

Preparing for Eruptions

What will happen in future eruptions and how can we be prepared?

Activities

1. Read or listen to Matt's Volcano Story from What's the Plan Stan Stories on:

<http://www.whatstheplanstan.govt.nz/teacher.html#disasters>

- Discuss what Matt saw and did before, during and after the eruption.
- Complete the worksheet to show where he got his information from, how he stayed safe and the agencies who were managing the response to the eruption.

2. Print individual copies of the Volcanic Hazards at Whakapapa pamphlet from:

http://www.geonet.org.nz/docs/volcano/Whakapapa_poster_A4.pdf

- Use the information on the pamphlet to complete the worksheet.

3. Listen to the Radio NZ interviews about current research on the Auckland Volcanic Field. Go to:

http://www.radionz.co.nz/search?mode=results&queries_all_query=Volcanoes

- Select:
 - Auckland's Volcanoes, from Our Changing World 6 Nov 2008
This explains the Devora Project (Determining Volcanic Risk in Auckland)
 - When the Siren Goes Episode 3 – Volcanoes 25 July 2008
Details current knowledge of NZ volcanoes and what would happen in an Auckland eruption
- Write or draw an imaginary eruption scenario for a new Auckland volcano. Include step by step details of the warning signs, the eruption sequence, the effects on the local population and environment, and the role of disaster management agencies such as Civil Defence.

A dramatic, detailed example of an imaginary eruption sequence is available on the Auckland Regional Council website.

<http://www.arc.govt.nz/environment/volcanoes-of-auckland/scenarios.cfm>

Students should aim for a less detailed sequence of physical events combined with information on the actions taken by the affected population.

Learning Intentions

- Relate volcanic hazards to their effects on individuals and property.
- Understand that all individuals are responsible for managing themselves in a volcanic crisis and may be able to assist others
- Understand that likely eruption scenarios are worked out by scientists to improve disaster preparation and management
- See disaster response as a multi agency task
- Identify groups trained to help in volcanic crises and their role in a disaster.

Success Criteria

Students can

- Name information sources available during a volcanic crisis
- Detail actions to ensure personal safety in a volcanic crisis
- Explain how scientists contribute to disaster preparation and management
- Name groups trained to help in volcanic crises and their role in a disaster.
- Write or draw a plausible eruption scenario for Auckland

Resources

- Matt's Volcano Story Worksheet
- Volcanic Hazards at Whakapapa Worksheet.

Vocabulary

crisis, management, preparation, scenario, agency, Whakapapa, response, Civil Defence, modelling

Preparing for Eruptions

What will happen in future eruptions and how can we be prepared?

Nothing is certain about future eruptions of New Zealand's volcanoes but all indications are that they will continue to occur. Knowledge of past events and current monitoring enable predictions to be made but volcanoes remain almost as unpredictable as earthquakes.

In the words of the Ministry of Civil Defence and Emergency Management:

'Don't think if, think when.'

The risks posed by New Zealand's natural hazards are a fact of life. Disasters happen quickly and without compassion. Therefore it is important that all New Zealanders are prepared so that the impact of a natural disaster is reduced and recovery is faster'.

The Ministry of Civil Defence and Emergency Management has the task of conveying disaster preparation information to the public. In 2006 the Ministry began a long term, public education programme aimed at increasing individual and community awareness and preparedness for disasters.

This programme includes:

- A website targeted at providing user-friendly information and advice for the public on what to do to be better prepared. www.getthru.govt.nz
- Advertising in the Yellow Pages regional directories
- What's the Plan Stan resource for primary and intermediate schools www.whatstheplanstan.govt.nz
- Disaster Awareness Week

A revised version of What's the Plan Stan that aligns with the new curriculum was sent to all NZ primary and intermediate schools in August 2009. It is a comprehensive, inquiry based resource that covers all NZ's natural hazards. Matt's Story from this resource details an eruption scenario and is used to show the personal actions and multi agency response necessary during a volcanic crisis.

The Ruapehu eruptions of 1995/96 lasted a total of four months and threw out more material than the combined total of all Ruapehu's eruptions since European settlement.

At least 16 organisations had key monitoring and management roles during the events. Successful management of any volcanic crisis requires excellent communication and a coordinated response from all agencies involved.

A large percentage of New Zealanders and tourists will ski, snowboard, climb or walk in Tongariro National Park. There are few places in the world where so much activity takes place on the slopes of active volcanoes. The volcanic hazard maps of Ruapehu which are available to all visitors to the National Park are probably not as widely read as they should be. Practise eruption events on the ski slopes show that not everyone knows where to go to avoid a lahar and outside the skifield areas there will be no loudspeakers to give instructions. In recent tsunami events there have been well informed children who have saved lives by warning people to head for higher ground. If they apply this knowledge to lahar hazards as well, people on the mountain are more likely to head in the right direction.

Planning for predicted events is a large part of disaster preparation. The potential hazards of our active volcanoes are well known and eruption scenarios have been developed. These scenarios give a basis for emergency management plans.

The Determining Volcanic Risk in Auckland (Devora) project is outlined in the radio interview. This ongoing work has already improved understanding of the history of the Auckland Volcanic Field. Better understanding of past events is likely to increase the accuracy of modelling of future events and help refine disaster management preparations.

Eruptions cannot be stopped but damage to people and infrastructure can be reduced with increased knowledge of what to expect.

Curriculum Links

Planet Earth and Beyond

Physical World

Science Concept	NOS
PE-Earth Systems L3/4 -develop an understanding of what makes up our planet LW-Ecology L3/4 -explore physical phenomena such as movement, forces, sound and waves	Communicating in Science
	Investigating in Science
	Understanding about Science

Social Science

Place and Environment

L4-understand that, events have causes and effects

Identity, Culture, and Organisation

L4-Understand how people participate individually and collectively in response to community challenges.

English

Processes and Strategies

L3&4-creates a range of texts by integrating sources of information

Assessment

In order to write or draw a plausible eruption scenario, students will need to process information from a variety of sources.

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What will happen in future eruptions and how can we be prepared?

What will happen in Auckland if a new volcano emerges?

The Auckland Regional Council website has extensive information on all aspects of the Auckland Volcanic Field including: day by day scenarios for possible future events and how they will be managed, how to be prepared for volcanic disasters and how to clean up after an eruption. This part of the ARC website is a comprehensive resource that has been developed for schools.

http://www.arc.govt.nz/environment/volcanoes-of-auckland/volcanoes-of-auckland_home.cfm

For more information on the Devora (Determining Volcanic Risk in Auckland) Project which was launched in 2008, including links to further information see:

<http://www.iese.co.nz/pageloader.aspx?page=1556d204d0d0>

What will happen if Egmont Volcano (Taranaki) erupts?

Massey University researchers have developed a scenario for a reawakening of this volcano.

http://volcanic.massey.ac.nz/research/infrastructure_protection.html

Although it has shown little or no sign of activity for over 200 years, recent research suggests Taranaki has erupted, on average, at least once every 90 years over the past 9000 years. The last eruption was in 1755 and formed the present cone. There is evidence that past eruptions of Taranaki have occurred in swarms of semi continuous eruptions over many years.

For information on this recent research and the effects a similar eruption would have see;

http://volcanic.massey.ac.nz/research/taranaki_due.html

Matt's Volcano Story

Use the information in Matt's story to fill in the table below.
The first events have been partially completed for you.

Name:

What Matt saw, felt or heard	What Matt did	Information source	Safety measures	Agencies involved
Felt small earthquakes	Drop, cover and hold	Uncle	Find a safe spot in an earthquake	
Heard radio bulletins warning of a possible volcanic eruption		Radio announcer		Communication networks such as radio stations relay information from Civil Defence to the public

Activity sheet 12

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Volcanic Hazards at Whakapapa

1. How will you be notified of an eruption if you are on the Whakapapa skifield?
2. If there is an eruption while you are on the mountain the loudspeaker messages will tell you where to go. If you cannot hear the messages where should you go?
3. What is the main danger to people on the skifields? Could people outrun this danger?
4. What are the extra dangers for people in the summit hazard zone and what should they do in an eruption?
5. Which T-bars are at risk from lahars and why?
6. Knoll Ridge Café and West Ridge Café are close to possible lahar paths. What aspect of their location makes them safe areas?
7. What would the lahar be made from?
8. If you saw or heard an eruption begin, what instructions would you give to nearby skiers in the two situations below.

Skiing in Happy Valley



Waiting at the bottom of the Waterfall T-bar

