

SECTION 2



LEARNING ACTIVITIES: PRE- AND POST-FIELD TRIP



Huts on Mt Ruapehu. Photos: M McDonald

These activities are designed to help determine student prior knowledge and interest and engage students in learning about alpine environments. They can be adapted for different curriculum areas and levels. Some activities could be repeated or extended after your field trip to an alpine environment, to help reinforce and reflect on learning. You will find links to these activities throughout the resource (e.g. to support learning about alpine environments), using the information provided in Section 5.

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Digital tools to record prior knowledge/experiences, key questions and communicate learning

The following digital tools could be used throughout your unit to gauge prior knowledge and experiences, identify students' interests and communicate learning with your wider school community.

Introduce and set up digital tools at the start of your unit, and revisit them throughout your unit. Here are some ideas.

Inquiry focus and teaching/learning experiences	Digital tools
Dive in and Ask <ul style="list-style-type: none"> • Sharing and recording prior knowledge and experiences in alpine environments • Introducing key concepts • Determining and recording research questions • Sharing online resources that will support student research 	https://padlet.com/ https://socrative.com/ https://quizlet.com/en-gb http://www.wordclouds.com/
Investigate, come to conclusions, make meaning <ul style="list-style-type: none"> • Collating and sharing research, field investigation results, etc. • Planning for action – sharing ideas • Sharing conservation action stories • Reviewing and reflecting on learning 	https://edu.google.com/products/productivity-tools/ http://digitalnz.org/ https://www.visualthesaurus.com https://answergarden.ch/ http://www.symbaloo.com
Sharing our findings and taking action <ul style="list-style-type: none"> • Collating and sharing research, field investigation results, etc. • Planning for action – sharing ideas • Sharing conservation action stories • Reviewing and reflecting on learning 	https://piktochart.com/ https://tellagami.com/ http://blabberize.com/ http://www.wordclouds.com/ http://voicethread.com/ http://popplet.com/ https://www.wikispaces.com/ Blogs 101 ways to show what you know

ACTIVITIES

Cooperative grid

A cooperative grid is a good way to gauge prior knowledge/experiences and for peer teaching (use the worksheet in the Appendix, page 2).

Examples of questions that could be included in the grid:

- Some facts I know about the history of Tongariro National Park
 - Some facts I know about what visitors can do in the park
 - Some facts I know about DOC's role in the park
 - Something I would like to find out about the park.
1. Each student gets a sheet and fills in the first column. Emphasise that it is their own knowledge, no-one is marking it and it is OK if they know nothing at the moment.
 2. Students move around the room, asking other students and filling in all the squares.
 3. The 'other' student has to say what they know, and the student fills in what they have heard in the box.
 4. They can then answer a question for that student.
 5. It is important that they listen to the answer and write it in the box themselves. Students are using their listening and interpreting skills in this activity.
 6. Once all the sheets are filled in, put students in groups of 3 or 4. They have to read and share all the information they have. It can be useful for junior classes to give them a sheet with the questions and then the columns merged so they have room to fill in the consensus answers. With 3 students in a group they potentially have answers from 12 different students to compare.
 7. The grid can be used in different ways. You may wish to have the question headings on the wall for students to enter their answers. There could be a feedback session for the class - limit each group to a particular question.
 8. They could construct paragraphs from the answers to each question as group notes.

This activity can then lead into the Mountain tracks activity. Once the students have established what they know as a group, it is easier to develop deep questions.

Mountain tracks

This activity provides an interesting frame for students to create questions about a new topic, which they can then answer at the end of the unit.

1. Divide the class into small groups (3-4 students) and give each group an A3 sheet of paper.
2. Each group draws a mountain with the 6 tracks - 3 on either side of a centre line (see the example sketch below).
3. Students then think of a question about the topic that they would like to find out for each track on the mountain and write it on the track.
4. Teachers can give question prompts for students to use (e.g. the '5 W's and an H' - what, when, where, why, who and how?).

Encourage students to use extended questions by adding conditions, for example:

- What if ...?
- What is an alternative?
- Who else might ...?
- Who makes decisions?
- When would we ...?
- How would this be an issue?

Over the course of the unit students will gather information so that at the end of the unit they can identify what they have learnt by answering the questions on the tracks. This is a good visual representation of student learning that could be displayed in your classroom.

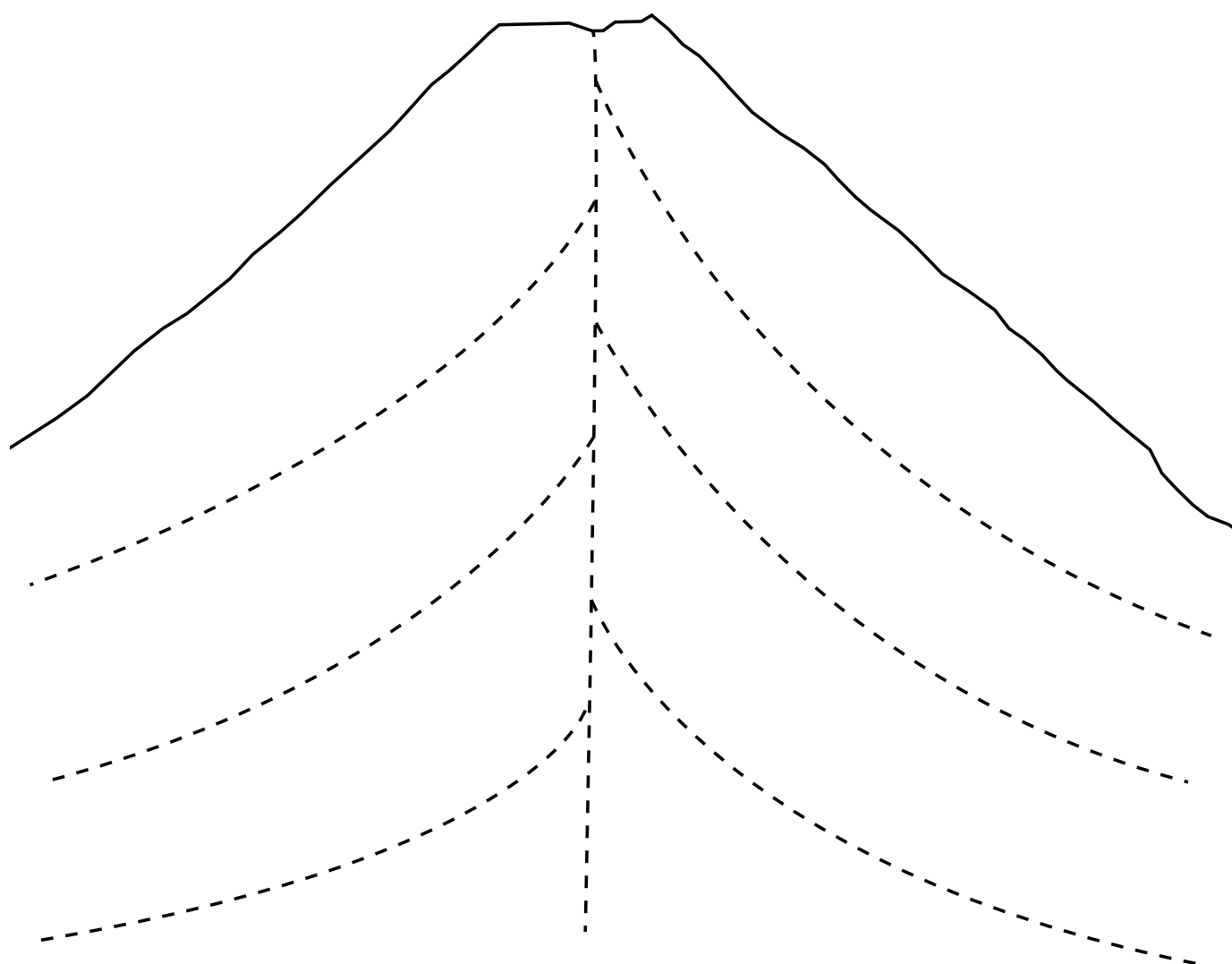


Figure 1: Example sketch of a mountain.

Consequence wheel

Students use a consequence wheel by writing:

1. An action in the centre.
2. Then writing some consequences of this action in the surrounding two spaces.
3. Students write the consequences arising from these in the next four spaces, and so on.
4. More layers may be added if needed.

To help students focus their thoughts, it can be useful to have positive consequences at the top of the wheel and the negative consequences at the bottom of the wheel, or they could colour code the positive and negative consequences. When students are used to the concept, make each consequence lead to a positive and a negative consequence. This is shown in the example below.

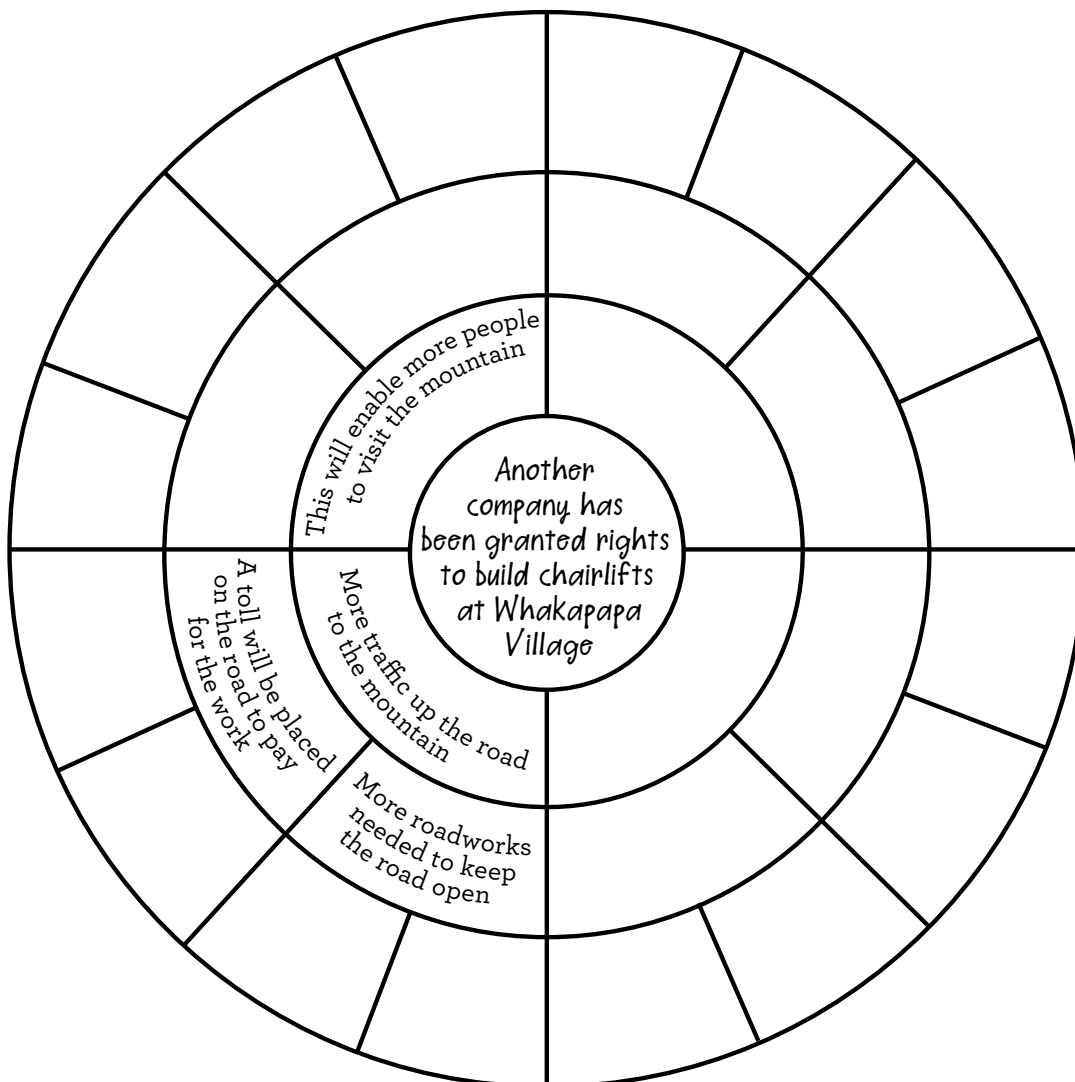


Figure 2: Example sketch of a mountain.

(Find a blank consequence wheel worksheet in Section 7: Appendix page 3)

Home and expert

This activity can help students identify topics that interest them. It is not necessary for everyone to be an expert in all areas but this helps them be an expert in one aspect and apply their learning to the wider topic.

Decide on the four topics students should be familiar with, such as:

- Skiing, tramping, accommodation and businesses on the mountain
- Mountain snowberry, alpine scree wētā, pipit/pīhoihoi, speargrass
- Tongariro, Ngauruhoe, Ruapehu and Taupo volcanoes
- Alpine high, mid, low and broadleaf forest ecosystems.

The information and photos in Section 5 can be used for this activity or students can do their own research. The more material you have, the longer the activity will take.

1. Number the participants 1, 2, 3, 4, 1, 2, 3 etc. until everybody has a number. Ask them to form themselves into home groups, each group containing one 1, one 2, one 3 and one 4.
2. Ask all the 1's to go to one corner at the back of the room, the 2's to the opposite corner, the 3's to a corner at the front and the 4's to the opposite corner.
3. Give each group their different material. Set a time frame for reading and taking notes. You could provide a template for them to fill in.
4. Each member of the group then has to become an 'expert' on their topic, as they will need to teach their home group.
5. Participants then go back to their home groups and share what they have learnt about their topic.

(Activity adapted from SEREAD)

Say-it grids

Say-it grids can be applied to any context, as an interactive way of processing information that has been researched or discussed. Students take on a role and research what that person would say in a specific scenario from that person's perspective.

Provide slips containing roles in boxes numbered Grids 1-4. Students take a sheet from one of the boxes.

For example:

Say-it grid 1

1. Number yourselves 1-4.
2. Imagine it is the 1970s in New Zealand.
3. Look at your role from the numbered box. Your task is to speak for 2 minutes as that person.
4. Spend time during the next 2 days researching your part and practising your speech. What might your character want right now? In the future? What are the values and attitudes that affect their actions? Decide how you will speak from that person's perspective.
5. At the given time, you will each have 2 minutes to speak, uninterrupted by any other speaker. Each person may ask one question each after the speaker has finished.

1. You are Jane, a keen skier who has returned from Europe eager to see more facilities at Whakapapa.

2. You are George, the owner of a motel keen to see more people coming to the mountain all year-round.

3. You are Natana, a local who has close iwi ties to the mountain and is keen to see it under Māori management.

4. You are Mary, a botanist, concerned about the effect of construction and more visitors on the flora of the mountain.

Grids can be found in the Appendix (pages 4-6) to photocopy and distribute to students.

Definition whispers

This activity that can be used at all year levels and with any unit of work to introduce new vocabulary/key concepts. It is a written form of 'telephone whispers'. It could be used early in the unit as a formative activity or as revision towards the end.

1. Divide class into groups of four.
2. Each student receives a sheet with a different word (see example below). Explain that they need to keep their word hidden from the rest of their group.
3. Each student writes a definition for their word. Remind them that they cannot use the word itself in their definition.
4. They then fold the paper so that the word is hidden and pass their paper to another person in their group.
5. Students then write the word they believe corresponds to the definition in front of them.
6. They then fold again to hide the definition and pass it on with their word showing. Next time round they write a word again etc.
7. When the papers are complete they can unfold and discuss the results.

For example:

Teacher	Student 1	Student 2	Student 3	Student 4
Word	Definition	Word	Definition	Word
Endemic				

Groups can have different sets of words, such as -

- Threatened, endangered, extinct, vulnerable
- Igneous, volcanic, metamorphic, sedimentary
- Alpine, dryland, estuary, forest
- Pest, predator, prey, producer
- Pollination, fertilisation, dispersal, germination

What am I?

This game is often used as an icebreaker. It is also a good introduction to a topic. It could also be played with place names in the alpine region you are studying ('Where am I?').

Students should be reminded of the rules of the Suchman questioning technique at:

<http://tnst.randolphcollege.edu/pedagogy/teaching-strategies/suchman-inquiry>.

- Answers can be only Yes or No.
- A 'Yes' answer means you can ask another question. A 'No' answer means you move on.

1. Students are given a sticky note with the name or photo of an alpine plant or animal. They place their sticky note on another person's back, without showing them what is written on the sticky note.
2. Each student then goes around questioning other students until they find out what is on the sticky note on their back, until they know "who they are".
3. They could then be asked to form a food chain or food web if the teacher has ensured sufficient links are present. Or to find another animal or plant that shares something in common with them (e.g. faces the same threats).

Tricky tracks

This activity is designed to help students distinguish between observation and inference. It introduces the concept that all ideas are valid unless there is further evidence to suggest otherwise.

<http://media.rsc.org/Nature%20of%20science/NSci-Bbox1.pdf>

Web of life

This is a great activity for showing connections between living organisms.

<http://www.landcareresearch.co.nz/science/plants-animals-fungi/plants/weeds/biocontrol/education/lessons-and-activities/web-of-life>

Investigating the impact of waste

'Waste timeline' is an activity about the time it takes for different types of rubbish to decay and is very appropriate for an alpine environment. Remember that all decomposition will take much longer in an alpine environment where the ground may be frozen for 3-4 months of the year.

'What's waste got to do with conservation?' is an activity about waste in the Pacific Ocean. It is a good way to generate questions about the impact of waste in an alpine environment.

Both activities can be found on TKI at <http://nzcurriculum.tki.org.nz/Curriculum-resources/Education-for-sustainability/Learning-experiences>

Choose your weapon

Students investigate and choose a biocontrol agent for a fictitious weed. This is a great activity to support learning about the control of heather in Tongariro.

<http://www.landcareresearch.co.nz/science/plants-animals-fungi/plants/weeds/biocontrol/education/lessons-and-activities/choose-your-weapon>

People and alpine environments – examining different values and perspectives

This activity allows students to examine different values and perspectives, and how these can have an impact on both people and the natural environment.

- Perspectives on Tongariro National Park' provides fictional examples of people's perspectives about

Tongariro National Park. It could be used as a starting point for researching groups of people involved with the alpine environment you are studying. See the Appendix, page 7

- In groups, students could use one of the featured people/groups to examine:
 - How does this person/group view and use the alpine environment?
 - How would the person/group interact with and/or affect alpine biodiversity?
 - What might the values of this person/group be?
 - How could these values affect their decisions?
 - How are these values similar or different to your own?
- Groups could then present or share their ideas.

Shake, rattle and roll

These activities focus on some of New Zealand's volcanic geology, exploring specific volcanoes, the consequences from their eruptions and the effect on local biodiversity. The resources are a good introduction for years 9 and 10 students.

www.doc.govt.nz/education-shake-rattle-roll

Cut and paste volcanic information

This activity can be used to show students' understanding of the Tongariro Volcanic Plateau, over the course of your unit of study.

1. In groups, students create an A3 plan of the Tongariro Volcanic Plateau.
2. Cut and paste the information in text boxes (see the Appendix, page 8) into the correct areas of the plan.

What rocks what?

Learning intention: To be able to distinguish between three major rock groups: igneous, sedimentary and metamorphic and name the various rock types within these groups, as well as the likely environments in which they were formed.

The rock wheel and information tables used for this activity could also be used to help identify rocks during your field trip. See the Appendix, pages 9–13.

An overview: The rock cycle

All three major rock types can be made into another type. Rocks are eroded by water, wind and ice to form sediments. These sediments are then buried, compacted and hardened to form sedimentary rocks. If the rocks are buried to an extremely deep level, they undergo heating and high pressures to form metamorphic rocks. If rocks get hot enough they melt to become magma. When magma cools it forms intrusive igneous rocks below the Earth's surface and extrusive rocks when erupted above the Earth's surface.

Activity materials needed:

- A selection of rock samples
- A hand lens/magnifying glass
- Coin
- Rock wheel and information tables
- Examples of how to describe a rock
- Glossary.

Activity instructions:

Using the rock wheel and information tables, answer the following three questions for each rock sample:

1. Which rock group does the sample belong to (e.g. sedimentary)?
2. What is the sample's rock name (e.g. conglomerate)?
3. What is the most likely way this sample of rock was formed (e.g. in a river setting)?

It is important to think about what kind of environment each rock was likely formed in. Try to think about modern day examples and apply them to the samples.

Remember one of the fundamental laws of geology is **uniformitarianism** – natural processes we see happening now (e.g. volcanoes, erosion) also happened throughout geological time.