the wild can make you very, very sick, and some can even be deadly.
- **Only eat mushrooms from the shop:** Emphasise that the only mushrooms that are safe to eat are the ones bought from a shop.
- **Never touch or pick wild mushrooms:** Teach students to never touch or pick any mushrooms they see growing outside, even in their own garden. Explain that some dangerous mushrooms can cause problems just by being touched.
- **If you see a wild mushroom, tell a grown-up:** Encourage students to tell an adult if they see any mushrooms growing in the wild, so the adult can make sure everyone stays safe.
- **Mushrooms are special living things:** You can also briefly mention that while some wild mushrooms are dangerous for humans to eat, they are still important parts of nature for other animals and plants. Mushrooms that ARE safe to eat, are very healthy and delicious.
- After discussing the safety rules, have students create a short, catchy slogan or a simple traffic light system (Red: Don't touch/ eat wild mushrooms; Yellow: Always tell a grown-up if you see one; Green: Only eat mushrooms from the shop.)

Foray not forage

- As a class brainstorm ways to enjoy 'foraying' not foraging e.g. hunt for mushrooms, take a photo never touch.
- Outdoor option: Take a walk around the school, or visit a forest to 'foray for fungi'. Look for mushrooms growing on trees, leaf litter, wood chips, or in the grass. Students take photos of what they find.
- Indoor option: use images of diverse mushrooms.
- Students record their findings including an image of the mushroom, where the mushroom was growing and features.

Option: Spore prints activity

- Demonstrate or complete the activity with the class. Sit the cap of a cup or flat mushroom onto paper or aluminium foil overnight. Use a magnifying glass or microscope if available to view the dropped spores.

Lesson 2: Let's visit a mushroom farm

Lesson Overview

In this lesson, students will learn how mushrooms grow in the wild versus how mushrooms grow on a farm.

Learning Intention

In this lesson, we will learn the six steps to mushroom farming, and how mushroom growers mimic mother nature. We will visit a mushroom farm virtually or in person.

Success Criteria (suggested)

I will know I am successful when I can:

- Identify and sequence the main steps involved in mushroom farming.
- Name and give examples of two important things mushroom farmers control in their growing rooms.

Guiding Questions

- How are mushrooms commercially farmed?
- What are the steps a mushroom farmer takes to grow mushrooms?
- Why do mushroom farmers need to monitor the environment in the growing rooms?

Vocabulary

- Carbon dioxide
- Casing
- Evaporation
- Harvest
- Humidity
- Moist
- Packaged
- Production
- Substrate
- Transported
- Ventilation

Differentiation

Visit a mushroom farm. Contact the AMGA to discover if a local mushroom farm will host a farm tour. [link]

Support:

- Encourage students to create their own mini-glossary of new vocabulary from the lesson, drawing a picture for each word.
- Provide sentence starters and a template for students to use to complete the mushroom production activity.

Challenge:

- Students watch the videos The Mushroom Master and Lost Creek Mushroom Farm investigate different ways mushrooms can be grown.
- Students can write or draw a detailed story about a mushroom's journey from being a spore on a farm to ending up on someone's plate, incorporating all the vocabulary and steps learned.

Resources

To complete all activities in this lesson, you will need:

- Year 3 -4 -Supporting Resource Pack
- Videos:
  - SA Mushrooms
  - Farm to Plate: Educating Food Industry Professionals about Australian Mushrooms
  - Mushrooms - Making Mushroom Compost
  - Mushroom growing and picking
  - Mushrooms - Packhouse & Distribution
  - The Mushroom Master
  - Lost Creek Mushroom Farm

Lesson 2: Content

Introduction

- Ask students to brainstorm what they already know about how mushrooms are grown on farms. Record their ideas on a class chart.
- Introduce students to the 'Steps to mushroom farming' using the information in the supporting resource pack.
- As students watch the video SA Mushrooms have them identify the key steps to mushroom farming.

Body

Let's visit a mushroom farm

- Students watch the video or visit a mushroom farm virtually or in person. Farm to Plate: Educating Food Industry Professionals about Australian Mushrooms.
- Recap the visit or video by asking students to recall what they saw at the mushroom farm and unpack any new vocabulary.

- Have students recall what mushrooms need to grow in the wild.
- Discuss how farmers control things like airflow, temperature, humidity, and evaporation in the growing rooms to mimic those natural conditions.
- Ask: Why is it important for farmers to monitor these things?
- Identify and discuss the different growing systems used on mushroom farms. Tray farm - where mushrooms are grown in large, rectangular timber trays filled with substrate. Shelf Farm - where mushrooms are grown on long, permanent aluminium shelves that stretch across a room.

Conclusion

- Mushroom production. Divide the class into groups. Each group watches one of the videos and uses the information from it to create an infographic flowchart to show the steps in one of the three stages to mushroom production. Groups share their information with the class.
    1. Making Mushroom compost (substrate) Mushrooms - Making Mushroom Compost (remind students that mushroom compost is called substrate).
    2. Mushroom growing and picking Mushroom growing and picking
    3. Mushroom packing and transporting Mushrooms - Packhouse & Distribution

Lesson 3: There's mush-room for sustainability

Lesson Overview

In this lesson, students will learn about sustainability in mushroom production, and why 'Fungi are a Future Food'.

Learning Intention

In this lesson, we will explain the sustainable practices used in mushroom production and explore why fungi are considered a 'future food'.

Success Criteria (suggested)

I will know I am successful when I can:

- Explain how sustainable practices are used in mushroom production.
- Identify why mushrooms are considered a 'future food'.
- Explain why it is important to eat local food and how this relates to sustainability.
- Suggest ways to make more sustainable food choices for the future.

Guiding Questions

- Why is it important to eat food that is grown locally?
- *Agaricus bisporus* mushrooms are sourced and grown all year round in Australia, does this make them sustainable?
- How can we make more sustainable food choices for the future?

Vocabulary

- Dependant
- Environment
- Food miles
- Future food
- Nutrients
- Sustainability

Differentiation

Support:

- Pair students up with a supportive 'buddy' during activities.
- Provide sentence starters or a word bank during the brainstorming session about making more sustainable food choices.

Challenge:

- Students design their own sustainable mushroom farm, drawing and labeling its features.
- Food Miles Map: Using a world map, students pick several common foods and try to trace their journey from farm to plate, discussing the food miles involved

Resources

To complete all activities in this lesson, you will need:

- Year 3 -4 Supporting Resource Pack
- Videos:
  - How did that get in my Lunchbox? By: Chris Butterworth

- Right This Very Minute | Book Nook Story Time (Read Aloud)

Lesson 3: Content

Introduction

- Farm to plate. Choose one of the following online stories to learn about the farm to plate journey of a food How did that get in my Lunchbox? By: Chris Butterworth, Right This Very Minute | Book Nook Story Time
- Use a Venn diagram to compare the farm to plate journey of mushrooms versus another farm product from one of the stories.

Body

- As a class, complete the quick quiz to discover where different fruits and vegetables originate.

Food miles and sustainability.

  - Ask the guiding question: Why is it important to eat food that is grown locally?
  - Explore the link between eating and making the right choices for food – considering food miles and sustainability.

- Think-Pair-Share: Ask the guiding question: *Agaricus bisporus* mushrooms are sourced and grown all year round in Australia, does this make them sustainable?
- Review the key points around why mushrooms are a sustainable food source and a future food.
- Students complete the sustainable mushroom farming activity drawing from their knowledge about sustainability and mushroom farming.

Conclusion

- As a class brainstorm: How can we make more sustainable food choices for the future? Record student responses.
- Students create posters to promote how they can make more sustainable food choices for the future.

Lesson 4: Mushrooms are a superfood

Lesson Overview

In this lesson, students will learn that fungi have a unique combination of nutrients that are different to fruits and vegetables.

Learning Intention

In this lesson, we will learn what vitamins and minerals are, and why they are important for our health. We will explore the nutritional properties and health benefits of mushrooms and learn that mushrooms can provide our body with nutrients that other foods can't – therefore they are a superfood!

Success Criteria (suggested)

I will know I am successful when I can:

- Explain why vitamins and minerals are important for our bodies.
- Describe some key nutritional benefits of mushrooms (A, B, C, D).
- Compare the health benefits of mushrooms to other foods.

Guiding Questions

- Why are vitamins and minerals important to our overall nutrition?
- Are mushrooms a vegetable?

Vocabulary

- Antioxidants
- Chitin
- Digestion
- Exposure
- Fibre
- Gut health
- Immune system
- Immunity
- Minerals
- Nutrients
- Nutritious
- Vitamins

Differentiation

Support:

- Provide students with a simplified chart of the ABCD health benefits of mushrooms.
- Provide sentence stems for discussions and answers.

Challenge:

- Using Canva, students design a poster to show the health benefits of mushrooms.
- Research specific vitamins and minerals found in mushrooms and their functions in the body.

Resources

To complete all activities in this lesson, you will need:

- Year 3 -4 Supporting Resource Pack
- Websites:
  - Healthy eating for children poster

- Videos:
  - Vitamins and Minerals for Kids | Learn the difference
  - Plant Based Diets: Educating Food Industry Professionals about Australian Mushrooms
- Sticky notes
- A4 paper, scissors and glue

Lesson 4: Content

Introduction

Why are vitamins and minerals important to our overall nutrition?

- Ask students: What do you already know about vitamins and minerals? Why do we need to eat healthy food?
- Watch and discuss the video: Vitamins and Minerals for Kids | Learn the difference - What new things did you learn about vitamins and minerals?
- Discuss as a class what vitamins and minerals are, where they come from, and why our bodies need them.
- Create a class chart of important and interesting facts that students have learnt that they can share with their families.

Body

- Refer to the Healthy eating for children poster to review the Australian Guide to Healthy Eating and the benefits of different food groups. As a class, discuss the benefits of different food groups and how a varied diet contributes to overall health.

Mushrooms are a superfood.

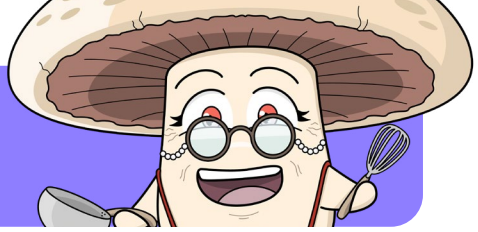
- Think-Pair-Share: Are mushrooms a vegetable?
- Prompt students - As we watch this video, think about what makes mushrooms different from other foods we've talked about.
- Students are given a sticky note to record a key mushroom fact as they watch the video and learn how mushrooms are a healthy unique food, unlike any other food. Plant Based Diets: Educating Food Industry Professionals about Australian Mushrooms. Students share their key learnings and create a class information chart.
- Identify and discuss the nutritional benefits of mushrooms and the ABCD health benefits, and compare the health and nutritional benefits of mushrooms with other foods, highlighting what makes mushrooms unique. (Antioxidants for immunity, B Vitamins for energy, Chitin/Fibre for a happy tummy, Vitamin D for strong bones).

What am I?

- As a class, discuss the concept of 'eating the rainbow' and how mushrooms, being white, add to a diverse and healthy diet.
- Students cut out and match the health benefits to the different coloured fruits and vegetables, and draw an example of each. Glue onto an A4 sheet of white paper. Students then trace, cut out and add the message: Eat the rainbow, don't forget white!

Conclusion

- Mushrooms quiz: Complete the quiz as a class.
- Recap the key messages about mushrooms being a superfood and their unique contribution to a healthy diet. Emphasise the importance of including mushrooms as part of a balanced diet.
- Pose the question: Today we discovered why mushrooms truly are a superfood! Can you tell me one reason why?



Lesson 5: Mini Mushroom Chefs

Lesson Overview

In this lesson, students will explore how mushrooms change in flavour and texture as they mature. They'll work in small groups to design and cook a mushroom recipe. Students will learn how fun and tasty mushrooms can be in everyday meals.

Learning Intention

In this lesson, we will learn about umami. We will cook mushrooms and explore how their flavour and texture changes as they mature.

Success Criteria (suggested)

I will know I am successful when I can:

- Describe the taste of umami.
- Explain how the flavour and texture of mushrooms change as they mature.
- Work with my group to design and cook a mushroom recipe.

Guiding Questions

- How does the flavour change between button, flat, swiss, and portobello mushrooms?
- Is a mushroom sweet, sour, bitter, salty or something else?
- What does 'Umami' taste like?

Vocabulary

- Bitter
- Senses
- Savoury
- Texture
- Umami

Differentiation

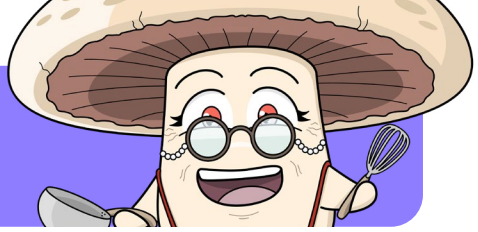
- Host a mushroom breakfast for the school to celebrate 'Mini Mushroom Growers.'
- Host a 'Mushroom Festival' – inviting parents and other year levels to visit the classroom to see the mushrooms growing, view the mushroom learnings and enjoy a mushroom dish prepared by the students.

Support:

- For the Cooking activity, provide pre-measured ingredients and step-by- step visual instructions to make it easier for students to participate safely and successfully.
- Pair students who may need extra support with peers who can offer assistance and encouragement during activities.

Challenge:

- Design a mushroom dish for the school tuckshop: Visit the school tuckshop to learn about healthy eating rules, and design a dish to sell. Make posters to promote the dish.



- Students design a healthy meal that prominently features mushrooms and includes a variety of colourful fruits and vegetables, explaining the nutritional benefits of their choices.

Resources

To complete all activities in this lesson, you will need:

- Year 3 -4 Supporting Resource Pack
- Mushroom dish images - internet, magazines, cookbooks etc.
- Videos:
  - How to Sauté Mushrooms
- Websites:
  - Recipes - Cooking with kids
  - Recipes - Cooking at home
- Participation certificates

Lesson 5: Content

Introduction

- Class discussion: 'Have you ever eaten a mushroom before?', 'What do you imagine it tastes like?', 'Do you think all mushrooms taste the same?'. Create a class chart and record student responses.
- Using the internet, cookbooks or magazines, students do a search and share images of mushroom dishes. Option: This may be done as a homework task with students bringing in and sharing images of popular mushroom dishes.

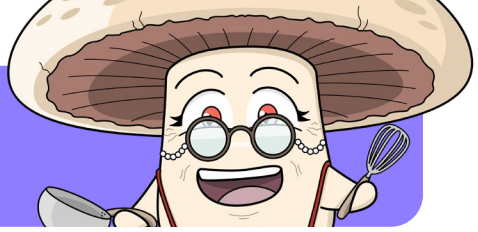
Mushroom tasting station

- Set up a tasting station with cooked *Agaricus bisporus* mushrooms (white button, swiss brown, or portobello, depending on availability ensure adult supervision and check for any allergies). Provide small, safe portions for students to try. Present simply cooked mushrooms (e.g. sautéed with a little olive oil or butter, no added salt or strong flavours. Adding a small pinch of herbs like thyme also adds lots of flavour as it makes it SO tasty! ... and teaches the benefits of adding herbs to flavour).
- Discuss: How does the flavour change between button, flat, swiss, and portobello mushrooms? Add students' responses to the class chart.

Body

Compare the taste of mushrooms to other foods.

- What does it taste like? After the mushroom tasting experience, have examples of foods that represent different tastes (e.g. sweet: strawberries, grapes; savoury: cheese, a small piece of plain cracker; salty: salty crackers; bitter: a tiny piece of lemon peel - be cautious with bitter tastes for young children and check for any allergies. **Do not include any foods that any student in the class is allergic to**.



- Students record and describe the foods and compare the taste of the cooked mushrooms to these other familiar tastes.
- Think-Pair-Share: Is a mushroom sweet, sour, bitter, salty or something else?

What is Umami?

- Ask: Can you name the five different tastes our mouths can recognise?
- Explain that there are five different tastes our tongues can recognise: sweet, sour, umami, bitter and salty. Display the names of the five different tastes and have students identify foods that belong to each of the taste groups.
- Ask students which group they think mushrooms belong to. Discuss the information on the Powerpoint about umami.
- Link discussion back to the student's mushroom and food taste testing sessions. Did they correctly label the different food tastes? Can they think of any other foods that belong to each taste group?

Conclusion

Mushroom cooking

- Have students brainstorm how mushrooms could be incorporated into daily meals - breakfast, lunch, dinner.
- Encourage students to share how and when they eat mushrooms.
- View the video: How to Sauté Mushrooms.
- In groups students design and write up a mushroom recipe. Optional: Recipe can be cooked at home or school and then photographed and shown at school.
- With adult supervision students cook simple mushroom recipes from the AMGA website. Recipes - Cooking with kids
- Encourage families to cook and try mushrooms at home. Create a simple family mushroom recipe from the Recipes - Cooking at home website - draw or write about it.

Class KWL

- Revisit the class KWL [What I know, What I want to know, What I learnt] and complete the L (learnt) section.

Participation certificates

- Congratulations! You are now a Mini Mushroom Grower.
- Print off certificates for the students.

Teacher feedback survey

- Use the links on the resource pack to complete the AMGA teacher feedback survey and the student post-survey.