

Discussion cards



Goal

Raise awareness and discussion about the complexity of climate change issues, some solutions and the connections with our places and professions. Blank cards are intended to be used as an "open-safe space" for ākonga to propose their own ideas, fostering their relationship with places/habitats, issues, and solutions, as well as exposing them to possible careers in this field.

This activity was inspired by "Layers of Climate Change"

[URL: <https://eos.org/wp-content/uploads/2023/12/layers-of-climate-change.pdf>].

Proposed activity

Materials:

- Cards (Place/habitat, Issue, Solution, Profession, Blank cards, Glossary)
- Whiteboard Pens

Instructions:

- Split the class into small groups (3-5 children) and give them a set of cards.
- Each group must combine a place/habitat, issue, solution, and profession to make a set. (*HINT: it might be easier to start a set with the issue card. Look for alike words to help you begin to match issues with solutions etc.*).
- The children can use the blank cards to propose their own ideas about places/habitat, issues, solutions, and professions that were not included in the cards.
- Ākonga might find there may be overlaps i.e. there is more than one solution to an issue, or more than one profession that is needed to work on a solution. This is expected. It is intended for them to gain a broader understanding about the complexity of environmental problems and how everything is part of interrelated systems and communities.
- The glossary should be made available during the activity (scientific literacy development).
- At the end of the exercise, each rōpū (group) can present to the class what they have found. This is where the gold is found, in the discussions and critical thinking around why groups placed sets together.
- Kaiako can guide a discussion by asking why and how ākonga connected their cards, and how they feel about proposed solutions, trying to encourage them to have an optimistic view of the future.

Printing instructions:

If you want to print additional cards, we recommend the following printing settings:

- Size: A4
- Full page slides (if asked)
- Colour (suitable for printing B&W)
- Print both sides

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Discussion cards - Key for teachers

These are suggested sets, but there is no right or wrong answers, giving the complex nature of the climate issues.



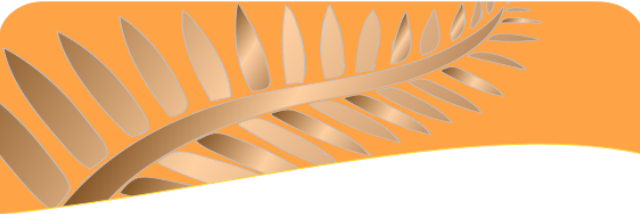
ISSUE	SOLUTION	PLACES/HABITATS	PROFESSION
The rising sea levels caused by melting glaciers pose a threat of flooding to coastal communities.	Monitor alterations in glacier size using satellite data and publicly distribute the information to enhance coastal resilience.	ICE // OCEAN // COASTLINE & COASTAL COMMUNITIES // ESTUARIES & WETLANDS // ISLAND NATIONS	CLIMATE SCIENTIST // ENVIRONMENTAL ENGINEER // URBAN PLANNER // CLIMATE COMMUNICATION SPECIALIST // CLIMATE ADAPTATION PLANNER // MANA WHENUA
The acidification of ocean waters affects marine food webs, putting fisheries at risk.	Adopt eco-friendly fishing methods, track ocean acidity, and foster coastal landscapes that buffer against acidification.	OCEAN // COASTLINE & COASTAL COMMUNITIES // ESTUARIES & WETLANDS // ISLAND NATIONS	CONSERVATION BIOLOGIST // ENVIRONMENTAL ECONOMIST // URBAN PLANNER // ENVIRONMENTAL EDUCATORS // CLIMATE ADAPTATION PLANNER // MANA WHENUA
Flood-prone areas undergo changes and expansion, while the infrastructure remains outdated.	Incorporate green spaces and ecofriendly friendly construction materials in new urban developments.	CITY // COASTLINE & COASTAL COMMUNITIES // ISLAND NATIONS	CLIMATE ADAPTATION PLANNER // URBAN PLANNER // ENVIRONMENTAL ENGINEER // CLEAN TECHNOLOGY ENTREPRENEURS
Extensive deforestation negatively impacts biodiversity, increases the risk of drought, and accelerates soil erosion.	Practice sustainable forestry, safeguard at-risk forest ecosystems, and engage in tree reforestation efforts.	FOREST	ECOLOGIST // CLIMATE POLICY ANALYST // CLIMATE ADAPTATION PLANNER // ENVIRONMENTAL EDUCATORS // CLIMATE COMMUNICATION SPECIALIST
Worsening drought conditions increase frequency and severity of wildfires.	Create innovative forest management approaches and maps identifying wildfire risks, considering changing rainfall patterns.	FOREST	ECOLOGIST // CONSERVATION BIOLOGIST // CLIMATE ADAPTATION PLANNER // ENVIRONMENTAL EDUCATORS
Urban/city heat pockets unfairly impact on economically poorer communities.	Create accessible and equitable urban green spaces to improve public health.	CITY // COASTLINE & COASTAL COMMUNITIES // ISLAND NATIONS	ENVIRONMENTAL ENGINEER // ECOLOGIST // CLIMATE POLICY ANALYST // URBAN PLANNER // ENVIRONMENTAL ECONOMIST // CLEAN TECHNOLOGY ENTREPRENEURS

Discussion cards - Key for teachers

These are suggested sets, but there is no right or wrong answers, giving the complex nature of the climate issues.




ISSUE	SOLUTION	PLACES/HABITATS	PROFESSION
Changes in the El Niño-Southern Oscillation (ENSO) pose a threat to food availability.	Offer smallholder farmers easily accessible Earth system data.	RURAL // CITY // COASTLINE & COASTAL COMMUNITIES // ISLAND NATIONS	METEOROLOGIST // CLIMATE SCIENTIST // SUSTAINABLE AGRICULTURE EXPERTS // ENVIRONMENTAL ECONOMIST // CLIMATE COMMUNICATION SPECIALIST
Methane (CH ₄), a greenhouse gas more powerful than CO ₂ , is increasing.	Plug methane leaks in natural gas wells, storage, and pipelines.	ATMOSPHERE	METEOROLOGIST // RENEWABLE ENERGY SPECIALIST // CLIMATE POLICY ANALYST // CARBON CAPTURE AND STORAGE (CSS) SPECIALIST // CLEAN TECHNOLOGY ENTREPRENEURS // CARBON SCIENTIST
Hurricanes and cyclones intensify and occur more frequently.	Integrate climate adaptation measures into coastal communities and infrastructure. Examples: Planning & engineering measures	ATMOSPHERE // RURAL // CITY // COASTLINE & COASTAL COMMUNITIES // ISLAND NATIONS	METEOROLOGIST // CLIMATE SCIENTIST // CLIMATE POLICY ANALYST // CLIMATE ADAPTATION PLANNER // CLIMATE COMMUNICATION SPECIALIST
Carbon dioxide (CO ₂) warms the atmosphere.	Promote both natural ecosystems and innovative technologies for capturing and sequestering carbon.	ATMOSPHERE	CLIMATE SCIENTIST // RENEWABLE ENERGY SPECIALIST // CLIMATE POLICY ANALYST // CARBON CAPTURE AND STORAGE (CSS) SPECIALIST // CLEAN TECHNOLOGY ENTREPRENEURS // CARBON SCIENTIST
Loss of taonga species. Examples: Native bird and fish species.	Work with mana whenua and Mātauranga Māori kaiarahi (leaders) to address issues.	RURAL // CITY // COASTLINE & COASTAL COMMUNITIES // ISLAND NATIONS // ESTUARIES & WETLANDS	ECOLOGIST // CONSERVATION BIOLOGIST // ENVIRONMENTAL EDUCATORS // MĀTAURANGA MĀORI KAIARAHİ // KAITIAKI
Culturally significant places at risk of being damaged. Examples: Coastal urupā (Māori burial grounds) and marae.	Work with mana whenua and Mātauranga Māori kaiarahi (leaders) to address issues.	RURAL // CITY // COASTLINE & COASTAL COMMUNITIES // ISLAND NATIONS // OCEAN	ENVIRONMENTAL ENGINEER // URBAN PLANNER // CLIMATE ADAPTATION PLANNER // ENVIRONMENTAL EDUCATORS // MĀTAURANGA MĀORI KAIARAHİ // KAITIAKI




The rising sea levels caused by melting glaciers pose a threat of flooding to coastal communities.



The acidification of ocean waters affects marine food webs, putting fisheries at risk.



Flood-prone areas undergo changes and expansion, while the infrastructure remains outdated.



Extensive deforestation negatively impacts biodiversity, increases the risk of drought, and accelerates soil erosion.



ISSUE



ISSUE



ISSUE



ISSUE







Worsening drought conditions increase frequency and severity of wildfires.



Urban/city heat pockets unfairly impact on economically poorer communities.



Changes in the *El Niño-Southern Oscillation (ENSO)* pose a threat to food availability.



Methane (CH₄), a greenhouse gas more powerful than CO₂, is increasing.

ISSUE



ISSUE



ISSUE



ISSUE





Hurricanes and cyclones intensify and occur more frequently.



Carbon dioxide (CO₂) warms the atmosphere.



Loss of taonga species.

Examples: Native bird and fish species.



Culturally significant places at risk of being damaged.

Examples: Coastal urupā (Māori burial grounds) and marae.

ISSUE



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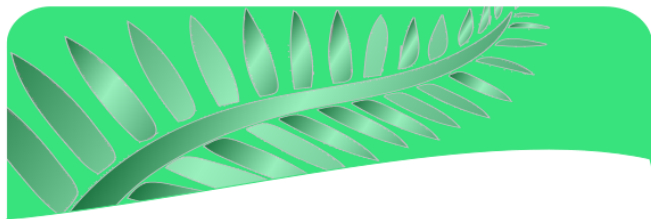


ISSUE

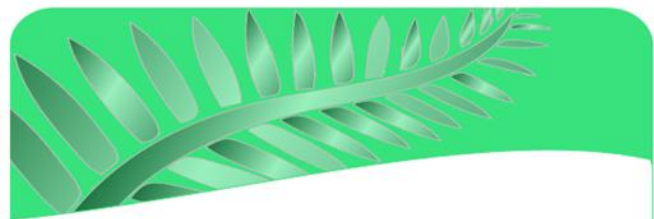


ISSUE

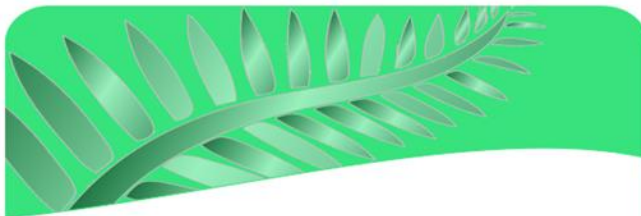




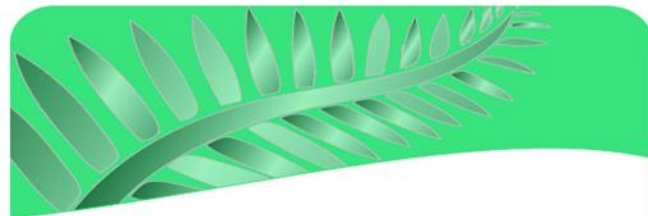
Monitor alterations in glacier size using satellite data and publicly distribute the information to enhance coastal resilience.



Adopt eco-friendly fishing methods, track ocean acidity, and foster coastal landscapes that buffer against acidification.



Incorporate green spaces and ecofriendly construction materials in new urban developments.



Practice sustainable forestry, safeguard at-risk forest ecosystems, and engage in tree reforestation efforts.



SOLUTION

 **GNS**
SCIENCE
TE PŪ AO



SOLUTION

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SOLUTION

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Create accessible and *equitable* urban green spaces to improve public health.

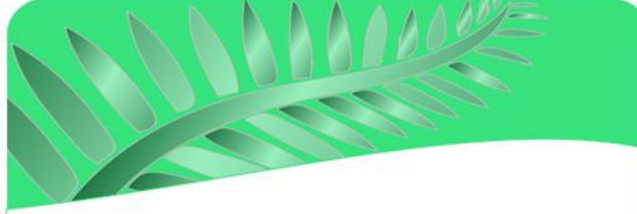


Create innovative forest management approaches and maps identifying wildfire risks, considering changing rainfall patterns.



Integrate climate adaptation measures into coastal communities and infrastructure.

Examples: Planning & engineering measures



Offer smallholder farmers easily accessible *Earth system* data.



SOLUTION



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SOLUTION



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SOLUTION



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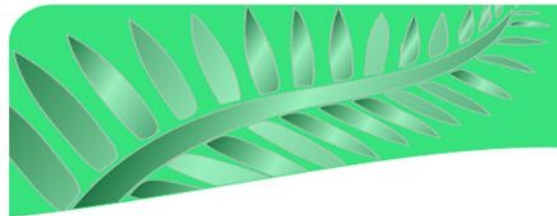


SOLUTION



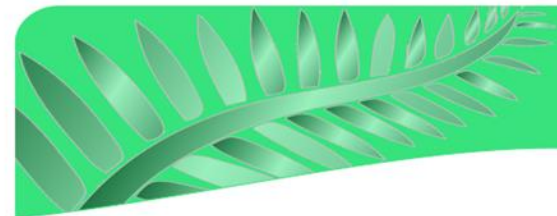
GNS
SCIENCE
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Plug methane leaks in natural gas wells, storage, and pipelines.

Promote both natural ecosystems and innovative technologies for capturing and sequestering carbon.



Work with mana whenua and Mātauranga Māori kaiarahi (leaders) to address issues.



SOLUTION



GNS
SCIENCE
TE PŪ AO



SOLUTION



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SOLUTION



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SOLUTION



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SOLUTION



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SOLUTION



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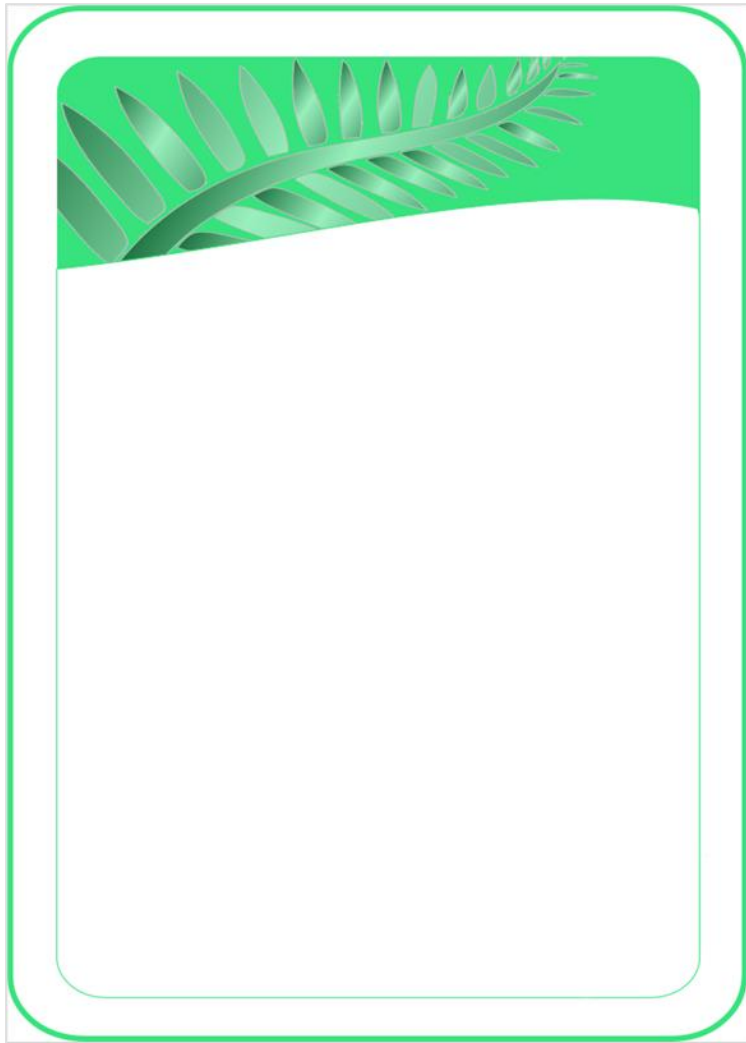


SOLUTION



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SOLUTION

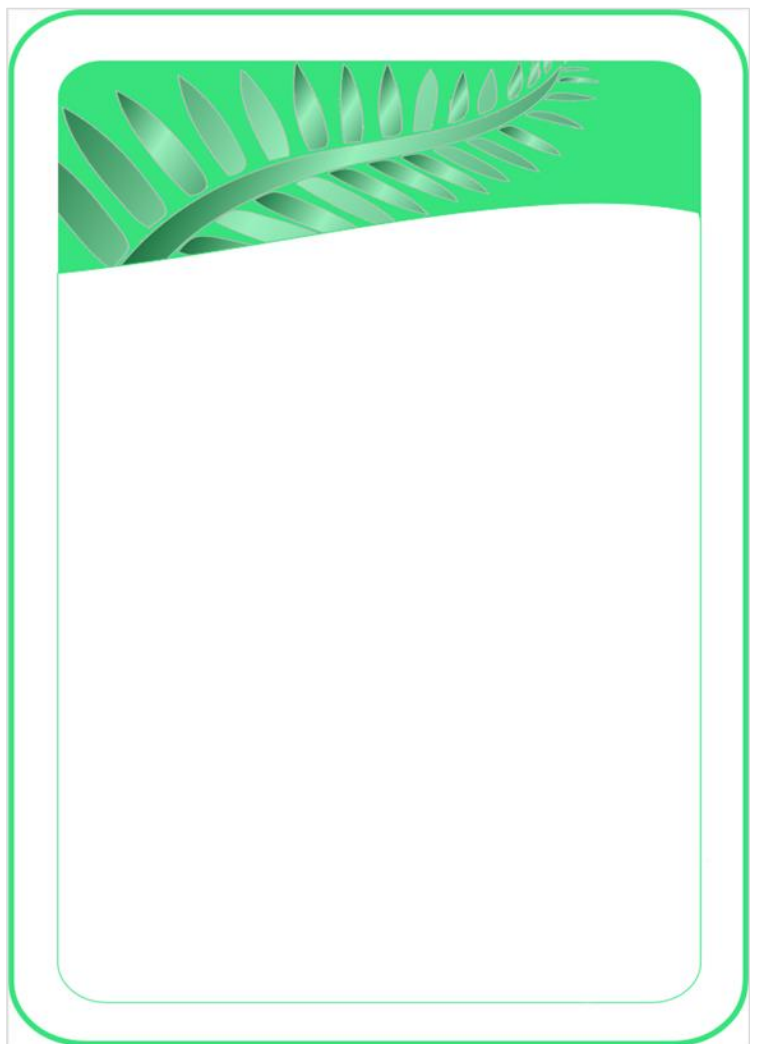
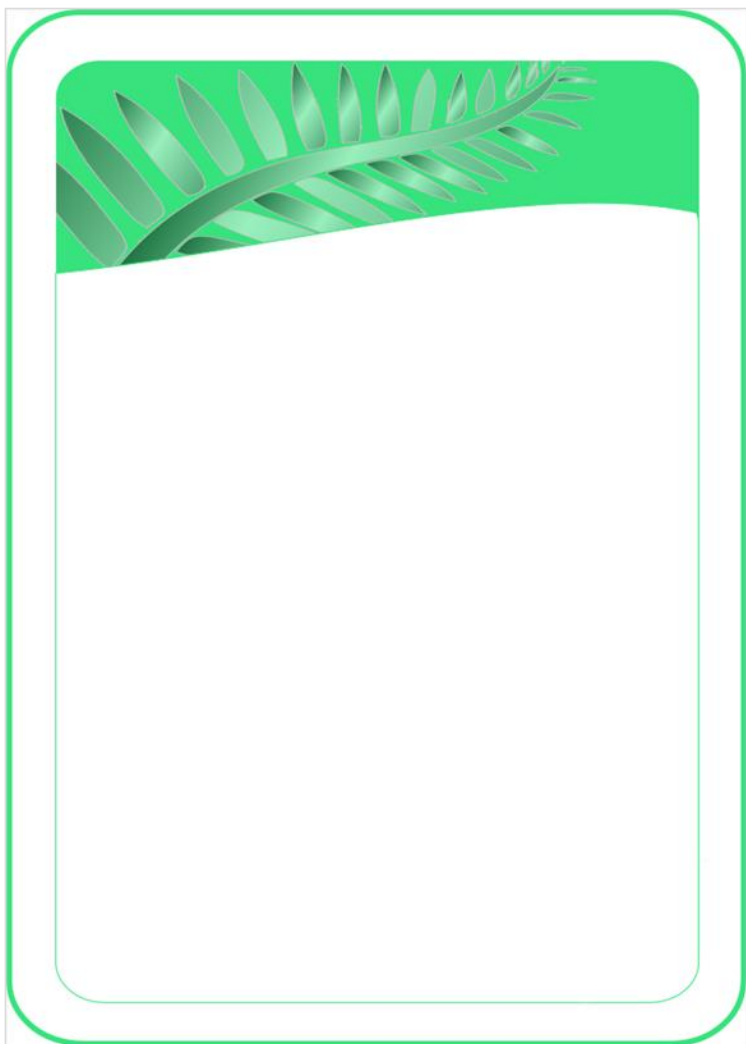
 **GNS**
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TE PŪ AO



SOLUTION

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SCIENCE
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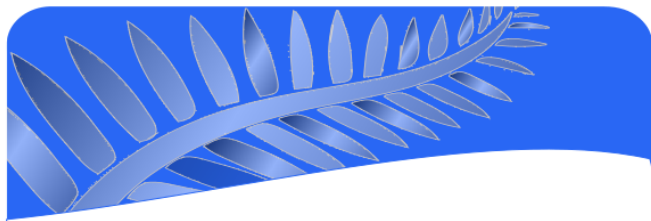
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SOLUTION

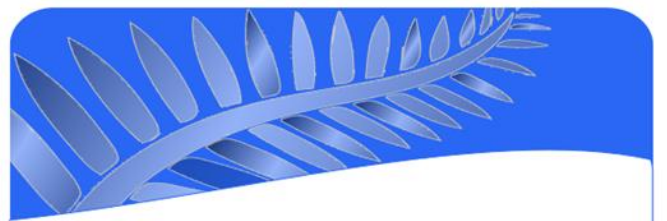
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TE PŪ AO





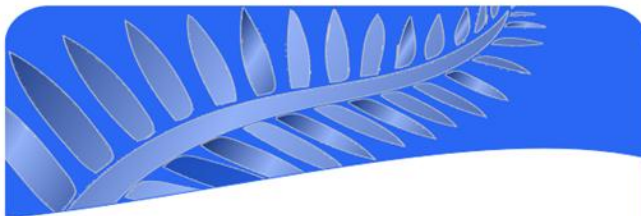
ATMOSPHERE

**Mixture of gases
that surround Earth
like a blanket.**



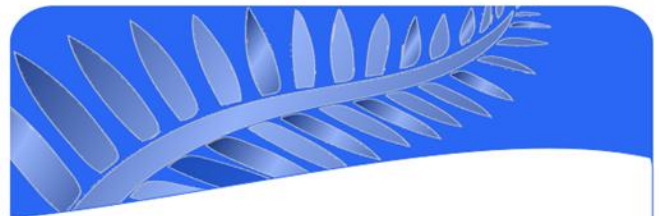
FOREST

**Examples:
Waipoua Forest,
Whakarewarewa
Forest**



OCEAN

**Examples:
Pacific Ocean,
Atlantic Ocean**



RURAL

**Examples:
Waiuku, Warkworth**



**PLACES/
HABITATS**



**PLACES/
HABITATS**

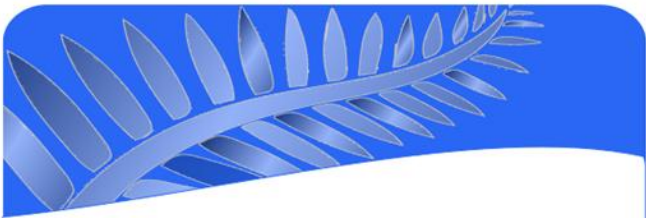


**PLACES/
HABITATS**



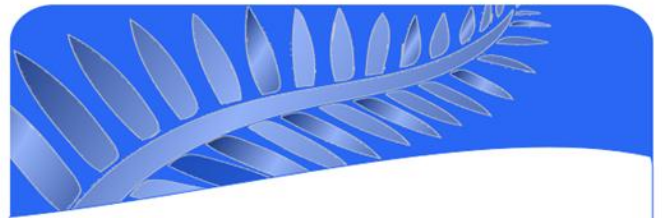
**PLACES/
HABITATS**





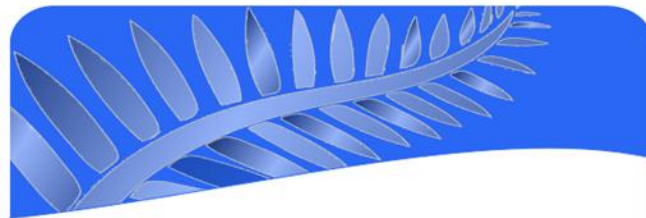
CITY

**Examples:
Auckland,
Wellington, London**



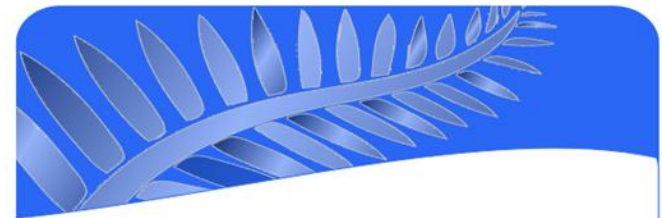
ICE

**Examples:
Antarctica, Arctic
Circle**



ISLAND NATIONS

**Examples:
Tuvalu, Kiribati, Fiji,
Samoa, Tonga, Cook
Islands**



COASTLINE & COASTAL COMMUNITIES

**Examples:
Whangaparāoa,
Beachlands**



**PLACES/
HABITATS**



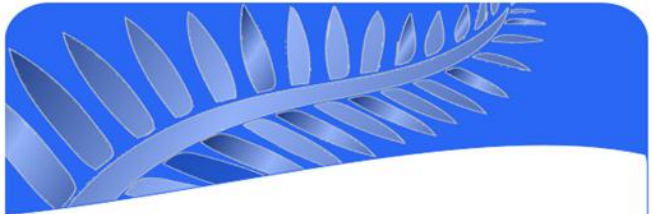
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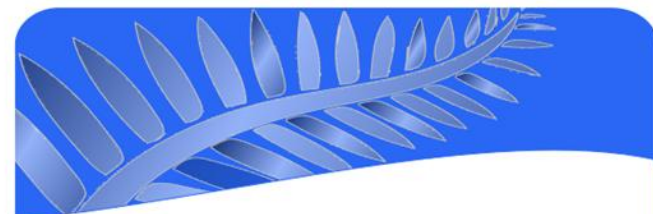
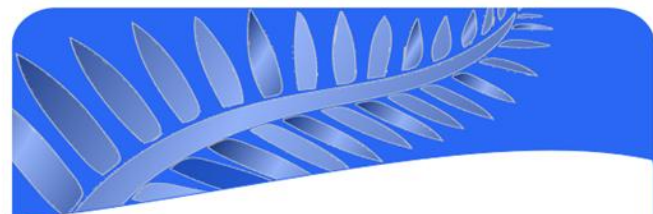
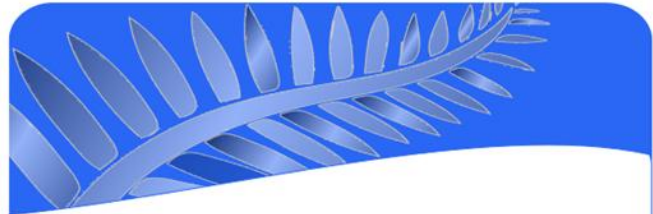


**PLACES/
HABITATS**



ESTUARIES & WETLANDS

**Examples:
Mangatāwhiri
wetlands, Manukau
Harbour**





**PLACES/
HABITATS**



**PLACES/
HABITATS**

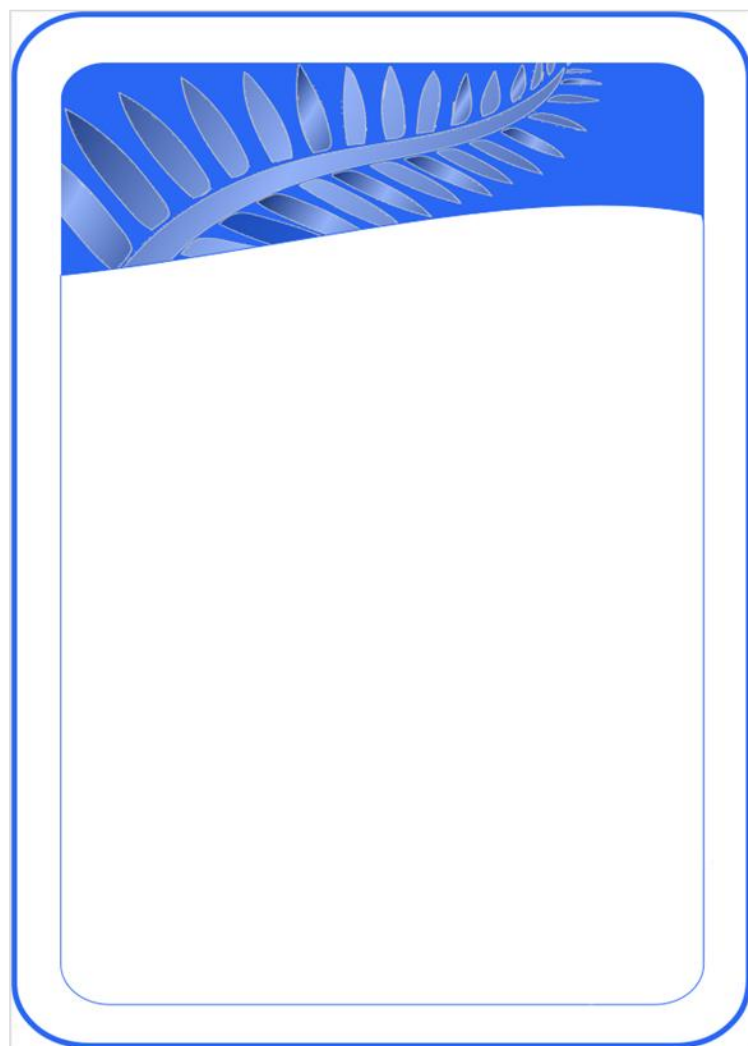
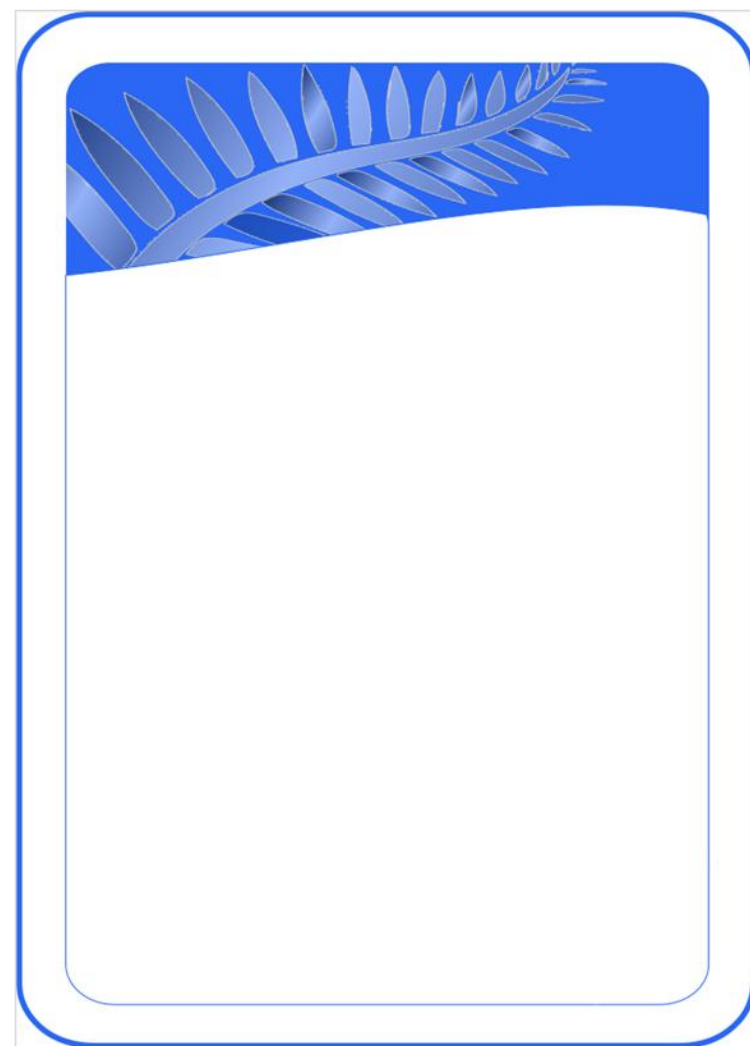
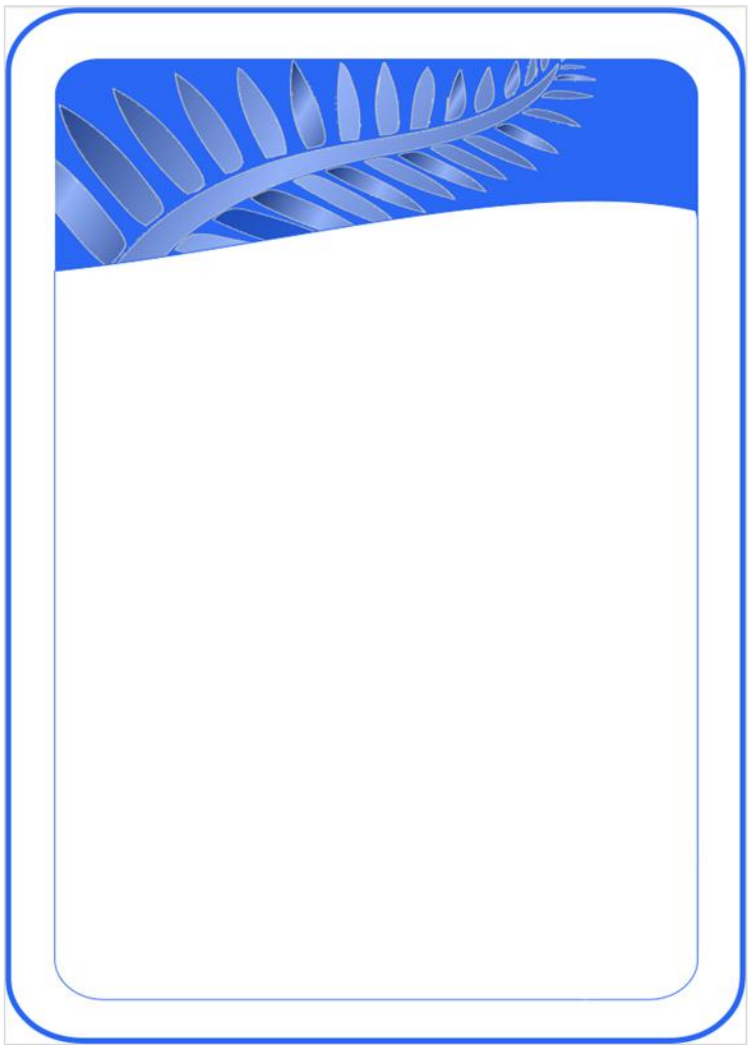
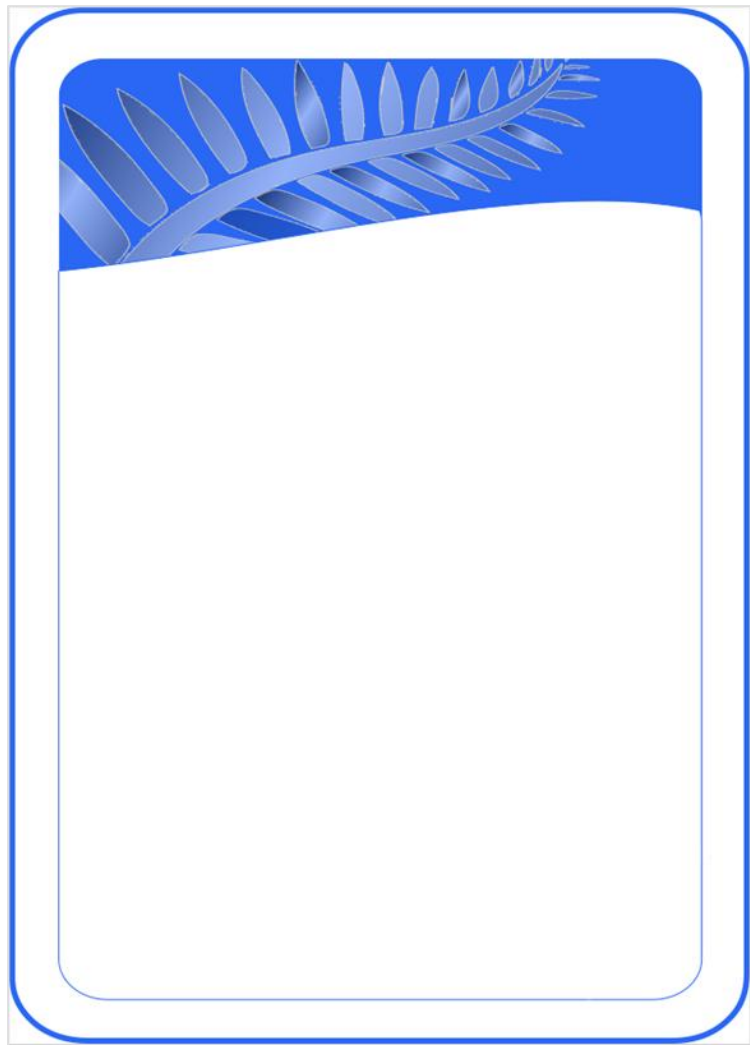


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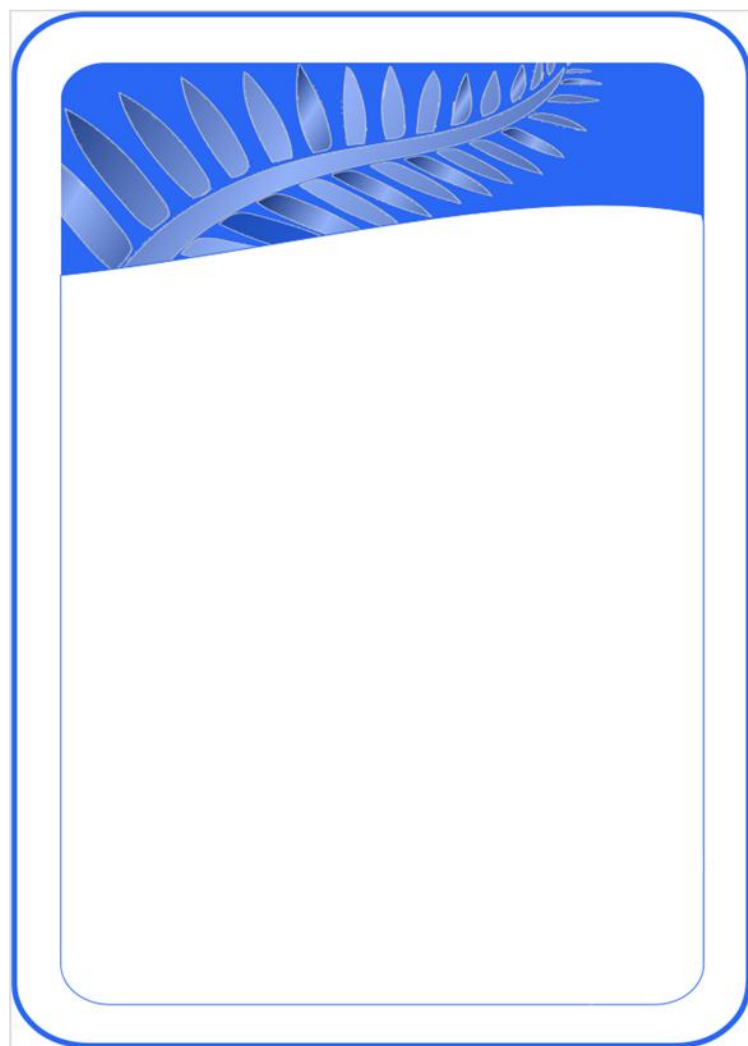
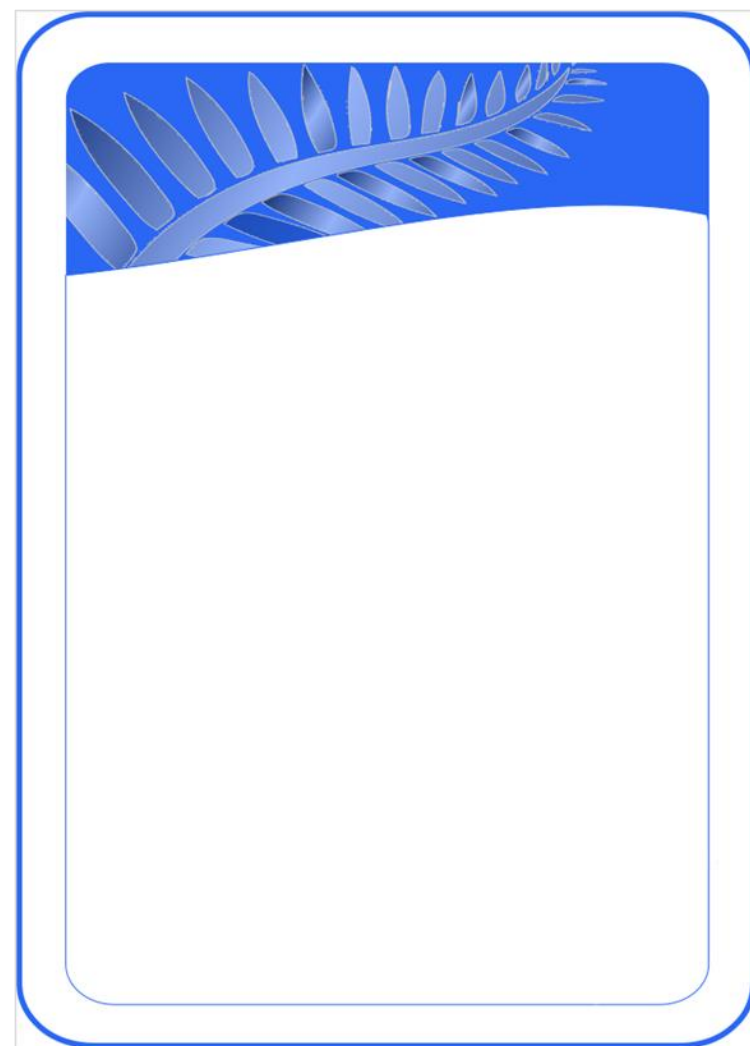
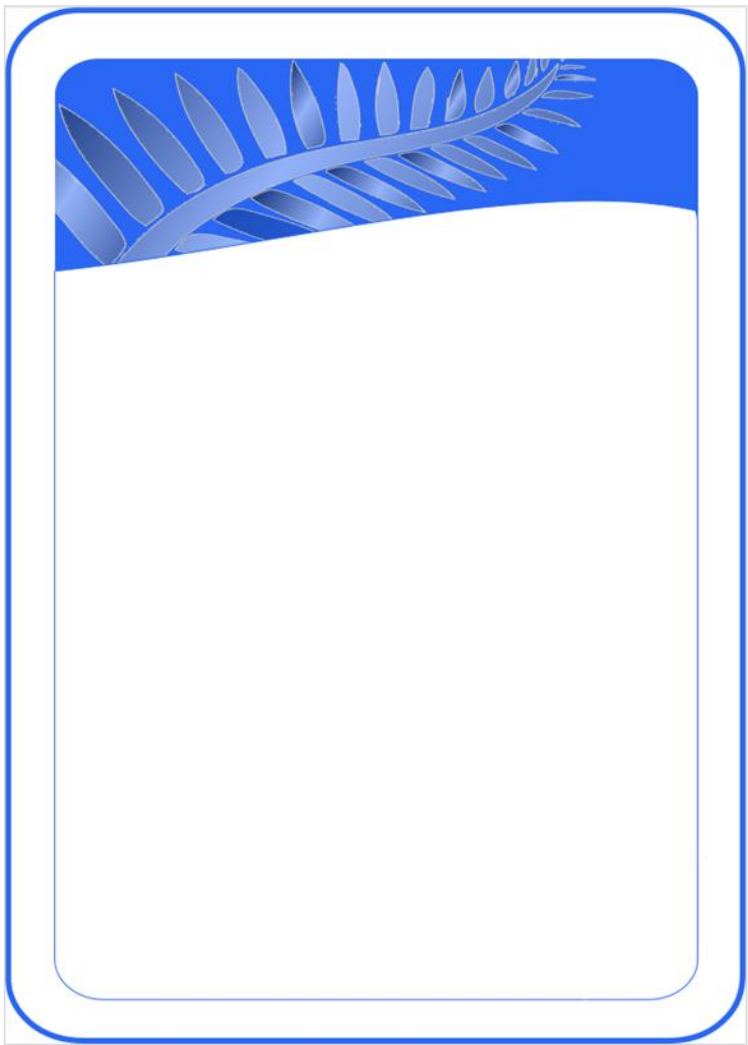
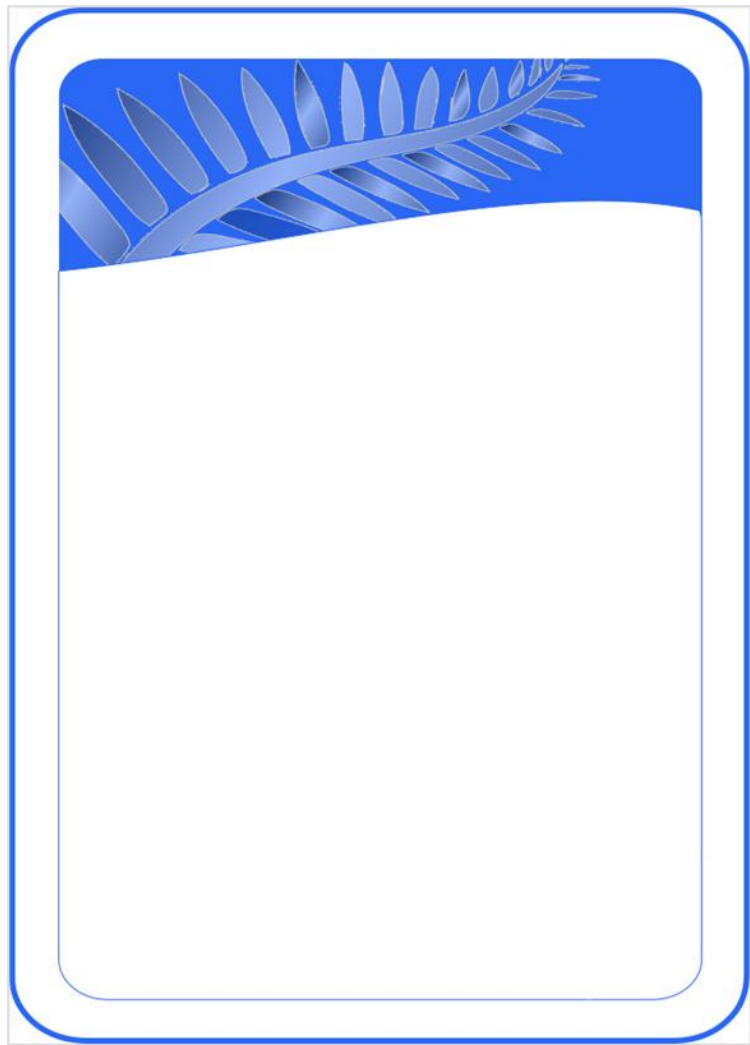


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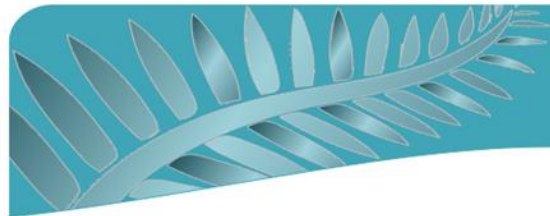


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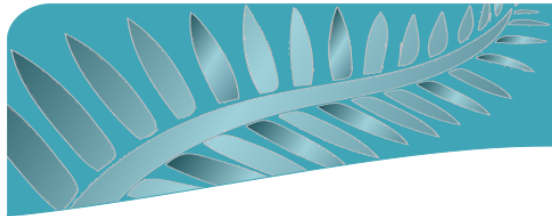
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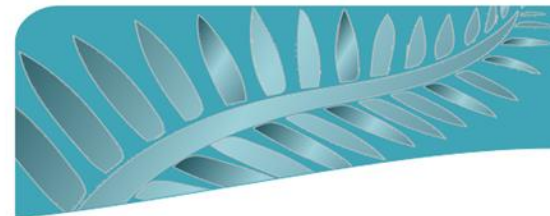
ENVIRONMENTAL ENGINEER

Helps take care of the Earth by figuring out ways to keep air, water, and land clean and safe for people, animals, and plants.



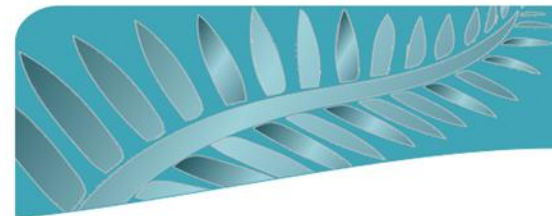
CLIMATE SCIENTIST

Helps us understand and take care of the Earth's weather and how it's changing.



ECOLOGIST

Explores and learns about plants, animals, and their homes to help keep Earth healthy.



RENEWABLE ENERGY SPECIALIST

Helps find and use clean energy sources like the sun and wind to power our homes and gadgets instead of using things that can harm the Earth.



PROFESSION



PROFESSION

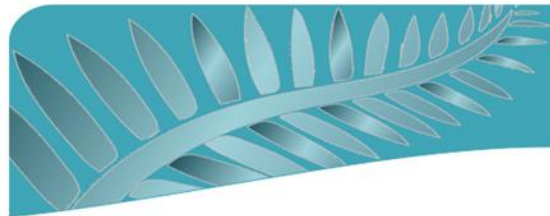


PROFESSION



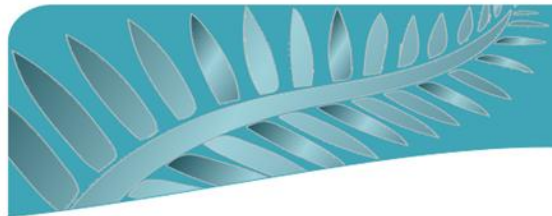
PROFESSION





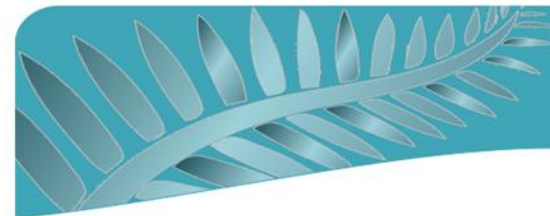
ENVIRONMENTAL LAWYER

Helps protect nature by using laws to make sure people and businesses take care of the environment and follow rules to keep our planet healthy.



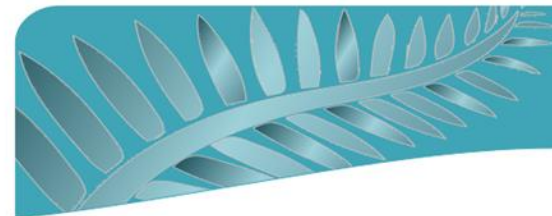
CLIMATE POLICY ANALYST

Helps make rules and plans to protect the Earth's climate by studying and suggesting ways to reduce pollution and use cleaner energy.



URBAN PLANNER CITY & DISTRICT COUNCILS

Helps decide where buildings, parks, and roads should go to make cities happy, healthy, and fun for everyone.



METEOROLOGIST

Studies what happens in the atmosphere and make weather forecasts to help us understand and predict things like rain, storms, and sunshine.



PROFESSION



PROFESSION

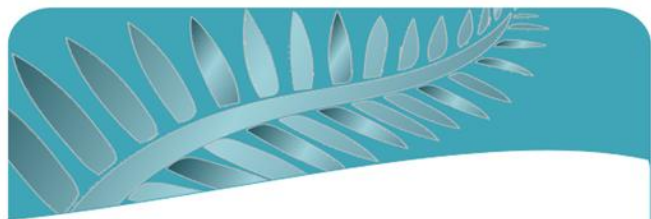


PROFESSION



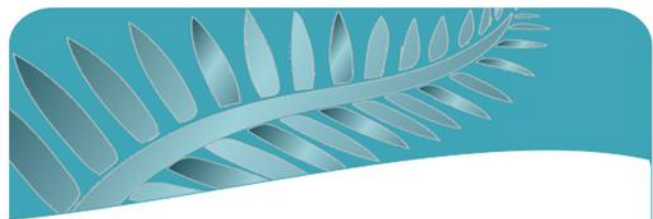
PROFESSION





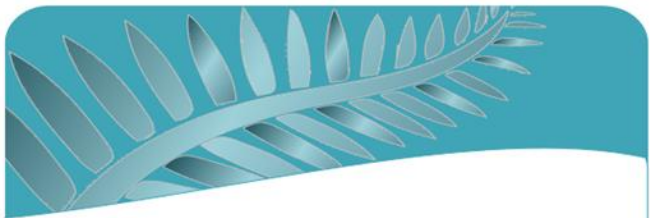
CONSERVATION BIOLOGIST

Helps protect and save animals and plants by studying them, their habitats, and finding ways to keep them safe for the future.



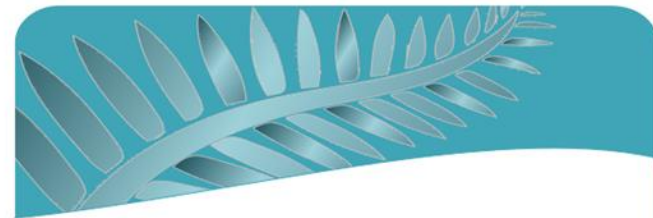
CARBON CAPTURE AND STORAGE (CSS) SPECIALIST

Helps find clever ways to catch and keep carbon dioxide, a gas that can harm the Earth, so we can have cleaner air and a healthier planet.



SUSTAINABLE AGRICULTURE EXPERTS

Helps farmers grow food in a way that keeps the environment healthy, helps communities, and makes sure we can have plenty of yummy food for a long time.



ENVIRONMENTAL ECONOMIST

Helps figure out how to take care of our planet by studying how people use resources and finding ways to protect the environment while still having enough for everyone.



PROFESSION



PROFESSION



PROFESSION



PROFESSION





CLIMATE ADAPTATION PLANNER

Helps communities get ready for changes in the weather by making plans to keep people safe and protect the environment.



CLEAN TECHNOLOGY ENTREPRENEURS

Create and develop cool inventions that help protect the Earth by using clean and eco-friendly solutions to solve environmental problems.



ENVIRONMENTAL EDUCATORS

Teaches about nature, conservation, and sustainability, inspiring people to care for the planet through engaging activities.



CLIMATE COMMUNICATION SPECIALIST

Helps explain to people why the Earth's climate is changing and what we can do to take care of our planet better.



PROFESSION



PROFESSION



PROFESSION



PROFESSION





CARBON SCIENTIST

**Helps us understand
and find ways to reduce
the amount of carbon in
the air to keep the
planet healthy.**



MĀTAURANGA MĀORI KAIARAHĪ (LEADERS)

**Māori experts in Te
Ao Māori and Māori
worldview.**



MANA WHENUA

**Tangata
whenua/people of
the place/habitat in
question.**



KAITIAKI

**Carers for the
environment in the
widest sense.**



PROFESSION



PROFESSION

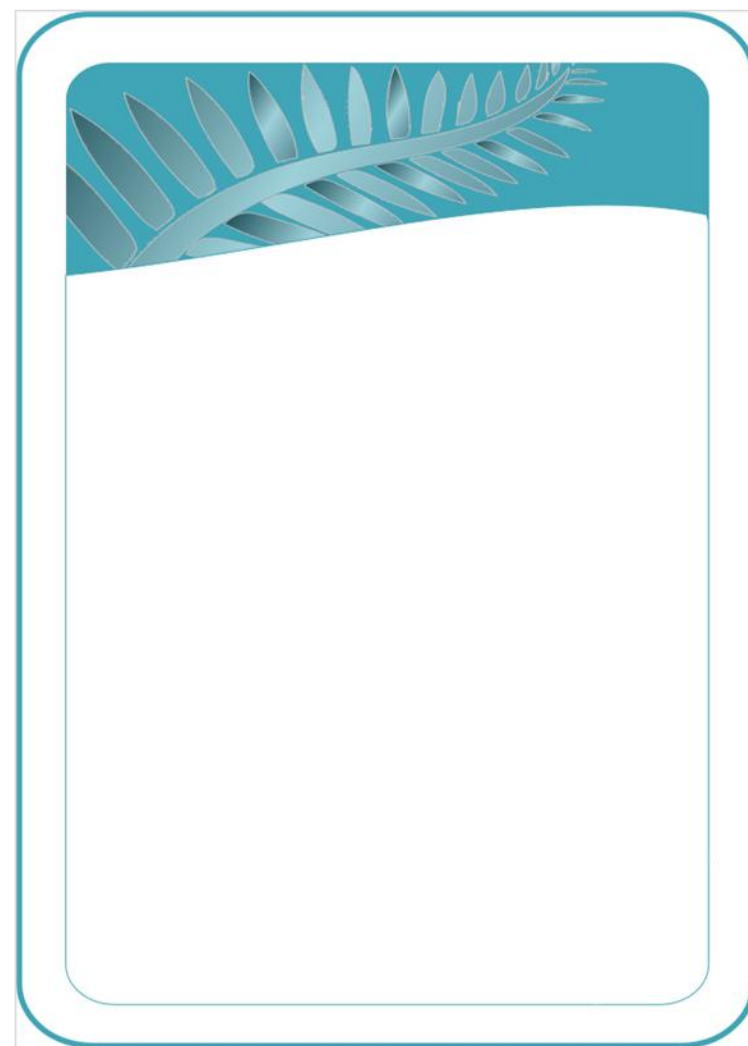
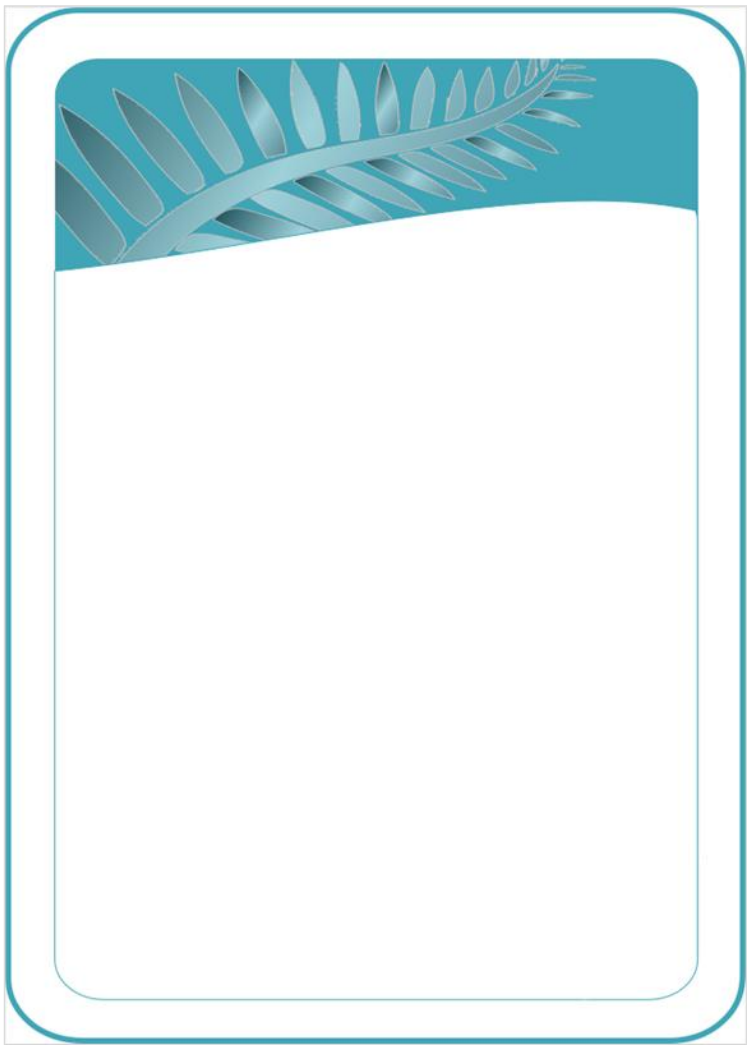


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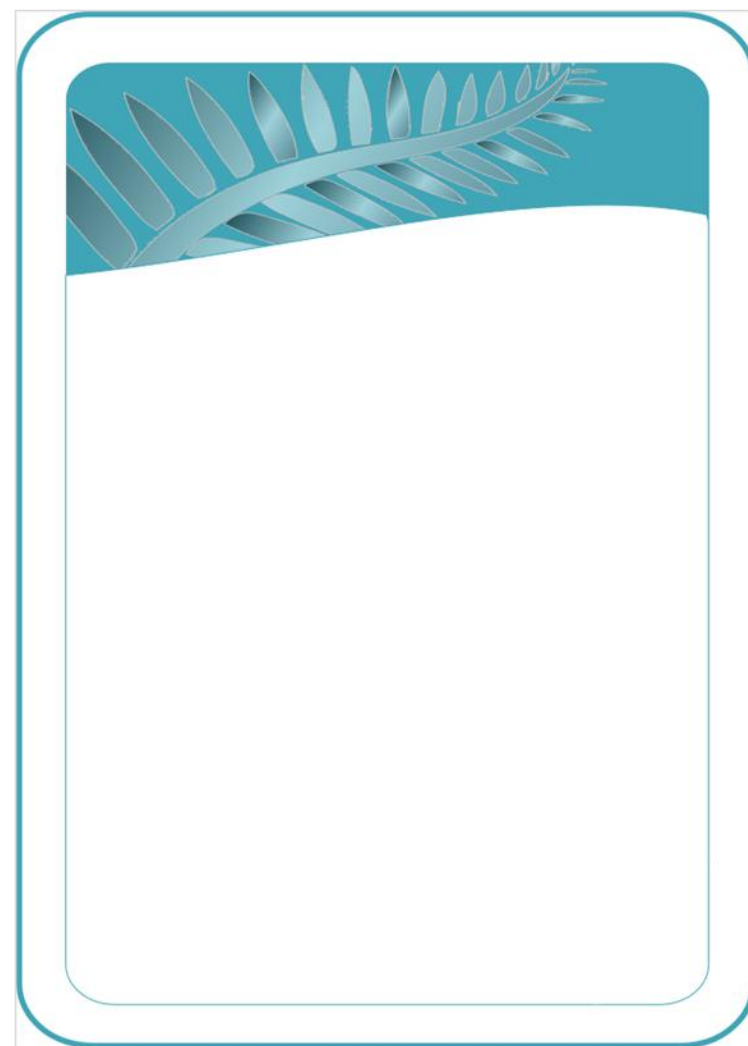
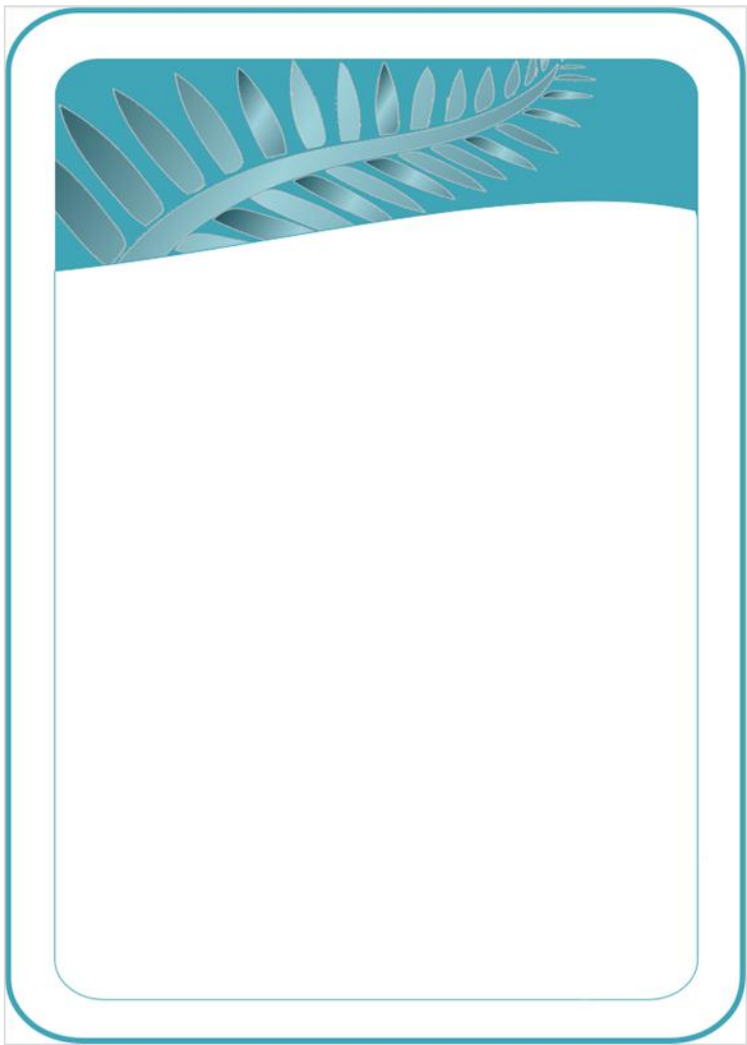
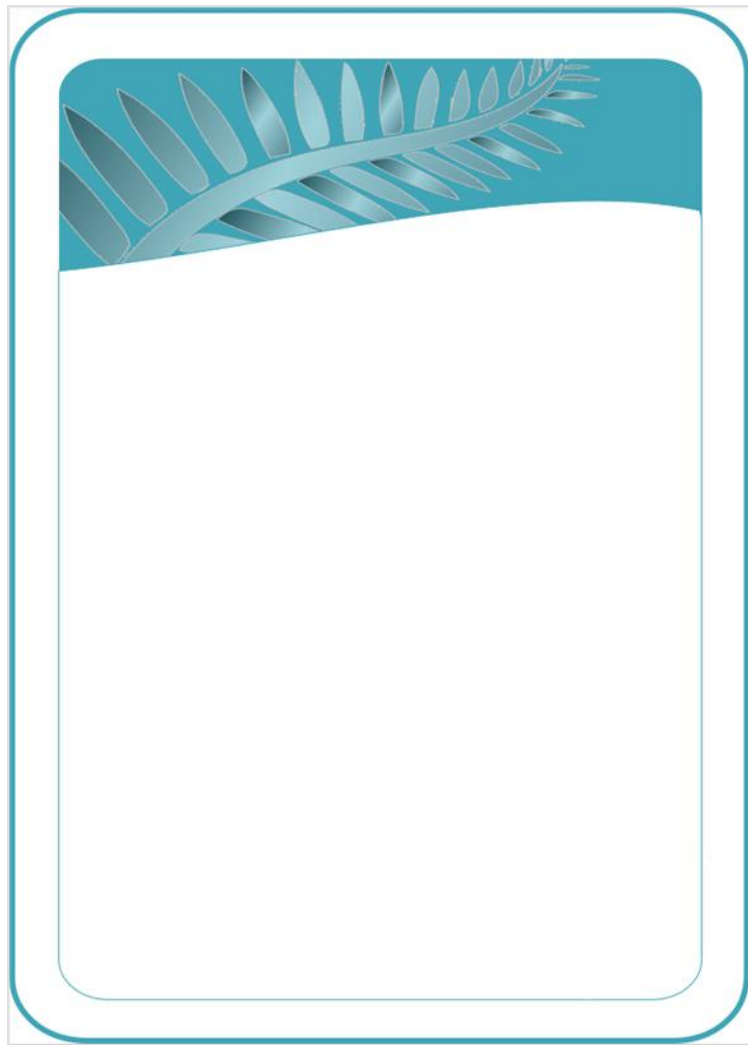


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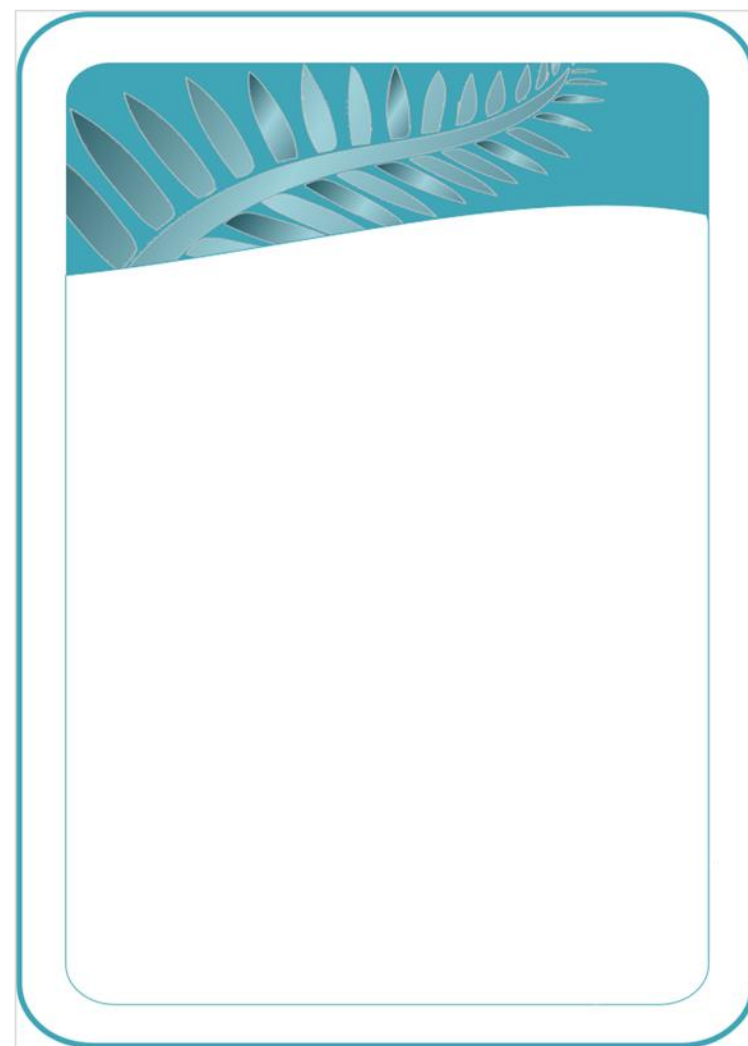
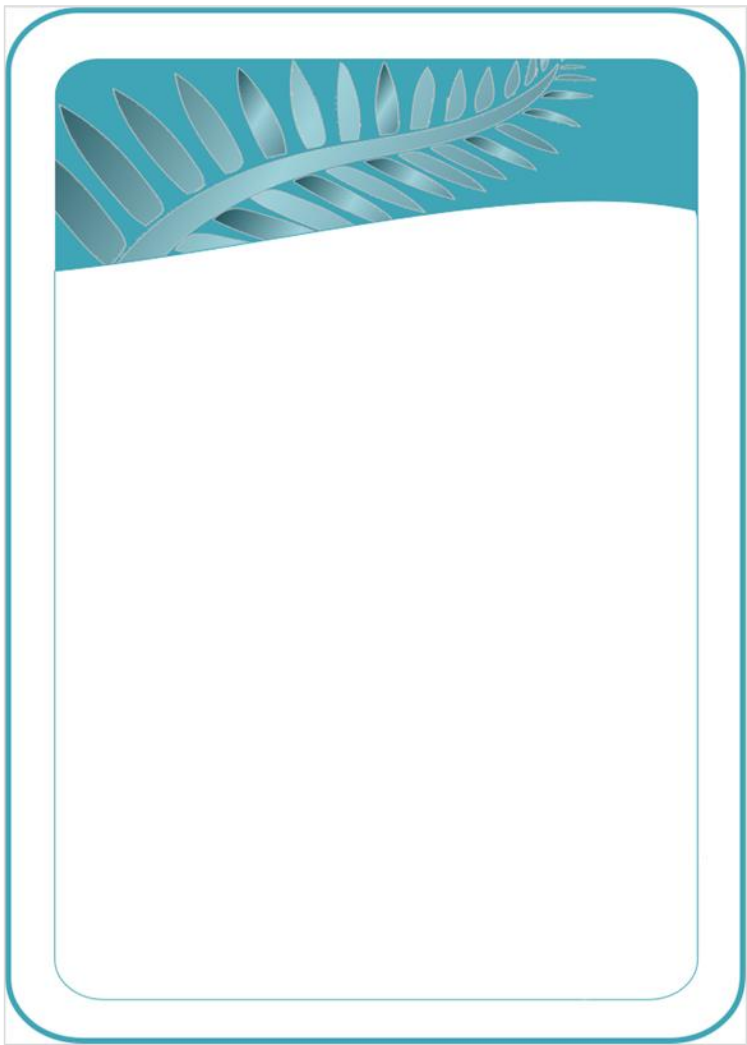


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ACIDIFICATION

When the water becomes more acidic. In oceans, CO₂ absorption increases acidification, harming sea creatures like corals and shells.

Glossary

BIODIVERSITY

Variety of life on Earth, encompassing the diversity of species, ecosystems, and genetic variations within and among them.

Examples: animals, plants, insects, sealife and humans.

Glossary

INFRASTRUCTURE

The support system for a city or town, including things like roads, bridges, water and wastewater systems that helps everything work smoothly.

Glossary

CLIMATE ADAPTATION

Making adjustments to how we live to better deal with the changes in weather and climate.

Glossary

BIODIVERSITY

Glossary

ACIDIFICATION

Glossary

CLIMATE ADAPTATION

Glossary

INFRASTRUCTURE

Glossary

COASTAL RESILIENCE

Making sure our shores are strong and prepared for challenges like storms and rising sea levels.

Examples: Seawalls and groynes

Glossary

CULTIVATE

To grow and take care of plants, making sure they have the right conditions to thrive.

Glossary

DEFORESTATION

Cutting down a lot of trees in a forest (usually for farming in Aotearoa).

Glossary

EARTH SYSTEM DATA

Information that helps us understand and take care of our planet better, for example: information collected from satellites, weather stations, and sensors, like temperature, rainfall, and changes in the environment including Mātauranga Māori.

Glossary

CULTIVATE

Glossary

COASTAL RESILIENCE

Glossary

EARTH SYSTEM DATA

Glossary

DEFORESTATION

Glossary

ECOFRIENDLY

Being kind to the Earth by using things that don't harm the environment, like recycling, saving energy, and taking care of nature. Kaitiakitanga in Te Ao Māori.

Glossary

EL NIÑO-SOUTHERN OSCILLATION (ENSO)

A climate phenomenon characterized by the periodic warming of sea surface temperatures in the Pacific Ocean equatorial zone, and the west coast of North and South America, influencing global weather patterns.

Glossary

EQUITABLE

Equitable means being fair and giving everyone an equal chance or opportunity. Equity recognises people and places have different needs and resources to enable them to have the same opportunities on a level platform. It's like giving people the right shoes for their size feet, instead of the same size for everyone.

Glossary

FOSTER

To help something grow, like taking care of plants or animals to make them healthy and strong.

Glossary

EL NIÑO-SOUTHERN OSCILLATION (ENSO)

Glossary

ECOFRIENDLY

Glossary

FOSTER

Glossary

EQUITABLE

Glossary

GLACIER

A giant thick mass of ice accumulated over a long period of time.

Examples: Fox Glacier in Westland

Glossary

INNOVATIVE TECHNOLOGIES

Tools or ideas that people create to solve problems or make life better in new and exciting ways.

Glossary

MANAAKI

Manaakitanga means the process of showing respect, generosity and care for the people who use services, their whānau and communities.

Glossary

POWERFUL

In the context of greenhouse gases, means that methane (CH₄) has a stronger effect on the environment compared to carbon dioxide (CO₂).

Glossary

INNOVATIVE TECHNOLOGIES

Glossary

GLACIER

Glossary

POWERFUL

Glossary

MANAAKI

Glossary



**SEQUESTER(ING)
CARBON**

Finding clever ways to trap and store carbon dioxide to help the Earth stay healthy.

Examples: plants sequester (absorb and store) carbon dioxide through photosynthesis.

Glossary



VULNERABLE

Something or someone that needs extra care and protection because they can be easily hurt or affected.

Glossary



Glossary



Glossary

VULNERABLE

Glossary

**SEQUESTER(ING)
CARBON**

Glossary

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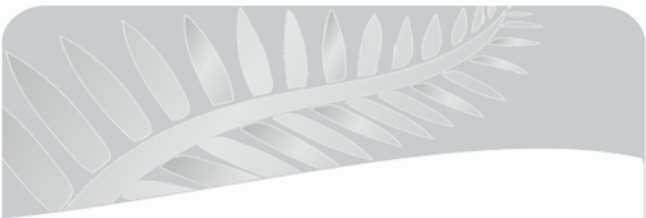
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