VCE GEOGRAPHY
UNIT 1 – AOS 1: CHARACTERISTICS OF HAZARDS
OVERVIEW

VCE Geography Unit 1 - AOS 1: Characteristics of Hazards

• Hazards and hazard events in general
  • Geological Hazards
  • Hydro-meteorological hazards
  • Biological hazards
  • Technological hazards

• In depth study of two hazards
ACTIVITY 1: HYDRO-METEOROLOGICAL HAZARDS

Pre-activity content

• Introduction to hydro hazards lesson
  • What are the hazards? (bushfires, storms, droughts, floods)
  • Why are they hydro-hazards?
  • Key characteristics and causes
    • Focus on Australian landscape and Southern Oscillation – in particular El Nino.
    • Why is Australia susceptible to hydro-hazards?
Collaborative Activity – Part 1

- Students are allocated pairs and a specific hydro-hazard
  - Bushfire, drought, floods, storms
- In relation to pre-activity content think about the following through a guided task sheet:
  - What is your hazard and how/why does it occur?
  - Where do you think your hazard is most likely to occur in Australia? Predict, thinking about the impact of El Nino and the images of its impact you have looked at.
  - Why is hazard prevalence distributed like it is? Zoom in and look at different scales. Is it similar to your prediction?
  - Obtain pictures of before and after of a particular hazard event– think about the possible impacts. Google maps historical imagery as a way to do this.
  - What is the scale of the hazard generally? Can you find an exception?
  - Is the hazard a natural or human cause?
**VCE GEOGRAPHY - UNIT 1: Hazards and disasters**

**AOS 1: Characteristics of Hazards**

**HYDRO-METEOROLOGICAL HAZARDS COLLABORATIVE ACTIVITY**

**Task Sheet**

**PART 1**
- You will be allocated a partner as well as a specific hydro-meteorological hazard (drought, flood, storm, bushfire).
- Using your allocated hazard work through the following questions:
  1. What is your hazard and how/why does it occur?
  2. Where do you think your hazard is most likely to occur in Australia? Predict, thinking about the impact of, and maps displaying the effects of Southern Oscillation and El Nino that you have seen.
  3. Now, look at how your hazard is actually distributed? Zoom in if possible and look at the distribution at different scales. Is the distribution similar to your prediction?
  4. Locate before and after pictures of your hazard event. Think about the possible impacts. (You could potential do this on Google Earth)
  5. One what scale does the hazard generally occur? Can you find exceptions?
  6. Is the hazard a natural or human cause?
- There are links to help you get started below, however you are welcome find further information beyond this if you like.

**PART 2**
- Find the other people within the class who were allocated the same hazard as you and your partner.
- Compare and discuss each partner groups answers to the part 1 questions.
- Now think about and record your answers/thinking to the following questions:
  1. How does the hazard relate to the concepts of interconnection and change?
  2. Does it relate to any other concepts?

**PART 3**
- As a group and in a way of your choosing, present the information to the questions looked at in part 1 and 2, as well as any other relevant and interesting information related to your hazard to the class.

**LINKS FOR EACH HYDRO-METEOROLOGICAL HAZARD**

- **Bushfire**
  - https://d2hr9r8at9filks.cloudfront.net/65444/65444.pdf - Chapter 7

- **Floods**
  - https://d2hr9r8at9filks.cloudfront.net/65444/65444.pdf - Chapter 5

- **Drought**

- **Storms**
  - https://d2hr9r8at9filks.cloudfront.net/65444/65444.pdfn - Chapter 6

**Link to El-Nino information and maps**

LOTS OF GOOD RESOURCES ON GEOSCIENCE AUSTRALIA AND THE BUREAU OF METEOROLOGY


Lots of good resources on Geoscience Australia and the Bureau of Meteorology

Not just maps – these sites also contain lots of really valuable information.
ACTIVITY 1: HYDRO-METEOROLOGICAL HAZARDS

Collaborative Activity – Part 2

- Partner groups locate others who were allocated the same hazard as them.

- Groups compare and discuss each pairs response to part 1.

- Groups think about the following questions:
  - How does the hazard relate to the concepts of interconnection and change?
  - Does it relate to any other concepts?

Collaborative Activity – Part 3

- Group is to present collective findings to the class
**LINKS TO THE STUDY DESIGN**

<table>
<thead>
<tr>
<th>Key Knowledge</th>
<th>Key Skills</th>
<th>Concepts</th>
</tr>
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</table>
| “An overview of hazards including their global distribution, location, scale, frequency, sequence, magnitude and their role in natural systems”; | “Analyse maps, data and other geographical information to develop descriptions and explanations”; | **Explicitly:**  
- Interconnection  
- Change  
- Scale |
| “The classification of types of hazards by their causes and the interconnection between causes;” | “interpret and analyse maps and other geographical data and information” (VCAA, 2015, p. 15). | **Implicitly:**  
- Distribution  
- Movement  
- Process |
| “The potential and realised positive and negative impacts on people and environments in the short and long term” (VCAA, 2015, p. 15). | | “VCE Geography is designed around two key themes: interconnection and change” (VCAA, 2015, p. 5) |
| | | “Concepts are used in the exploration of each area of study to assist in the observation, description, interpretation and analysis and explanation of geographic phenomena” (VCAA, 2015, p.5). |
Collaborative learning
- Increase self-efficacy;
- Peer explanations as improving student outcomes (Emerson, 2013).

Inquiry learning
- Beginning at analysis stage – students communicating and reflecting their findings (Matthews & Cranby, 2014).
- Gain conceptual insight and understanding (Hoepper, 2014).

Higher order thinking
- Apply, analyse and evaluate
- Strong Geography (Rutherford, 2015).

Formative Assessment
- Ability to change curriculum to suit students;
- Timely feedback (Bennetts, 2005).
What do you see?
AoS 1: Characteristics of Hazards

Where was this photo taken?
What has occurred in this location?
What are some factors of risk for people in this image?
Collaborative Activity – Part 1

• In table groups, students are given an image of the April 2015 Earthquake in Nepal (but not told what/where it is from).
• Students will need to analyse the image and pull ideas of where they believe the source came from.
• Students will then need to log on to Padlet.com on their device and answer the following questions:
  1. Where was the photo taken?
  2. What has/is occurring in this image?
  3. What are some of the factors of risk for the people in this image?
• Class discussion surrounding the Nepal Earthquake April 2015.
Mini Lecture: Part 2

- Watch and discuss CCTV footage from Nepal Earthquake, April 2015.

Teacher prompting questions:
- Describe the devastation the earthquake caused.
- What is the top layer of the earth called?
- What are tectonic plates?
- Where do most earthquakes occur?
- Why were Nepali authorities having such a difficult time reaching some of the worst-hit villages outside Katmandu?
Higher order thinking/Formative assessment: Part 3

• Provide students with data from the past 50 years of earthquakes in Nepal, include the following:
  - Year
  - Magnitude
  - Casualties

• Ask students to find one more piece of data of their choice (i.e. location, economic status, employment rate, India’s Earthquake data, frequency). Students must source it from a reliable resource.

• Ask students to plot data on a graph that they seem best portrays all of the data (i.e. Bar graph, Column Graph, Histogram).
Formative assessment: Part 4

- Students must critically analyse the plotted data for a report and answer the statement:

Interpret and analyse the plotted data, draw a conclusion on how earthquakes have affected Nepal in the past?
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<td>Movement, Place, Change</td>
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<tr>
<td>“The nature of physical causes and location, scale, frequency, magnitude, sequence of earthquakes”.</td>
<td>“Collect, sort, process and represent data and other information”.</td>
<td>Region, Scale</td>
</tr>
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<td>“the potential and realised positive and negative impacts on people and environments in the short and long term”.</td>
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ACTIVITY 3 PART A: THE EUROPEAN RABBIT

Logging onto pestsmart find out:
- Scientific name
- Country originated from
- Reason for introduction
- Distribution of rabbits across Australia
- Diet of the rabbit
- Habitat preferences
- Characteristics that make the rabbit a pest

ACTIVITY 3 PART B: SOCIAL, ENVIRONMENTAL AND ECONOMIC IMPACTS OF THE RABBIT

• Watch the youtube clip: https://www.youtube.com/watch?v=OFatcNMFVZQ

• Students are required to fill in the table of the social, environmental and economic impacts of the rabbit.

• Students will then be required to log on petsmart and continue to fill in the impacts http://www.petsmart.org.au/wp-content/uploads/2012/02/RABFS3.impacts.pdf
## ACTIVITY 3: SOCIAL, ENVIRONMENTAL AND ECONOMIC IMPACT OF THE RABBIT

<table>
<thead>
<tr>
<th>Economic Impacts</th>
<th>Environmental Impacts</th>
<th>Social Impacts</th>
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Location: Bacchus Marsh farmland

Data to be collected whilst on fieldwork.

At every burrow students must enter a waypoint into the GPS

- For every burrow count the number of entrances to the burrow
- Is there any evidence the burrows are still active? Fresh scats, scratching's, tracks, sightings of a rabbit

How many rabbits did you sight?

What other fauna was sighted?

What flora is growing in the area?

Is most of the flora native or introduced?

What is the land being used for? Agriculture, nature reserve

What are some of the environmental, economic and social impacts that are present in this area? Eg. Erosion, weed invasion

Draw a sketch of the area
RESOURCES REQUIRED FOR FIELDWORK

• Gps or if you don’t have access use phone app such as ‘trail tracker gps’

• Camera

• Apps: field guide to Australian fauna, Australian wildflowers, field guide to pest animals in Australia

• Field books
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<td>• Change</td>
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<td>• “The role of human activity in initiating and/or compounding the selected hazards and how this has changed over time”</td>
<td>• “Collect, sort, process and represent data and other information”</td>
<td>• Distribution</td>
</tr>
<tr>
<td>• “The potential and realised positive and negative impacts on people and environments in the short and long term”</td>
<td>• Interpret and analyse maps and other geographical data and information”</td>
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<td>• “describe the characteristics of selected hazard”</td>
<td>• Process</td>
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<td></td>
<td>• Scale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Spatial association</td>
</tr>
<tr>
<td></td>
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<td>• Sustainability</td>
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</table>
Applications and data concerning this AOS – includes GIS.

Timeline of the top ten natural disasters by death toll.

https://www.timetoast.com/timelines/87557
Overview of major natural disasters in Australia's history

A variety of maps and graphs displaying data from worldwide loss events from 1980-2014.

GENERAL RESOURCES

Earthquake tracker - daily as they happen.

http://earthquaketrack.com/recent
GENERAL RESOURCES

Data and information on Victorian Earthquakes.

GENERAL RESOURCES

https://emknowledge.org.au/disastermapper/#/home
GENERAL RESOURCES

Managing coastal hazards and the coastal impacts of climate change

This practice note provides guidance on:

- managing coastal hazards
- the decision-making process for assessing coastal hazard risk
- planning for development in coastal areas.

Coastal hazards

Coastal hazards such as wildfire, various forms of flooding, acid sulfate soils, landslide and landslide need to be considered as part of the planning and building processes. For the purposes of this practice note, coastal hazards mean inundation (both coastal and riverine) and erosion.

Coastal Hazard impacts/areas according to Australian government websites.

Coastal hazard technical guide

Determining coastal hazard areas


GENERAL RESOURCES

• Agriculture Victoria gives an A-Z list of pest species in Australia specific to Agriculture

GENERAL RESOURCES


REFERENCES


**Pedagogy**

**Inquiry**
The use of directed investigation for each hazard, followed by a class discussion of student findings. In this way, inquiry begins at the analysis stage and then provides students a chance to communicate and reflect on their findings (Matthews & Cranby, 2014). As Hoepper (2014) suggests exploring each of the lesson topics through inquiry allows students to gain conceptual insight and understanding.

**Formative Assessment**
Bennetts (2005) suggests that by placing a greater emphasis on formative assessment student learning can be improved, through the ability to quickly change the curriculum and provide timely feedback.

**Deep Analysis/Higher-order thinking**
Promoting strong geographical analysis provides students with insights and skills (Rutherford).

Through the metacognitive process of reflection, discussion, and then further reflection, students are encouraged to self-assess their own opinions and responses. As Lowe (2016) notes this process emphasises learning awareness as well as independence and value of thought, which results in students becoming more effective and responsible learners.

Under Blooms taxonomy evaluation is a higher order thinking skill, requiring students to go beyond mere recall, and to critique, judge, defend and justify. Thinking at a high level which is required for deep and conceptual understanding.

**Fieldwork**
"Fieldwork is seen as an indispensable opportunity to apply concepts and inquiry methodology in a practical and holistic manner in real environments" p. 237 of text

"If students are unable to undertake fieldwork there is a danger that conceptual and methodological understanding, and more importantly application, will be lacking" p. 237 of text

Cranby (2002) asserts that fieldwork provides an opportunity to reinforce what students have learned in the classroom through the practical application of theory, inquiry-based learning, and experimental learning. P. 237

List of skills/positives from field work p. 237

**Developing Geographical thinking**
Table pg. 250