



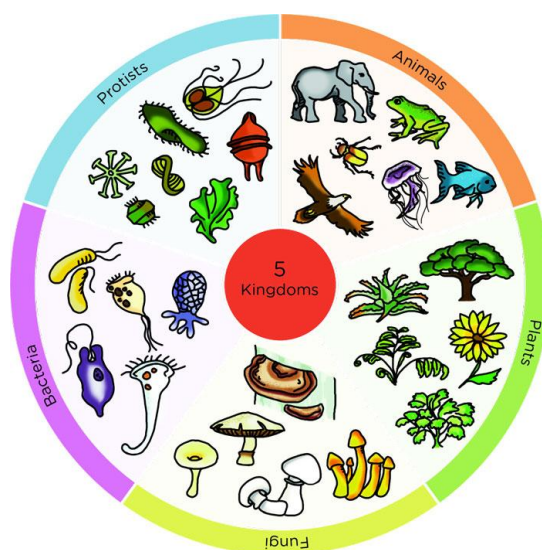
Introduction to Fungi

Aims:

- Understand what fungi are,
- Learn where fungi live and their role in the ecosystem,
- Identify the diverse types of fungi you can find in New Zealand

What is fungi

Fungi are not plants but they are also not animals either. But they are living organisms. All life forms are divided into 5-6 kingdoms. Fungi come in all shapes, sizes and colours. The most well know are mushrooms. But did you know that yeast is also a type of fungi? Fungi is the plural form of fungus.



Five Kingdoms of living things



And did you know that a fungus even appears on one of our bank notes? It's the only fungus in the world to appear on a banknote.



NZ \$50 note showing a fungus

This beautiful vivid fungus is called a Blue pinkill. The Māori name for this is Werewere-kokako, because its colour is similar to the blue wattles of the kōkako bird.

In a story told by Tūhoe, the mushroom is paired with the kōkako, as it is on the note, as it is said that the kōkako gets its blue wattles by rubbing its cheek against the mushroom.



The kit can link to the following NZ Curriculum (2026)

Curriculum	Examples of Activities
Science (2007) - Investigating in science - planning and carrying out investigations into fungi, predicting where fungi might be found. - Understanding about science - learning why fungi matters. - Communicating in science - sharing findings from fungi surveys.	- Observe and describe fungi types. - Classify fungi into groups - Investigate how ecosystems depend on biodiversity and how fungi contribute to soil health, decomposition, and food webs.
Maths (2026 Curriculum) – use in addition to maths textbooks as desired Students collect, sort, and display data; interpret patterns and trends; critique reliability.	Students record types, colours and sizes found, create graphs (bar charts, pie charts), and interpret biodiversity trends.
English (2026 curriculum) <i>Oral Language</i> - Share observations and findings of the fungi they find, including colour, shape, size and location. - Engage in discussions about the role of fungi in ecosystems. - Discuss why fungi grow in certain habitats (shade, moisture, decaying wood). <i>Reading</i> - Using identification charts, photos, or field guides during the fungi hunt. <i>Writing</i> - Write structured reports and explanations using appropriate language features. Write clear instructions for how to conduct a fungi hunt or how to identify fungi safely.	- Students present findings from monitoring activities. - Group discussions on why fungi are important for biodiversity. - Students read DOC or Science Learning Hub resources on fungi. - Create “Fungi Hunt Reports” with sections like What I Found, Where It Was, What It Looked Like.



Where do they live?

Fungi occur on land, in soil, in fresh water and the sea, and in the air. The majority live on land, mainly on soil or decomposing material where they play an important role recycling carbon.

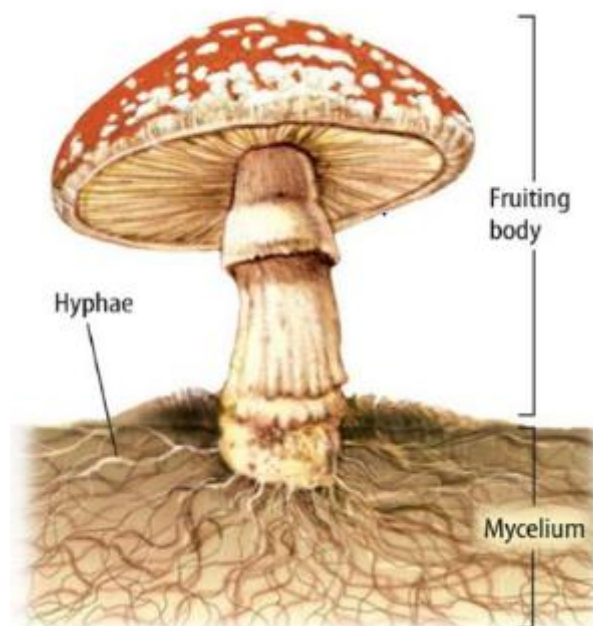
You'll find them in places where there are fallen trees, decomposing plant material on the ground, and also in the soil.

The tip of an iceberg – what you see are only a small part of the whole organism

Fungi are made from chitin which is the same material which give invertebrates (bugs) their hard external skeleton. For fungi that we find in the bush there are two distinctive parts to them. What you see above ground and what you don't see below ground.

What you see above the ground is only a small part of the whole organism. Fungi reproduce by releasing spores into the air from their gills, in the same way that ferns release spores into the air from underneath their leaves.

When it is time to reproduce, the fungi become conspicuous. What you see above ground is called the **fruiting body**, the spore producing part of fungi. The tip of the iceberg.



Structure of Fungi



When they are not reproducing, they are hidden underground and are simply a mass of hyphae which are thin strands of cells that make up the majority of the fungus body. These hyphae branch into a larger mass called *mycelium*. When you pull rotten wood apart, the white stringy strands you see are the hyphae which are used by fungi to gain their nutrients.

Interactions between Fungi and Other Organisms

The two most common beneficial or mutualistic relationships are between:

- Fungi and plants; and
- Fungi and lichen

Fungi and Plants

Most terrestrial (land) plants have beneficial or mutual relationships with fungi. This relationship means that fungi have a beneficial role in the **health of our soils** since healthy soils, mean healthy plants.

Decomposition is the role of **saprophytic** fungi which make up most fungi in soil. This means that they break down dead organic matter to release nutrients for the fungi to use. They can also break down the cellulose and lignin which are the structural components of plants, and they also help bind soils together.

Some fungi called **mycorrhizal** fungi have a close relationship with plant roots. Hyphae of this type of fungi weave their hyphae in and around the roots of the plant forming mycorrhizae. As the fungus releases nutrients into the soil when they break down the organic matter, this is taken up quickly by the plant. In return, the fungus gains carbohydrates from the plant to help them grow. This greatly helps the survival of both species.

Fungi and Lichen. What is lichen?

Lichen are complex organisms that are in a mutually beneficial relationship between a fungi and an **algae**. Lichen cannot exist without the fungus or the algae.

The dominant partner in the relationship is the fungus which is the reason why they are often mistaken for a fungus as they look like them. These two species are so intertwined that they look like one organism when in fact they are two. The algae have photosynthetic cells which provide nutrients to the lichen.



An example of Lichen

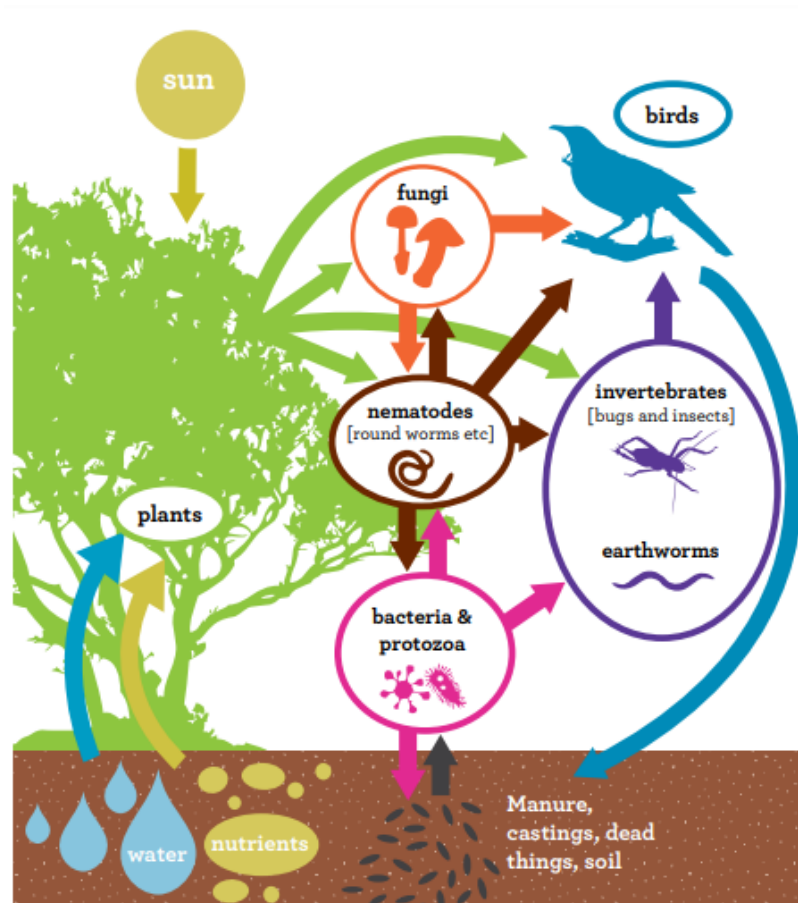
Role of Fungi in Ecosystems

The diagram below illustrates the flow of energy through a typical native forest ecosystem. Energy is represented by the arrows in the diagram and how it passes from the sun to plants to animals, and other organisms.

Soil, water and nutrients make up an important part of the ecosystem and provide a rich environment where living things can thrive.

A healthy ecosystem is where the connections are intact and no part of the ecosystem is disrupted.

A healthy environment is also dependent on clean air and water and available nutrients.



Connections in an Ecosystem

When to find fungi

Typically **autumn** (from about April onwards) is fungi hunting season. This is also the time of year when it is cool and damp which is a trigger for fungi to start reproducing. In winter and early spring you still might see fungi around.

When we are outside, we often will not see fungi as they can be quite small, and may only stay around for a short time since their fruiting bodies are only visible while the fungi releases its spores.



Health and Safety

Some wild mushrooms are poisonous so it is recommended that students either wear gloves if they are handling fungi or to wash their hands thoroughly. Ideally, fungi hunting should be an **observation only** activity rather than collecting the different types to show at the end of a session.

Fungi Bingo

A great introductory activity for any age group is simply to do fungi bingo. This helps students to see the variety of types, shapes and colours of fungi.

Use the bingo sheet below.

Note that the different types shown on the sheet come in a range of colours and the images included are just examples of those types.

Spore Prints

Making mushroom spore prints is another cool activity you can do with students. Instructions for this are NOT included in the kit. But can be found on several websites including Kids Greening Taupō.

Other Useful Resources:

Search for fungi in the following websites:

Kids Greening Taupo - <https://www.kidsgreeningtaupo.org.nz>

Science Learning Hub - <https://www.sciencelearn.org.nz>

There are not any student specific identification guides to fungi but the following book is useful:

A photographic Guide to Mushrooms and other Fungi of New Zealand by G. S. Ridley, New Holland Publishers.

Which fungi can you spot today?

mushroom with gills

☐

shelf fungi

☐

mushroom with pores

☐

paper fungi

☐

jelly fungi

☐

Which fungi can you spot today?

coral fungi

☐

pouch fungi

☐

woody clubs and balls

☐

paint-splash fungi

☐

cup fungi

☐

what other fungi can you spot?