GEOGRAPHY BULLETIN

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PROJECTS • REPORTS • RESOURCES • ARTICLES • REVIEWS

EXECUTIVE 2023

GEOGRAPHY BULLETIN

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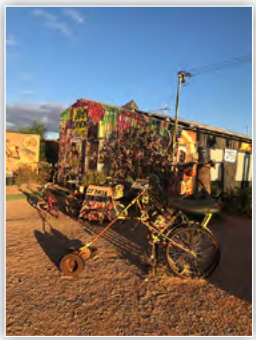


Front cover – John Dynon Art Gallery, adjacent to Layard Street, Silverton (May 2023). Source: Dr Susan Caldis

Back cover – Facing west on from Wilangee Road, Silverton across the Mundi Mundi Plains (May 2023). Source: Dr Susan Caldis

The Geography Bulletin is a quarterly journal of The Geography Teachers' Association of NSW & ACT Inc. The 'Bulletin' embraces those natural and human phenomena which fashion the character of the Earth's surface. In addition to this it sees Geography as incorporating 'issues' which confront the discipline and its students. The Geography Bulletin is designed to serve teachers and students of Geography. The journal has a specific role in providing material to help meet the requirements of the Geography syllabuses. As an evolving journal the Geography Bulletin attempts to satisfy the requirements of a broad readership and in so doing improve its service to teachers. Those individuals wishing to contribute to the publication are directed to the 'Advice to contributors' at the back of this issue.

GEOGRAPHY BULLETIN

Volume 55, No 3, 2023
EDITOR: Katerina Stojanovski

EDITORIAL

Editorial

Welcome to Edition 3 of the Geography Bulletin. This issue has an exciting mix of information relevant to geography education.

Thank you to all the authors for contributing their articles, resources and activities which will support Geography Teachers. GTA is grateful for all contributions to the Bulletin. If you have an article, resource, activity that you would like published please submit your contribution to the GTA NSW & ACT Office by email gta.admin@ptc.nsw.edu.au. The Guidelines for Contributors can be found on page 60.

Articles, resources and activities in Edition 3 include:

- A critique of the revised Australian primary school geography curriculum by Alaric Maude, Associate Professor of Geography, Flinders University
- Mystery of Blood Falls; Dr Susan Bliss, Educational Consultant
- Powerful Geography 1, Case Studies for Senior Students by Lorraine Chaffer Coordinating Author
- Spirit and Home: New films for developing powerful geographical understanding by Shu Jun Lee and Jane Dyson, University of Melbourne
- Understanding Local Geography through your Local Government Area: Hornsby Shire AND Writing your own Year 12 Essay and Short Answer Question by Martin Pluss, Head of Department Social Science Northholm Grammar School
- Spiral of Skills 7–10 by Olivia Andrew
- The Big Issue Classroom by Jenny Tracey, State Coordinator NSW/ACT – The Big Issue Classroom

Katerina
Editor

Katerina Stojanovski

Participants at the Google Tools in the Geography Classroom event.

President's Report

Bulletin 3 has a variety of interesting articles and teaching resources. *Powerful Geography 1 – Case Studies for Senior Geography* which is currently being written for the newly released Stage 6 Geography Syllabus, due to be released in late Term 4 and will be valuable for students and teachers as they commence the new course next year. I would like to thank the coordinating authors; Lorraine Chaffer and Louise Swanson and writing team; Khya Brooks, Karen Bowden and Matt Carroll for all their work in putting this wonderful resource together.

GTA has three webinars planned in Term 4 to support the Stage 6 Geography Course:

- People, Patterns and Processes – Thursday 26 October from 4.30pm–5.30pm
- Geographical Investigation – Wednesday 1 November from 4.30pm–5.30pm
- Earth's Natural Systems – Date TBC

We were fortunate to have secured sponsorship from Google for Education for a Spatial Technology Event showcasing Google Tools in the Geography Classroom. This is a free event for GTA members which was held on Friday 13 October. I would like to extend my appreciation to Chris Betcher, Program Manager, Google for Education for making this Professional Learning event possible. Chris Betcher presented two workshops, Building classroom projects in Google Earth and Exploring Google's Geo Tools for Education. Naomi Gaskell discussed Innovation in Google Geo Tools. Kieran Bonin delivered a keynote on ICT in Schools Successes and Challenges and Dr Susan Caldis delivered a keynote on Locating the Distinctive Core of Geography.

Applications for the 2023 Brock Rowe award are open until Friday 20 October. The Brock Rowe award, is an award for excellence in teaching geography in schools, is granted jointly by the Councils of the Geography Teachers' Association of New South Wales & ACT and the Geographical Society of New South Wales to persons who have demonstrated consistently, over a period, excellence in the teaching of geography in schools.

Don't forget to submit your entries for the 2023 Young Geographer Award. Registrations close on Friday 27 October.

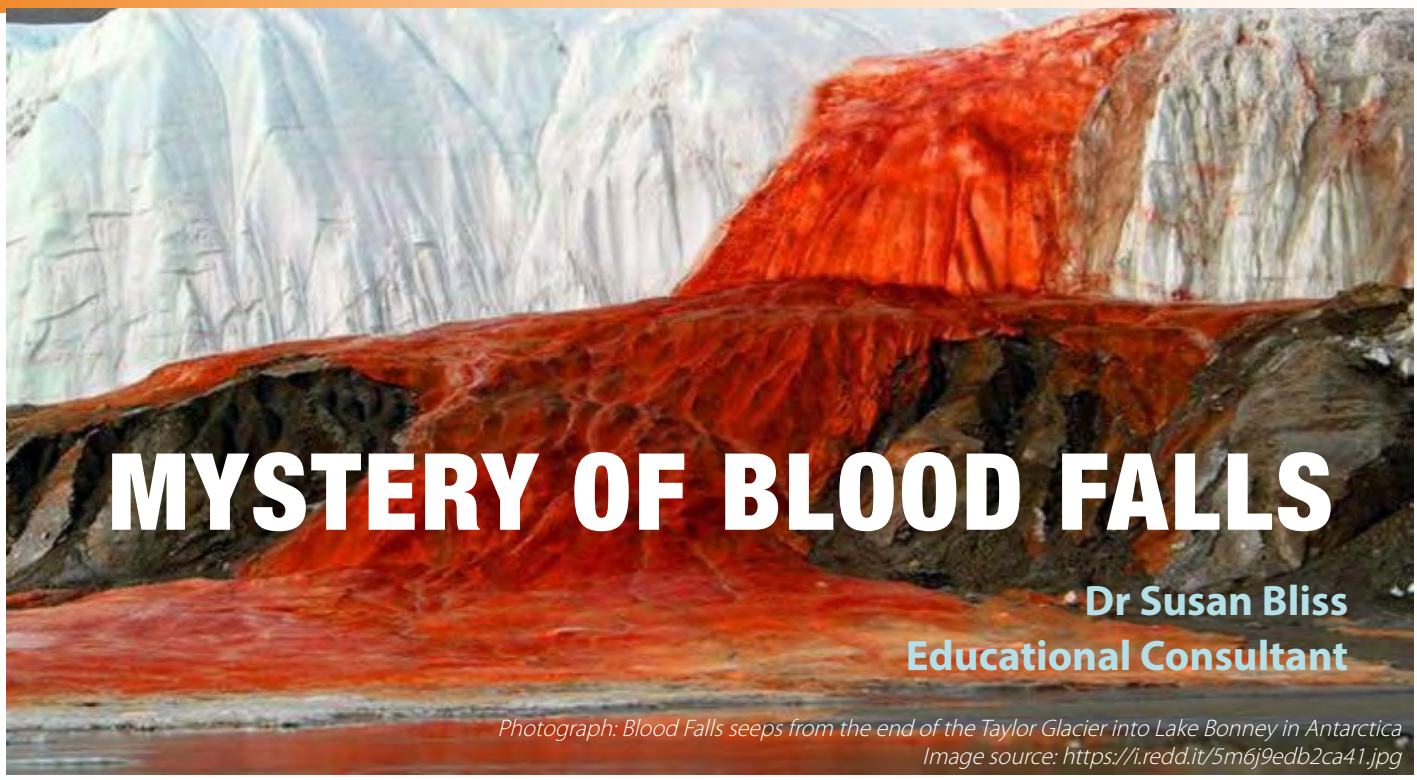
Prizes for the winning entry in every category are:

- 1st Prize $500
- 2nd Prize $250
- 3rd Prize $100

Planning for the Australian Geography Teachers Association (AGTA) Conference for 2024 is currently underway. The conference will be held in Darwin, NT between Wednesday 2 and Friday 4 October next year. Sign up for updates **HERE**

Katerina

Harry Down, Unsplash image



MYSTERY OF BLOOD FALLS

Dr Susan Bliss
Educational Consultant

Photograph: Blood Falls seeps from the end of the Taylor Glacier into Lake Bonney in Antarctica
Image source: https://i.redd.it/5m6j9edb2ca41.jpg

CURRICULUM

- Landforms and Landscapes
- Ecosystems

An Antarctic glacier appears to be bleeding! Observed is a five-story high, rust-coloured waterfall seeping from a glacier's terminus. The unique, above-ground landform known as 'Blood Falls', indicates a subterranean world with an ancient system of salt water rivers and an underground salt lake, swarming with microbial life in a place devoid of light and oxygen.

However, scientists appear less interested in the waterfall's weird colour but fascinated by the microbes living in the ancient underground ecosystem. They ask- *'Is this primordial ooze the source of all life'?*

As geographers the mystery requires investigation by determining answers to key questions such as:

- What is it?
- Where is it located?
- How was it formed?
- Why is it red in colour?
- Why is it hyper saline? What are the impacts?
- How does an ecosystem survive below hundreds of metres of ice in cold and dark conditions over millions of years?
- What can scientists learn from the 'time capsule' ecosystem?
- Why should it be protected?
- Who was the Australian who discovered 'Blood Falls'?

What is Blood Falls?

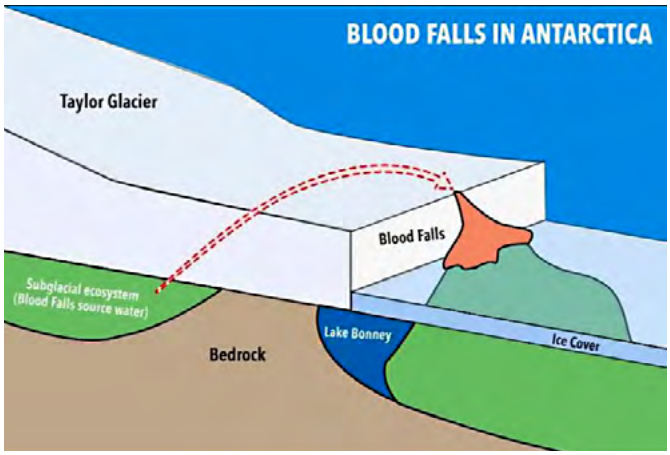
> *"Blood Falls is an outflow of an iron oxide-tainted plume of saltwater, occurring at the tongue of the Taylor Glacier onto the ice-covered surface of West Lake Bonney in the Taylor Valley of the McMurdo Dry Valleys in Victoria Land, East Antarctica".*
>
> *"Iron-rich hypersaline water sporadically emerges from small fissures in the ice cascades. The saltwater source is a subglacial pool of unknown size overlain by about 400 metres of ice at several kilometres from its tiny outlet at Blood Falls."*
>
> https://geog.ucsb.edu/antarcticas-blood-falls/

Blood Falls is a unique landform, as it did not originate from glacial melted water typically found in other continental glaciers. Instead a cascade of **iron rich hypersaline water,** originally trapped underground for millions of years, escaped to the Earth's surface via fissures under **Taylor Glacier** in **East Antarctica**.

When the water reached the surface it became **oxidised**, colouring the water blood red. A **red salt**

cone, known as **Blood Falls**, was formed at the end of Taylor Glacier.

Diagram shows how water from an ancient lake travels to Blood Falls



Source: https://www.thesun.co.uk/tech/3416557/antarctic-blood-falls-mystery-finally-solved-by-scientists-who-claim-natural-wonder-is-caused-by-a-secret-lake-thats-been-hidden-for-one-million-years/

Where is Blood Falls located?

- Blood Falls, is located in **Taylor Valley**.
- Taylor Valley is one of the **McMurdo Dry Valleys (MDV)** in the Transantarctic Mountains. It is located between Asgard Range in the north and Kukri Hills in the south, containing numerous glaciers, lakes and rivers.
- Approximately 29 kilometres long, Taylor Valley extends from the retreating **Taylor Glacier** in the west to **McMurdo Sound** in the east.
- Subglacial water flows to Earth's surface from the terminus of Taylor Glacier onto ice covered **Lake Bonney** in Taylor Valley.

Map illustrating the location of Taylor Valley and Taylor Glacier in Antarctica

Source: https://en.wikipedia.org/wiki/Taylor_Valley#/media/File:Mcmurdo_sound_USGS_map.jpg

Image: Scientists arrive at Blood Falls, Antarctica. https://www.reddit.com/r/photographs/comments/ev9mvb/scientists_arriving_to_blood_falls_antarctica/

Satellite image of Taylor Glacier, Blood Falls and Lake Bonney

Source: https://en.wikipedia.org/wiki/Taylor_Valley#/media/File:Taylorvalley_ast_2000334.jpg

What is the environment surrounding Blood Falls?

Climate

Taylor Valley, one of the McMurdo Dry Valleys (MDV)**,** encounters a **freezing desert environment.** Located in a rain shadow area behind mountains, the valleys experience low precipitation**,** mean annual temperature -19.8°C, and strong katabatic winds that reach 320 kilometres per hour. The winds evaporate all moisture, hence hindering the formation of ice and snow that covers most of Antarctica.

Taylor Valley and the other MDV encompass the **largest ice-free region in Antarctica,** with a combined area of 4500km^2. The average moisture is less than 6mmpa, generally falling in the form of snow and summer glacial melt.

- Scientists consider the MDV to be one of the Earth's most extreme deserts, and these dry conditions are thought to have endured for about fifteen million years.

A seal carcass in one of the Dry Valleys of Antarctica in a stage of advanced mummification.

Source: https://www.livescience.com/18343-seal-mummies-antarctic-microbes.html

Researchers analysed microbes living under a carcass of a seal naturally mummified by the Antarctic cold and aridity. These centuries-old mummies have been seen up to 66 kilometres inland in the Dry Valleys and 1,800 meters above sea level; why the seals roamed so far away from the coast to their death remains a mystery, with potential culprits including viruses and bad weather.

Flora and Fauna

There are no large plants, birds or mammals in the MDV. This was supported by Scott in 1903 when he first discovered MDV and saw extensive exposed rocky surfaces and believed the region 'lacked life'. However, biota was restricted to **microbial communities** as well as **aquatic ecosystems** that thrived in glacial melt-streams that flowed into ice-covered lakes.

Soils are the oldest, driest and coldest on Earth. They are poorly developed, low in biological activity, possess large quantities of salt, register a high pH, and as the ground is frozen (permafrost), growth of vegetation in hindered, especially complex plants.

Lack of precipitation in **Taylor Valley,** leaves exposed rock with sparse patches of moss, algae and cyanobacteria in the permafrost, a source of moisture during the thawing season for top soils. In fact cyanobacteria is able to start the photosynthesis process within 48 hours of receiving liquid water.

Climate is important for scientific research in Taylor Valley. The legacies of past climates exert a strong influence on the structure and function of current ecosystems. While ecosystems depend on water for survival, a minor change in climate can affect the growth and reproduction of organisms.

What are the landforms surrounding Blood Falls?

The McMurdo Dry Valleys such as Taylor Valley exposes bedrock and prominent geological features as there has been little erosion and minimal vegetation coverage.

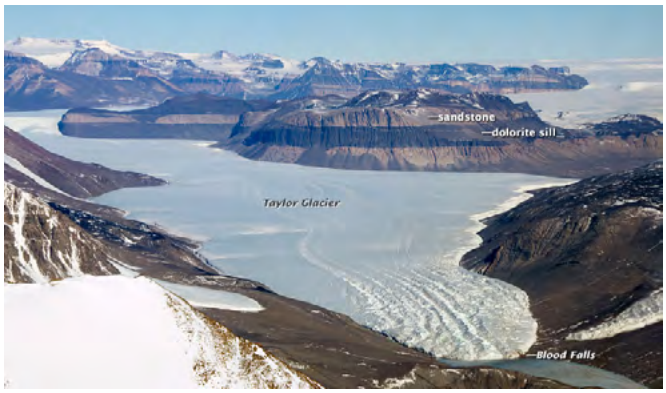


Image: Blood Falls at the toe of Taylor Glacier, 2013. Source: https://commons.wikimedia.org/wiki/File:Taylorglacier_pho_2013_studinger.jpg

Landforms

- **Glacier:** Taylor Glacier in Taylor Valley is located in the centre of the photograph. It is a '**cold-based glacier'** unlike other glaciers that are 'wet based'. A cold-based glacier 'flows', pushed forward by its own weight. The glacier gathers minimal debris, causes little erosion, and leaves behind only small moraines. The glacier also differs on the surface-instead of **crevasses** it is comparatively flat and smooth.

  Adapted: https://en.wikipedia.org/wiki/Taylor_Glacier; https://earthobservatory.nasa.gov/images/82524/taylor-valley-antarctica

- **Sandstone:** The sandstone layers were formed at the bottom of a shallow sea between 250 million and 400 million years ago. Around this period, the Earth's southern continents were part of the supercontinent Gondwana.

- **Dolerite:** The dark rock is dolerite, a remnant of volcanic eruptions about 180 million years ago. The eruptions contributed to forcing Gondwana apart.
- **Blood Falls:** At the lower right of the preceeding photograph is located **Blood Falls** that emerged from an ancient hypersaline lake trapped beneath **Taylor Glacier's 400 metres of ice**. It then flowed towards frozen **Lake Bonney**.
- **Lake Bonney** is unique within the MDVs due to its extreme salinity from hypersaline, anoxic, and iron-rich subglacial brine that exists beneath Taylor Glacier and pours out at Blood Falls.

The area covering the Lower Taylor Glacier, Blood Falls and McMurdo Dry Valleys were designated to be protected because of their unique physical properties, unusual microbial ecology and geochemistry, as well as an important site for paleoclimatic and glaciological research.

How was Blood Falls formed?

During a geological period called the **Pliocene Epoch,** about five million years ago, global warming caused East Antarctica's ice sheets to melt and sea levels to rise about 20 metres. Taylor Valley was flooded and developed into a deep fiord.

- Around 5 million years ago sea levels rose, flooding East Antarctica. This created a salty inland lake
- Around 3 million years later, glaciers formed over the saline lake
- Around 2 million years ago a sub-glacial lake of saltwater became trapped and isolated. The frozen glacier surrounding the lake acted as a 'time capsule', preserving microbial species.

Research from University of Alaska, calculates that salt water took approximately 1.5 million years to finally reach Blood Falls as it made its way through fissures and channels in the glacier.

Adapted: from https://www.forbes.com/sites/trevornace/2017/04/28/mystery-of-antarcticas-blood-falls-is-finally-solved/?sh=8d507c22ef8d

What caused the red colour in Blood Falls?

- Earliest explorers noticed the stain at the terminus of the glacier and speculated that **red algae** was responsible for the bright colour. Investigations later found the water was unsuitable for the growth and survival of algae.
- In 2009, scientists discovered the red colour was due to high levels of **iron oxide in saltwater** from a network of subglacial rivers and a subglacial lake.
- **Iron** is a common substance in Antarctic bedrock. Glaciers scraping the bedrock contributed to iron in the water.
- When the iron in the water reached Earth's surface at Blood Falls, oxygen in the atmosphere changed the colour to deep red in the same process human's salty, iron-filled blood turns red when makes contact with the atmosphere.

Ripley's Believe It or Not!

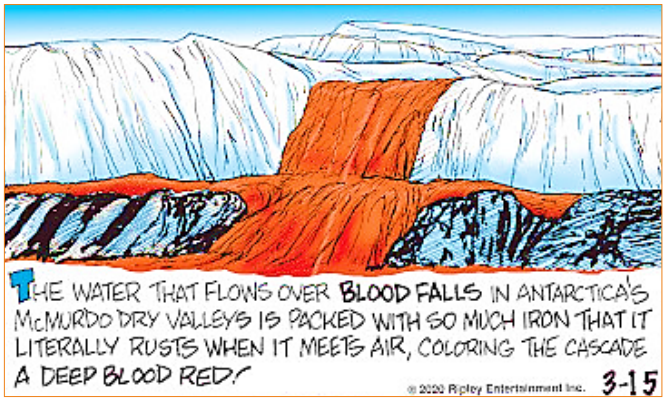


Image source: https://www.ripleys.com/weird-news/cartoon-03-15-2020/

Why does salt affect water flow?

The large very salty lake beneath Taylor Glacier occasionally overflows due to water moving at the back. This then causes Blood Falls to flow.

> *Using echolocation technology scientists were able to "see" how water flowed under the Taylor Glacier. Scientists were shocked to find that the lake hadn't frozen despite being entombed in ice for millions of years.*

Source: https://www.thesun.co.uk/tech/3416557/antarctic-blood-falls-mystery-finally-solved-by-scientists-who-claim-natural-wonder-is-caused-by-a-secret-lake-thats-been-hidden-for-one-million-years/

Taylor Glacier is the coldest known glacier, to possess **constantly flowing water.** With freezing temperatures and little melting from Taylor Glacier, one wonders why water slowly oozes out of Taylor Glacier at Blood Falls, rather than freezes. The answer is **hyper salinity** described as brine – too salty to freeze and releases heat when frozen.

Water too salty to freeze

Geochemical analyses of Blood Falls show the brine is of marine origin. Around 5 million years ago sea levels rose creating a salty inland lake, later covered by glaciers.

As a result the subglacial lake is three times saltier than seawater and too salty to freeze.

Salt water releases heat when it freezes

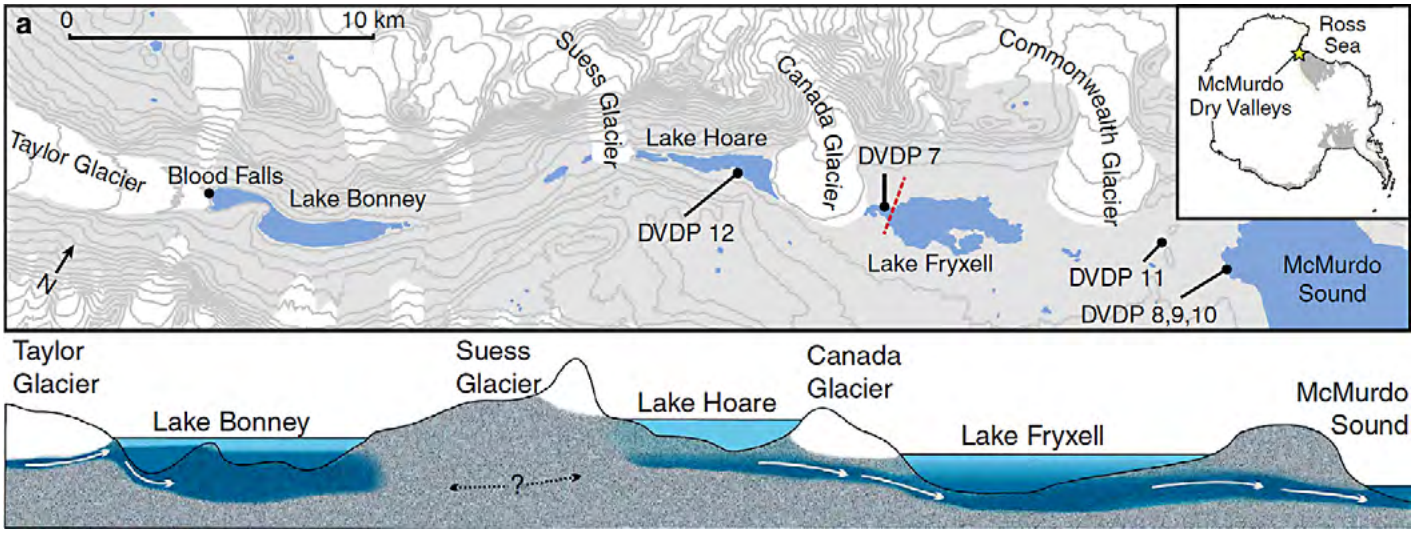
It melts the surrounding ice enabling it to flow through the extremely cold Taylor Glacier and emerge out at Blood Falls on the Earth's surface.

The brine is hypersaline, anoxic with high concentrations of ferrous iron, silica, and sulphate.

Scientific data strongly supports the marine origin of Blood Falls with its chemistry resembling cryo-concentrated seawater.

The process called salt cryo-concentration refers to the high concentration of salt in the encapsulated lake. When the climate cooled, the freezing seawater increased saltiness in the lake, since crystallised ice rejects salt.

Map and simplified cross section of Taylor Valley and its salt groundwater



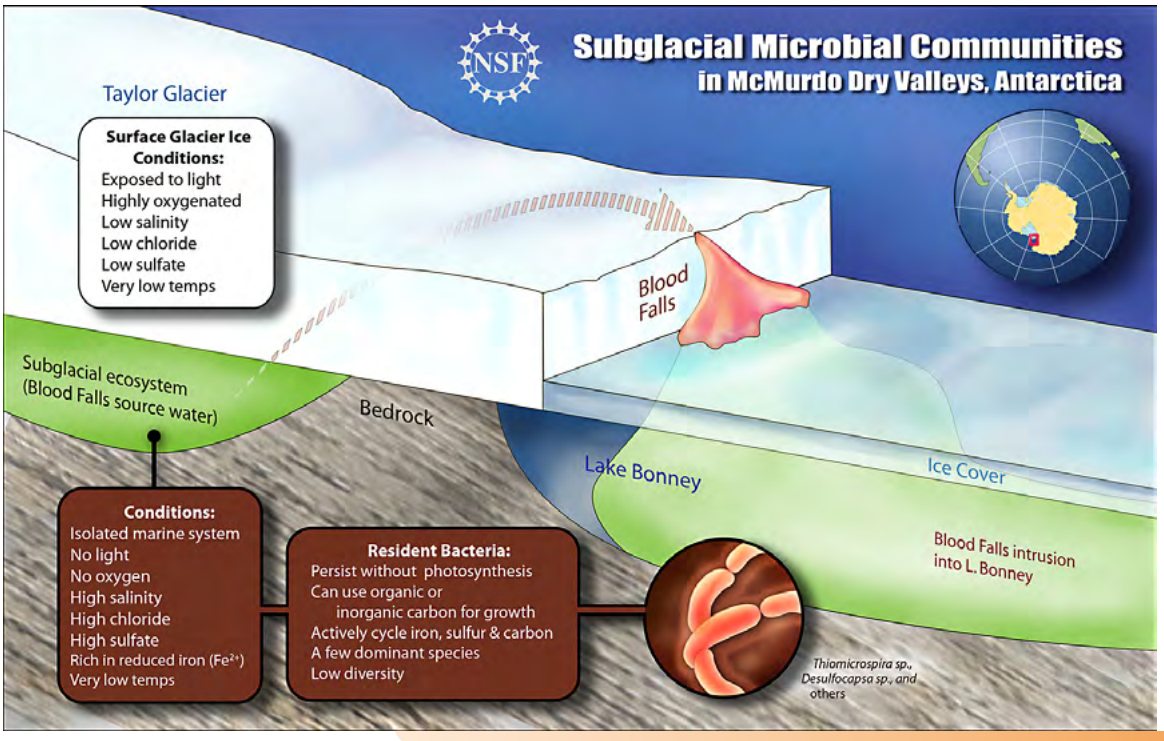
Source: https://arstechnica.com/science/2015/04/salty-groundwater-supports-life-in-antarcticas-extreme-dry-valleys/

What lives in a hyper-saline subglacial lake?

Millions of years ago, when glaciers covered salt lakes in Taylor Valley, microbes living in the water became isolated. Without sunlight, devoid of oxygen, frozen temperatures, extreme quantities of salt, and complete darkness buried 400 metres below the glacier, a unique ecosystem evolved.

Taylor Glacier is completely frozen to the bedrock preventing surface derived water from penetrating below ground. This ensured the maintenance of pristine conditions in the subglacial hyper saline basin.

A schematic cross-section of Blood Falls showing how subglacial microbial communities have survived in cold, darkness, and absence of oxygen for a million years in brine water below Taylor Glacier.



Source: https://en.wikipedia.org/wiki/Blood_Falls#/media/File:Blood_falls1_f_Low_Res_nsf.gov.jpg

Grand Prismatic Spring, Excelsior Group, Yellowstone Hotspot, northwestern Wyoming.
Image source: https://upload.wikimedia.org/wikipedia/commons/d/d4/Grand_Prismatic_Spring_%285_June_2013%29_28_%2814299472538%29.jpg

The microbes use Iron II (Fe2+) and sulphate (SO4-) in the lake that comes from the underlying bedrock.

The microbes obtain energy from breaking **sulphates.** Then the iron in the water restores the sulphates. Recycling occurs and life continues in these extreme conditions, resembling the beginning of life on Earth, before oxygen was principally present in the atmosphere.

What is the significance of microbes?

Tiny microbes are capable of surviving in super salty, high-iron, very cold water, without sunlight, under a glacier. It turns out these extremophiles were even more extreme than previously recognised, and studying them further can help us understand how life might survive in other extreme environments, such as outer space.

https://www.vice.com/en/article/7xq7ba/scientists-finally-solved-the-mystery-of-antarcticas-blood-falls

Extremophiles *are able to withstand and even thrive in extremely harsh environments, including freezing temperatures.*

The extremophiles of Blood Falls, however, do not use photosynthesis. They use a more unusual process called chemosynthesis. Chemosynthetic organisms are able to convert sulphur and iron compounds (not sunlight and oxygen) into energy. As Blood Falls' chemosynthetic bacteria extract iron from the rocks they come in contact with, they gradually erode the bedrock around the lake.

https://www.nationalgeographic.org/media/blood-falls/

The salt water contains a diverse microbial community that is metabolically active and influences ***weathering*** *and the* ***geochemistry*** *of the subglacial fluid by liberating ions such as iron and silica from subglacial bedrock.*

https://www.nature.com/articles/ncomms7831

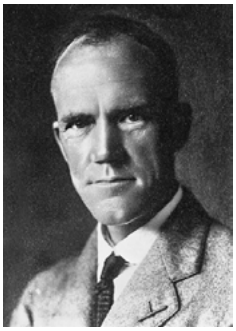
Jill Mikucki at Dartmouth College, investigated water samples from Blood Falls. The samples contained at least ***17 different types of microbes****, and* ***almost no oxygen****. An explanation may be that the microbes use sulphate as a catalyst to respire with ferric ions and metabolise the microscopic amounts of organic matter trapped with them. Such a metabolic process had never before been observed in nature.*

https://geog.ucsb.edu/antarcticas-blood-falls/

The McMurdo Dry Valley region is one of the coldest and most inhospitable places on Earth often compared to the frigid and dry deserts of Mars, or Jupiter's moon, called Europa. This hidden ecosystem of microbial life now has scientists wondering if Mars too, could support a similar ecosystem. This ecosystem could also help explain the scientific hypothesis known as "Snowball Earth" which states that our planet was once completely (or almost completely) frozen – probably around 650 million years ago. If this was the case, how did living forms survive? Well, much like they did within the frozen Taylor Glacier.

Source: https://www.bustle.com/p/what-is-blood-falls-antarcticas-mysterious-red-waterfall-has-puzzled-us-for-decades-55336

When was Blood Falls discovered? Who discovered it?



Blood Falls in Antarctica, is one of the coldest and inhospitable places on Earth. As a consequence it was not until 1911 when it was discovered by the Australian geologist and geographer Thomas Griffith Taylor on Scott's Terra Nova expedition.

Taylor Valley and Taylor Glacier are named after the noted geographer who was originally a teacher in Sydney and later lectured at Sydney University.

"It's unearthly, it's unreal," Steve Martin, an Antarctic historian, stated in the episode of Science Solved It. "So when [explorer] Griffith Taylor and his friends saw the Blood Falls flowing red out of the end of the Taylor Glacier, they must have thought it was just another incredible oddity in a very strange part of the world."

https://www.vice.com/en/article/7xq7ba/scientists-finally-solved-the-mystery-of-antarcticas-blood-falls

Preceeding image and notes: Griffith Taylor Source: https://en.wikipedia.org/wiki/Thomas_Griffith_Taylor#/media/File:Griffith_Taylor.png

What is the significance of Blood Falls?

There are numerous reasons for studying Blood Falls in Geography and Science, such as:

- Few glaciers possess **hyper saline outflows** and fewer are **coloured red**.
- Unlike surrounding glaciers in Antarctica, the underground water is **hyper saline** and does not freeze in extremely low temperatures.
- Investigations aim to assist scientists address questions about life on **'Snowball Earth'**, when large ice sheets covered Earth's surface millions of years ago.
- Taylor Glacier sealed off a body of water for millions of years making it a **'time capsule'**. This led to the evolution of **isolated microbes** that evolved independently from the rest of the world.
- As the area contains a rich laboratory of life in the super salty, high-iron, freezing water and dark environment, it could possibly provide scientists with a better understanding of life below the ice caps on **Mars**.

The ability of sub-cryospheric environments such as this one to support life on Earth hints at an increased possibility of finding life in similar environments elsewhere in our solar system.

Source: https://earthsky.org/earth/what-makes-blood-falls-red-antarctica

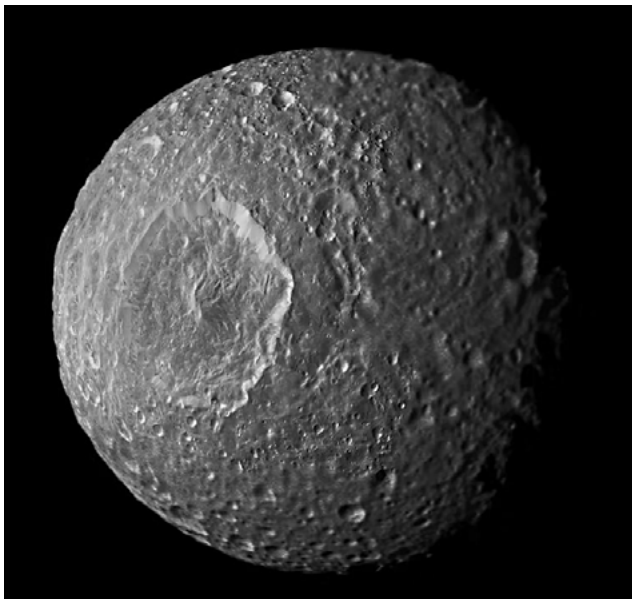
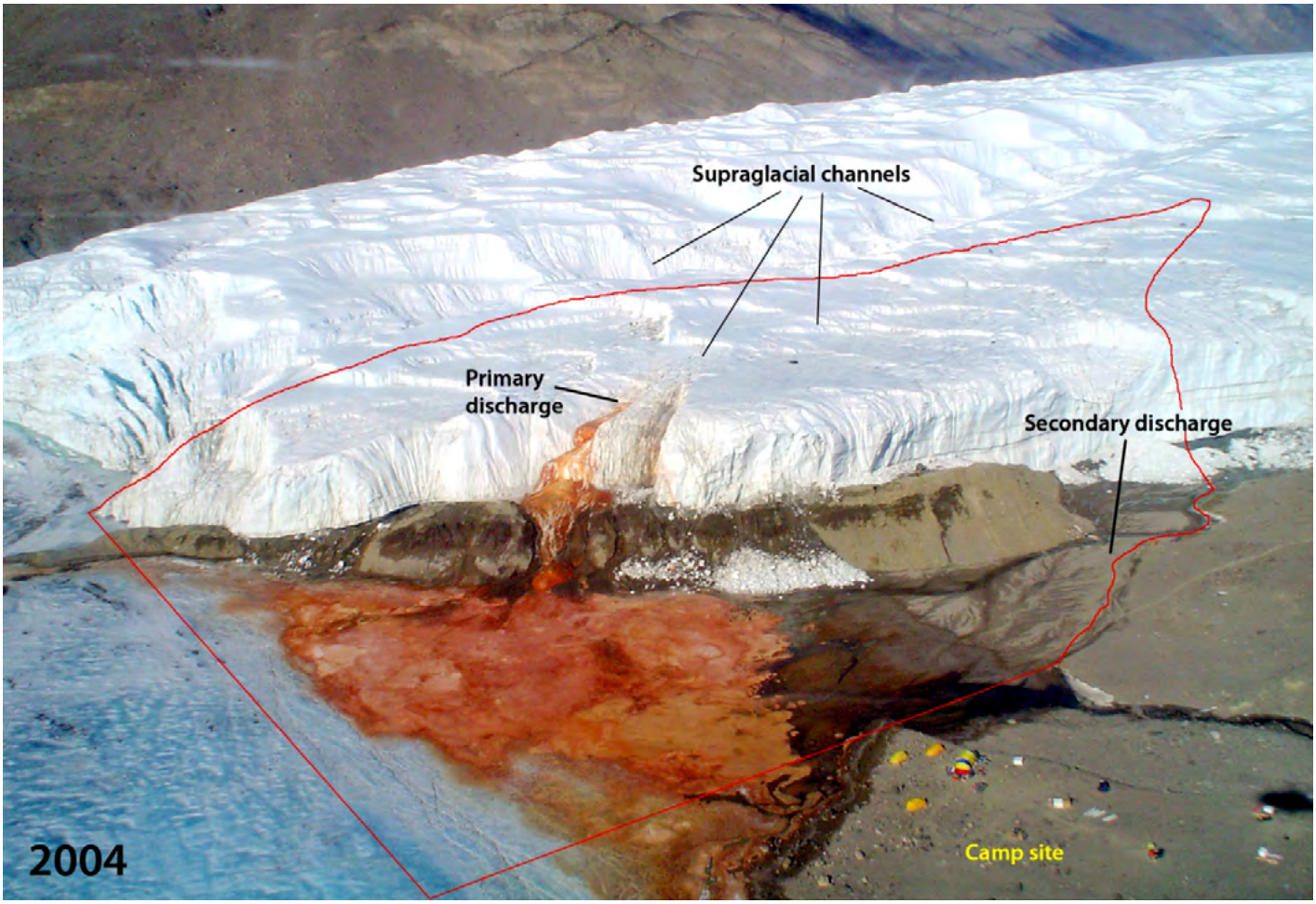


Image: Could similar microbial life as found in Antarctica be found on Mimas? NASA/JPL-Caltech/Space Science Institute
Source: https://theconversation.com/discovery-of-microbe-rich-groundwater-in-antarctica-guides-search-for-life-in-space-40931



Aerial view of the terminus of the Taylor Glacier in 2004, with Blood Falls at centre and Lake Bonney at lower left. Primary and secondary discharge are noted. Photographer unknown: 18 Nov 2004. Source: https://documents.ats.aq/recatt/att513_e.pdf

Aerial view of Blood Falls. Wikimedia Commons Source: November2014-Blood-Falls-Taylor-Valley-HR (2).jpg

The volume and physical extent of the **primary Blood Falls surface outflow varies over time**. The active flow events range from a few hundred to several thousand cubic metres of saline icing. The discharge events occur at episodic intervals of one to about three years and flow onto ice-covered Lake Bonney. A secondary, much smaller and less distinct, surface discharge has been observed on a few occasions.

Why should Blood Falls be protected?

Management Plan for Antarctic Specially Protected Area No 172 (https://documents.ats.aq/recatt/att513_e.pdf)

The Taylor Valley Visitor Zone in the McMurdo Dry Valleys **Antarctic Specially Managed Area (ASMA)**, permits tourism and research, while protecting the environment.

Reasons for protection

- The primary reasons for the designation of the Area to be protected are its **unique physical properties**, **unusual microbial ecology** and **complex and dynamic geochemistry**.
- The **lower Taylor Glacier subglacial brine reservoir** and **Blood Falls** are globally unique and a site of **outstanding scientific importance**.
- Blood Falls outflow contains a unique microbial community of marine origin.
- The **microbes** in the subglacial environment have survived for millions of years without external input.
- Geochemical analysis of Blood Falls outflow resembles a concentrated seawater remnant from the **Pliocene intrusion of marine waters**, combined with products of weathering.
- Provides an example of the **diverse physical** and **chemical places** for life in the polar desert of the McMurdo Dry Valleys.

GLOSSARY

Antarctic Ice Sheet: Thick glacier covering most of Antarctica.

Bacteria: Single-celled organisms found in ecosystems.

Bedrock: Solid rock beneath Earth.

Environment: Conditions that influence an organism or ecosystem.

Extremophile: Microbe that adapted to very harsh environments such as freezing water.

Fissure: Narrow opening or crack.

Glacier: Mass of ice that moves slowly over land.

Hypersaline Lake: Type of lake containing very high salt content.

Isolate: Separate organism, apart from others.

Landscape: Geographic features of a region-lithosphere, atmosphere, hydrosphere and biosphere.

Microbe: Tiny organism, usually a bacterium.

Outflow: Water, sediment and chemicals discharged by a river or flowing water.

Oxidation: Substance combined with oxygen changes its physical and molecular structure.

Plume: Upward flow of a fluid, such as water from underground sources.

Pristine: Pure or unpolluted.

Snout: End of a glacier. Often called a terminus.

Subglacial lake: Inland body of water that exists under a glacier or ice cap.

ACTIVITIES

Classify the following statements as either true (T) or false (F):

- Blood Falls is a natural, not a supernatural phenomenon.
- Taylor Glacier in located in West Antarctica.
- Taylor Valley is one of the McMurdo Dry Valleys in the Transantarctic Mountains.
- Dolerite is a sedimentary rock.
- Blood Falls is the melted residue of Taylor Glacier.
- An ancient hypersaline lake is trapped beneath Taylor Glacier's 400 metres of ice.
- Around one million years ago sea levels rose, flooding East Antarctica.
- McMurdo Dry Valleys encompass the largest ice-free region in Antarctica.
- Water in the hyper-saline lake beneath Taylor Glacier is about three times saltier than the ocean.
- Extremophiles are unable to thrive in extremely harsh environments.
- Blood Falls outflow contributes to salinity in Lake Bonney.
- Reddish particles formed in the Blood Falls is the result of a chemical reaction between iron and oxygen.

Read through the text on Blood Falls, either individually or as a class

- Express the ideas in the text in your own words. Share your ideas with other class members.
- Re-write the text by illustrating the **main concepts** in one of the following activities:
- Draw an annotated diagram
- Design a series of illustrative/cartoon panels
- Create an animated video
- In groups answer the key questions on the first page.

RESOURCES

YouTube

- Antarctica's Blood Falls Scientists Solve the Mystery – https://www.youtube.com/watch?v=e-jPIVlC7Wg
- Weird Places: Blood Falls – https://www.youtube.com/watch?v=plaf9LDJR9c

ICT

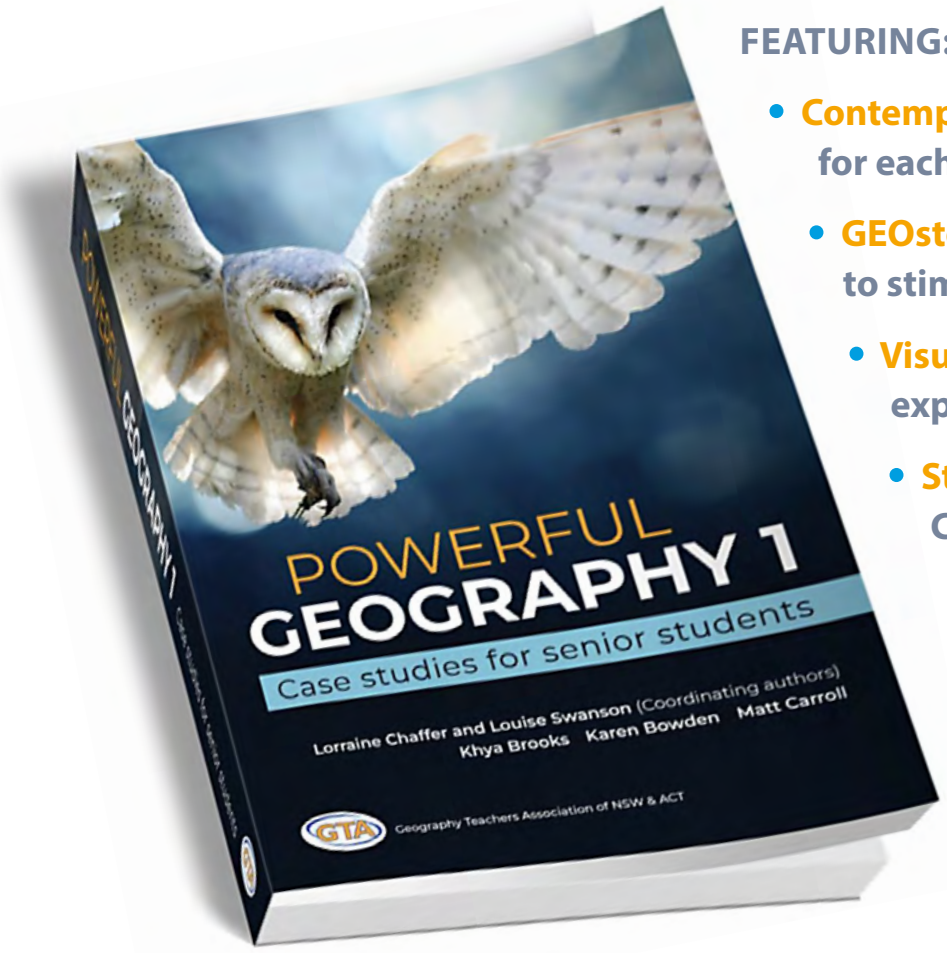
- Blood Falls
  - https://www.researchgate.net/figure/Location-of-Blood-Falls-The-McMurdo-Dry-Valleys-are-located-in-East-Antarctica-A-west_fig1_6362251
  - https://www.researchgate.net/figure/Map-of-Taylor-Valley-in-Antarctica-a-Map-of-major-lakes-glaciers-and-DVDP-boreholes_fig4_276126491
- Science behind Antarctica's mysterious Blood Falls – https://sharethe.buzz/science/the-science-behind-antarcticas-mysterious-blood-falls
- Mystery of Antarctica's Blood Falls is finally solved – https://www.forbes.com/sites/trevornace/2017/04/28/mystery-of-antarcticas-blood-falls-is-finally-solved/?sh=8d507c22ef8d
- National Science Foundation: Unusual Antarctic Microbes Live Life on a Previously Unsuspected Edge – https://www.nsf.gov/news/news_summ.jsp?org=NSF&cntn_id=114488&preview=false

Other References

- Mikucki et al., 2015: "Deep groundwater and potential subsurface habitats beneath an Antarctic dry valley".
- Mikucki et al., 2009: "A Contemporary Microbially Maintained Subglacial Ferrous Ocean".
- NSF Press Release: "Unusual Antarctic Microbes Live Life on a Previously Unsuspected Edge".
- Smithsonian Magazine: "Antarctica's Blood Red Waterfall". https://www.smithsonianmag.com/travel/antarcticas-blood-red-waterfall-180949507/
- Forbes – Mystery of Blood Falls. https://www.forbes.com/sites/trevornace/2017/04/28/mystery-of-antarcticas-blood-falls-is-finally-solved/?sh=8d507c22ef8d

POWERFUL GEOGRAPHY 1 AND 2

Case studies for Senior Geography



FEATURING:

- **Contemporary case studies** for each Content Focus Area
- **GEOstories** – micro case studies to stimulate discussion
- **Visualise This** – key concepts explained using illustrations
- **Student Activities** – Core knowledge, Application, Extension, Fieldwork & Skills

Visit the Authors' Blog HERE

CONTENT OUTLINE

Lorraine Chaffer, Coordinating author

The team of authors for Powerful Geography 1 are excited about the case studies they have created, the beautiful illustrations created for the book or used with permission, many never seen before, and the inclusion of Visualise This, concept explainers.

This book offers teachers and students a range of case studies and GEOstories (mini case studies) to support teaching the NESA Stage Geography Syllabus (2022).

Powerful Geography 1 is organised into the three Content Focus Areas for Year 11, however the content in each case study is relevant across more than one of these.

This is NOT a traditional textbook and does not cover all syllabus content. The use of GEO stories (micro studies), large case studies and a visual dictionary (Visualise This) for each Content Focus Area covers essential content knowledge, concepts, tools, and skills.

Short GEOstories provide an opportunity to differentiate student learning on the basis of depth of content, cognitive load and student activities.

The student activities throughout each section focus on three areas.

- Demonstrating understanding of content and concepts.
- Using geographical tools and skills
- Analysing stimulus material

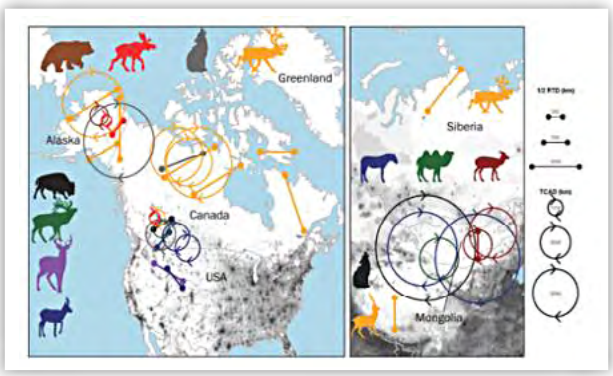
The activities are scaffolded as Core Knowledge, Application and Extension.

SECTION 1: EARTH'S NATURAL SYSTEMS

The purpose of this section is to develop an understanding of the processes, cycles and circulations that create an integrated Earth System, including the natural processes that change Earth's land cover over time.

Chapter 1: GEOstories

Five GEOstories provide examples of the interconnectedness of Earth's– hydrological, atmospheric, ecological, and geomorphic systems and the wonder and values of nature. These stories can be used as an introduction to the syllabus content Focus Area, Earth's Natural Systems, or to engage students in discussion about the interconnectedness and value of natural systems for the overview section. The stories go beyond the narrative to engage with geographical content, tools, skills, and concepts. Each is supported by student activities.



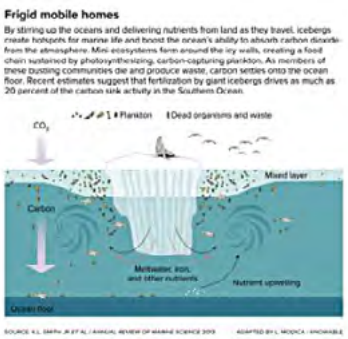
Great terrestrial wildlife migrations. Adapted with permission

1.1. Inspirational wildlife migrations
1.2. Forest elephants: Valuing nature.
1.3. Whales: Ecological engineers.
1.4. Blown away: The story of dust.
1.5. Iceberg Alley: An uncertain future

Earth Systems taught through the lens of a case study

The purpose of the case studies for Earth's Natural Systems is to teach natural processes, cycles, and circulations in a context that will assist conceptual understanding. Select one option from the two case studies provided –The Cryosphere and Forest Systems. Each study incorporates place-based studies and is supported by the Visualise This section that follows.

Chapter 2: THE CRYOSPHERE



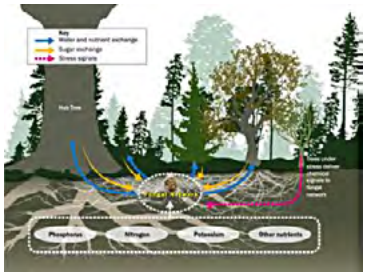
NASA and IPCC are two global organisations that refer to the cryosphere as a distinct natural system because of the role it plays in global processes, cycles and circulations and its impact on Earths systems.

Icebergs support diverse ecological communities

There are significant links to climate change – natural and anthropogenic. A study of Patagonia provides a deeper insight into glaciers, the global retreat of glaciers and loss of ice mass. This content links to anthropogenic land cover change from the Focus Area: Human – Environment Interactions.

Chapter 3: FOREST SYSTEMS

Forests link all of Earth's natural systems and can be used to explain key concepts related to atmospheric and hydrological processes, cycles, and circulations as well as ecological succession and geomorphic influences. Factors influencing forest systems such as latitude, altitude and oceanity are integrated throughout. Natural and anthropogenic change have impacted forests at a range of scales. Canada's Boreal Forests and the Congo Rainforest are place-based studies. Each study touches on anthropogenic change studied in the Content Focus Area - Human – Environment Interactions.



Forests function through underground networks

VISUALISE THIS

Visualise This 1–7 use illustrations, maps, graphs, and photographs to explain key concepts related to Earth systems and natural change to build conceptual understanding. Many of these are also relevant to Human – Environment Interactions.

Fieldwork equipment and techniques

- Visualise This 1: Earth's Natural Systems – a safe space for humanity.
- Visualise This 2: Global atmospheric circulation.
- Visualise This 3: Global oceanic circulations.
- Visualise This 4: Glacial and interglacial cycles.
- Visualise This 5: Ecological succession.
- Visualise This 6: Permafrost.
- Visualise This 7: Fieldwork techniques for Earth's natural systems.

SECTION 2: PEOPLE, PATTERNS & PROCESSES

The purpose of this section is to develop an understanding of global trends in population growth, the distribution and use of Earth's natural resources, and the transformation of places.

Chapter 4: GEOstories

4.1. Environmental refugees: Forgotten Victims

4.2. Slipping through our fingers: A global sand crisis.

4.3. Sea floor mining: The next frontier.

4.4. Churchill: A story of human resilience

4.5. Global networks: Eyes in the sky

Seafloor mining (with permission)

Place-based case studies

Each study is place-based and supported by illustrated concepts in Visualise This.

Chapter 5: POPULATION and RESOURCES

Three studies focus on understanding:

- population dynamics in **Japan** and **Uganda**, both at different stages in the Demographic Transition Model and how each nation is dealing with the challenges related to their situation.
- issues associated with the exploitation of oil in Nigeria.

Oil in exploitation in Nigeria

Issues related to resource use are also investigated in GEOstories 2 (Sand) and 4 (Sea floor mining) and linked to Visualise This 11: The global commons.

Option studies

Chapters 6 and 7 investigate the role of people in transforming places and environments, the processes involved, and responses to change. The selected options are:

- Human resilience in diverse environments (Venice)
- Political power and contested spaces. (Ukraine)

GEOstories 4.4 and 4.5 provide other insights into human resilience (Churchill) and technological change (Global satellite networks).

Chapter 6: VENICE: Human ingenuity and resilience

Venice was settled in a shallow lagoon where challenges relating to its survival, including access to freshwater and constructing buildings in mud, were overcome through human ingenuity and resilience over a long period of time. Today, sea level rise, mass tourism and depopulation are contemporary challenges facing Venice and raise the question of whether ingenuity can once again save the city and secure its future.

Venice and the Venetian Lagoon.

Chapter 7 UKRAINE: A contested place

This study investigates the interplay of history, geography and politics that led to the Russian invasion of Ukraine in 2022 and the ongoing conflict.

The Ukraine story today follows a complex history as a contested place, with long periods of time under the dominance of other nations or nation states including Russia. Now Ukraine is politically aligning itself with the west while Russia considers Ukraine an integral part of the Russian Federation.

Key influences in the Ukraine – Russian conflict.

VISUALISE THIS

Visualise This 8 - 12 use illustrations, maps, graphs, and photographs to explain key concepts relevant to population and resource use and human perceptions of places.

- Visualise This 8: The Demographic Transition Model
- Visualise This 9: Perspectives on population and resources
- Visualise This 10: Global value chains
- Visualise This11: Global commons
- Visualise This12: Fieldwork techniques for investigating people and places.

SECTION 3 HUMAN – ENVIRONMENT INTERACTIONS

The purpose of this section is to develop an understanding of the role of people in contemporary climate change, human impact on Earth's land cover and the interactions of natural and human processes in an option study.

Chapter 8: GEOstories

8.1. Saving a species: Wollemi pine (Fire)

8.2. Masters of the flood: The Netherlands (Flood)

8.3. Forests of hope: Madagascar. (Deforestation)

8.4. Lost Oases: Morocco. (Desertification)

8.5 Species migration: Ecological responses to change (Climate change)

8.6 Parks on fire: NPWS bushfire management. (Fire)

The Netherlands leads to world in innovative flood management developed in response to storms from the North Sea inundating the country.

Case study options

The case studies for this section focus on understanding the interplay of natural systems and human actions in causing land cover change and the implications of those interactions. The case studies cover the three option topics – A Geographic Region, A Contemporary Hazard. and Climate Change. The feature study on the Lake Eyre Basin Region embeds many geographical tools and skills. The other studies are smaller and less skills based. Each study is supported by the Visualise This section that follows.

Chapter 9: LAKE EYRE BASIN REGION

Lake Eyre Basin (LEB) is one of the world's great desert river systems, one of the last unregulated river systems in the world and a place with a rich Aboriginal heritage. It is a place of inspiring natural beauty and ephemeral rivers that never reach the sea and where wetlands, waterholes, and mound springs support unique ecosystems. The Lake Eyre Basin has high economic value from the activities of pastoralists, mining and energy companies and tourists. Although the region has a small population and low population density it faces increasing pressure to develop water and energy resources and increase tourism.

Mithaka people and Dreaming tracks.

Chapter 10: THE ARCTIC: Region on a threshold

The Arctic is on a threshold of irreversible environmental change due to global warming. The interplay of natural systems and human activities in the region provides a deep understanding of the consequences of melting sea ice, ice sheets and glaciers and melting permafrost on people and the environment, including First Nations communities. The *'Race for the Arctic'* highlights growing political interest in a potentially ice free ocean ripe for resource exploitation and as an all year shipping route. This study can be used as a stand-alone investigation of a region or to illustrate land cover change (melting ice sheets and glaciers).

Indigenous reindeer herders

Chapter 11: NORTH COAST FLOODS 2022

In February 2022, the east coast of the NSW recorded over a year's rain in a week that led to a series of devastating floods in the Richmond River catchment on the far North Coast. Nothing in the history of flooding in the town of Lismore and downstream settlements such as Woodburn and

Extent of the North Coast floods

the Cabbage Tree Island Indigenous community could prepare for this unprecedented event. A lack of contemporary monitoring technology and the unpreparedness of authorities in responding quickly to the unfolding disaster exacerbated the impact of the floods. The magnitude and intensity of the flooding, the impact on communities and responses to the event continue to be the centre of debate.

Chapter 12: PACIFIC ISLAND ATOLL NATIONS: A climate change challenge

Low lying Pacific Island nations such as Kiribati, Solomon Islands, Maldives and Tuvalu are at the forefront of climate change. These countries may potentially disappear as sea levels rise, extreme weather events increase in frequency and intensity, coastal erosion worsens, and water invasion of freshwater aquifers continues. When the foreign minister for Tuvalu recorded a speech for the United Nations climate conference in 2022, he stood knee-deep in seawater and spoke about creating a 'Metaverse' version to highlight the impact of climate change. It was a plea for international action. This study will investigate The effectiveness of people and organisations in managing ONE climate change challenge *at a selected place*.

Coral atolls increasing vulnerability to climate change.

Chapter 13: THE GEOGRAPHICAL INVESTIGATION

This is a step-by-step guide to undertaking a geographical investigation using excerpts of best practice from past student investigations for the Senior Geography Project.

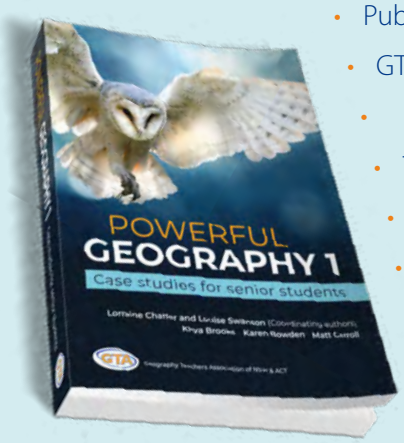
VISUALISE THIS

Visualise This 13–18 use resources such as illustrations, maps, graphs, and photographs to explain key concepts relevant to climate and land cover change as well as case studies such as the Cryosphere and The Arctic Region.

- Visualise This 13: The Anthropocene
- Visualise This 14: Land cover change
- Visualise This 15: Tipping points
- Visualise This16: Feedback loops
- Visualise This17: Rewilding
- Visualise This 18: Antarctica's Doomsday glacier

Climate Change:: Feedback loops

SALES and SUPPORT



- Publication is anticipated to be between December 2023 – January 2024 tbc.
- GTA is self-publishing and working hard to have the books available asap
- Books will be sold through the GTANSW & ACT online shop.
- The cost of the books will depend on final production costs tbc.
- An author's Blog will provide online support.
- Units of work based on the case studies in Powerful Geography 1 and other resources are being prepared and will be released during Term 4.
- Sample pages will be available soon.

2023 BROCK ROWE AWARD

The Brock Rowe Award, an award for excellence in teaching geography in schools, is granted jointly by the Councils of the Geography Teachers' Association of New South Wales & ACT Inc. and the Geographical Society of New South Wales Inc. annually to persons who have demonstrated consistently, over a period, excellence in the teaching of geography in schools.

The nomination is made by a teaching colleague and requires the endorsement of the school principal (or school executive).

Entries close on 20th October 2023 – Nominate now!

If you have any questions about the Award or the nomination process please contact gta.admin@ptc.nsw.edu.au

chuttersnap, Unsplash image

A critique of the revised Australian primary school geography curriculum

Alaric Maude, Associate Professor of Geography, Flinders University

This document is a detailed critique of the revised Australian curriculum for the F–6 Geography Knowledge and Understanding Strand.

Removal of essential content

Knowledge of the world

The previous curriculum had a sequence of content descriptions that gave students some knowledge of the world beyond Australia, knowledge that was insisted on by the then heads of the education authorities of the states and territories. The content descriptions were:

- The division of the world into hemispheres, continents and oceans (in Year 2).
- The main climate types of the world and the similarities and differences between the climates of different places (in Year 3).
- Australia's neighbouring countries (in Year 3).
- A brief study of the continents and major countries of Africa and South America (in Year 4).
- A brief study of the continents and major countries of Europe and North America (in Year 5).
- The geographical diversity of the Asia region (in Year 6).
- Differences in the economic, demographic and social characteristics of countries across the world (in Year 6).
- The world's cultural diversity, including that of its indigenous peoples (in Year 6).

In the revision, the only world knowledge retained is the study of Australia's neighbouring countries in Year 3 and Asia in Year 6. Consequently students will learn nothing about the division of the world into continents and oceans, or about four of the continents. They will learn nothing of some of the countries Australia is closely connected to through history, trade, migration, alliances, and government and non-government aid, such as the United States, the United Kingdom and countries in Europe. The inclusion of this world knowledge in the original curriculum was insisted on by the then heads of the state and territory education bureaucracies, who regarded it as essential content. Students will also learn nothing about the economic, demographic, social and cultural differences between the countries of the world, and will have no sense of the world as a whole. This is a significant loss of knowledge that future citizens should have.

It might be argued that some of this is common knowledge and that, for example, everyone knows that there are seven continents. However, outside the English-speaking countries children are taught that there are six continents, with either Europe and Asia, or North and South America combined. There are also equally logical five and four-continent models. Students could learn from all this that geographical definitions are human constructs, and may differ between countries and cultures.

Knowledge of their place

Place is the dominant concept in the primary school geography curriculum. While places are parts of the Earth's surface that have been defined, named and given meaning by people, the concept of place is about ways of thinking about and explaining places and their significance to us. The content on place in the revised curriculum is disappointing.

For example, in Foundation this content description in the previous curriculum:

> *The places people live in and belong to, their familiar features and why they are important to people*

has been replaced with this one:

> *the features of familiar places they belong to, why some places are special and how places can be looked after*

The revised content description has a significant change of focus.

1. The change removes the emphasis on 'the places people live in and belong to', and puts it on features. The aim of the previous content description was to give students an understanding of the meaning of a place by thinking of where they live as a place, so it started with the place that children live in and

belong to, and then examined its features. In the revision the focus on the place children live in is further reduced by the words 'familiar places they belong to', which implies more than one place, and by this new elaboration:

identifying reasons why people live in or visit places, such as the provision of basic needs (water, food, shelter), to enhance lives (holiday places, places for recreation, for religious observance) and to maintain cultural connections to Country/Place

This elaboration replaces this one in the previous curriculum:

identifying how places provide people with their basic needs (for example, water, food and shelter) and why they should be looked after for the future

The revised elaboration adds places that people visit, which was originally a content description in Year 2 that has been deleted, and makes the content more complicated than is appropriate for Foundation students. Adding 'reasons why people live in or visit places' to the elaboration makes it even more complex, as well as confusing. In the elaboration in the previous curriculum students were asked to think about how places provided them with their basic needs, and it complimented a content description in Year 1 Science. The revised elaboration implies that the reason people live in places is to provide their basic needs, which changes the meaning completely and is nonsense.

2. The revised content description removes the words 'and why they are important to people'. This eliminates much of the point of the content description in the previous curriculum, which was to get children to think about the significance of their place in their lives, for the reasons explained below. The retention of this content description in Foundation:

   the importance of Country/Place to First Nations Australians and the Country/Place on which the school is located

   suggests that the revisers of the curriculum recognise place as only being significant for First Nations children.

3. The revision misuses the idea of a 'special place'. In the primary school geography education literature a special place is a place such as a child's bedroom, cubby house, play area, neighbourhood playground or holiday location. It is not the place they live in, or their community, as stated in this revised elaboration:

   identifying the places, communities, Country/Place they live in and belong to, and why that place may be special to them; for example, a neighbourhood, suburb, town or rural locality, or community

Why do these changes matter? They matter because they have removed the focus on the place that children live in, and why that place is important to them. Becoming familiar with the place you live in, and developing an attachment to it, contributes to the emotional development of children. Jack, a British social work academic, concludes from research in the UK that 'place continues to play an important role in the development of personal identity, feelings of security and a sense of belonging in the modern world' (Jack, 2015: 417). Spencer (2005, p. 305), a psychologist, argues that in 'doing geography' with children, the teacher is facilitating 'the child's very personal development of self-identity which will shape much of their lives, their values, sense of belonging and self-worth'. This occurs through the development of a child's familiarity with and sense of attachment to their place. It is an important but largely neglected contribution of primary school geography to the development of children. This contribution has been severely reduced in the revised curriculum.

Several other aspects of the concept of place have been deleted in the revision.

1. In the previous curriculum Year 2 had this content description:

   The idea that places are parts of Earth's surface that have been named by people, and how places can be defined at a variety of scales

   In the revision the first part, which asked students to think a bit more deeply about the concept of place, has been removed. Earlier versions of the curriculum described places as parts of the Earth's surface that have been given meaning by people, which is an even deeper idea and one worth returning to the curriculum.

2. In the previous curriculum Year 3 had this content description:

   The similarities and differences between places in terms of their type of settlement, demographic characteristics and the lives of the people who live there, and people's perceptions of these places

   This content further developed an understanding of places by studying them as settlements, populations and communities, and it also provided an opportunity or students to learn how to use

ABS statistics to find out about their own place and others that they were interested in. This is a task well within the capacity of Year 3 students. The previous content description also had this elaboration:

`*exploring people's feelings for place and the factors that influence people's attachment to place, through reading and viewing poems, songs, paintings and stories*

It encouraged students to think and talk about their emotional connections to their places, and to places that they might have lived in before.

3. In the previous curriculum Year 5 had this content description:

   The environmental and human influences on the location and characteristics of a place and the management of spaces within them

   This was intended to complete the sequence of content descriptions developing the concept of place by examining ways of explaining the characteristics of a place, and thinking about how the spaces within it are managed. It provided an opportunity for students to learn more about their own place, and to engage with local planning issues and conflicts. It could even get them involved in making a submission to their local government. It showed students how their understanding of places could be applied to real world issues.

   The content of this content description is partly included in this content description in the revised curriculum:

   the influence of people, including First Nations Australians and people in other countries, on the characteristics of a place

   This revision no longer includes reference to the management of the spaces within a place.

The previous curriculum had a recognisable, but by no means perfect, progression in understanding the concept of place, from the place the child lives in and its features and characteristics, to the importance of places for people, their feelings for and attachment to places, the meaning of a place, the settlement and population characteristics of places, and the environmental and human influences on what places are like, including the actions of local people. Most of the links in this progression have been weakened or deleted, and the understanding of places and their significance to young people has been greatly reduced.

Climate

In Year 3 a content description on the main climate types of the world and the similarities and differences between the climates of different places has been removed. Climate is not in the primary school Science curriculum, so students will not learn of the difference between weather and climate, something that is frequently misunderstood and which confuses people's understanding of climate change. For example, there are regular letters to the Editor of The Australian asking how can global warming be happening when the weather is so cold. They will also learn nothing about the climates around the world, knowledge which is an important part of world knowledge and is required to understand the different biotic regions or biomes of the world studied in Year 9 geography.

Addition or retention of unnecessary content

1. Year 2 has this content description:

   the interconnections of First Nations Australians to a local Country/Place

   Year 3 has a very similar content description:

   the ways First Nations Australians in different parts of Australia are interconnected with Country/Place

   Both have been refined from the previous curriculum. The only difference between them seems to be whether people are connected to a local C9ountry/Place or to non-local Countries/Places. Having two content descriptions on much the same topic should be avoided when so much content has been deleted, and the two could easily be combined.

2. In Year 5 this revised content description:

   the management of Australian environments, including managing severe weather events such as bushfires, floods, droughts or cyclones, and their consequences

   has replaced this one from the previous curriculum:

   The impact of bushfires or floods on environments and communities, and how people can respond

   The old content description was added following a recommendation of the Victorian Bushfires Royal Commission. It was solely about reducing the impacts of bushfires or floods, and quite limited. Its three elaborations were:

   mapping and explaining the location, frequency and severity of bushfires or flooding in Australia

explaining the impacts of fire on Australian vegetation and the significance of fire damage on communities

researching how the application of principles of prevention, mitigation and preparedness minimises the harmful effects of bushfires or flooding

The revision has broadened the content to be about the management of Australian environments, and removed the references to communities and how people can respond to natural hazards. This change is carried through in the two elaborations:

exploring how environments are used and managed, the practices and laws that aim to manage human impact, the use of zoning to manage local environments, creation of wildlife corridors and national parks

examining how changes due to environmental practices create issues, such as water shortages and increased floods and bushfires, the impact of issues on places and communities, and how people can mitigate the impacts through building codes, zoning, firebreaks and controlled burns, and efficient irrigation

Now teachers are asked to cover a wide range of environmental management practices, almost as many as in the Year 10 unit on environmental change and management. At the same time the principles of prevention, mitigation and preparedness that would help students to grasp the range of practices that can be adopted to manage the impact of bushfires or floods have been deleted. How this change contributes to stripping back the curriculum is unclear.

Reduced conceptual level

1. In Year 3, this content description in the revised curriculum:

   sustainable use and management of renewable and non-renewable resources, including the custodial responsibility First Nations Australians have for Country/Place

   has only two very long elaborations:

   exploring how some resources are used and managed in sustainable and non-sustainable ways; for example, auditing use of renewable and non-renewable resources in the classroom, investigating recycling and waste disposal of non-renewable resources in the school and by local government, reducing waste through "nude food" lunch boxes and using recycled toilet paper, examining how renewable resources such as timber are managed

   investigating how First Nations Australians adapted ways of living using knowledge and practices linked to the sustainable use of resources and environments (for example, rotational use and harvesting of resources; mutton-bird harvesting in Tasmania; the use of fire; the use of vegetation endemic in the local area for food, shelter, medicine, tools and weapons; and the collection of bush food from semi-arid rangelands), and how this knowledge can be taught through stories and songs, reflecting their inherent custodial responsibilities

   A major problem with the first elaboration is that there is nothing in it about the meaning of sustainability, or about the principles that can be applied to decide if the use of a renewable resource, or the disposal of a waste, is sustainable. There are only references to some individual actions that may help sustainability, whatever that might be. This was also a deficiency in the previous curriculum, partly produced by the resistance of at least one state to any reference to definitive statements about sustainability. Unless students understand what sustainability means as a concept, and how to apply that meaning in practice, they will have little understanding of what we need to do to become sustainable, and why.

2. Similarly, a major weakness with the second elaboration is that it does not explain the meaning of custodial responsibility, which would seem to be essential, and how it produces sustainable practices. Furthermore, the last two of the practices described in the second elaboration are not about sustainable resource use. More relevant practices that could be included are prohibitions on hunting and burning in specific areas and at specific times, prohibitions on catching animals when they are breeding, and prohibitions on harvesting plants that are seeding.

   Without an understanding of the concepts of sustainability and custodial responsibility, students are left with a collection of facts about practices, and little understanding of the logic underlying them.

3. Because of the deletions and changes to the content on places noted earlier, students will have a much poorer understanding of the concept of place, the dominant one in primary school geography.

4. In Year 2 a content description on activities in the local place and reasons for their location has been removed, while in Year 3 a content description on the influence of purpose, distance and accessibility on the frequency with which people visit places has also been removed. Their elimination deletes

the two main content items that developed understanding of the concept of location, including why things are located where they are, and the influence of location and accessibility on people's activities. These were in the curriculum to get students thinking about the effects of location and distance on their lives, and about where things should be located, as location is a core geographical concept. The Year 3 content description also asked students to look for patterns in their visits to places by investigating the relationship between the distance to places, the purpose of visiting them, and the frequency of visits. This is an exercise in making a generalisation and discovering a principle.

Errors and inconsistencies

Scale

Year 2 in the revised curriculum has this content description:

> *how places can be spatially represented in geographical divisions from local to regional to state/territory, and how people and places are interconnected across those scales*

Its elaborations are:

> *investigating the places locally and at a broader scale that they and their families visit for shopping, health, recreation, religious or ceremonial activities, or other reasons*
>
> *identifying links they and other people in their community have with people and places at the regional and/or state/territory scale; for example, where produce in their supermarket comes from or produce from their farms goes to, relatives they visit, places they go for holidays*
>
> *describing how communication and transport technologies connect their place to other places at the regional and/or state/territory level; for example, online communication, phone, road, rail, planes, ferries*

Both the content description and these elaborations are confused about scale. The visits, links and connections they describe are between individual places, as each one clearly states, and are therefore at the same scale. They are not visits, links and connections between a place and a region or a state, but between a place and other places that are located in another region or state. They are connections across distance, and not across scales.

Features

The term 'features' is used in Foundation and Years I and 2, and is defined in the Glossary as the:

> *Visible elements of a place; classified as natural (e.g. rivers), managed (e.g. parks, farms) and constructed or built (e.g. home, a city).*

Features are tangible things that can be observed, do not change rapidly, and can be located on a map. The term 'characteristics' adds intangible elements, such as weather and population composition, and is used instead of features from Year 3 onwards.

Year 1 in the revised curriculum has this content description:

> *the natural, managed and constructed features of local places, and their location*

Two of the elaborations for this content description are:

> *identifying natural features (for example, hills, rivers, native vegetation and weather), managed features (for example, farms, parks and gardens) and constructed features (for example, roads and buildings) and locating them on a map*
>
> *describing the daily and seasonal weather of their place using simple terms such as "rainy", "hot", "cold", "windy" and "cloudy", and comparing it with the weather of other places that they know or are aware of; for example, "It was windy at the beach but not at my house", "It is colder on the mountain", "It is rainy in the winter", "It is hot in the summer"*

The problem with both elaborations is that the definition of 'features' in the glossary quoted above does not include weather, as it is an intangible concept, changes rapidly, and does not have a fixed location, as is required by the content description.

Elaborations that don't match their content description

Elaborations should describe ways that teachers can teach the content description to which they belong. The following are instances where the elaborations appear to be incompatible with their content description.

1. Year 1 in the revised curriculum has this content description:

   how places change and how they can be cared for by different groups including First Nations Australians

   Two of its elaborations: are

   identifying which resources they can recycle, reduce, re-use or none of these, and what local spaces and

systems support these activities; for example, rules, signs, waste collection truck routes

describing how local places change due to changing weather and seasons, and how we can care for places because of those changes; for example, not walking in muddy areas during wet weather, and watering plants in dry weather

The first elaboration is only tenuously linked to the idea of caring for places, while the second has no link. It is about regular seasonal changes, and not about permanent changes such as new buildings, structures or land clearing.

2. Year 3 of the revised curriculum has this content description:

   the similarities and differences between places in Australia and neighbouring countries in terms of their natural, managed and constructed features

   Two of its elaborations are:

   investigating differences in the type of housing that people use in different climates and environments

   exploring different types of settlement and classifying them into hierarchical categories, such as isolated dwellings, outstations, villages, towns, regional centres and large cities

   To be compatible with the content description the first elaboration should be limited to the neighbouring countries. The second elaboration has been imported from a content description in the previous curriculum on types of settlement that has been deleted, and has no relationship with the revised content description.

3. Year 6 of the revised curriculum has this content description:

   the geographical diversity and location of places in the Asia region, and its location in relation to Australia

   It looks similar to this one in the previous curriculum:

   The geographical diversity of the Asia region and the location of its major countries in relation to Australia

   However, the revised content description is now about the diversity of places, and not of the diversity of the region as a whole. It is also about places, not countries, yet these changes are not matched in several of the elaborations, which continue to about the diversity of the region and about countries. Two other elaborations are:

   comparing the daily lives of people in other countries, in terms of food, clothing, personal and household goods, housing and education, and differences between the wealthy and poor in a country

   researching the proportion of the Australian population and of the population from their local area who were born in each world cultural region, using data from the Australian Bureau of Statistics, and then comparing aspects of selected cultures

   They have both been imported from content descriptions that have been deleted. The first covers the world while the second is only about Australia; neither belong to a content description that is about the Asia region.

4. Also in Year 6, this content description in the revised curriculum:

   Australia's interconnections with other countries and how these change people and places

   is the same as in the old curriculum, but this elaboration has been added:

   using geospatial tools such as a globe, wall map or a digital application, to identify the geographical divisions of the world, including the Asia and Pacific regions

   This has no relationship with the content description, which is about countries, not the geographical divisions of the world into continents and oceans, and has been imported from a deleted content description in Year 2 of the previous curriculum. Its addition to this Year 6 content description is inexplicable, as this is knowledge that should have been learned early in primary school, and not in Year 6.

Removal of human aspects of places

In two content descriptions and their elaborations there has been an elimination of the human aspects of places.

1. This Year 3 content description in the revised curriculum:

   the similarities and differences between places in Australia and neighbouring countries in terms of their natural, managed and constructed features

   replaces this one in the previous curriculum:

   The location of Australia's neighbouring countries and the diverse characteristics of their places

   Three of the elaborations in the revised content description are:

   identifying and locating examples of the main climatic types in Australia and neighbouring countries

(for example, equatorial, tropical, arid, semi-arid, temperate) and the features of those climate types and their impact on other natural features

identifying and describing the similarities and differences between places in Australia and places in neighbouring countries, such as Indonesia and Pacific Island nations, in their natural features; for example, rocks, landforms, bodies of water, climate, soils, natural vegetation and animal life

choosing a place in a neighbouring country, such as Indonesia or Pacific Island nations, to compare with a place in Australia in terms of managed and built features, to explore the reasons for similarities and differences

There are three issues here. One is that a content description on climate and climatic types has been deleted from the revised curriculum, yet is needed for students to understand what a climate is and how it differs from weather. The second is that the revised content description is about features, and climate is not a feature of a place according to the definition noted earlier. The third is that the previous content description was about characteristics, which are both physical and human, but in the new elaborations there is no mention of human characteristics such as populations, cultures, economies and ways of living. Instead, it is suggested that teachers focus on 'rocks, landforms, bodies of water, climate, soils, natural vegetation and animal life,' and on 'managed and built features'. This is another inexplicable change.

2. A similar change has been made in Year 5. The previous curriculum had this content description:

   The environmental and human influences on the location and characteristics of a place and the management of spaces within them

   The content of this content description is partly included in this one in the revised curriculum:

   the influence of people, including First Nations Australians and people in other countries, on the characteristics of a place

   Three of its elaborations are:

   identifying how First Nations Australian communities altered the environment and sustained ways of living through their methods of land and resource management; for example, firestick farming

   exploring the extent of change in the local environment over time (for example, through vegetation clearance, fencing, urban development, drainage, irrigation, erosion, farming, the introduction of grazing livestock such as sheep and cattle, forest plantations or mining), and evaluating the effects of change on economic development and environmental sustainability

   exploring examples of positive influences people have on the characteristics of places; for example, reforestation, land-care groups, rehabilitating former mining, industrial or waste disposal sites

   These elaborations are only about the environmental characteristics of a place, so once again learning about the human characteristics of a place has been removed.

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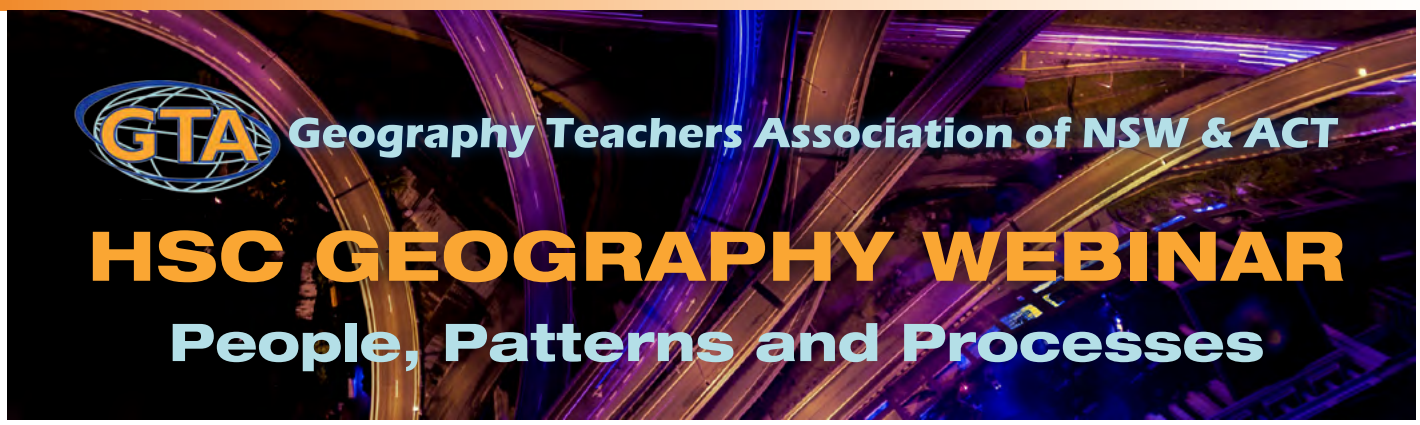
Alaric Maude
14 June 2022



This webinar will unpack the 'People, Patterns and Processes' unit in the Preliminary course and provide teaching ideas and potential case studies for this part of the course. This session aims to be a practical 'walk-through' of the content and material in this part of the syllabus, and will give you a range of ideas on how to program this unit for your school context. Additionally, each of the five optional studies will be examined to help you decide which one you might choose for your own program.

TOPICS

- Overview of the diversity and extent of human activity
- Population and resource consumption
- People, patterns and processes study
  - Study 1: Human resilience in diverse environments
  - Study 2: Local places and global economic change
  - Study 3: Place and cultural change
  - Study 4: Political power and contested spaces
  - Study 5: Technological advances and the transformation of places.

PRESENTER: Ms Alex Pentz, Head of Social Science – Roseville College

DATE: Thursday 26 October, 4.30 – 5.30pm

COST: Members $40, Non-members $60.

For further information contact: gta.admin@ptc.nsw.edu.au

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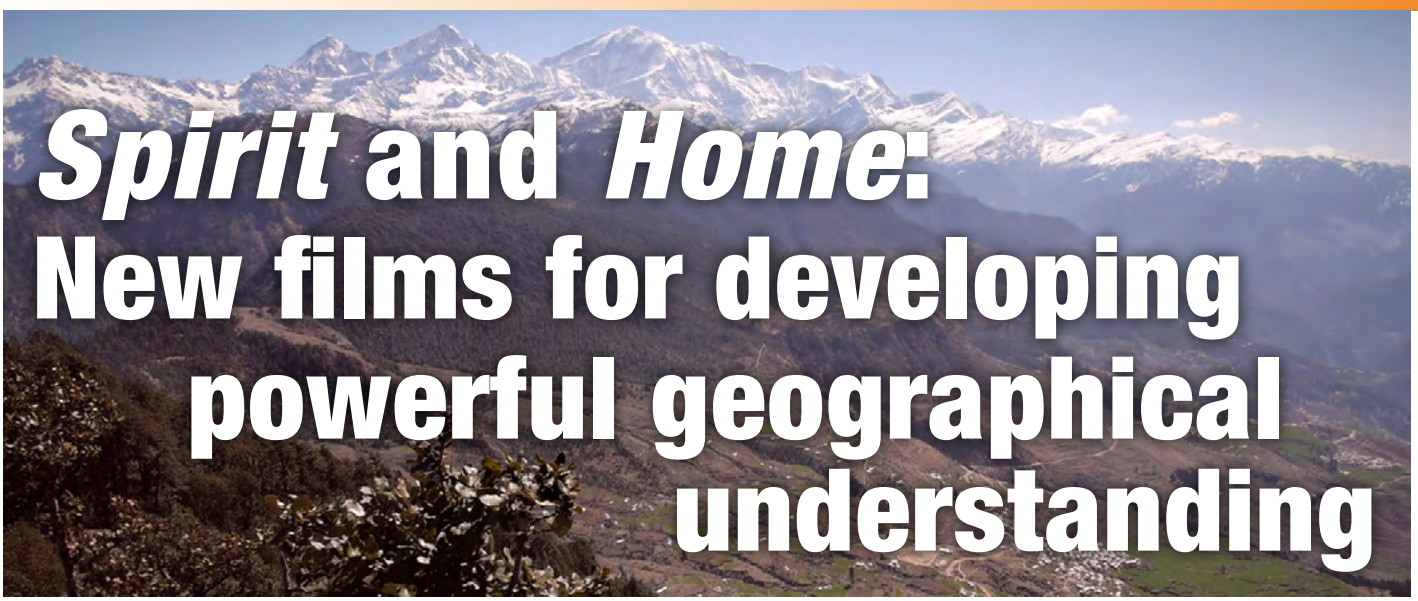


Spirit and *Home*: New films for developing powerful geographical understanding

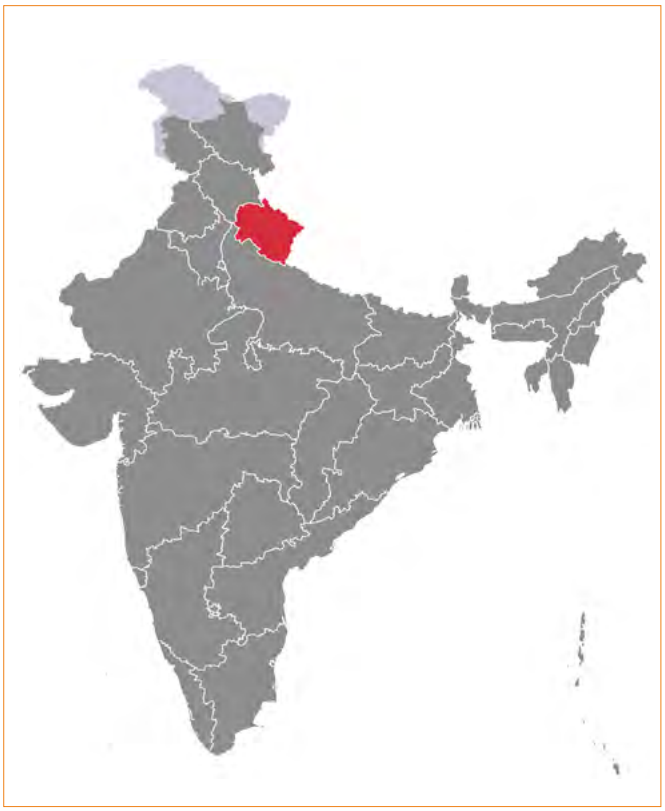
Shu Jun Lee and Jane Dyson
University of Melbourne

Films as a teaching resource

Films transport us to places in ways that words alone cannot, which is why they are an especially valuable resource for the geography classroom. Take the concept of economic development, for example; students can understand it by examining geographical information in written texts including development indicators in various countries. However, films can provide students with the opportunity to understand the perspectives of people living in very different cultural settings and to form visual and acoustic impressions of their lives. In doing so, film can stimulate discussions that develop a more nuanced understanding of how 'development' and change are experienced by different sets of people on the ground.

To use films effectively in the classroom, teachers can use various scaffolds to encourage students to actively process new perspectives. For example, the 5W1H strategy – described later – is valuable in this context. Teachers also need to ensure that, after viewing a film, sufficient time is provided for students to think about and respond to new perspectives portrayed (Durbin, 2002). Using dialogic teaching strategies can help students to think critically about geographic issues in film and to empathise with people in very different cultural settings.

It is not always easy to find films that both explore issues through a geographical lens and intersect with a high school curriculum. Here we introduce two films – produced by a geographer – with accompanying lesson plans that are aligned to the Victorian geography curriculum standards. ***Spirit*** and ***Home*** are documentary films made by Associate Professor Jane Dyson, whose earlier film ***Lifelines*** has been successfully used as a teaching resource in secondary school classrooms in Australia, the United Kingdom and the United States, as well as in higher education (Kriewaldt & Dyson, 2017, www.lifelinesfilm.com).



Map of India showing the location of Uttarakhand in red.

Top: View of the village nestled beneath the Himalayan peaks. Credit: Ross Harrison

A young woman dances during the Pandav Lila, a festival depicted in the film, Spirit. Credit: Ross Harrison

Two new films: *Spirit* and *Home*

Based on Dyson's long term ethnographic research in a high-altitude Himalayan village in Uttarakhand, India since 2003, the films document continuity and change through the eyes of the villagers. The once highly remote region has been transformed in the past two decades; the building of a new road, installation of electricity and telecommunications, and the rapid expansion of educational facilities have provided new possibilities in the village beyond subsistence agriculture. Nevertheless, young people are increasingly leaving the area to access even better educational and employment opportunities in the cities. But leaving one's home is a difficult decision and often taken reluctantly. Many young people eventually return to the village with renewed commitment to the village, and its development.

The two new films explore the tensions between the 'old' and 'new' from different angles. ***Spirit*** (19 minutes) examines ideas of belonging in this remote area as it undergoes rapid social and economic change. It depicts how, despite new opportunities for education and growing rates of outmigration, villagers still prioritise their connection to their community, to the land on which they live, and to the many thousands of Hindu gods who are also said to inhabit the mountains. The cultural and spiritual practices in the village celebrate these interconnections across the physical, social and cultural/spiritual realms, and, in this respect, villagers share similar perspectives to Australia's First Nations people and their connection to Country. Culminating in the exuberant *Pandav Lila* – a ten-day festival that celebrates the gods and draws people back to the village – ***Spirit*** explores the tensions people face in managing 'development' and change while maintaining their connection to each other and the land.

Home (8 minutes), on the other hand, is a short film that focuses on a young generation of women who, despite their educated status, continue to farm and contribute to domestic work considerably more than young men. The film follows the story of Munni as she contemplates her inevitable arranged marriage, her ambivalent pursuit of an education outside the village, and her connections to her family, community and the region.

Both films – ***Spirit*** and ***Home*** provide students with a visual understanding of key geographical concepts such as place, interconnection, and social and economic change. Lesson plans have been designed to help teachers make use of the films to build students' geographical thinking and understanding. The resources aim to help students engage with the various characters and themes in the films, critically consider different perspectives and reflect on the implications of development for people's lives.

Two older women discuss changes in the village. Credit: Ross Harrison

Suggested Lesson Plans

The first lesson plan is based on the film ***Spirit*** and is designed for the **Year 7 unit** 'Place and Liveability,' which investigates people's connections to place and how these shape their identity, and sense and perceptions of place. After viewing the film students will assume the roles of different characters in the village and simulate a village gathering to discuss the future needs of the village. The role play activity encourages students to consider how different people perceive and are connected to place. This then enables students to reflect on their own assumptions and perceptions about place.

The remaining two lessons plans are based on the film ***Home***. The first plan is designed for the **Year 8 unit** 'Changing nations' and encourages students to adopt the 5W1H (what, why, who, when, where and how) strategy to actively engage with the film. This strategy supports students to collect, record and subsequently analyse geographical information (DET, 2020). The lesson discussion encourages students to construct their own understanding of how education for girls influences population changes, and how education might act as a push/pull factor for urbanisation and internal migration in India.

The 5W1H strategy for active viewing of the film ***Home*** is also recommended in the final lesson plan designed for the **Year 10 unit** 'Geographies of human wellbeing'. Students are encouraged to record any information from the film that helps them infer the level of wellbeing in the state of Uttarakhand. They will then conduct further research on wellbeing indicators for Uttarakhand and compare these with another Indian state. The lesson plan suggests for teachers to engage students in critical discussions on various ethical dimensions including if and how the indicators show gender differences.

Munni contemplates her homeland. Credit: Ross Harrison

Developing powerful geographical understanding

A focus on ethics and values is a vital component of many geographical issues. Roberts (2017) proposed that geography teachers play an important role in helping students consider diverse perspectives, interrogate knowledge claims and develop their own opinions with respect to ethics and values. This prepares them for civic participation and informed decision making on complex issues like uneven development, climate change, or a global pandemic. Documentary films like ***Spirit*** and ***Home*** are powerful resources that teachers can use to explore the ethical/values dimension and develop the geographical thinking and understanding that will empower students to shape their future.

The lesson plan for ***Spirit*** is appended with this article. You can access all the lesson plans as well as the films, ***Spirit*** and ***Home,*** at www.spiritdocumentary.com/resources

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Women gather to talk before working in the forest. Credit: Ross Harrison

Authors' biographies

Jane Dyson is an Associate Professor of Human Geography at the University of Melbourne. For two decades, she has conducted research on young people and regional change in the Indian Himalayas. Her work is published in academic books and journal articles and presented in award-winning films.

Shu Jun Lee is a lecturer at the Melbourne Graduate School for Education, University of Melbourne. An experienced Geography teacher and leader, she recently completed her PhD researching on the place and potential of inquiry in the secondary geography curriculum.

Spirit Lesson Plan for Year 7 Geography

Written by Jane Dyson & Shu Jun Lee

Subject: Geography	**Year level: 7**
Topic: Place and liveability	**Time required: 90 minutess**

Lesson summary

Students will watch the film ***Spirit*** and participate in a role play that would encourage them to reflect on diverse perspectives on place/Land.

Curriculum links

The cultural connectedness of people to places and how this influences their identity, sense of place and perceptions of a place (AC9HG7K07)

LEARNING OBJECTIVES

Knowledge

Students will be able to:

- describe the characteristics of a place
- explain the cultural connectedness of people to places and how this influences their identity, sense of place and perceptions of a place
- relate these concepts to the cultural connectedness of First Nations Australians to Country

Skills

Students will develop skills of

- communicating with peers
- empathy
- community awareness
- knowing Asia and its diversity

Values

Students will be able to

- develop intercultural understanding

Resources required

Spirit video (including transcript for students who may benefit from access to the written text)

Spirit Lesson Plan for Year 7 Geography

Lesson Outline

Teacher guidelines	Student activity	Timing
Introduction		
Teachers may use a photograph of a place familiar to students as a trigger activity. Teacher asks students to brainstorm the characteristics specific to that place; these include natural and human features.	Students lists the characteristics of a place.	10 mins
Teacher introduces the film and provides some background information on the place where the film is set: the Garhwal Himalaya village in the Indian state of Uttarakhand.	(optional) Students locate the Indian state of Uttarakhand using Google Maps or Google Earth, and describe their observations of the location.	
Development		
Teacher introduces the role play task and assigns and explains the roles. Teacher shows the film Spirit (approx. 20 minutes).	Students pay particular attention to their assigned characters in the film.	20 mins
Teacher gets students to discuss how their characters 'see' the village and the factors influencing their perception of the village. Teacher guides students to imagine how the characters may envision the future of the village.	Students work in groups to discuss the perceptions of their assigned characters.	15 mins
Teacher assumes the role of the village leader (pradhan) and facilitates the discussion at the village gathering. Teacher may use the hot-seat strategy or any other role-play strategies.	Students assume their roles; characters take turns to sit on the hot seat to be interviewed by the rest of the class.	30 mins
Conclusion and reflection		
Teacher debriefs the activity and guides students to reflect on the cultural connectedness of people to places and how this influences their identity, sense of place and perceptions of a place. Teacher can also extend the discussion to include how the First Nations people in Australia perceive Country.		15 mins

Spirit Lesson Plan for Year 7 Geography

Role Play Activity

Background information

The village in which this film is set if located in the Indian state of Uttarakhand, in the Garhwal Himalayas. Over the past two decades the once highly remote village has seen many changes. The inflow of state funds has led to the development of infrastructure including a road, electricity and telecommunications, and schools. The Indian government's push for free and compulsory education since 2009 has enabled the younger generation to receive basic education, providing new possibilities in the village beyond subsistence agriculture. Nevertheless, young people are increasingly leaving the area to access even better educational and employment opportunities in the cities. But leaving one's home is a difficult decision and often taken reluctantly. Many young people eventually return to the village with renewed commitment to the village, and its development.

Despite new opportunities for education and growing rates of outmigration, villagers still prioritise their connection to their community, to the land on which they live, and to the many thousands of Hindu gods who are also said to inhabit the mountains. The cultural and spiritual practices in the village celebrate these interconnections across the physical, social and cultural/spiritual realms. The film culminates in the exuberant ***Pandav Lila*** - a ten-day festival that celebrates the gods and draws people back to the village. The festival illustrates how the wellbeing of the land and the spirits is perceived to be closely connected to the wellbeing of the villagers and their animals. In this respect, villagers share similar perspectives to Australia's First Nations people and their connection to Country. The villagers in the film acknowledge that this interconnectedness is something that those outside of the village may not experience or understand.

The roles

Each group of students will represent one of the following characters/groups of people:

Saraswati Saraswati is the main character in the film ***Spirit***. When she married her husband, she moved to the village as an unusually well-educated young woman. However Saraswati worked hard like the other women in the village. She also had children who have since left the village for education elsewhere. Although she now works at a school, Saraswati continues to share the work on the land with the other women. While she feels sad that she has not achieved as much as she would like in her life, she now feels at home and connected to the village and the land.	***The older ladies*** All their lives, the older generation has worked hard, living off the land, and maintaining the connections between the physical, spiritual and cultural realms in the village. They are somewhat sceptical of younger generations with their 'newfangled' ideas and who they perceive to scorn hard work. They fear that young people will leave the village, and worry about the implications of outmigration for the economic, social and spiritual life of the village.
Saraswati's children Saraswati's children were born in the village but they moved away when they were young to find a better education. They come home occasionally to visit and participate in festivals including the Pandav Lila.	***Dancers in the Pandav Lila*** The Pandav Lila is conducted to ask the gods to protect the cows and other livestock in the village. During the festival, the dancers are spontaneously possessed by the gods and goddesses. The whole village gathers to help organise and participate in the festival. The exuberant performances last from dusk to dawn. At the end of the 10 days, even as the dancers go back to their normal lives, the spirit which they embodied and displayed remains high.

Spirit Lesson Plan for Year 7 Geography

State government officials	***Tourists from Australia***
The state of Uttarakhand in north India was established in 2000. Prior to that, it was part of the state of Uttar Pradesh. Since 2000, Uttarakhand has become one of India's fastest developing states. Agriculture remains one of the state's key industries. Tourism, manufacturing and other industries are also growing. The state continues to look out for opportunities in the various districts for economic development.	Uttarakhand offers many natural and cultural attractions with spiritual significance. Tourists visiting the Garhwal Himalaya can enjoy mesmerising views of the snow-capped Himalayas, visit key Hindu pilgrimage sites and learn from the multiple religious and cultural festivals.

The task

In your assigned groups, after viewing the film, think and discuss:

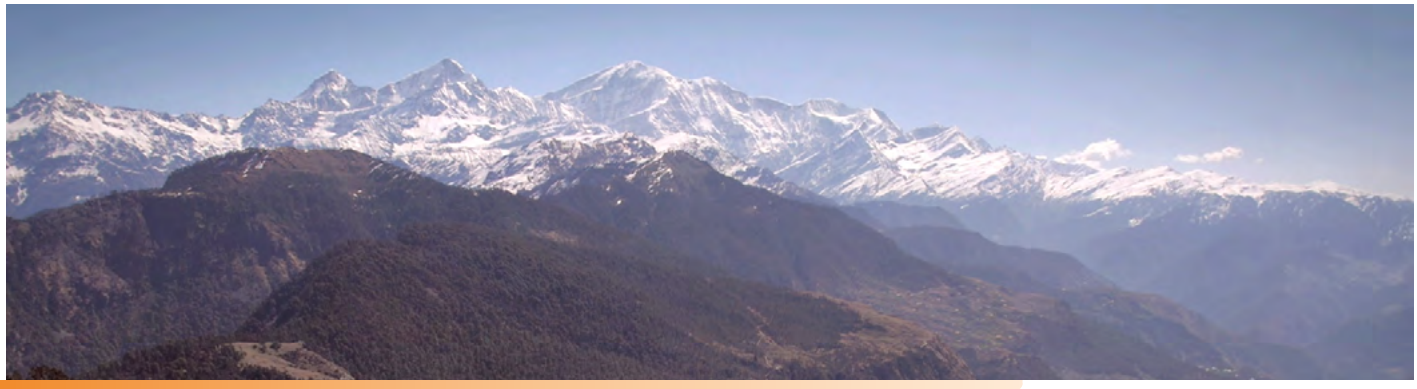
- How does your assigned character 'see' the village?
- Which factor is the most influential in influencing this character's perception of the village?
- What might your assigned character want for the future of the village?
- What might the other characters want for the future of the village? How will your character respond to these perspectives?

The role play scenario

- There is a village gathering today for everyone to discuss the future of the village.
- Each character is hot-seated for 5 minutes. The characters take turns to sit on the hot seat to be interviewed by the rest of the class.
- The entire discussion will be facilitated by the village leader (the teacher).

Additional information

- Official website on *Spirit* with further information https://www.spiritdocumentary.com/
- Using role play and drama in lessons, Literacy Teaching Toolkit by Victoria Department of Education and Training https://www.education.vic.gov.au/school/teachers/teachingresources/discipline/english/literacy/speakinglistening/Pages/exampleroleplay.aspx
- Additional film from the same village – *Lifeline*s (16 minute version and 10 minute version) – and associated lessons plans available at: www.lifelinesfilm.com/resources
- Further film: *Home* (8 minutes), and associated lesson plan available at: www.spiritdocumentary.com/otherfilms and www.spiritdocumentary.com/resources



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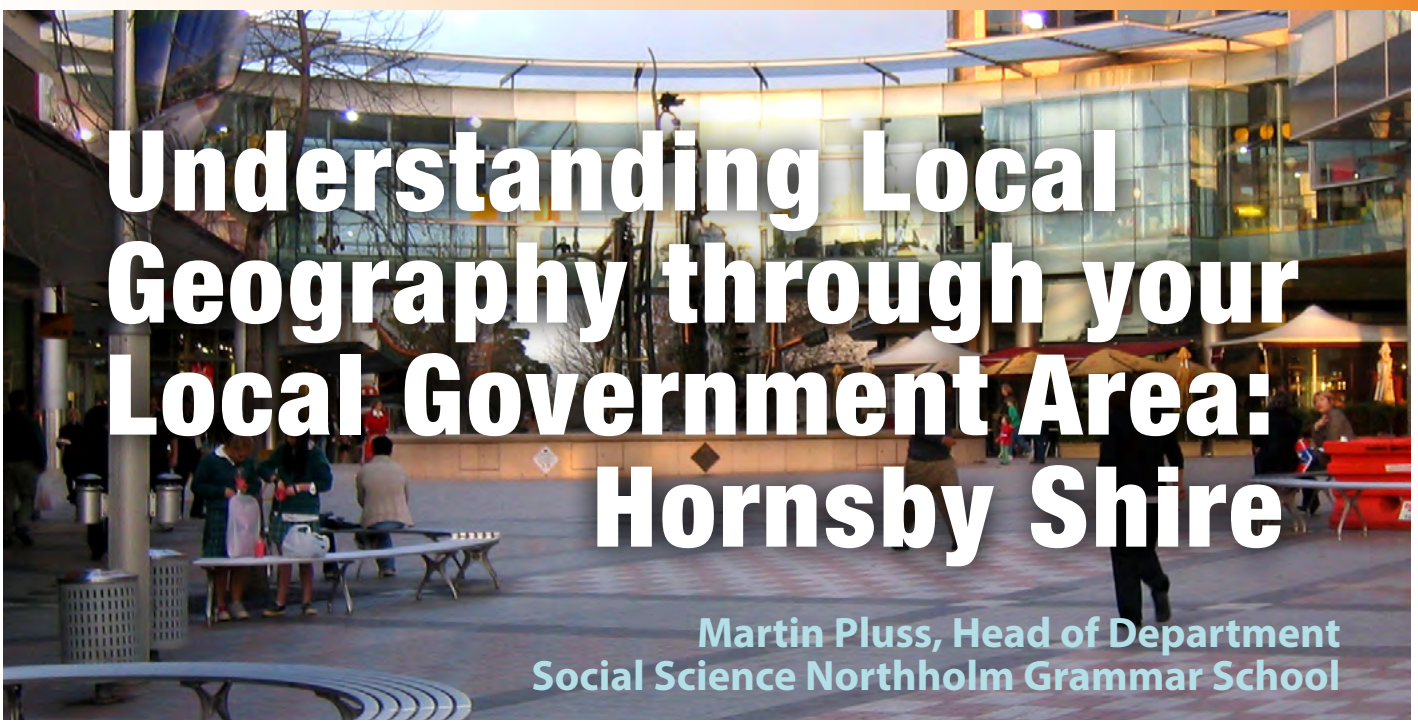


Understanding Local Geography through your Local Government Area: Hornsby Shire

Martin Pluss, Head of Department
Social Science Northholm Grammar School

Introduction

Schools are in Local Government Areas (LGAs) and students live in LGAs. Sometimes they are the same LGAs and sometimes they are not. Either way local councils are a rich source of primary and secondary information for geography teachers and students.

My school and where I reside are within the boundaries of Hornsby Shire Council. Attending most Council meetings since 2015 and every meeting in 2022 has been most informative and useful to build an understanding of local geography.

My intention is to encourage students and teachers to take explicit interest in local council activities from a geographical perspective. This article will share the key geographical issues addressed in 2022 by Hornsby Council staff, Councilors and the community.

Hopefully this will provide ideas for teachers to consider about their own LGA and in their classroom. Where lists of information are provided in this article, for example with flood management, the goal is to provide content starters for further investigation in your local area.

Hornsby Shire LGA

In 2022 Hornsby Shire's population was 159138 people and it is expected to grow by 12.8%% to 179 582 people in 2036. The number of dwellings in the Shire is expected to rise 17% from 56 904 (2022) to 66 632 (2036). (Figure 1) Operationally, the council has its eyes on the present and planning for a growing population and state government dwelling compliance (Figure 2).

Reading Council documentation, attending council meetings and engaging in community groups are ideal ways to develop an understanding of geographical issues in your local area. Hornsby Council meetings are on the second Wednesday of each month except for January. The business papers are online on the first Monday of the month.

Agenda items and reports are based on the council's organisational structure which is as follows: Office of General Manager, Corporate Services Division, Community and Environment Divisions, Planning and Compliance Divisions and Infrastructure and Major Assets Divisions. Each division provides insights into geographical issues from delivery of services and facilities, provision of social and economic infrastructure, sustainable practices for waste management, protection and management of the environment and planning for future needs across the shire and in specific places. Each division writes detailed reports from which geographical data can be gleaned.

The meetings also have Confidential Items, Mayoral Notes and public individuals and community groups are afforded the opportunity to present for three minutes, on agenda items and in the public forum. The public forum enables students to engage in active citizenship.

The meeting format includes the national anthem, prayer from a local church group and welcome to the Country by a local Durag or Garigal indigenous elder(s). Agenda items are passed by the exception method, that is, if no member of the public or the council wishes to speak to the item. All other items are addressed during the meeting.

Prior to the last two terms of council, councils were the main decision maker for Development Applications (DAs). Currently, if there are more than ten objections to the DA or the development is considered as state significant the Council is limited in what it can do about a DA. The decision is passed to the Northern Sydney or the Hornsby Planning Panels. Students find this useful information to share with their parents if they have concerns about developments in their local area.

The year 2022 was the first year of a three-year cycle until the next election in September 2024. In the beginning of each year, an Operational Plan, based on strategic planning, was formulated and presented to the community. This is where the community can discover what is planned for local paths, footpaths, services & facilities and events.

What did 2022 look like in Hornsby? How can it provide insight into school geography? How can it contribute to student primary and secondary research? How can students be engaged in local geographical issues? Who are the active local community groups in the area? What are the opportunities available for active citizenship?

Some answers to these questions come through an investigation of Shire wide projects and initiatives. Figure 1 indicates a series of agenda items, with geographical implications, in meetings throughout 2022.

Shire Wide Geographical Issues

Hornsby Shire projects and initiatives have impacts across all Hornsby. In 2022 the following three Shire wide issues provided examples and an avenue for further research by students and teachers. A similar opportunity would be available in your LGA.

Some projects and initiatives in 2022 include the Community Strategic Plan 2022–2032, Design Excellence Planning Panel, Disability Inclusion and Social Inclusion Plan, a renewable energy infrastructure initiative, Healthy Aging Hornsby, Draft Flood and Risk Management Strategy, Agri Business Tourism reforms and approaches to telecommunication facilities. The work of various committees fed into decision making and these committees had specific agenda items in 2022. Committees of human geographical interest are the Aboriginal and Torres Strait Islanders Consultative Committee (HATSIC), the Heritage Advisory Committee and the Arts and Culture Advisory Group.

Here are three Shire wide initiatives with geographical content, processes and management strategies which can be aligned to syllabus content. They are presented as Hornsby examples and hopefully provide insights into what is possible in your local government area.

Community Strategic Plan 2022–2032

https://www.hornsby.nsw.gov.au/council/forms-and-publications/publications/community-plan

The Community Strategic Plan is a significant Shire wide initiative with geographical implications as Agenda Item 2 in March 2022, The Community Strategic Plan 2022–2032 – Your Vision, Your Plan. It is based on a ten-year plan divided into a four-year plan for delivery and a one year operational plan to be documented through annual, bi-annual and quarterly reports. Each document provides substantial data, graphs and maps.

The council's role is to provide transparent decision making and supporting strategic documents including a local strategic planning statement and a resourcing strategy including a long-term financial plan, a workforce management strategy, and an asset management strategy and plans.

The guiding principles for the management of human and environmental resources include working with other councils and state government, securing services for community needs, acting fairly without bias for the community and recognising diversity needs and interests. Specific social justice considerations such as access, equity, participation, and rights are recognised. Finally, the long term cumulative social, environmental, economic and civic leadership are to be considered.

Hornsby is linked to the Greater Sydney Commission North District Plan. Hornsby deals with the following geographical challenges such as the rate of population growth (Figure 2), traffic and transport, housing supply (Figure3), housing affordability and diversity, climate change and environmental sustainability, resilience and planning and the natural environment. There are a multitude of stakeholders such as traditional owners, state and federal government and community groups. There is a wealth of resources for all Sydney based teachers through the Greater Sydney Commission.

The community plan is designed around the principles of Hornsby being livable, sustainable, productive and collaborative. This is a valuable framework which could be adopted by teachers and students because it investigates geographical issues and provides a

framework for measuring progress which would be useful for their own research.

Four questions are addressed for each theme.:

- What is measured?
- How is it measured?
- What is the baseline for comparison?
- What is the target?

For the theme of Liveable Hornsby what is measured is a connected and cohesive community. The measurement comes from looking at the detail of the strategic direction. In Hornsby's case this is "caring for community where the built environment and people combine to create a sense of belonging and support." The community indicator base line for comparison is measured by volunteer participation rates, compared to a 2016 baseline of 24.9% The target to increase or maintain this participation.

This approach is replicated for the three other themes, and all provide local research opportunities for students. *A Sustainable Hornsby* is measured by the ability to recover from natural disasters, strategies for net zero emissions, recycling and organic waste and sustainable resource uses, tree canopy of private land and transition to a water sensitive city. *A Productive Hornsby* with integrated and accessible transport can be measured by safety on the roads, reliance on private motor cars, use of sustainable transport such as E Vehicles. *A Collaborative Hornsby* the quality of the services provided to Council Customers and the opportunities to participate in council decision making.

All LGAs will have a Community Strategic Strategy which is most useful for Stage 4 Place and Livability – access to services and facilities, community and enhancing livability.

Disability Inclusion Action Plan (Social Inclusion).

Sometimes a geographer needs to dig around to find the geographical implication of the Shire wide initiative, for example, in the April Council meeting Item 7 included the Disability Inclusion Action Plan (Social Inclusion). There were four themes and sub themes treated: developing community attitude and behaviour, creating liveable communities, supporting access to meaningful communities and improving access to services through better systems and processes.

On a closer examination the accessible geographical implication for students is via the theme of creating livable communities. A geographer would need to be engaged in the provision and maintenance of accessible paths, kerb ramps, and crossings. Accessibility and safety of footpaths requires an understanding of the natural environment and the human interactions of such environments. Improving travel and access to transport in Hornsby provides an opportunity to understand the processes and the impact on the natural and built environment of private and government transport organisations. In addition the focus on disability is well suited to the section in Stage 5 Human Wellbeing – Human Wellbeing in Australia and the following syllabus item: "…***examination of the reasons for and the consequences of differences in human wellbeing for TWO groups of people in Australia…. people with disabilities.***"

View of Berowra Waters from the Benowie Track. Source: Wikimedia Commons

Flood Risk Management Strategy

The Flood Risk Management Strategy was Agenda Item 5 in the October Council Meeting. Most LGAs would have areas that are subjected to flooding, this was particularly the case for Hornsby. There are fourteen main catchments in the Shire and 52 sub catchments with the dominant form of flooding overland flow. Flooding affects the whole Shire but mainly the lowlands along the Hawkesbury River and the townships of Brooklyn & Wisemans Ferry (Hornsby LGA) Spencer & Gunderman (Central Coast LGA). Major tributaries to the estuary include Mangrove, Berowra, Mooney Mooney, Mullet and Cowan creeks. Most of the foreshore and adjacent land is national park, with much of the foreshore only accessible by boat.

The key issues raised and a focus for student research include the size of the flood, effective warning time, flood readiness, rate and rise of flood water, duration of flooding, ease of evacuation , effective flood access and the type of development on the floodplain. Students then need to consider the environmental and social

characteristics of the area such as population size, structure and distribution, soils, contaminated lands, water management, threatened flora and fauna, aboriginal heritage and acre sites.

All these issues provided detailed content to explore Stage 4 Water in the World in a range of suburbs (Figure 4) such as Beecroft, Castle Hill, Cheltenham, Cherrybrook, North Epping, West Pennant Hills. This enables a local consideration of the following syllabus points: water cycle, water scarcity and management and a natural hazard.

What's next?

In 2022 there were dozens of Shire wide initiatives with geographical implications for students to engage in further primary and secondary research. Some of these initiatives are in response to state government requirements and as such would be similar projects and policies in place for your LGA. Such resources and documents would be online for your community and if you were prepared to go one step further and attend a few meetings you would learn more.

It is now up to you, the geography teacher, to align what you can learn from your LGA in your geography teaching, linked to a variety of syllabus points. The starting point should be maps of your LGA and the Wards (Figure 5). These will provide a breakdown of the suburbs (Figure 4) you can investigate and then students can follow up the ABS Quick Stats for more data. Local Government Areas are a common factor in all local geography for NSW geography students. If leveraged well, council activities can provide considerable insight and relevance to syllabus points in the geography classroom.

A possible future article in this local geography series couldl focus on the place based initiatives and projects in Hornsby Shire. This will examine place-based approaches to community engagement and management strategies in Hornsby Shire to assist students develop local geographical understanding.

Hornsby Shire Council Chambers. Source: WikimediaCommons

Figure 1: Hornsby Council Meetings 2022

AGENDA ITEMS OF GEOGRAPHICAL SIGNIFICANCE	
February 2022	Agenda Item 5 Sydney North Planning Panel and Hornsby Planning Panel – local and community members.
March 2022	Agenda Item 3 Draft Community Strategic Plan 2022–2032. Agenda Item 5 Design Excellence Panel – Panel Members.
April 2022	Agenda Item 6 Dual Naming and Renaming of Council Facilities Policy Agenda Item 7 Disability Inclusion Plans (Social Inclusion)
May 2022	Agenda Item 4 Realignment of suburban boundary between Middle Dural and Glenorie. Agenda Item 6 Byle's Creek Planning Study – a Report on submissions. Agenda Item 7 Onsite Sewage Management System Policy.
June 2022	Agenda Item 8 Draft Rural Lands Study.
July 2022	Agenda Item 4 Draft Disability Inclusion Action Plan. Agenda Item 6 Planning Proposal Old Northern Road. Agenda Item 7 Planning Proposal 7 City Road Pennant Hills. Agenda Item 8 Hornsby Town Centre Master Plan.
August 2022	Agenda Item 2 Deferred Report Car Parking Management Brooklyn. Agenda Item 7 Hornsby Aboriginal and Torres Strait Islander Consultative Committee (HATSIC) Membership. Agenda Item 12 Expression of Interest- Provision of Renewable energy infrastructure.

September 2022	Agenda Item 7 Healthy Aging Hornsby. Agenda Item 8 Arts and Culture Advisory Group. Agenda item 11 Exhibition of Cherrybrook Station Precinct and State Significant Planning proposal.
October 2022	Agenda Item 5 Hornsby Shire Draft Flood Risk Management Strategy and Plan. Agenda Item 6 Public Domain Guidelines and Improvements Beecroft Town Centre.
November 2022	Agenda Item 1 Hornsby Shire Council Report 2021–2022.
December 2022	Agenda Item 6 Draft Healthy Aging Hornsby Strategy. Agenda Item 8 Mark Taylor Oval Indoor Cricket Lease. Agenda Item 9 Community Events Grants Program. Agenda Item 10 Planning Proposal Byle's Creek. Agenda Item 11 Agri Tourism Planning Reforms. Agenda Item 14 Proposed Co-location of Telecommunications Facilities at Normanhurst.

Figure Two: Hornsby LGA Population 2022–2036

YEAR	PEOPLE	PERCENTAGE GROWTH
2022	159 138	
2032	174 894	9.9%
2036	179 582	12.8%

Figure Three: Hornsby LGA Dwellings 2022–2036

YEAR	DWELLINGS	PERCENTAGE GROWTH
2022	56 904	
2032	64 247	12.9%
2036	66 632	17.0%

Figure Four: Hornsby LGA Wards and Suburbs

WARD A	WARD B	WARD C
Asquith, Arcadia, Berowra, Berowra Heights, Brooklyn, Berrilee, Calabash, Cowan, Canoelands, Dangar Island, Dural, Fiddletown, Forest Glen, Glenorie, Galston, Glenhaven, Hornsby Heights, Laughtondale, Mt Colah, Mt Kuring-gai, Maroota, Middle Dural and Singletons Mill.	Hornsby, Normanhurst, Pennant Hills, Thornleigh, Wahroonga, Waitara, Westleigh.	Beecroft, Castle Hill, Cheltenham, Cherrybrook, North Epping, West Pennant Hills.

Figure Five: Hornsby LGA - Sydney Context

Resources

Hornsby (2022) Community Strategic Plan 2022–2032
https://www.hornsby.nsw.gov.au/council/forms-and-publications/publications/community-plan

Hornsby Map Reference
https://profile.id.com.au/hornsby/about

Download a Report for the Key Geographical Characteristics of Hornsby
https://profile.id.com.au/hornsby/reports-by-area

Hornsby Business Papers
https://businesspapers.hornsby.nsw.gov.au/

Hornsby Shire Facebook Page
https://www.facebook.com/HornsbyCouncil/

Birrawanna Track. Source: Wikimedia Commons

SPIRAL OF SKILLS 7–10

Olivia Andrew

Introduction

An all-too-common approach taken by teachers when receiving their allocations for a given year is to focus on developing programs for the topics they are required to teach. However, in Geography there are many tools that need to be embedded when teaching knowledge and skill content descriptors from the syllabus.

In New South Wales, the curriculum separates and identifies map and graph tools that students need to create, interpret and analyse within Stages 4 and 5. Whilst this is helpful, particularly for out-of-field Geography teachers there are two questions to address.

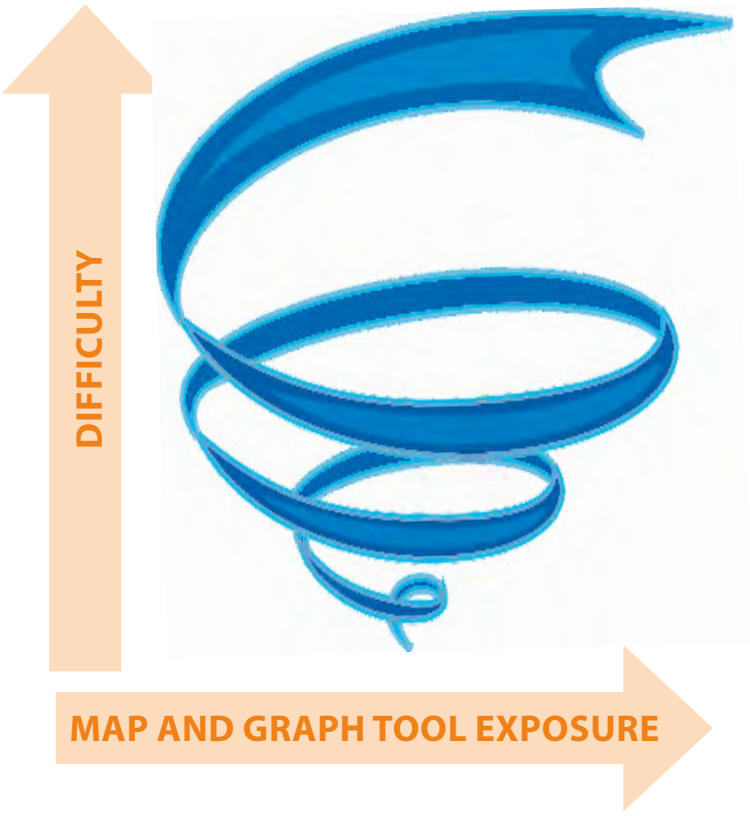
- Which topic is most appropriate to include each type of map or graph in?
- How do those skills that apply to all topics differ in complexity each year?

The Foundation

The aim of a 'Spiral of Skills' framework is to ensure that students are taught all the required geographical tools and that skills are appropriately scaffolded throughout the learning journey (see figure 1). Therefore, it is dependent on a department-wide approach to the teaching and learning program. Without this, there is a risk that students will not use all of the different types of maps and graphs within each stage or continue to build upon their existing skills when they have a change in teacher.

Two key principles that underpin this framework are consistency and repetition. By having a department-wide approach on how to teach each skill consistently for each year level, teachers will have an understanding of how their students have been taught previously when taking on a new class. Additionally, this avoids confusion among learners. Careful consideration also needs to go into each learning activity and resource to ensure that skills are repeated on a continuous basis. This enables students to be able to identify key language associated with each skill and the application of them becomes automatic, ultimately avoiding the need to re-teach the skills as often between year levels.

Figure 1: Aim of a 'Spiral of Skills' framework



1. Matching tools to topics

In order to ensure that all of the required tools are taught, departments need to divide them up to match the topics they best relate to. Consideration also needs to go into the order of topics based upon the complexity of the tools that they focus on. Table 1 below provides an example of how this could look within Stages 4 and 5.

Table 1: *An example of how map and graph tools could be matched to Stages 4 and 5 topics.*

STAGE 4				STAGE 5			
Place & Liveability	**Landforms & Landscapes**	**Inter-connections**	**Water in the World**	**Human Wellbeing**	**Sustainable Biomes**	**Changing Places**	**Environmental Change & Management**
Sketch maps Political maps Bar graphs Column graphs	Topographic mapping Pie graphs Line graphs Cultural mapping	Flowline maps Cartograms	Climate graphs Précis map Synoptic charts	Choropleth maps Scatter graphs	Thematic maps Compound column graphs	Population profiles Overlay maps	Relief maps Land-use maps Cross-sections

Although each tool has been linked to a topic, it does not mean that students should only come across them at that point. The emphasis should be on the repeated creation of the specific tool where it has been best aligned. For example, population profiles link to the Human Wellbeing and Changing Places topics. Teaching and learning programs might involve examining case studies where students have to interpret the population structure of different places during the Human Wellbeing topic. However, when they study the Changing Places unit further along in Stage 5, students may use data to create population profiles or vice versa. This approach not only ensures the repetition of tools, but accommodates for elements of the Geographical inquiry skills in the syllabus.

Teaching Advice

It is recommended that Stages 4 and 5 begin with an overview of Geographical skills. This could be done through the completion of a short booklet, which can be used as a base guide as students' progress through each topic. When they come across a tool or skill within the teaching and learning program, instructions could direct them back to this booklet to refresh their understanding.

For Stage 4, this overview could include:

- **Map types:** Sketch, relief, political, topographic, flowline, choropleth, isoline, précis, cartograms and synoptic charts.
- **Map features:** BOLTSS (including different types of scale – line, written and ratio).
- **Types of graphs:** Column, pie, bar, line, climate, compound column and population profiles.
- **Graph features:** SALTS
- **Spatial levels:** Local, regional, national, international and global.
- **Absolute location:** Latitude and longitude.
- **Map analysis:** PQE
- **Map interpretation:** Direction (8-point compass rose), relative location, area references, grid references, altitude, contour lines and intervals, gradient and local relief.

This could be built upon for Stage 5 by adding:

- **Map types:** Thematic maps, land use maps and special-purpose maps.
- **Graph types:** Scatter graphs.
- **Absolute location:** Degrees and minutes of latitude and longitude.
- **Map analysis:** Comparative PQE.
- **Map interpretation:** Direction (16-point compass rose), bearings, aspect and density.

2. Developing a consistent approach (7–10)

Once Geographical tools have been matched to topics, departments should develop a consistent approach of how generalised skills apply to all topics and how they should be taught at each year level. This enables all students within a cohort to be exposed to the same approach, allowing for a smoother learning journey and the building of the skills. Without this, different teachers may expect students to demonstrate a skill in different ways or continuously expect the same level of competency from year seven through to ten, creating confusion and preventing maximum growth.

An example of how to frame questions and activities relating to the application of the PQE method at each year level is shown below. It is recommended that an example is also modelled to students when they complete the first PQE activity for the year. Depending on student ability, this modelling may be needed more frequently.

YEAR 7

Using PQE method, Source 1 and the table below, describe the _____.

Pattern An overview sentence explaining the pattern you see.	**Guiding Question** *The **pattern** of this (name type of map) is that…*
Quantify Specific information to explain the pattern you found (e.g numbers, statistics or sizes).	**Guiding Question** *The evidence to **quantify** this pattern is…*
Exception Something that does not fit the pattern you found.	**Guiding Question** *The **exception** to this pattern is…*

YEAR 8

Using the **PQE** method (**P**attern, **Q**uantify and **E**xception) and Source 1, **describe** the _____.

Don't forget to use the following sentence starters.

- *The **pattern** of this (name type of map) is that…*
- *The evidence to **quantify** this pattern is…*
- *The **exception** to this pattern is…*

YEAR 9

Using the **PQE** method (**P**attern, **Q**uantify and **E**xception) and Source 1, **describe** the distribution of _____.

However, students should be taught and apply more specific vocabulary when identifying the pattern, such as:

- Clustered
- Dispersed
- Linear
- Radial
- Random

YEAR 10

Using Source 1, **describe** the distribution of _____.

Using Sources 1 and 2, **compare** the distribution of _____.

Note: These questions model those asked in Stage 6 where the automatic application of PQE is required when students are asked to describe the distribution of a variable on a map or compare data.

3. Repeating the basics

Repetition is one of the keys to the success of the 'Spiral of Skills' framework. This is because the more students are exposed to various tools and skills, the more likely they are to consolidate their understanding. Some ways that resources and activities could be adapted to achieve repetition include:

Map work

Have students:

- Identify the type of map shown/created.
- Identify the type of scale is used.
- Identify and justify the spatial level of the map.
- Use the scale and compass rose to identify the relative location between two points.
- Apply the relevant features to the map (BOLTSS).
- Analyse the distribution of the data using the PQE method.

Graph work

Have students:

- Identify the graph of map shown/created.
- Apply the relevant features to the graph (SALTS).

Case studies

Have students:

- Use Google Maps to identify the absolute location of the place.
- Use the measurement tool of Google Maps to identify the relative location between the place and the nearest capital city.
- Use the SHEEPT method to analyse the impact of a geographical issue on a place.

Conclusion

Rather than focusing on the task at hand, look at the bigger picture. Creating and implementing a 'Spiral of Skills' within a school requires staff to work collaboratively as a department, as opposed to individual teaching and learning teams. Whilst this can often present with challenges, such as time constraints, additional workload issues and frequent changes of staff, the benefits far outweigh them. Students are introduced to all Geographical tools, provided with a scaffold to develop their skills and are set up with a strong foundation to achieve success in the senior years of their studies and beyond. Additionally, it can make creating classroom resources and activities easier for teachers, by providing them with clear guidance and consistency as staffing and allotments change each year.

Note: This article applies a 'Spiral of Skills' framework to map and graph tools. It can also be applied to other geographical skills, such as fieldwork and use of spatial technologies.

GTA NSW & ACT Support for Teachers and Students

Professional Learning events in Semester 2

- **Online learning courses** – Anytime PL
- **Webinar** – People, Patterns & Processes
- **HSC Exam Prep** – Resource package for members
- **Google Tools in the Geography classroom** – Members only

Online Social Media Support

- **Facebook page**
- **HSC Teachers Group**
- **Primary Teachers Group**
- **Twitter @gtanswact**

Resources

- **Geography Bulletin**
- **Geography Bulletin Guide** (Find any article)
- **Classroom Posters**
- **Scoop.it** media curation site. Topics K–12

Keep up to date with upcoming events.
Visit the GTA website **HERE**

Geography Teachers Association of NSW & ACT

GEOGRAPHICAL INVESTIGATION WEBINAR

This webinar will unpack the 'Geographical Investigation' unit (formerly Senior Geography Project) in the Preliminary course and provide teaching ideas and planning for this part of the course. This session aims to be a practical 'walk-through' of the content and material in this part of the syllabus, and will give you a range of ideas on how to program this unit for your school context.

The session will provide helpful primary fieldwork ideas to help in with physical or human geography focused investigations.

PRESENTERS:

Kieran Bonin – HSIE Teacher and Year Advisor; Orange High School and James Harte – Geography Teacher; Cranbrook School

DATE: **Wednesday 1 November, 4.00 – 5.00pm**

COST:

Individual registration – Member $40 & Non-member $60
School registration (2 or more teachers) – Member $56 & Non-member $84

LOCATION: **Online via Zoom, link sent on registration**

CLICK TO REGISTER

For further information contact: gta.admin@ptc.nsw.edu.au

Writing your own Year 12 Essay and Short Answer Question

Martin Pluss, Head of Social Science, Northholm Grammar
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Introduction

Here is a suggested way for students and teachers to write their own HSC essay and Short Answer questions. The process will be valuable in relation to preparing essay and short answer questions with the new Stage 6 Geography Syllabus implementation from 2024. Especially since we will not have twenty-three years of past papers to draw upon. This process is based on the current 1999 Stage 6 Geography Syllabus. Figure One is a template you can use after you have reviewed the process outline below.

The Procedure

Resources:

- Syllabus Document
- NESA Glossary of terms

Process:

- Select one or two Syllabus Points.
- Selects a NESA term (describe, explain, evaluate).
- Combine the syllabus statement and the NESA term into a question.
- The examples below do not make use of questions which may ask you to refer to stimulus material

Essay Examples

Essay:

Syllabus Points – People and Economic Activity

Pick a syllabus point:

- **Factors** explaining the nature, spatial patterns and future directions of the selected economic activity such as
  - biophysical: climate, soils, topography, site.
  - ecological: sustainability and resource use.
  - economic: competitive advantage, consumer demand, mobility of labour and capital.
  - sociocultural: tradition, changing lifestyles, labour participation rates.
  - organisational: ownership, decision making and control.
  - technological: transportation, information transmission and flows, biotechnology.
  - political: quotas, tariffs, compacts, agreements.

Pick a NESA Term

- **Explain** –
  Relate cause and effect; make the relationships between things evident; provide why and/or how.

Combine the syllabus statement and the NESA term into a question.

ESSAY QUESTION:

Explain how factors contribute to the nature, spatial patterns and future directions of a selected economic activity.

Essay: Syllabus Points – Urban Places

Pick a syllabus point:

- the challenges of living in mega cities such as housing, traffic infrastructure, water and power supplies, sanitation services, employment, and other social and health issues.
- the responses to these challenges such as self-help projects, community self-government, cooperation from NGOs, urban protest and the operations of informal economies.

Pick a NESA Term

- **Evaluate –**
  Make a judgement based on criteria; determine the value of

Combine the syllabus statement and the NESA term into a question.

ESSAY QUESTION:

Evaluate the responses to challenges of living in mega cities.

Essay: Syllabus Points – Ecosystems at Risk

Pick a syllabus point:

TWO case studies of different ecosystems at risk to illustrate their unique characteristics including:

- spatial patterns and dimensions: location, altitude, latitude, size, shape and continuity
  - biophysical interactions including:
    - the dynamics of weather and climate
    - geomorphic and hydrologic processes such as earth movements, weathering, erosion, transport and deposition, soil formation
    - biogeographical processes: invasion, succession, modification, resilience
    - adjustments in response to natural stress
  - the nature and rate of change which affects ecosystem functioning
  - human impacts (both positive and negative)
  - traditional and contemporary management practices.

Pick a NESA Term

- **Compare**
  Show how things are similar or different.
- **Contrast**
  Show how things are different or opposite.

Combine the syllabus statement and the NESA term into a question.

ESSAY QUESTION:

Compare and contrast the nature and rate of change which affects ecosystem functioning.

Short Answer Examples

Now apply the same process to short and answers and collect stimulus material as required.

Short Answer:

Syllabus Points – People and Economic Activity:

- the environmental, social and economic impacts of the economic activity such as pollution, resource depletion, labour exploitation, cultural integration, provision of infrastructure, job creation, transfer pricing.

Pick a NESA Term

- **Describe**
  Provide characteristics and features.

Combine the syllabus statement and the NESA term into a question.

- **Describe** ONE of the environmental, social and economic impacts of the economic activity you have studied.

Short Answer
Syllabus Points – Ecosystems at Risk

- vulnerability and resilience of ecosystems.
  - impacts due to natural stress.
  - impacts due to human induced modifications to energy flows, nutrient cycling, and relationships between biophysical components.

Pick a NESA Term

- **Explain**
  Relate cause and effect; make the relationships between things evident; provide why and/or how.

Combine the syllabus statement and the NESA term into a question.

- **Explain** ONE example of vulnerability and resilience of ecosystems.

Short Answer
Syllabus Points – Urban Places

- the challenges of living in mega cities such as housing, traffic infrastructure, water and power supplies, sanitation services, employment, and other social and health issues.

Pick a NESA Term

- **Discuss**
  Identify issues and provide points for and/or against.

Combine the syllabus statement and the NESA term into a question.

SHORT ANSWER QUESTION:

Discuss TWO the challenges of living in mega cities.

Conclusion

With the advent of a new Syllabus in 2024 for Stage 6 Geography there will be some unanswered questions. There is not the depth of past examination questions from which to draw to enable our students to practice their HSC technique. This procedure could be of use in 2024 as we develop assessment tasks for the teaching of the 2024 Syllabus in the Preliminary Course. This will be good practice for us as teachers as we get ready for 2025.

Figure 1: Template to Generate Questions

WRITING MY OWN SHORT ANSWER OR EXTENDED WRITTEN RESPONSE QUESTION
Select a Syllabus Point(s) to Assess https://educationstandards.nsw.edu.au/wps/wcm/connect/44b0bedc-7902-41eb-8cb8-7f15829488ee/geography-stage-6-syllabus.pdf?MOD=AJPERES&CVID=
Select a NESA Directive Term https://educationstandards.nsw.edu.au/wps/portal/nesa/11-12/hsc/hsc-student-guide/glossary-keywords
Combine the Syllabus Point (s)and the NESA Directive Term Term into a question
Where required select and provided stimulus material to be examined to answer the question designed.

Course Outline

The GTA presents an online professional learning experience for you, focused on "Analysing the 2022 HSC Geo Exam". The 3 hours of NESA accredited professional learning, covering each question with included example responses in an *'anytime' online PD.*

Registration in this course also gets you a free 3-hr NESA accredited course, *Integrating Maps Effectively into Geography Lessons.*

What you can learn

Participants in this professional learning are able to ask, discuss, and learn about:

- *Assessment practices such as exam development, marking and moderation*
- *Thinking about examination trends and analysing your student's results, including through using RAP data*
- *Strategies for teaching content, geographical skills, and exam skills*

Outcomes

As a result of participating in this professional learning teachers will:

- *Be better able to prepare students for Trials and the HSC Examination*
- *Increase their understanding of the HSC exam development process including marking and moderation*
- *Refine their knowledge of constructing and marking school-based assessment tasks*

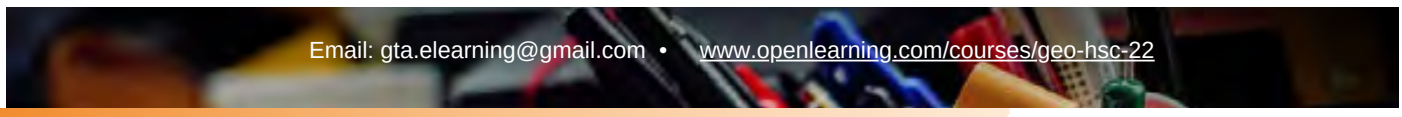
How to register

You can register for the course by:

- *Direct CC payment at the course website (see full URL in brochure footer - also note, if you don't yet have an Open Learning account, create one at the website by clicking Join Up / Sign Up)*
- Or, if your school can pay for you, follow the instructions at shorturl.at/kHQT0 to organise a payment invoice*

*Please note, requesting a payment invoice does not register you as a participant; payment must be made for registration to occur. Please allow at least 7 business days for the payment invoice to be sent to your school and for them to make the payment.

GTANSW Member Price	Non-Member Price
$199	**$240**



The 2023 GTA NSW & ACT Young Geographer Awards

The Young Geographer Awards invites students in NSW and the ACT to demonstrate engagement with Geography, the discipline and with the tools and skills of Geography through the creation and conduct of an inquiry-based research project. Although it is not essential, teachers are encouraged to incorporate the research and construction of the project into their teaching programs to help support students.

Unsplash image by Bill Oxford @bill_oxford

Prizes for the winning entries in the Young Geographer Award, in any category are:

1st Prize $500 **2nd Prize $250** **3rd Prize $100**

Registration opens – June 2023
& closes – Friday 27 October 2023

The 2023 GTA NSW & ACT Young Geographer Awards

AWARD CATEGORIES

GEOGRAPHICAL RESEARCH AWARD

This award allows students to demonstrate original geographic research on any topic from the Australian Curriculum or NSW K–10 Geography Syllabus. Students will identify an inquiry focus and should conduct both primary and secondary research to investigate this topic. Category submissions will be judged against entries in the same Stage.

GEOGRAPHY IN STEM AWARD

This award allows students to demonstrate geographic research on any topic from the Australian Curriculum or NSW K–10 Geography Syllabus. However, a significant STEM contribution must be present in the final product and Geography must drive the project. The STEM contribution may be explicitly evident in the collection of primary data, the tools used for analysis of data and/or in the final presentation and communication of the research.

NESA SENIOR GEOGRAPHY PROJECT (SGP) / IB INTERNAL ASSESSMENT AWARD / ACT EQUIVALENT PROJECT

This award recognises excellence in the NSW Senior Geography Project (SGP) or International Baccalaureate Internal Assessment (IA) Projects. Those who study Geography in the ACT may also submit Geography research projects of a similar scope.

GTA NSW & ACT GEOGRAPHY TEACHER AWARD

Although a separate award event, teachers are encouraged to use their experiences in supporting the Young Geographer Award as an entry. This award recognises the contribution that teachers make in supporting their students and teaching peers. Participating teachers are asked to write an article of approximately 500 words for the Geography Bulletin, journal of GTA NSW & ACT, that examines how they successfully incorporated the competition into their teaching practice, established an exemplary fieldwork program or delivered outstanding professional learning events.

The 2023 GTA NSW & ACT Young Geographer Awards

PROJECT SPECIFICATIONS

The projects submitted for all categories should:

- Be less than 3000 words when written or under 10 minutes in an audio-visual format.
- Incorporate appropriate primary and secondary research for the inquiry topic.
- Demonstrate excellent research skills
- Demonstrate excellent communication of geographical information using a variety of tools and skills.
- Demonstrate the capacity for active citizenship from the undertaken research.

All award entries must be submitted digitally as either Acrobat.PDF files, websites or suitable audio-visual files.

AWARD TIMELINE

2023 competition closing date – Friday 27 October

Each school is able to submit a maximum of four (4) entries per category. There is no cost for entry to the competition.

Judging will take place between Term 4 2023 and Term 1 2024. Members of GTA NSW & ACT are encouraged to apply and participate as a member of the judging panel. The judging is a valuable Professional Development event and participation in the judging process, for example SGP marking, will help teachers gain perspective about their own classroom practice and student achievement.

Prize winners will be notified by early March 2024. Prizes will only be awarded where suitable entries are available. All competition entrants will receive a YGA Certificate of Participation.

The 2023 GTA NSW & ACT Young Geographer Awards

AWARD MARKING CRITERIA

CRITERIA	OUTSTANDING	COMMENDABLE	SATISFACTORY	NEEDS FURTHER DEVELOPMENT
Identifies a relevant and engaging geographic inquiry topic	Topic is appropriate for the relevant syllabus. Topic is highly engaging Topic allows for research which is spatial in nature.	Topic is appropriate for the relevant syllabus. Topic allows for research which is spatial in nature.	Topic is inappropriate for the relevant syllabus. OR Topic does not allow for research which is spatial in nature.	Topic is inappropriate for the relevant syllabus. AND Topic does not allow for research which is spatial in nature.
Incorporates appropriate primary research for the inquiry topic	Outstanding demonstrations of accurate, well planned primary data collection. Clear and appropriate presentation of collected primary data.	Demonstrations of well planned primary data collection. Clear presentation of collected primary data.	Primary data is collected using appropriate methods.	Little or no primary data is collected. OR Primary data is collected using inappropriate methods.
Incorporates appropriate secondary research for the inquiry topic	Outstandingly detailed information and technical vocabulary used consistently throughout the project. An accurate, complete and consistently styled bibliography is presented.	Detailed information and technical vocabulary used throughout the project. A consistently styled bibliography is presented.	Some detailed information and technical vocabulary used in the project. A bibliography is presented.	Generic examples and generic language used throughout the project. No attempt is made to reference sources used.
Quality of geography research	Insightful analysis or discussion is made based on the collected primary and secondary data. Conclusions about inquiry topics are based on analysis or discussion of data.	Analysis or discussion is made based on the collected primary and secondary data. Conclusions about inquiry topics are based on analysis or discussion of data.	Primary and secondary data is used to draw conclusions.	Conclusions are based on superficial, generic or general information.
Communication of geographical information	Geographical information is presented in sustained, logical and well sequenced paragraphs. A variety of appropriate tools (photos, graphs, maps etc) are selected and used to convey geographic information engagingly.	Geographical information is presented in sustained, logical and well sequenced paragraphs. Appropriate tools (photos, graphs, maps etc) are selected and used to convey geographic information.	Geographical information is presented in logical paragraphs.	Geographical information is presented in paragraphs.
Capacity for active citizenship from the project	Evidence of active citizenship is present within the project.	Capacity for active citizenship is articulated within the project.	Capacity for active citizenship is alluded to within the project.	No capability for active citizenship is evident within the project.
Format and presentation	Project is highly engaging and is attractively formatted. 3000 words or less or under 10 minutes. Digitally submitted in correct file type and able to be accessed by judges.	Project is attractively formatted. 3000 words or less or under 10 minutes. Digitally submitted in correct file type and able to be accessed by judges.	Project exceeded 3000 words or 10 minutes by up to 10%. Digitally submitted in correct file type and able to be accessed by judges.	Project exceeded 3000 words or 10 minutes by over 10%. Digitally submitted in incorrect file type or unable to be accessed by judges.
STEM Award Category	Outstanding,sustained and innovative incorporation of Science, Technology, Engineering and/or Maths to support the enactment, collation and/or communication of the geographical inquiry. The contribution and purpose of STEM in the geographical inquiry is clearly and thoroughly explicated.	Commendable innovative incorporation of Science, Technology, Engineering and/or Maths to support the enactment, collation and/or communication of the geographical inquiry. The contribution and purpose of STEM in the geographical inquiry is clearly explicated.	Some innovative incorporation of Science, Technology, Engineering and/or Maths to develop the enactment, collation and/or communication of the geographical inquiry. The contribution and purpose of STEM in the geographical inquiry is explicated at times although mostly inferred .	Little evidence of innovative incorporation Science, Technology, Engineering and/or Maths in the enactment, collation and/or communication of the geographical inquiry The contribution and purpose of STEM in the geographical inquiry is not explicated.

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The Big Issue

Jenny Tracey
State Coordinator NSW/ACT – The Big Issue Classroom

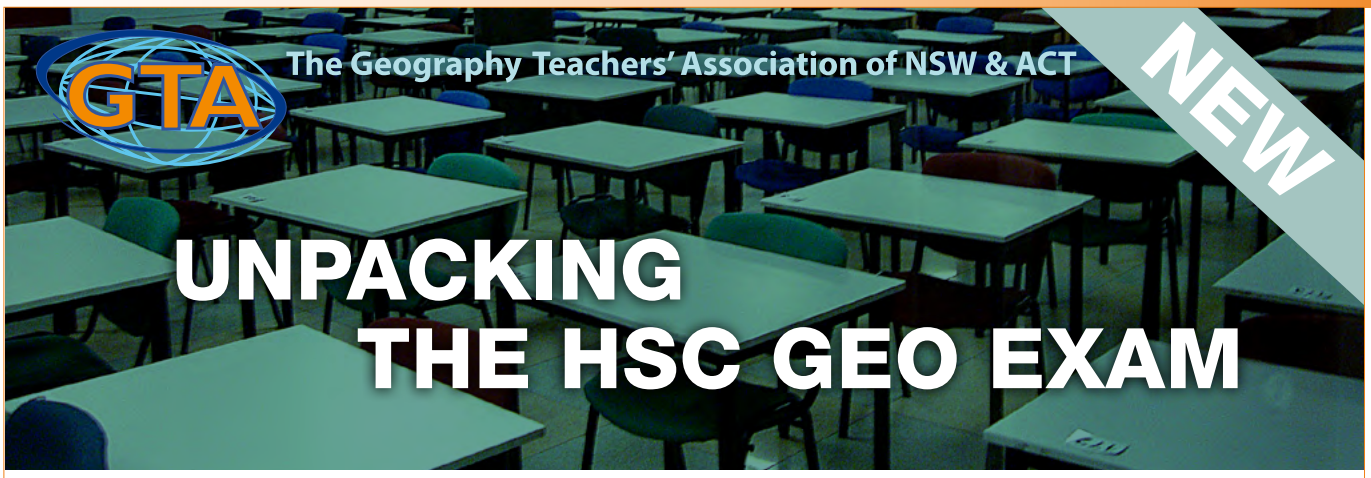
The Big Issue Classroom is a useful resource in the study of Geography, making it come to life!

The Big Issue Classroom workshops examine the causes and types of homelessness, and the liveability of places. We explore some of the barriers to inclusion that people experiencing marginalisation face and the role of The Big Issue in helping them tackle some of these barriers. Students are encouraged to consider the impact of place, personal choices and circumstances, as well as the importance of social connections and support networks in dealing with complex situations.

Workshops include a presentation of some of the main concepts and statistics of homelessness, and an interactive activity that helps students understand the barriers that people face. A guest speaker will share their personal experiences of homelessness, explaining how they used support services and networks to overcome challenges and reconnect with the community. The guest speaker will also share their perception of place and how their living situation affects their choices and connections to the community.

These workshops link well to the Geography curriculum, in particular when linked to the liveability of places and the effect of place on people's wellbeing. Our workshops also emphasise the need for support services and different ways for people to connect. Every workshop booked provides paid work experience for a guest speaker experiencing marginalisation or disadvantage.

For Booking inquiries and workshop pricing go to: https://thebigissue.org.au/our-programs/education/



A 3hr NESA-accredited, flexible, anywhere, anytime online learning opportunity through Open Learning

This professional development course unpacks the HSC Geography exam using the 2021 exam as an exemplar, and so explores strong approaches for teachers to prepare their students for the HSC.

Through watching the videos, reading the materials and engaging with the discussions in this PD you should become more confident about rigorously preparing your students to interpret and answer questions, and so better prepare them for the HSC Trials and Examinations.

The course objective is for you to complete learning activities where you address the following outcomes:

- apply knowledge of the content and teaching strategies of Geography to develop engaging teaching activities (AITSL Standard 2.1.2)
- develop, select and use informal, formal, diagnostic, formative and summative assessment strategies to assess student learning (AITSL Standard 5.1.2)

Here are some reviews of *Unpacking the HSC Exam*:

- *Very thorough, informative, and detailed, but most of all valuable. For example, I really enjoyed hearing from the Senior Marker. Such an insightful process that I wouldn't get otherwise.*
- *This course is great! The GTA should feel so proud of the effort and expertise in putting this together.*

To access the course go to openlearning.com/ptc-nsw/courses/geo-hsc

COST: $129 (association members $99) you can register straight away at that website, by first creating an *Open Learning* account by clicking *Join Up* or *Sign Up*, and then paying using credit card. If you want your school to pay for you, follow the instructions at **shorturl.at/goIJ4** to organise an invoice. If you have any questions email gta.elearning@gmail.com

Completing Unpacking the HSC Geo Exam will contribute 3 hours of NSW Education Standards Authority (NESA) Accredited PD in the priority area of Delivery and Assessment of NSW Curriculum/EYLF addressing standard descriptors 2.1.2, 5.1.2 from the Australian Professional Standards for Teachers towards maintaining Proficient Teacher Accreditation in NSW.

www.openlearning.com/agta/ • gta.elearning@gmail.com

POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS

The Geography Teachers' Association of NSW & ACT

GEOGRAPHY POSTERS FOR SALE

GTA NSW & ACT has printed a number of infographic posters for classroom use.

Posters are linked to topics studied in Geography K–12 for the Australian Curriculum and NSW Syllabuses.

- A **bank of questions** for individual and groupwork will be accessible via Google Drive to all schools /teachers purchasing posters.
- Posters can be purchased in **pre-packaged sets** or as **individual posters**.
- **New posters** will be added to the website throughout the year.

SOURCES AND PRICING

Posters have been sourced from organisations including the Geological Society (UK), Visual Capitalist and Graphic News. GTA NSW & ACT has also commissioned some posters.
Posters are being sold in sets of 4 or 5 to make postage viable. Affordability was a key consideration when determining pricing.
Administration, printing and distribution, licensing and design costs where relevant are incorporated into the cost of each pack.
Postage includes the cost of cylinders. A maximum of 5 posters will be packaged in any postage cylinder.

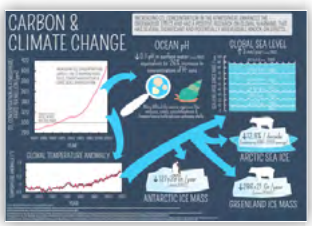
PACK 1: THE CARBON CYCLE – $70 includes p/h

Contents:

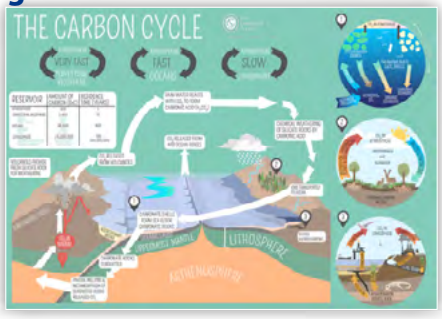
Click here to order Pack 1

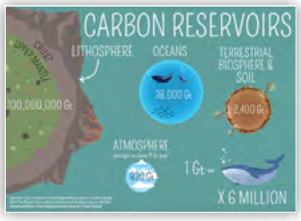
1 x A1 poster: **The Carbon Cycle**

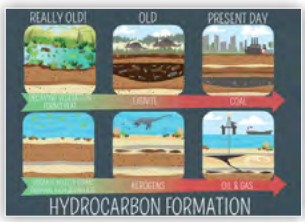
4 x A2 posters: **Carbon Set**



– **Carbon & the Greenhouse Effect**
– **Carbon Reservoirs**
– **Hydrocarbon Formation**
– **Carbon & Climate Change**







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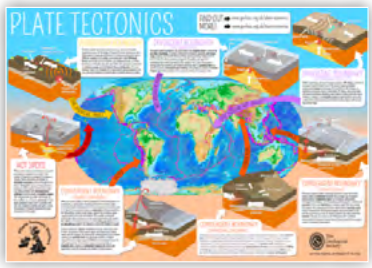
The Geography Teachers' Association of NSW & ACT

GEOGRAPHY POSTERS FOR SALE

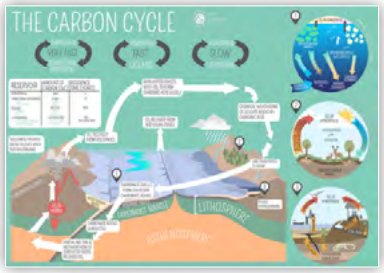
PACK 2: GEOGRAPHY CONTENT – $81 includes p/h

Click here to order Pack 2

Contents: 4 x A1 posters



- **Plate tectonics**
- **Minerals in a smartphone**
- **The Carbon Cycle**
- **On the Brink: The biggest threats to Earth's biodiversity**



PACK 3: A1 CAREERS poster – 3 for $50 includes p/h

Where will GEOGRAPHY take you?

New Pack 3 coming Term 2

Also sold individually, see below...

About the poster sizes –

A1 = 594mm X 841mm

A2 = 420mm X 594mm

A3 = 297mm x 420mm

INDIVIDUAL SELECTION: A1 sized posters @ $15 per poster (one type per order)

Up to 5 posters $15 postage (1 cylinder)
6 to 10 posters $30 postage (2 cylinders) etc

Choose from posters:

- **Plate tectonics**
- **Minerals in a smartphone**
- **The Carbon Cycle**
- **On the Brink: The biggest threats to Earth's biodiversity**
- **Where will GEOGRAPHY take you?**

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POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS POSTERS

The Geography Teachers' Association of NSW & ACT

GEOGRAPHY POSTERS FOR SALE

INDIVIDUAL SELECTION: A1 & 60cm square posters @ $15 per poster (one type per order)

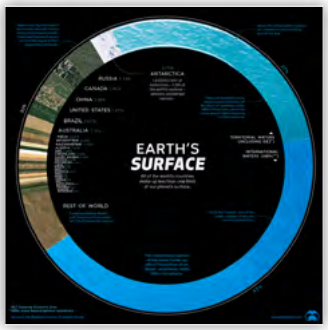
Up to 5 posters $15 postage (1 cylinder)
5 to 10 posters $30 postage (2 cylinders)

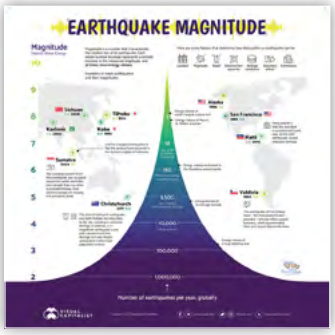
Choose from posters:

- **Biomes and Ecosystems** (A1 size)
- **Earth's surface**
- **Earthquakes**
- **UN sustainable development goals**

PACK 4: Three square posters – $55 includes p/h

Click here to order Pack 4

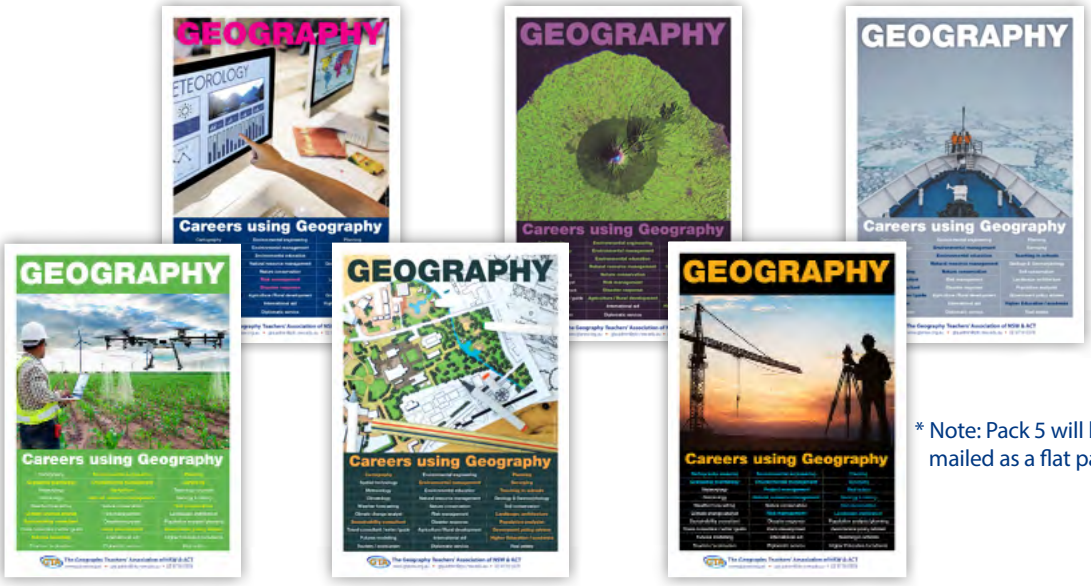




PACK 5: GEOGRAPHY CAREERS – $35 includes p/h*

A set of 6 x A3 **Careers Using Geography** flyers

Click here to order Pack 5



* Note: Pack 5 will be mailed as a flat pack

For more details and to order go to: www.gtansw.org.au/order-resources/

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Calling All Educators!

Are your Year 9 and 10 students passionate about tackling global food security challenges?

If they've developed innovative solutions, we have an exciting opportunity for your school!

Introducing the "Development for a Better Future" Competition for Australian School Students in Year 9 and 10.

Why should you participate?

Win Big: Your school could WIN $1000! Plus, your students' remarkable work will be showcased nationally and internationally.

Foster Future Leaders: We're on the lookout for the future's scientists, researchers, communicators, AI and big data specialists, nutritionists, geographers, engineers, designers, social scientists, problem solvers, and creative thinkers. Let your students' ideas shine!

Address Critical Issues: We need young minds to help us tackle pressing food security challenges. Entries should relate to your students' use of one of the Crawford Fund's "Development for a Better Future" teaching and learning modules.

How to Participate:

- **Record a Video:** Encourage your students to record their ideas in a video. It can be created by an individual student or a class team.
- **Submit:** Send your video to the Crawford Fund. As an educator, you can submit these videos on behalf of your students.

Judging Criteria:

Entries will be assessed based on:

1. Message Clarity
2. Understanding of the Issue
3. Appropriateness of the Solution

What's in it for You?

The Crawford Fund will proudly showcase your submissions on their website and social media channels. They'll also share them with their esteemed partners, amplifying your students' work and their proposed solutions.

Module Topics:

1. Support farmers in the Asia Pacific Region to address climate change challenges.
2. Develop a training program around a climate-smart technology.
3. Raise awareness of how Covid-19 impacts food and nutrition security.
4. Showcase an innovative solution to enhance food production in our region.
5. Review strategies to address gender dimensions impacting agriculture.
6. Inform about the value of Genebanks and crop diversity.
7. Develop an awareness-raising campaign on Food Loss and Waste.

Learn more about the Crawford Fund's "Development for a Better Future" modules and the competition at Competition Entries. Act fast, as the competition closes on November 24, 2023!

For additional competition details and instructions on video submissions, find more information here.

Join us in shaping a brighter future through your students' innovative ideas. Together, we can make a meaningful impact on global food security.

Let's inspire the next generation of change-makers!

ADVICE TO CONTRIBUTORS

Geography Bulletin guidelines

1. *Objective:* The Geography Bulletin is the quarterly journal of The Geography Teachers' Association of NSW & ACT Inc. The role of the Geography Bulletin is to disseminate up-to-date geographical information and to widen access to new geographic teaching ideas, methods and content. Articles of interest to teachers and students of geography in both secondary and tertiary institutions are invited, and contributions of factually correct, informed analyses, and case studies suitable for use in secondary schools are particularly welcomed.

2. *Content:* Articles, not normally exceeding 5000 words, should be submitted to the GTA NSW & ACT Office by email gta.admin@ptc.nsw.edu.au

   Submissions can also be sent directly to the editors: Lorraine Chaffer (lchaffer@tpg.com.au)

   Articles are welcomed from tertiary and secondary teachers, students, business and government representatives. Articles may also be solicited from time to time. Articles submitted will be evaluated according to their ability to meet the objectives outlined above.

3. *Format:* Digital submission in Word format.
   - Tables should be on separate pages, one per page, and figures should be clearly drawn, one per page, in black on opaque coloured background, suitable for reproduction.
   - Photographs should be in high resolution digital format. An indication should be given in the text of approximate location of tables, figures and photographs.
   - Every illustration needs a caption.
   - Photographs, tables and illustrations sourced from the internet must acknowledge the source and have a URL link to the original context.

Note: Please try to limit the number of images per page to facilitate ease of reproduction by teachers.

Diagrams created using templates should be saved as an image for ease of incorporation into the bulletin.

All assessment or skills tasks should have an introduction explaining links to syllabus content and outcomes. A Marking Guideline for this type of article is encouraged.

4. *Title:* The title should be short, yet clear and descriptive. The author's name should appear in full, together with a full title of position held and location of employment.

5. *Covering Letter:* As email with submitted articles. If the manuscript has been submitted to another journal, this should be stated clearly.

6. *Photo of Contributor:* Contributors may enclose a passport-type photograph and a brief biographical statement as part of their article.

7. *References:* References should follow the conventional author-date format:

   Abbott, B. K. (1980) *The Historical and Geographical Development of Muswellbrook* Newcastle: Hunter Valley Press.

   Harrison, T. L. (1973a) *Railway to Jugiong* Adelaide: The Rosebud Press. ***(2nd Ed.)***

8. ***Spelling*** should follow the Macquarie Dictionary, and Australian place names should follow the Geographical Place Names Board for the appropriate state.

Refereeing

All suitable manuscripts submitted to the Geography Bulletin are subject to the process of review. The authors and contributors alone are responsible for the opinions expressed in their articles and while reasonable checks are made to ensure the accuracy of all statements, neither the editor nor the Geography Teachers' Association of NSW & ACT Inc accepts responsibility for statements or opinions expressed herein.

Books for review should be sent to:

The GTA NSW & ACT Council
PO Box 699
Lidcombe NSW 1825

Editions

There are four bulletins each year – two published each semester. Special Editions are created on need.

Notice to Advertisers

'Geography Bulletin' welcomes advertisements concerning publications, resources, workshops, etc. relevant to geography education.

FULL PAGE (26 x 18cm) – $368.50
Special issues $649.00

HALF PAGE (18 x 13cm or 26 x 8.5cm) – $214.50
Special Issues $382.80

QUARTER PAGE (13 x 8.5cm or 18 x 6.5cm) – $132.00
Special issues $242.00

All prices include GST

Advertising bookings should be directed to:

GTA NSW & ACT Office
Telephone: (02) 9716 0378
Fax: (02) 9564 2342
Email: gta.admin@ptc.nsw.edu.au

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