Questions from page 180 of *ESA Study Guide Year 10 Science*

**Understanding**

1. Name two places where the Maori fire gods were said to have burst from the ground. 
   
   and

2. Give two reasons geothermal areas have special significance for Maori.

3. What proportion of New Zealand’s electricity needs could potentially be met by using geothermal energy to make electricity?

**Thinking**

What sort of emissions do geothermal power stations produce – and not produce?

**Contributing**

What other countries in the world have geothermal resources? Find out how one other developed country makes use of its geothermal resources.

Answers (except for ‘Contributing’) are provided on page 319 of *ESA Study Guide Year 10 Science*
Questions from page 184 of *ESA Study Guide Year 10 Science*

**Understanding**

1. What is the difference between oceanic and continental crust?

   [Blank space for answer]

2. What element makes up most of the core of the Earth?

   [Blank space for answer]

3. In what way does the magnetic field protect Earth?

   [Blank space for answer]

4. What causes the tectonic plates to move?

   [Blank space for answer]

5. Which two tectonic plates collide at New Zealand?

   [Blank space for answer]

**Thinking**

Name four countries, other than New Zealand, that lie on the Pacific ring of fire.

[Blank space for answer]

[Blank space for answer]

[Blank space for answer]

Answers are provided on page 319 of *ESA Study Guide Year 10 Science*
Chapter 14: The geosphere
Volcanoes

Understanding

1. On which tectonic plate does the North Island lie?

2. Choose from the word list to find the correct word for each of the following descriptions.
   andesite  caldera  magma  pyroclastic flow  subduction

   Descriptions
   a. Volcano that forms a cone shape: ___________________________
   b. One tectonic plate moves under another: _______________________
   c. Large crater, often containing a lake: _________________________
   d. Melted rock, deep under the ground: _________________________
   e. Fast-moving current of hot gas and rock: ____________________

3. Name two New Zealand andesite volcanoes.
   ___________________________ and ___________________________

Thinking

Explain how Lake Taupo formed from a caldera volcano.

Contributing

Research the likelihood and possible dangers of volcanic activity from one of:
   • Mount Ruapehu
   • Mount Taranaki
   • Rangitoto.

Answers (except for ‘Contributing’) are provided on page 320 of ESA Study Guide Year 10 Science
Questions from page 192 of *ESA Study Guide Year 10 Science*

**Understanding**

1. What causes earthquakes?

2. What is the difference between the *focus* and the *epicentre* of an earthquake?

3. Which sort of earthquake waves travel most quickly?

4. Describe three effects on Wellington of the 1855 earthquake.

5. Give two uses for seismometers.

**Thinking**

How many points are on the Richter scale?

**Contributing**

Explain how to be prepared for an earthquake and how to take cover during one.

Answers (except for ‘Contributing’) are provided on page 320 of *ESA Study Guide Year 10 Science*
**Questions from page 194 of *ESA Study Guide Year 10 Science***

**Understanding**

1. How old are the Southern Alps?

2. What process is continually creating the Southern Alps?

3. What process is continually wearing the mountains down?

4. On the following map of the South Island and the Alpine fault, label the areas that have been moved apart by 480 km.

![Map of South Island and Alpine fault](image)

5. What carved out the U-shaped valleys of Fiordland?

**Thinking**

Complete the following flow chart by adding three more boxes to follow the journey of a rock, from the time it becomes part of a mountain to when it becomes sediment in the sea.

- Uplift – tectonic plate movement uplifts the rock as the mountain rises up out of the sea.
- Ice and water – the action of ice and water loosens the rock from the mountain.

Answers are provided on pages 320 and 321 of *ESA Study Guide Year 10 Science*
Questions from page 196 of *ESA Study Guide Year 10 Science*

**Understanding**

Draw a diagram of the heat cycle. Label your diagram with the following labels:

1. Sea water evaporates
2. Water with dissolved minerals runs into rivers
3. Minerals settle on the ocean floor
4. Limestone forms
5. Limestone is subducted
6. Magma forms
7. Volcanoes erupt
8. Carbon dioxide in the atmosphere.

**Thinking**

Explain how the cycle involving carbon dioxide helps to even out heat on Earth.

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**Contributing**

Burning fossil fuels (oil, petrol and coal) is putting extra carbon dioxide into the atmosphere. We need to use less oil, petrol and coal. Suggest what life would be like if we were not able to burn fossil fuels.

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*Answers (except for ‘Contributing’) are provided on page 321 of *ESA Study Guide Year 10 Science*.*