

GEOGRAPHY BULLETIN



The
Geography Teachers Association
of New South Wales Inc.

Volume 54 No2 2022

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Front cover: Grand Canyon National Park,
East rim topographical map

Back cover: Grand Canyon
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GEOGRAPHY BULLETIN

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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.

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NOTE: THERE ARE THREE APPENDICES THAT SUPPLEMENT THIS EDITION OF THE GEOGRAPHY BULLETIN.

Appendix 1: Student Worksheets

Appendix 2: Sustainable Biomes

Appendix 3: Earth's forest loss over the last 10,000 years.

EDITORIAL

Welcome to Geography Bulletin 2 for 2022. This edition has a focus on Geographical tools and skills and includes a range of activities for most topics in 7–10. Many thanks to the following authors and sources for their contribution to this edition.

Susan Caldis provides an insightful overview of the issues for new teachers associated with teaching out-of-field in '*Overwhelmed*' and '*underprepared*': *The realities of out-field teaching in geography during a time of transition into the teaching profession*.

Martin Pluss explains the development of a successful approach to the teaching of skills in geography supported by a sample activity in *Teaching skills in Geography: Strategies, reflections, breakthrough, and a mapping activity*.

Rachel Honey reports on *Geography's Big Week Out* for state winners of the Australian Geography Competition.

I acknowledge the following sources for materials adapted to create content for this edition:

- **Education Victoria** for access to information on using an inference framework for interpreting photographs adapted with the addition of student activities by Lorraine Chaffer for the article *Interpreting photographs*.
- **Sydney Water** for materials on Sensory Mapping during Fieldwork, adapted for this edition by Lorraine Chaffer.

The following teachers contributed *skills activities and ideas* that make up the theme of this edition:

- **Drew Collins** for a *Whitewater Rafting*, a mapping activity for Year 11.
- **Katerina Stojanovski & Christina Kalinic** for an activity to introduce *Sustainable Biomes*.
- **Chad Cary** for an explanation of his experience as a non-geographer using *Escape Rooms* to engage students.
- **Louise Roberts** for *Make a Water Cycle Model and Valuing of water*,
- **Gretchen Wiseman** for activities to investigate *Spatial variations in Human Wellbeing*.

As editor I have created a range of skills activities using stimulus material from different sources including photographs and infographics purchased by GTANSW & ACT, past School Certificate Tests from BOSTES and skills publications no longer available for purchase.

- Synoptic charts and climate graphs for Water in the World
- Geomorphic processes in the Grand Canyon for Landscapes and Landforms
- Topographic mapping activities for Landscapes and Landforms
- Applying the concepts of place, space and change for Sustainable Biomes
- Creating text using infographics for Environmental Change
- Applying geographical knowledge to respond to a scenario for Environmental Change.
- Graphs and infographics to determine progress towards the SDGs for Human Wellbeing

Lorraine Chaffer
Editor



Lorraine Chaffer

SKILLS ACTIVITIES IN PAST EDITIONS

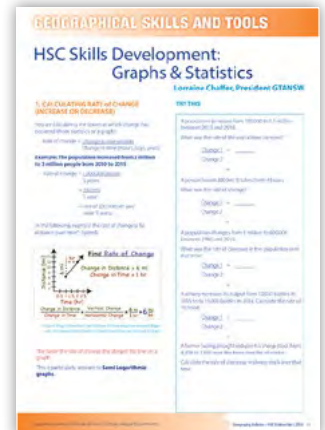
Skills activities are incorporated into most Geography Bulletins. Use the Find a Bulletin Article documents under the Resources Tab on the GTA website to locate activities relevant to the topics you are teaching. Articles are hyperlinked to take you directly to each article after logging in.



Volume 53, Special Edition 2021



Volume 53, Special Edition 2021



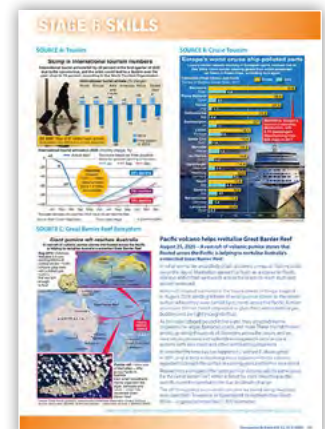
HSC Edition No 1 2018



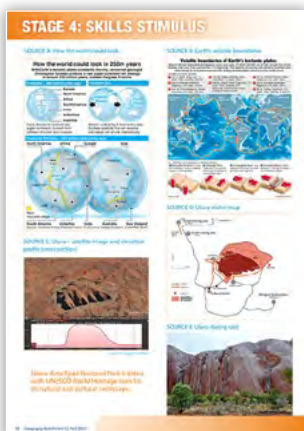
Volume 53, No 3, 2021



Volume 52, No 1, 2020



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Volume 52, No 2, 2020



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President's Report

Dr Susan Caldis

Welcome to the second *Geography Bulletin* for 2022, the focus of this edition identifies one of the distinctive aspects of geography and effective geography teaching – one of our ways of doing geography: how to use, apply and incorporate geographical tools and skills into our classroom practice in a meaningful and seamless way.

Thank you to Lorraine for conceptualising this Bulletin around such an important part of our teaching and thank you to all the authors who have shared practice and ideas from their own classrooms and experiences. I know there is much to reflect on from each article and to absorb into our practice to ensure we are delivering 'geographical geography lessons'.

The question about 'what makes your geography lesson geographical?' was an important recurring question for theory-practice reflection in my doctoral thesis. Participants were regularly asked to reflect on this question in connection with the *Professional Standards for the Accomplished Teaching of Geography* or GEOGStandards (Hutchinson & Kriewaldt, 2010) <https://agta.asn.au/files/Professional%20Standards/geogstandards.pdf> and consider not only what the distinctiveness of geography is but also how it becomes evident in their practice. Sometimes teaching contexts present a range of constraints and it is not always

possible to teach geography in the planned for or desired way. However, having a simple, familiar question with an accessible evidence base to guide thinking was shown to be helpful for shaping practice and being able to justify decisions about why various approaches are taken for teaching geography. Whilst the GEOGStandards were derived from the practice of experienced geography teachers across the country, part of my thesis was testing out the GEOGStandards in the context of pre-service and early-career teachers.

In the NSW K–10 syllabus, geographical tools and skills are identified in 'Inquiry skills' where acquiring, processing, communicating provide a structure for investigating; also 'Geographical tools' identify broad categories: maps, fieldwork, graphs and statistics, spatial technologies, and visual representations. As you can see from Table 1, an understanding, use and application of geographical inquiry, tools and skills fits most neatly into GEOG Standards 1, 2, 3 and 6.

Table 1: *Professional Standards for the Accomplished Teaching of School Geography* (Hutchinson & Kriewaldt, 2010; Kriewaldt & Mulcahy, 2010)

STANDARD	OVERVIEW
Knowing geography and the geography curriculum	As the teacher: understand the discipline, including concepts and skills; understand the curriculum; understand that geography draws from the social sciences, physical sciences, and humanities; and make connections with other curricula and learning areas.
Fostering geographical inquiry and fieldwork	Allow students to carry out: a range of structured and open-ended inquiries; and undertake inquiry in the field, selecting and using geographical tools.
Developing geographical thinking and communication	Encourage and support students' understanding of spatial reasoning; conceptual interdependencies, interconnections, and assemblages; real-world contexts at a range of scales; and lived experience as a personal geography.
Understanding students and their communities	Use local community contexts and personal geographies to connect, enhance, and enrich conceptual and perspective-focused learning.

GTA NSW & ACT NEWS: PRESIDENT'S REPORT

STANDARD	OVERVIEW
Establishing a safe, supportive, and intellectually challenging learning environment	Facilitate students becoming active participants in their learning by creating a need to know and creating conditions for students to question complex geographical ideas.
Understanding geography teaching — pedagogical practices	Teachers: have extensive understanding of pedagogical content knowledge; encourage students to gather information from a variety of sources; use fieldwork; and introduce a range of tools to students.
Planning, assessing, and reporting	Plan, monitor, and assess geographical learning through a range of formal and informal methods; recognise achievement and provide direction for improvement; and use diagnostic assessment to inform teaching practice.
Progressing professional growth and development	Engage with professional learning communities and recognise that geography is an evolving subject that requires regular updating of content knowledge.
Learning and working collegially	Actively engage with the professional community; share expertise; build a culture of professional improvement; and promote geographical education.



In May and June, GTA NSW & ACT hosted an online symposium 'Showcasing STEM in geography', designed to help geography thrive in various teaching contexts. The purpose of the symposium sessions are to prompt and challenge thinking about how to emphasise and incorporate elements of STEM into classroom practice for geography. Again, the connection into the GEOGStandards is clear, especially items 1, 2 and 3.

This year, GTA NSW & ACT will not be hosting an Annual Conference due to ongoing Covid uncertainties. We will be continuing to strengthen our online offerings

through webinars, short anytime courses through the open learning portal, and events such as the STEM symposium. Towards the end of 2022, we investigate the viability of holding in-person events. If you are wanting to attend an in-person conference, allow me to recommend the AGTA Conference in Hobart held between 28 – 30 September <https://agta.asn.au/conf2022/program.php>. Shortly GTANSW & ACT will be offering a range of merit-based scholarships to attend the AGTA Conference.

I wish you every success for the remainder of Term 2 and hope this edition of the Geography Bulletin inspires thinking and either confirms your practice in the geography classroom or gives you a range of ideas to incorporate into your teaching of geography.

Best wishes, Susan

Dr Susan Caldis, President GTA NSW & ACT | Chair AGTA



‘Overwhelmed’ and ‘underprepared’: The realities of out-field teaching in geography during a time of transition into the teaching profession

Dr Susan Caldis, Macquarie University; President GTA NSW & ACT

Abstract

As pre-service teachers transition into the profession, it is likely they will experience teaching beyond their subject specialisation and/or stage of schooling. This situation is known as out-of-field teaching. Whilst there is a growing body of evidence about the extent and impact of out-of-field teaching occurring in the teaching profession overall, little is known about out-of-field teaching in geography. This article shares important findings from a recent doctoral study that progresses understanding about out-of-field teaching in geography. These findings were initially shared at the 2021 National Summit on Teaching Out-of-Field (<https://oofas-collective.org/toofsummit>) and are written up more fully and more formally in my thesis (Caldis, 2021, *Transitioning into the profession and transformation of pedagogical practice in the secondary geography classroom*) and in Caldis (2022) *Transitioning into the profession with an out-of-field teaching load*. The article showcases the realities of out-of-field teaching faced by five pre-service geography teachers as they transitioned into the teaching profession. ‘Anna’, ‘Emily’, ‘Grace’, ‘Karen’, and ‘Matt’ (all pseudonyms) join the profession expecting to teach geography, however, not only were they asked to teach out-of-field, they were also asked to support out-of-field colleagues to teach geography. The realities are shaped around lived experience, responses to the emerging constraints and the consequences on their practice.

Introduction

Out-of-field teaching can be defined by subject, stage of schooling and also by self-identification of practice (Du Plessis, 2015; Hobbs, 2013). It is known to occur in response to factors such as teacher shortages (sector, subject, locations) and policy decisions about funding, employment and timetabling (Shah et al., 2020; Weldon, 2016, 2018). Out-of-field teaching is reported as a common experience by those who are entering the teaching profession and journeying through their early-career years (Caldis, 2022; Campbell et al., 2019; Du Plessis & Sunde, 2017). It is also reported as something for which initial teacher education programs do not provide suitable preparation. As a result, when this situation is encountered by early-career teachers it has potential to negate wellbeing and disrupt classroom management (Caldis, 2022; Du Plessis, 2020).

The research findings shared are from my recent doctoral research. Findings go some way towards being able to understand the urgency and impact of out-of-field teaching in geography, as called for in *Geography: Shaping Australia's Future* (NCGS, 2018). Focus is on the realities of out-of-field teaching faced by pre-service geography teachers as they transitioned into the profession. My research was a qualitative longitudinal study, conducted in three phases over 18 months and

conceptualised around pedagogy and reflexivity. ‘Anna’, ‘Emily’, ‘Grace’, ‘Karen’ and ‘Matt’ were purposely sampled from a geography methodology unit at an Australian metropolitan university. Out-of-field teaching was not a pre-determined research focus, however, it emerged in research findings as being a prominent part of journeying into the early-career years of teaching,

1. Lived experience, constraints and consequences

The lived experience, constraints, and consequences relate to out-of-field teaching being noted by four participants as a distinct entry point into the profession and characteristic of their first year of teaching. Teaching out-of-field was identified as a constraint to teaching practice due to a lack of preparation from the ITEP, the incidence of precarious employment and whole school timetabling decisions. Feeling stressed and overwhelmed together with difficulties in managing the classroom compared to when teaching their in-field subjects were mentioned as the main consequences of teaching out-of-field.

• 1A An entry-point into the profession.

Anna, Grace, Karen and Matt identified teaching out-of-field as being a distinctive entry-point into the profession and a feature of their first year of teaching.

Grace, Karen and Matt taught in Sydney; they each entered the profession as a casual relief teacher and then quickly gained a short-term contract within the Human Society and Its Environment (HSIE) department at a given school (approximately 10 – 12 weeks). Anna relocated to regional New South Wales for employment on a 12-month contract as a HSIE teacher at a Kindergarten to Year 12 school.

As an entry-point into the profession (Phase 2 of the study), Grace, Karen and Matt experienced out-of-field teaching as part of their day-to-day casual relief teaching appointments during Term 3 (July – September) where they were either teaching across several schools or teaching across different departments in one school. Grace, Karen and Matt soon had their casual appointments extended into a short-term contract as a HSIE teacher at a designated school for the remainder of Term 3 and throughout Term 4 (October – December). The short-term contract requirements meant they took on the teaching load of a HSIE teacher who was on leave. Whilst there was a small amount of geography on their timetable, the HSIE subject combination did not match participant subject specialisations. For example, during Phase 2: Profession-entry, Matt taught commerce, business studies and geography yet his subject specialisations were geography, history and modern history. Karen taught “multiple subjects: arts, geography, commerce, legal studies and future learning [but] I’m only trained in one of those subjects”. Anna was hired as a HSIE teacher, yet Anna’s timetable included agriculture, design and technology, Stage 3 (primary), geography and history. As a result, teaching out-of-field beyond HSIE was a dominant component of Anna’s entry into the profession and first year teaching.

Emily did not experience teaching out-of-field in Phases 2 and 3. Due to a vacancy arising in the Social Sciences department, she was hired as a geography teacher at the school where she completed her professional experience. Although her Head Teacher mentioned the possibility of also teaching commerce, Emily, a career-change teacher, had developed a strong subject-identity for geography, and had confidence to cite recent research about the impact of out-of-field teaching to her colleagues. As a result, her timetable remained in-field throughout her entry into the profession and first year of teaching.

- **1B Lack of preparation from ITEP and whole school timetabling decisions.**

Phase 1 of the study focused on professional experience and the final stages of candidature

in an initial teacher education program, at no time throughout this phase did the participants mention or experience teaching out-of-field. Phase 2 of the study focused on entry to the profession and Phase 3 on the first school year of teaching. It was during Phases 2 and 3 that participants spoke frequently about the out-of-field teaching phenomenon in response to feeling “overwhelmed” and “underprepared” from the ITEP. Matt withdrew from the study after Phases 1 and 2 citing that his timetable for the new school year (Phase 3) did not include geography although he was hired as a HSIE teacher, and he would mostly be teaching out-of-field.

Anna, Grace, Karen and Matt self-identified as out-of-field teachers, even within a HSIE context depending on the subject being taught. They reported OOF as a constraint to their feelings of being able to cope with the demands of entering and transitioning into the profession. They also reported the ITEP as not sufficiently preparing them for teaching out-of-field whilst also attributing this experience to timetabling decisions, faculty organisation and precarious employment.

Matt said he “felt constrained by teaching commerce [because] I’ve never been prepared for that ... it comes with a level of stress and expectation so that reduces my excitement [about teaching]”. When elaborating about ‘expectation’, Matt explained the students don’t know you are teaching out-of-field, only you do, but the students are still expecting a comprehensive and detailed lesson for the given subject, and that placed additional stress on him as a teacher who is new to the profession.

Anna had the largest out-of-field teaching load compared to the other participants and referred to this phenomenon as being “indicative of my year in review”. Anna also explained how she felt lack of preparation in the ITEP was a contributing factor to her struggle in coping effectively with the move away from her networks to a regional school and community; also her difficulty in adapting to a co-educational context when all her professional experience placements had been in all-girls schools. Overall, Anna said her transition into the profession was “a LOT”, but she felt she managed the out-of-field teaching experience by just “keep[ing] going” despite it being “debilitating and draining”, and that she “survived under pressure so that is a success”.

There were varying degrees of scale of out-of-field teaching, for example, Grace had a history and geography teaching specialisation which accredited her as a HSIE teacher, yet within a HSIE faculty during Phases 2 and 3, Grace also taught commerce and

business studies. As mentioned previously, Anna taught several subjects beyond HSIE and at the end of Phase 3 when her contract was extended for another 12 months, there was “another twist, teaching languages in 2021”. Grace and Karen often questioned why they had to teach business studies or commerce when there were HSIE colleagues who were teaching geography out-of-field. As Grace and Karen were the specialist geography teachers in the HSIE faculty, they were expected to help and provide advice to their non-geography-specialist HSIE colleagues about how to teach geography. Grace wondered “why can’t I have a full teaching load of geography?” when there were enough geography classes to fill her timetable.

- **1C Stress, feeling overwhelmed, and difficulties with classroom management.**

Anna, Grace, Karen and Matt identified an increasing amount of classroom management problems occurring with their out-of-field classes compared to when they were teaching geography. They also mentioned experiencing heightened levels of stress and often feeling overwhelmed by teaching out-of-field, which affected their wellbeing and also contributed to Anna’s development of serious problems with anxiety.

2 Possibilities for support

There were three areas of support mentioned by the participants which they felt enabled them to navigate the complexities of out-of-field teaching as part of their entrance and transition into the profession. One area of support was the creation of a dialogic safe space through the doctoral study group which provided a mentoring structure using explicit theory-practice reflection activities with a recurring question in every data generation activity in each phase. For example, the use of reflexivity theory to interpret context was noted as being helpful for participants to understand what enables and constrains their practice so that they can develop a viable plan for action to respond to the identified constraint of teaching out-of-field. The recurring question, ‘What makes your geography lesson geographical?’ became a point of understanding what was distinctive about teaching geography as a specialist teaching subject, however, this question also became a point of application for participants to delve into the distinctiveness of other subjects. For example, Anna started to insert the name of other subjects she was teaching into the question, such as ‘what makes this agricultural lesson agricultural?’

Another area of support for learning how to teach an out-of-field subject was related to engaging with

expert others. This occurred through either joining a professional teacher association, or through accessing social media such as subject-specific FaceBook groups, or by developing relationships with other teachers in their school or department who teach the given subject as their specialist area.

Participants also drew heavily on their personal values and beliefs about what it means to be a teacher to propel them through the difficult moments of teaching out-of-field. For example, Anna had a strongly-held belief that “country kids should be able to access the same quality of education as city kids ... and this is my responsibility to provide them with the best possible education”.

Conclusion

In conclusion, teaching out-of-field was a prominent experience of entering and transitioning into the profession for five early-career HSIE teachers. Difficulty in responding to and managing the out-of-field teaching phenomenon was attributed to a lack of preparation in the ITEP, school-based timetabling decisions, and precarious employment. Feeling stressed, being overwhelmed, and having to manage an increased incidence of classroom management issues were identified as the results of teaching out-of-field. Support structures to help navigate the complexities of OOF were named as being the use of explicit theory-practice reflection activities within a mentoring structure, engaging with expert others, and harnessing and acting upon the personal values and beliefs about what it means to be a teacher.

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GTA NSW & ACT Support for Teachers and Students in 2022

Professional Learning events

- **Semester 1** – HSC Meet the Marker – Symposium
- **Webinar Program**
- **Online learning courses** – Anytime PL
- **Semester 2** – Potential Stage 6 Conference



Keep up to date with upcoming events. Visit the GTA website [HERE](#)

Online Social Media Support

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

Resources

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

For Students

- **HSC Exam Preparation Digital Package**
- **Young Geographer Awards**

HSC STUDENT SUPPORT

NEW FORMAT, NEW PRESENTERS, NEW IDEAS and GREAT ADVICE!

Lorraine Chaffer, Vice President GTA NSW & ACT

GTA NSW & ACT has traditionally organised revision lectures for HSC Geography students and their teachers. In 2020 and 2021 when COVID-19 affected how schools operated, the association changed to a digital format to support HSC students. The digital package consisted of pre-recorded videos and support materials for teachers to use with their HSC classes through online platforms such as zoom or in person tutorials and lessons when schools were open.

2022 HSC EXAM PREPARATION DIGITAL PACKAGE

This style of package will be repeated in 2022 due to the continued impact of COVID-19 on staffing and the potential for students to attend Face-to-Face presentations. It is hoped that these can return as an option in 2023 in conjunction with a digital format.

One advantage of the previous digital packages was the ability of schools in regional and remote parts of NSW to receive the same support as those in Sydney and Newcastle. Feedback from teachers in 2021 led to a new approach. Presentations were reduced in content and length to allow time for class discussion during and after each video. It was also time for long time presenters, GTANSW Councillors Grant Kleeman, Sharon McLean and me to step back and for GTA to support a new cohort of presenters with current classroom and / or HSC marking expertise. An Expression of Interest process has resulted in 18 shorter presentations with 13 presenters representing all sectors, Sydney and regional schools.

Presenters

Matt Carroll, Cranbrook, Bellevue Hill
Sammy Coburn & Alan Cizzio, Maitland Grossman High School
James Harte, Roseville College
Nathalie Newton-Walters, Lindisfarne Anglican Grammar
John Wigan, Asquith Girls High School
Renee Yeowell, Knox Grammar, Wahroonga
Judd Newton, Henry Kendall High School, Gosford
Lorraine Chaffer, GTA NSW & ACT

Brett Stewart, The Kings School, North Parramatta
Liam Callaghan, Kinross Wolaroi School, Orange
Karen Bowden, GTA NSW & ACT
Andrew Toovey, Mount Annan Christian College
Jaye Dunn, Asquith Girls and Aurora College

Purpose of the package

- Examination support and advice for 2022 HSC Students preparing for Trial HSC and HSC Examinations
- Professional Learning for teachers new to teaching Stage 6 Geography
- Teachers work through the material with students, stopping to reinforce key concepts and ideas, or to make notes on the handouts.
- Presentations on specific case studies e.g., an ecosystem, economic activity or economic enterprise show approaches that can be applied across all case studies. Maybe ask your students to work in groups to produce a similar recorded presentation and / or PPT for their own case studies and present to the class OR stop to draw comparisons during a video.
- Support for flood affected Northern Rivers schools. In a NESA led program to support seriously flood affected schools, GTA NSW & ACT is offering free registration for the HSC Exam Preparation Digital Package for approved schools. Information on this and other support can be found on the NESA website.

For more details and registration [CLICK HERE](#)



The Geography Teachers' Association of NSW & ACT

HSC EXAM PREP PACKAGE FOR STUDENTS & TEACHERS

PURPOSE OF THE PACKAGE

- Examination support and advice for 2022 HSC Students
- Professional Learning for teachers new to teaching Stage 6 Geography and useful for institutions preparing pre service teachers for classroom practice.

CONTENTS

- The package consists of pre-recorded videos and support materials. Teachers can use the materials with their HSC classes, irrespective of the number of enrolled students.
- Seventeen shorter presentations and thirteen presenters representing all sectors, and both Sydney and regional schools. Only two case study presentations are repeated from 2021. **Note there may be small variations in the final package.*

USE

- Recommended for tutorial and in class revision / teacher led revision.
- Transfer key ideas and advice from illustrative examples and case studies to those studied in your school.
- One suggestion for deeper learning during revision is to ask students to prepare their own HSC Preparation video for a section of a topic.
- Not to be used for private tutoring purposes.
- Links and passwords are NOT to be provided to students.
- Streamed directly from Vimeo and not downloadable.
- Support materials downloadable from a Google Drive folder.

ACCESS

- Registration is by school. The registered teacher will receive the links and passwords to access Vimeo and the Google Drive resources
- Access will be available from **Tuesday 14 June to Monday 24 October** (HSC exam)
- Presentations on specific case studies show approaches that can be applied across other studies and will be particularly useful for teachers new to HSC Geography. Stopping a video to draw comparisons will help students contextualise the depth of their knowledge and understanding of their own case studies. Individuals or groups of students can be asked to create their own case study presentations to share with other students. Developing a presentation and creating a script will reinforce key concepts and factual information and expose gaps in their preparation for the HSC.

HSC EXAM PREP PACKAGE FOR STUDENTS & TEACHERS

PACKAGE CONTENT

TOPIC	PRESENTATION	PRESENTER
All Topics	General Advice 1 – Ten Tips to Nail the Trial / HSC Exam	Matt Carroll, Cranbrook, Bellevue Hill
	General Advice 2 – Revision strategies	Renee Yeowell, Knox Grammar, Warrawee
Skills and tools	Skills and tools presentations include mapping and using mathematical techniques.	Sammy Coburn and Alan Cizzio Maitland Grossman High School James Harte, Roseville College
People and Economic Activity	General advice for this topic	Nathalie Newton- Walters, Lindisfarne Anglican Grammar, Terranora
	Economic Activity – Cocoa	John Wigan, Asquith Girls High School
	Economic Activity – Viticulture	Renee Yeowell, Knox Grammar, Warrawee
	Economic Enterprise – Tamburlaine *	Matt Carroll, Cranbrook, Bellevue Hill
Ecosystems at Risk	Biophysical Interactions	Judd Newton, Henry Kendall High School, Gosford
	Vulnerability and Resilience*	Lorraine Chaffer, GTA NSW & ACT
	Importance of management and Protection	Brendan Stewart, The Kings School, Nth Parramatta
	Evaluating management strategies	Judd Newton, Henry Kendall High School, Gosford
	Case study: Alpine ecosystems	Liam Callaghan, Kinross Wolaroi School, Orange
	Case Study: Great Southern Reef	Matt Carroll, Cranbrook Bellevue Hill
	Case Study: Great Barrier Reef *	Matt Carroll, Cranbrook Bellevue Hill
Urban Places	General Advice, World cities and Megacities	Karen Bowden, GTA NSW & ACT
	Urban Dynamics in a Country Town or Suburb	Andrew Toovey, Mount Annan Christian College
	Urban Dynamics in a Large City	Jaye Dunn, Asquith Girls High & Aurora College

* Denotes a repeat presentation from 2021

SCHOOL & TEACHER REGISTRATION

\$ 265 Members \$385 Non-members

Schools with less than 5 students can contact the GTA for a per student rate.

NOTE: All prices include GST

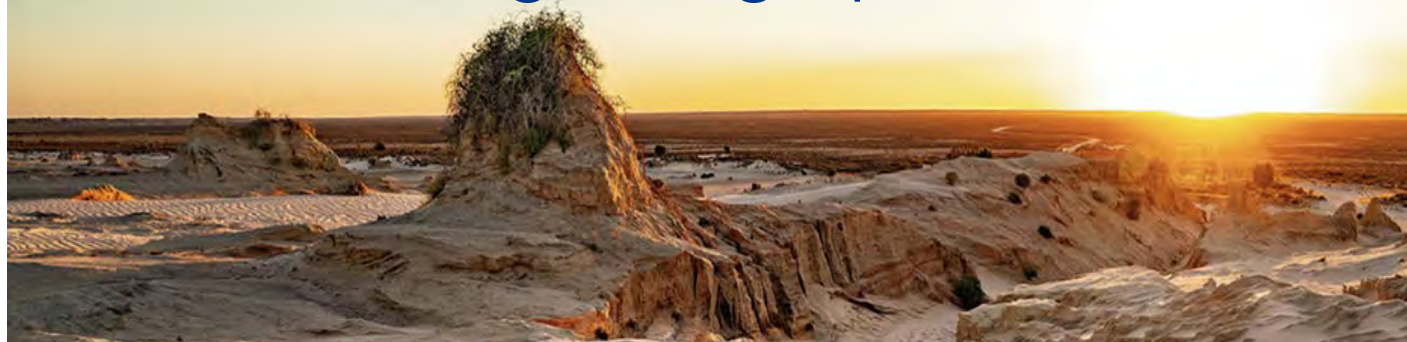
REGISTER HERE

Any questions contact Lorraine Chaffer through GTA NSW & ACT at gta.admin@ptc.nsw.edu.au

Phone: (02) 9716 0378 • Email: gta.admin@ptc.nsw.edu.au • www.gtansw.org.au • PO Box 699 Lidcombe 1825

COMPETITION RESULTS

2022 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.

There are prizes available for the winning entries.
The Young Geographer Award prizes are as follows.

- First Prize in any category \$500
- Second Prize in any category \$250
- Third Prize in any category \$100

Entries are now open for the 2022 Young Geographer Awards. For details see the GTA website <https://www.gtansw.org.au> Link on sliding banner

2021 COMPETITION RESULTS

Congratulations to all students who entered the 2021 competition. The standard of entries was outstanding, making the selection of winners very difficult.

The TWO overall winners are:

- **Millie Ferguson**, Roseville College
A Study of the Implementation of Environmentally Sustainable Practices in the Frenchs Forest Region'.
Teacher: James Harte. Prize \$500.
- **Sunae Park**, Meriden
An investigation into the liveability of Beecroft for Older Residents 65 or over.
Teacher: Bree Moore. Prize \$500.



FULL WINNERS LIST

CATEGORY: Senior Geography Project / International Baccalaureate Internal Assessment

First Place

Millie Ferguson

Topic: A Study of the Implementation of Environmentally Sustainable Practices in the Frenchs Forest Region. Prize \$500

Equal Second Place

Sarah Davidson

Topic: Investigating the Social Impacts of the Metro Northwest on North West Sydney. Prize \$250

Equal Second Place

Katie McCarthy

Topic: Population Changes in the Yass Valley. Prize \$250

Third Place

Theresa Scarcella

Topic: The economic and environmental influences of food waste in Sydney Markets, and its contribution to a microbusiness in Brownlow Hill. Prize \$100

Highly Commended

Talitha Moss

Topic: Microplastics from our Washing Machines

Highly Commended

Megan Price

Topic: To what extent do the changes in the discharge, load particle size and gradient in the Thredbo River support the Bradshaw and Schumm models?

COMPETITION: YOUNG GEOGRAPHER AWARDS

Highly Commended

Jaya Morphet

Topic: Impact of Tourism in Byron Shire

CATEGORY: Geographical Research

First Place

Sunae Park

'An investigation into the liveability of Beecroft for Older Residents 65 or over'. Prize \$500

Second Place

Oliver Rucinski

How can we reduce noise pollution from the Moore Park Stadium precinct? Prize \$250

Third Place

Mia Pertsinidis

An investigation into the liveability of Hurlstone Park for people with disabilities. Prize \$100

Highly Commended

Jack McGonigal

To what extent does smokers drift negatively impact liveability for residents of Paddington Terrace?

A selection of topics investigated during 2021

- Factors affecting water quality in the Rose Bay Harbour area
- An investigation of gentrification in the local government area of Waverley
- Social and Environmental Impacts of Urban Consolidation in Ashfield
- What are the social and environmental impacts of the Green Square Development on the suburb?
- An inquiry into the lasting effects of factories alongside the Parramatta River
- What are the social and environmental consequences of White Bay Cruise Terminal on Balmain residents?
- What is the impact of the Seven Ways streetscape upgrade on the local Bondi community?
- An inquiry into the lasting effects of factories alongside the Parramatta River.
- How does the weight of global environmental issues impact the psychological wellbeing of young people in Sydney? How can effective strategies be implemented to manage this?

Marker comments on selected entries

Marking guideline for the Young Geographer Awards are shown on page 16.

Senior entries

- *An outstanding entry with thorough primary research supported by secondary research. Strong analysis of data and evidence of active citizenship. Clearly & concisely communicated results & useful recommendations.*
- *Effective & thorough primary research using a variety of different methods (interviews, surveys, photographs). Thorough analysis of data using a variety of geographic tools, clearly referred to in the text. Excellent analysis of research methods & good recommendations.*
- *Multifaceted research covering a wide range of impacts of the & using a variety of different primary research methods. Excellent analysis of findings and excellent coverage of possible solutions.*
- *An outstanding piece of research involving the construction of a and collection of a wide variety of primary data over a 10 week period. Detailed analysis of the results supported by secondary research. A highly engaging topic choice with clear reference to civics.*
- *An engaging topic that has been well researched and documented in an engaging and interesting format. The use of Story Maps & the embedded video added to the presentation. An excellent piece of work.*
- *A strong piece of work, offering detailed analysis of primary data collection and linking it well to secondary research. An excellent selection of geographic tools that are labelled appropriately and referred to in the text. Attractively presented in a clear, easily accessible manner. Capacity for active citizenship needs to be addressed.*

Junior entries

- *An engaging topic. Clear and concise presentation of data. Excellent use of appropriate colour adds to engagement. Excellent evidence of active citizenship. Photos & other secondary sources needed to be more clearly referred to in the text.*

For current information on the 2022 competition visit the GTA NSW & ACT website at –
<https://www.gtansw.org.au>

COMPETITION: 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. 2500 words or less or under 10 minutes. Digitally submitted in correct file type and able to be accessed by judges.	Project is attractively formatted. 2500 words or less or under 10 minutes. Digitally submitted in correct file type and able to be accessed by judges.	2500 words or less or under 10 minutes exceeded by up to 10%. Digitally submitted in correct file type and able to be accessed by judges.	Project exceeded 2500 words or less, or under 10 minutes by more than 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

COMPETITION RESULTS



Geography's Big Week Out and International Team

Each year sixteen Year 11 students from around Australia are selected to participate in Geography's Big Week Out (GBWO) based on their scores in the Australian Geography Competition. The 2020 GBWO had to be cancelled because of COVID-19. Continually changing border, quarantine and gathering restrictions, flight cancellations, and last-minute cases of COVID, made organising the 2021 GBWO particularly challenging, but after three changes of date and location, the "2021" GBWO was finally held in Brisbane from 9 to 13 April 2022.

The participating students were:

Student	School	State
Amad Arzavi	Comet Bay College	WA
Hamish Carson	Shore School	NSW
Zara Ford	Canberra Grammar School	ACT
Elyse Helmgren	Ascham School	NSW
Patrick Holland	Hobart College	TAS
Elijah Jacobson	Sydney Grammar School	NSW
George Leeton-Watts	Wesley College - St Kilda Road Campus	VIC
William Matthews	Brisbane Grammar School	QLD
Rachel Morden	Timboon P-12 School	VIC
Lucy Schwarz	Arden Anglican School	NSW
William Stafford	Sydney Grammar School	NSW
Justine Thomas	Comet Bay College	WA
Annika van den Brenk	Sunshine Coast Grammar School	QLD
Ioanna Vaughan-Jones	Walford Anglican School for Girls	SA
Jessica Wang	St George Girls High School	NSW

COMPETITION: GEOGRAPHY BIG WEEK OUT



On the last day the students sat a 2-hour test, and from that the four highest-scoring students have been selected to represent Australia at the **2022 International Geography Olympiad** (iGeo). Best of luck to our Australian students:

- Lucy Schwarz, Arden Anglican School, Sydney, NSW
- Justine Thomas, Comet Bay College, Rockingham, WA
- Ioanna Vaughan-Jones, Walford Anglican School for Girls, Adelaide, SA
- Jessica Wang, St George Girls High School, Sydney, NSW

Teams from a diverse range of approximately 50 countries compete in the iGeo each year. The 2022 iGeo was to have been held in Paris in August but will now be held virtually. Instead, the Australian team will come together on the Gold Coast to compete. The students sit three challenging tests, including a Fieldwork Exercise that by necessity will be adapted to a virtual delivery. All students will be observed and recorded by international monitors during the tests, both through the computer on which they were working, and through a second observing camera, via Zoom. Opportunities for students from different countries to interact with each other are built into the programme.

Australia has been taking part in this highly prestigious international contest since 2006. Year 11 students from this year's Australian Geography Competition have the chance to be selected for the Australian team to the

The fieldwork focussed on investigating public spaces in central Brisbane and assessing their quality. Three quite different sites were assessed – the City Botanic Gardens, a central city square and a pedestrian mall in a downtown area. Tasks included mapping, surveying users, estimating transient populations, and analysis and visualisation of data.

The geographical concepts and skills learnt through participation in the fieldwork has inspired me to further analyse and evaluate urban environments in other parts of Australia. GBWO gave me opportunities to collect primary quantitative and qualitative data/observations which was a fun yet challenging experience that has deeply enhanced my geographical skills and understanding. Jessica



2023 International Geography Olympiad in Bandung, Indonesia (COVID-19 allowing).

The Australian Geography Competition is a joint initiative of the Australian Geography Teachers' Association and the Royal Geographical Society of Queensland. Costs of participating in GBWO and the iGeo are met by the Australian Geography Competition with support from the Australian Government Department of Education, Skills and Employment, the University of Melbourne, and the University of New South Wales.

For further information on the Australian Geography Competition, Geography's Big Week Out or Australia's participation in the International Geography Olympiad, please see the website or contact Rachel Honey.

Rachel Honey, Competition Coordinator
AGCcoordinator@rgsq.org.au
www.geographycompetition.org.au

Teaching Skills in Geography

Strategies, reflections, breakthrough and a mapping activity

Martin Pluss, Northholm Grammar School
Acting Head of Entrepreneurship

Skills are one of the most difficult topic areas to teach in geography. This is because there is a diverse range of student capabilities, they require a variety of different cognitive functions, they involve a mixture of different tools to use such as the calculator, ruler, dividers, compasses for the drawing of maps, diagrams, tables and for multiple combinations of skills in single questions. We also have teachers not trained in geography or the teaching of geography.

Invariably students do not have all the equipment and as the teacher you have to produce alternatives in the classroom like asking students to pull out pieces of their hair or shoelaces to measure the length of a meandering river. Also, there is the sharing of rulers, pencils, and gear which interrupts the flow and concentration of students in the room.

Coupled with gear issues is the difficulty of scope and sequencing the teaching of skills and the practicing of skills for speed and accuracy. Especially when the goal is to teach skills in a manner which maintains student retention of how to complete skills.

Strategies for Teaching Skills

There is a pathway through.

I have tried almost every combination for the teaching of skills. My motivation is to reduce the perceived difficulty of skills being a factor contributing to students not picking geography in Stage 6.

One approach is the **teaching of skills within the teaching of the content of the course** such as population pyramids during Global Challenges, transects during the SGP in the local area or semi logarithmic graphs during Urban Places. This approach has its merits but **lacks the repetition required for retention** in a student's long-term memory.

With this approach the student tends to remember the content of the course, not the skills. For example, the student remembers the facts like low rainfall in a desert

area of Australia, rather than the skill of the drawing of the climate graph and the correct labeling of columns and lines in the graphs.

My preference is an alternate approach called **Skills Friday** – or the last lesson of the week depending on the timetable. What does this look like throughout the year?

At the beginning of Year 11 in the first term there is a systematic treatment of the teaching of skills every Friday. I work on the principle of prior knowledge, auditing what students know and then explicitly teaching the higher order skills.

Depending on the nature, attitude and motivation of the students I might mix up a difficult skill in one week like vertical exaggeration, gradient or some statistical manipulations like percentage changes. In another week I work on repetition of hopefully easier skills such as grid and area references, direction, bearings and locating places on maps.

In **Term 2 Skills Friday** becomes SGP Friday. Here the focus is on the stages completed in the SGP over the term. We start with a plan of investigation, developing a research question followed by research and planning.

This is followed, in the middle weeks of the term, with techniques of data collection in which students bring in the photos taken of their fieldwork area and some field drawings. In the last third of the term the focus shifts to collation of the data. Transforming of the data into format that can be presented in the final report, due in Week 3 Term 3.

GEO SKILLS: TEACHING SKILLS IN GEOGRAPHY

Skills Friday returns in Term 3, the last term of the Preliminary Course. The focus is HSC practice papers. Some of us have been teaching this Geography syllabus since 2001. So, with the Catholic and the HSC papers there are forty-two examination papers of skills that the students can do.

In Term Three every student completes one examination paper of skills each week. This repetition is crucial for two reasons: to build confidence that they can do the skills and secondly it provides an orderly manner where students can improve their skills for retention.

Throughout the term I focus on two things – **accuracy and speed**. Accuracy in the earlier days. I point out to the students that I give them two hours to do twenty multiple choice questions, most would get full marks. Next, I introduce the second concept of speed. Unfortunately, students do not have two hours to do the twenty multiple choice questions so my mantra towards the end of Term 3 becomes speed and accuracy.

In the HSC year the **language shifts from Skills Friday to HSC Technique Friday**. In Term 4, the start of the HSC Course, the focus is on building an understanding of the syllabus points. This requires the explicit teaching of how to link the syllabus points to the content examined.

Now I am providing the roadmap of the course content being taught. Usually in the form of mind maps and flowcharts. Once there is depth of knowledge there is an explicit focus on the writing of introductions, conclusions, short answers and eventually extended written responses.

In Term One in the HSC year, I bring out the next series of HSC multiple-choice skills questions. The goal is to see how much of the skills that have been learned on an ongoing basis throughout the Year 11 coursework has been retained in the long-term memory.

It is usually clear what has been retained but often there are identifiable common weaknesses. These usually relate to students' specific skill 'blocks', even skill phobia. For example, statements like "I can't do gradients" indicates I need to be more explicit in my instruction. Sometimes the issue is not the skill retention but the process such as using the calculator. Students enter numbers the wrong way around and then get confused with the numbers in relation to decimal points.

The **HSC Technique Friday**, through Term 2 and 3 of the HSC year, is a combination of skills, multiple choice technique and short answer and essay writing. This

involves breaking the component parts into drilling introductions, the essay body, conclusions, use of stimulus materials and application of key terms to geographical knowledge. Of course there is the explicit teaching of the NESA Glossary of terms.

Reflection on the strategies

There are a few ways to teach skills but two of the most obvious are firstly the **direct teaching of the skill** itself and then the **repetition of the knowledge learned** to embed the understanding in the long-term memory. Secondly, skills can be taught in context with the content we are delivering in the classroom at a point in time throughout the courses.

Skills tend to stay in the short-term memory when they are taught in bits and pieces over a period of four or six years depending on if the student takes Stage 6 Geography. Careful consideration needs to be made in how skills are taught, based on several factors.

As a teacher it is crucial that you are confident in teaching skills and if you have weaknesses, improve them. One of my many achilles heels, for example, is that I finished my schooling the year before calculators were introduced. I have had to develop a strategy of arranging friends for students to show other students how to use the calculator. Fortunately, on most occasions I can get to an answer in my head while they are working out the function buttons on the calculator.

Then there is the dynamic of the classroom mix to consider, including the students' attitude, aptitude and capacity to improve the learning of skills. Small student numbers lend themselves to better teaching of skills because it enables you to provide one to one instruction, feedback and follow up.

In classes where there are numerous students there is often a range of abilities. This is where you need to develop some tricks of the trade. For example, when do you bring the whole class back into focus or when do you run around the classroom answering the same question multiple times? The latter is more effective for retention than the former but more time consuming.

For example, when it comes to area and grid references my go to instructions are "bottom of the page before the side of the page." This is where my goal is the student getting the answer correct – understanding of Eastings and Northings sometimes comes later once the student is satisfied, they can get the answer.

Unfortunately, the anxiety comes from not getting the solution rather than the process. Accordingly, sometimes I work on understanding later.

GEO SKILLS: TEACHING SKILLS IN GEOGRAPHY

The Breakthrough

These verbal tricks I developed have proved to be the breakthrough I needed, particularly in the teaching of skills in Stage 4 and 5. I discovered as I was walking around the room, I got better at **verbalising little tricks** to help students remember the process. This confirmed there is the capacity for skills to be better taught through the process of verbalising and listening, prior to doing. Below is one strategy which has had some success.

In the teaching of drawing of maps in Stage 4 I started to do an activity which involved students listening to instructions to draw a map. Many of us get our students to draw a map of a classroom or a room in their house. This develops an appreciation of space and the relative location of unique features in place, hopefully to some sort of scale.

A variation of this is to get the students to write up instructions of what a room(s) looks like and ask a peer to draw the space from their instructions. I have also tried the same approach where students provide instructions on how to get from school to home and the students have to work out where they live.

The **visualisation process** of understanding place, space and scale is especially important because it provides the foundation of so much more down the track. It becomes clear that verbal instructions are important, but the verbal instructions need to be

repeated because of students' capacity to listen. This is where the writing of instructions is crucial.

The **writing of instructions** improves the outcome of drawing accurate maps. Also, the reading of instructions or listening to them on a recording has proven to be a creative way to get the students to engage with space and place in the skill of map or field sketch drawing.

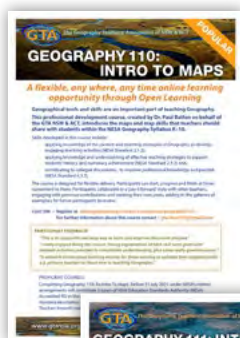
For example, I came across this approach many years ago in Bowral when I wrote out instructions on how to draw through my house. During this process students had to visualise and draw a bird's eye view map by listening to or reading my instructions. It was interesting to see the assorted designs in my house compared to what it looked like.

This was a breakthrough in my teaching of map drawing. The students were able to engage with the skill of understanding of space and place through a different medium.

Over the years the approach has been refined. For example, Susan Vega's song Tom's Diner has a version with music and one without music with just these words of the song. This latter version creates an audio of a scene of a person sitting inside a café looking out the window. It describes the scene so well that students can sketch the scene accurately.

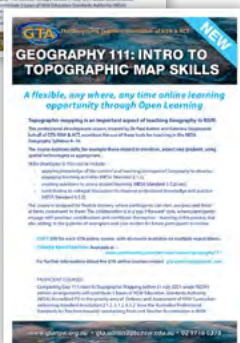
When I have done this as an activity it has been popular and engaging. It would be a good starting activity prior to attempting the following mapping activity.

Open Learning Courses for Mapping Skills



GEOGRAPHY 110 – Introduction to Mapping

This professional-development course introduces the maps and map skills that teachers should share with students. Through completing the learning activities in this course you should become more confident about including a range of map types and introductory map skills in your lessons.



GEOGRAPHY 111 – Topographic Mapping Skills

Through completing this course, you will better understand topographic maps and related map skills that can be used in the K-12 Geography curriculum.

For more information visit GTA NSW & ACT at <https://www.gtansw.org.au>

A Mapping Activity

Let me take you through this **activity involving the drawing of a plan for a block of units and then one unit in the block**. Here are the instructions. This is the ambitious version. My suggestion is to learn from the example and set your own up for a space and place you know well.

Block Instructions

The unit block consists of twelve units with two side by side blocks. The front of the blocks face to the East and the back is to the West. There is one building with four units on the left (southern) side and another building on the right (northern) side with eight units on this side. The block with eight units is split by a corridor and a stairwell with four units on one side and four units on the other. The block is terraced on four levels. In the middle of the front of the unit blocks are the letter boxes and behind them the garbage bins. There is an entry driveway on the southern side and an exit driveway on the northern side.

ACTIVITY: Draw a sketch of your visualisation of the apartment complex



Figure 1: Eastern view of the apartment complex

Unit Instructions

Now let us draw one unit in the block in stages. Draw the map with north at the top and a landscape rectangle.

1. Shape of the unit and patio

The shape of the unit is a rectangle 10 m (north/south) by 14m (east/west). There is a 10m by 3 m wide patio outside these dimensions on the front (east). There is a glass hip high gate which opens on to a 10 metre by 3-metre-wide patio which runs the frontage of the unit. The gate is in the middle of the patio. There is a BBQ on the right (north) and a table and two white chairs on the left (south).



Figure 2: Front of the unit.

ACTIVITY: Draw the shape of the unit and the patio.
Draw in the gate, BBQ, tables and chairs of the patio.

2. The kitchen, dining and living area

The entrance is from the east through two sliding doors beyond the 10m wide patio.

The two sliding doors open into a living area which is in the shape of a rectangle 10m (north/south) x 6 m (east/west). With your back to the door on the left-hand (south) side there is a kitchen to the back and a dining table towards the front. On the right-hand side is a living area with a TV on the right (northern) wall in between two single lounge chairs. Opposite the TV is a three-seater lounge, and on the back (western) side wall of the room is a two-seater lounge. There is a door leading to the hallway in the middle of the back wall between the kitchen and living area.



Figure 3: The kitchen, dining and living areas

ACTIVITY: Draw the kitchen, dining and living space and add the furniture.

3. Bedrooms, bathroom and laundry

In the middle of the back wall of the living room is the entrance to a hallway which is 5m long. If you stand at that entrance, there is a hallway to the right which is 4m from the internal front door. Next on the right is a L-shaped bathroom with the shower being the L shape behind the following mentioned toilet room. Following this on the right is a separate toilet. A rectangle shaped laundry is straight ahead at the back (western) end of the unit running to the right or north behind the toilet and shower of the bathroom.

Going back to the entrance to the hallway to the left-hand (southern) side is the main bedroom with a queen size bed and following this on the left-hand side the next door is the second bedroom with three single beds.

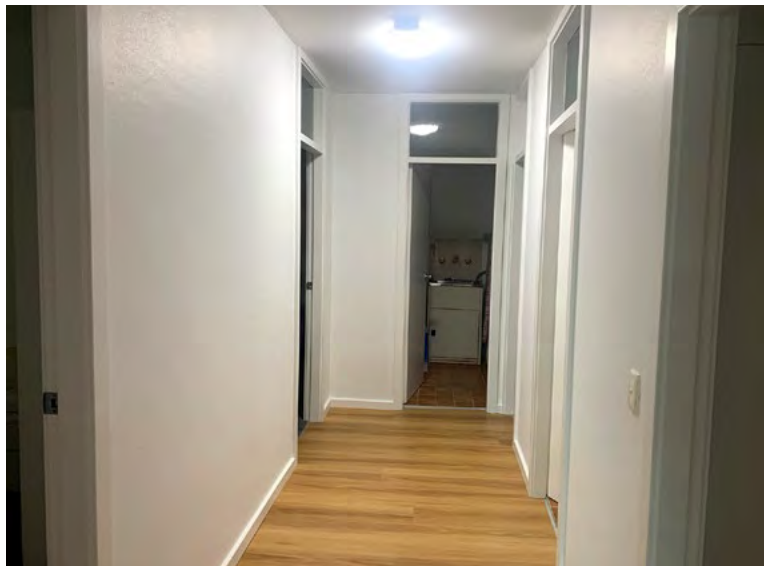


Figure 4: View from the entrance to the rear of the unit.

ACTIVITY: Draw the back rooms of the unit.

Conclusion

This activity is going to cause frustration. It may well have done so for you already. You will have multiple questions from students about how well you have provided instructions from which to draw. The students will get frustrated because they want a quick fix and an answer. Resist the quick solution.

The success of the activity depends on how you set it up. It needs to be made clear that the point of the exercise is to help students visualise place and space without having seen it. Scattered through this article are samples of a range of students' attempts at the activity.

At the end of the exercise provide the map of the unit. See Figure 5. If necessary, you could simplify the task by only providing instructions for individual rooms at a time and put the pieces all together at the end.

Initially the sketch will not be to scale but a later run through can address this skill. The beauty about this exercise is in getting the students to focus on their visualisation of space and place. Give the class a break for a few weeks and reverse the process and ask the students to provide their own instructions to draw a room in their house.

It is an activity they will not forget, and you will not forget.

GEO SKILLS: TEACHING SKILLS IN GEOGRAPHY

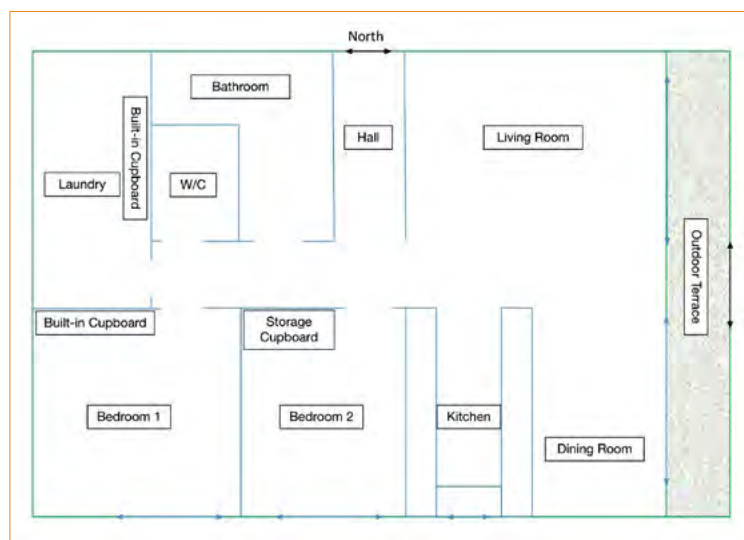


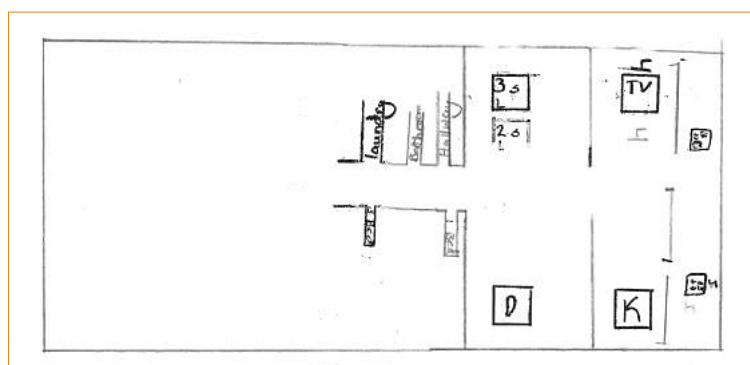
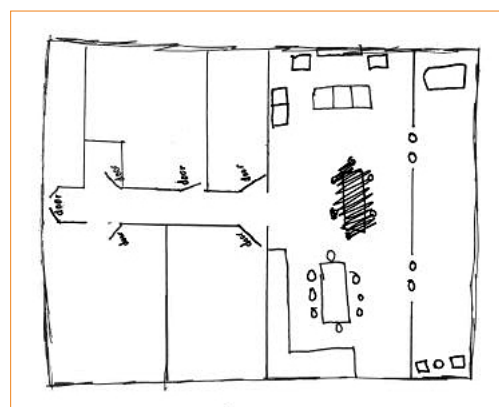
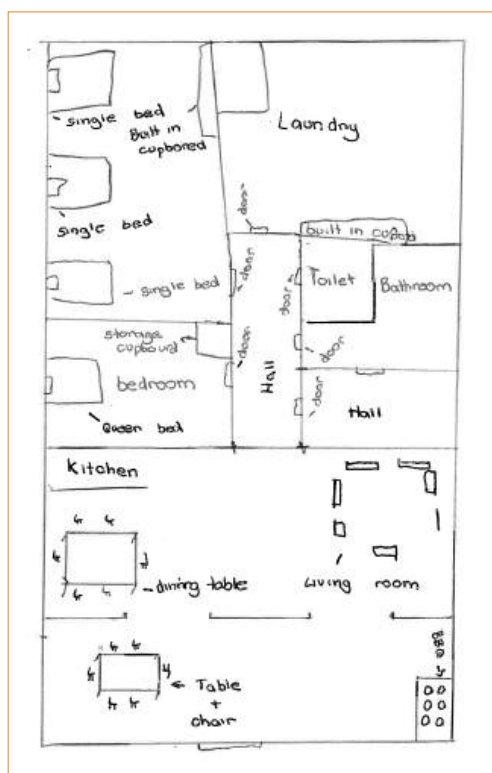
Figure 5: Map of the unit

Interestingly, there are unintended consequences from the activity. Some students who struggle with tests and assignments nailed this task displaying a good sense of space and place. This provided me with a good case for positive reinforcement and a demonstration for students that they can be solid geographers.

Alternatively, the task is humbling for some students who normally do well and were challenged. Perfectionists really struggled but in my debrief they could see the benefit. Finally, in relation to getting the best out of students the task provided insight into students, who think differently, can respond to written and oral instructions and displayed the capacity to endure the uncomfortable for one moment more until success became evident.

Give it a go – be comfortable with being uncomfortable.

Samples of student work.



Skills Questions in HSC Exams

GTANSW & ACT E Learning Team

One important theme that emerged from recent surveys on HSC exams is gradation.

In any exam a range of ability questions are provided. This means that Band 2/3 students can access the easier questions effectively whilst also providing challenging questions to differentiate the Band 6 students.

NESA explains that the examination paper as a whole should:

- “provide the range of candidates with the opportunity to demonstrate what they know, understand and are able to do”
- “and will allow for appropriate differentiation of student performance at each band on the performance scale, including demonstration of higher order skills.”

The 2021 HSC Geo Exam – challenging skills

One review of the 2021 exam is that it demonstrated that whilst some skills can be asked in easy, straightforward ways, those same skills can be tested in more challenging ways.

Challenging question #1

Reading synoptic charts can be easy – e.g., What is the air pressure at a point. But in the 2021 HSC Geo exam interpreting synoptic charts was one of the most difficult questions. It was a question requiring the reading of isobars to get the wind direction.

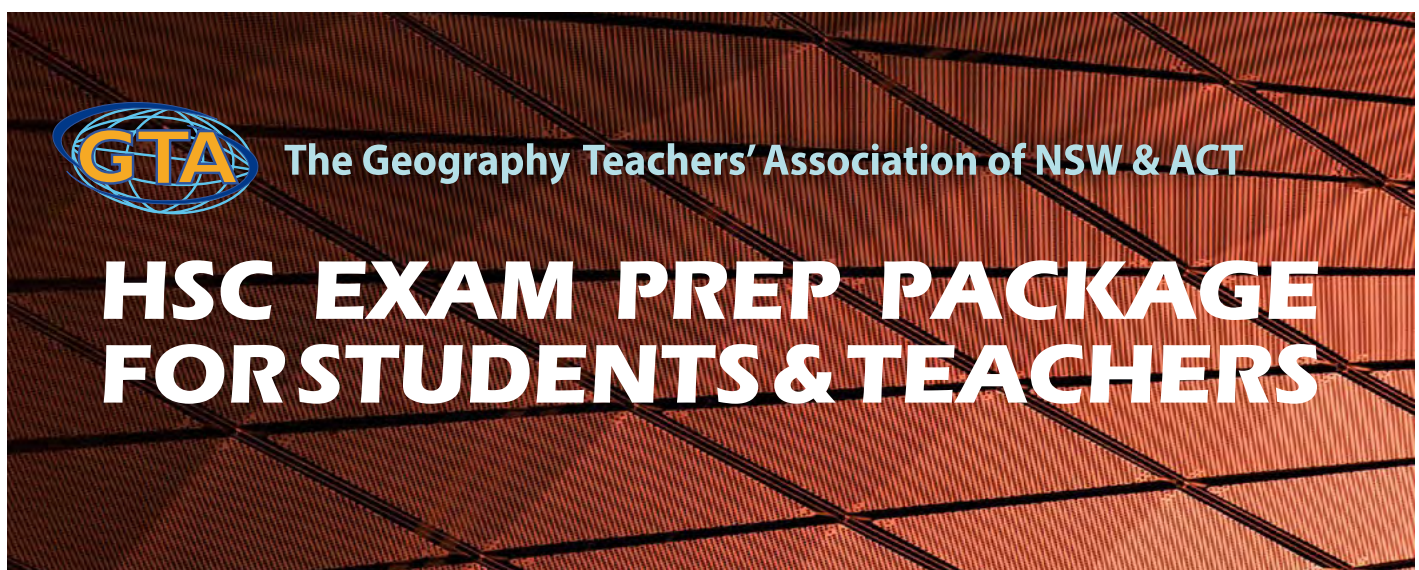
This is not the only HSC Exam to feature that type of question, but certainly in the survey of teachers many saw it as a challenging question.

Solution: The key to this skill is to know that wind in the Southern Hemisphere travels clockwise around lows (almost parallel to the isobars). And wind is named after where it comes from. So, the answer is WNW, or C.

Professional learning opportunities

To see more **tips related to the HSC exam**, including its skills, and more explanations of 2021 difficult questions, you can register for the ‘anytime’ PD (cost \$90) at: <https://www.openlearning.com/ptc-nsw/courses/geo-hsc/homepage/?cl=1>

Advice for students on skills are provided in two presentations in the HSC Exam Preparation package at <https://ptcnsw.eventsair.com/gta.../register/Site/Register>





Unsplash image

White Water Rafting – The Snowy River

A mapping activity for Year 11

Drew Collins

You have been asked by a client of your business **“Wet, Wild and Snowy”** to put together a white-water rafting trip down the Snowy River. Complete all of the tasks below to comply with the requirements of the client and your own knowledge of what will make your clients happy. Your knowledge of Biophysical Interactions and Map Skills will help you complete this task.

Resource: Kosciusko Map Extract, Kleeman and Peters *Skills in Australian Geography* p34–35

1. You will meet your clients at a town in AR 1966. What is its name? _____
2. Your starting point is an element of the built environment at 158643. _____
3. Your client gets car sick and wants to know how far you will be travelling in the car from the road intersection south of Mount Guthrie to the “drop in” starting point. _____ km
4. To provide the client with more information you decide to calculate the length of time it will take to drive this distance at an average speed of 25km/h. _____
5. One of your clients’ friends has decided to walk to the drop in point from the locked gate. You need to provide some information:
 - a. Grid Reference of the southernmost locked gate _____
 - b. Direction from the gate to the drop in point _____
 - c. Bearing from the gate to the drop in point _____
 - d. The local relief between these two points _____

Finally, we are at the drop in point! It is a cold morning, and you have to give a briefing in the sun.

6. State the aspect of slope at 156643. _____
7. Would you choose this site or 163644 to give your briefing?
Give a reason.

8. You need to state the direction you will be traveling when you enter the river.
State the general direction of flow for the Snowy River in AR 1564. _____

GEO SKILLS HSC: MAPPING ACTIVITY



Looking along the Main Range track towards Mt Northcote from near Mt Kosciusko. Photo: Peter Dowley. Source: Wikimedia Commons

9. You need to make the tributary of Blue Lake Creek in 3 hours.
How fast will you need to raft down the river? _____

You have arrived at the lunch spot before your hike to Blue Lake. Your client has some unfit friends on the trip, and he wants you to show them a cross section of the hike from the intersection of Blue Lake Creek and the Snowy River to 180700.

10. Draw two cross sections on another page. One cross-section will have a vertical scale of 1:4000 and the other will have a vertical scale of 1:2000.

11. Which of these two cross-sections would you show to the unfit friends to encourage them to walk up to blue lake? _____

12. Calculate the vertical exaggeration of each cross section.

1:4000 _____

1:2000 _____

13. What type of glacial landform feature is Blue Lake? _____

14. You need your clients to wear the appropriate clothing up to Blue Lake.
Using your knowledge of the adiabatic lapse rate, calculate the temperature at Blue Lake if the temperature at the bottom is 18°C. _____

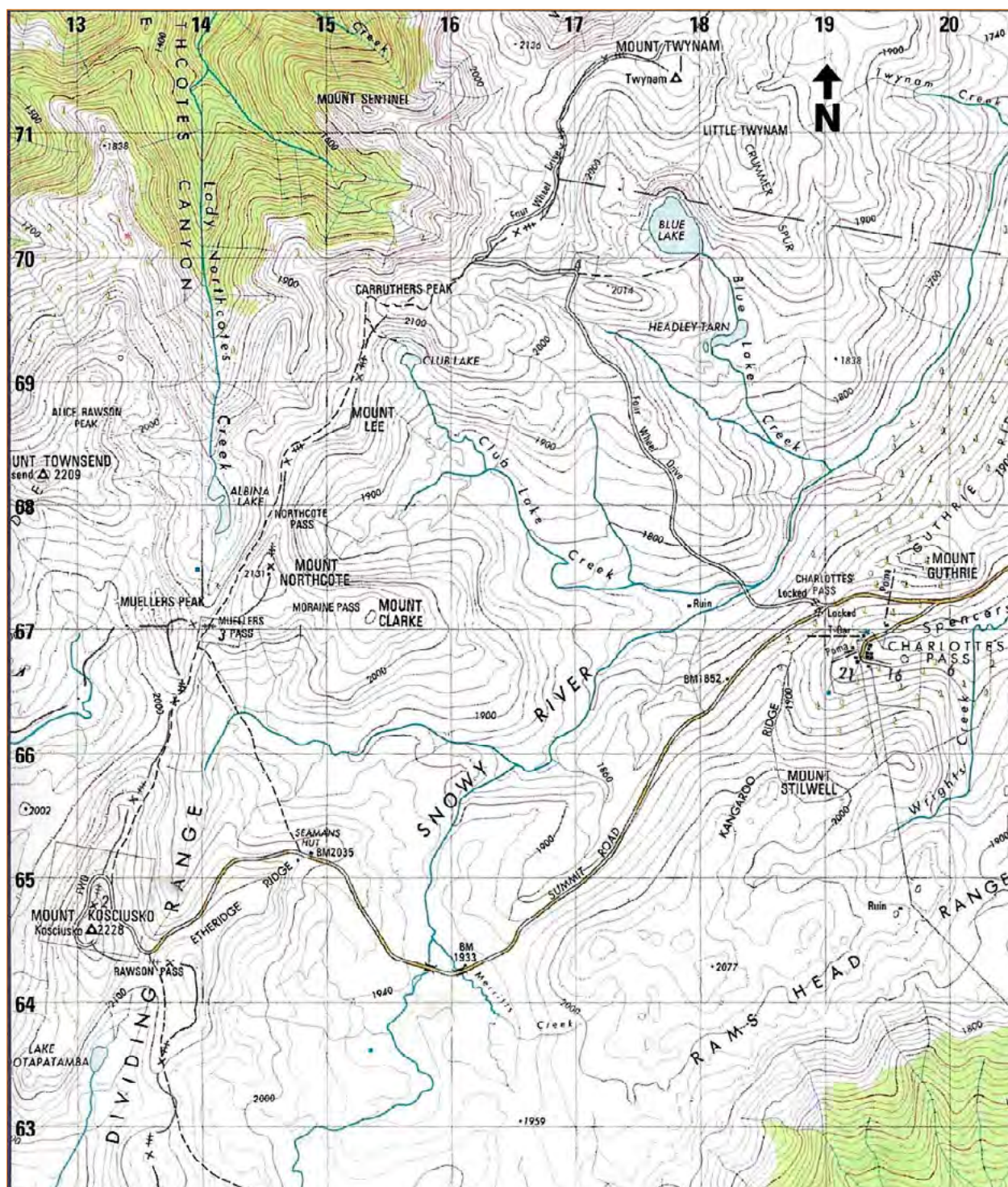
Safety is the number one priority. Rigorous laws govern outdoor adventure in Australia. For beginner rafters the gradient of the river must not be steeper than 1:15.

15. Can your trip proceed? Calculate the gradient of the Snowy River from the drop in point to Blue Lake Creek as a ratio. 1: _____

16. So can you go on your trip? _____

GEO SKILLS HSC: MAPPING ACTIVITY

Topographic Map Extract



Scale 1:50,000 Contour interval: 20 metres

To complete this activity, either use:

- The topographic map extract above
- *Skills in Geography Education*; Grant Kleeman, Andrew Peters. Pages 34–35
- A paper version of Thredbo Topographic Map or download a map from SixMaps e-topo

Note: If printing the map above select actual size to get the correct scale

Interpreting Photographs

Text: Education Victoria
Activities: Lorraine Chaffer

Photographs frequently feature as a visual resource in the geography classroom. Students today are exposed to visual images every day, within and beyond the classroom, so it is important to help them develop a more critical eye to interpret photographs geographically.

Photographs are often taken for specific purposes. Students need to consider how these purposes may affect their interpretation of the issue or aspect that the photographs are trying to portray. In addition, photographs provide a small and selective view. It is important therefore that students can understand the broader context in which the photograph is situated.

Geographers use several types of photographs, including ground-level photographs, oblique and vertical aerial photographs, and satellite images. Whereas vertical aerial photos and satellite images are more similar to maps (they are useful for portraying information about patterns across large areas of space), ground-level and oblique aerial photos require rather different interpretation skills.

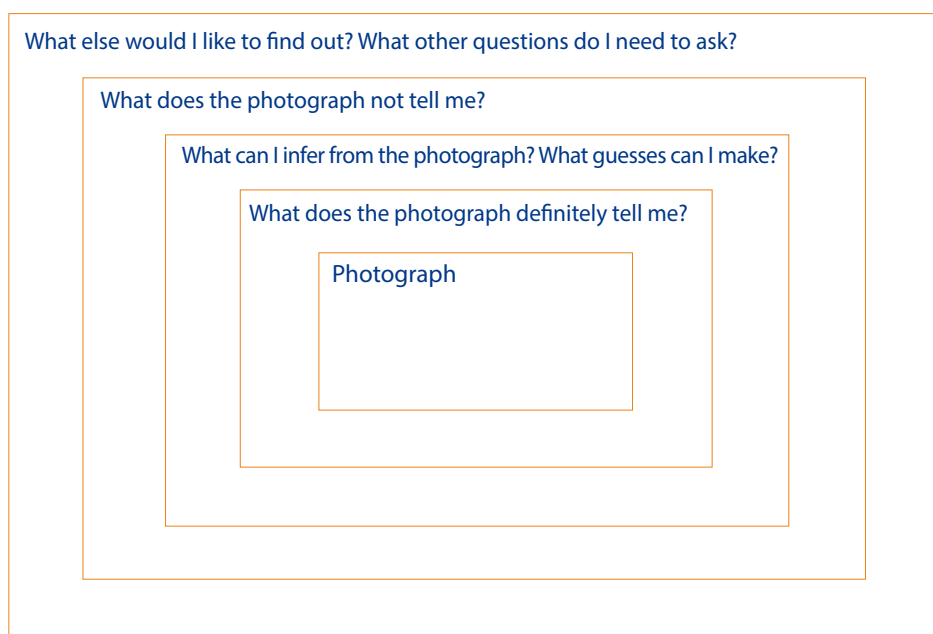
Layers of inference

One strategy to help students interpret photographs critically is the layers of inference framework. This framework encourages students to first identify the literal meanings in photographs, then draw on their prior knowledge to build inferences and predictions.

The purposes of using the layers of inference framework are to encourage students to:

- examine photographs closely to identify specific features
- draw on their prior knowledge to make inferences or informed guesses or predictions
- become aware that the photographs present only partial evidence
- be curious and ask questions
- be critical by considering both what is shown and what is not shown (adapted from Roberts, 2013, p.155).

Teachers can support students to analyse photographs using the layers of inference framework using either a *graphic organiser* or as a *template*.



*Layers of inference framework
graphic organiser*

GEO LITERACY: INTERPRETING PHOTOGRAPHS

The following procedure for using the layers of inference framework involves three sequential steps (adapted from Roberts, 2013). These steps can be used by individual students, but the process is strengthened by peer collaboration. A Year 10 student work sample for Geographies of human wellbeing is provided.

1. Examine the photograph and any available contextual information for the photograph. This is often outlined in a caption.
2. Answer the layers of inference questions starting with the inner questions and proceeding to the outer layers in turn. If possible, students work collaboratively to discuss and write their ideas and questions in the framework.
3. Discuss responses to questions in turn and have students share their ideas and questions.

Source: Text extracted from Literacy Teaching Toolkit: Reading and interpreting visual resources in Geography on May 15th, 2022. <https://www.education.vic.gov.au/school/teachers/teachingresources/discipline/>

[english/literacy/Pages/reading-and-interpreting-visual-resources-in-geography.aspx](https://www.education.vic.gov.au/school/teachers/teachingresources/discipline/english/literacy/Pages/reading-and-interpreting-visual-resources-in-geography.aspx)

Photograph

What does the photograph definitely tell me?

What can I infer from the photograph? What guesses can I make?

What does the photograph not tell me?

What else would I like to find out? What other questions do I need to ask?

Layers of inference framework template

Food riots across Africa between 2007-2008



Source: <https://www.relocationafrica.com/south-africa-could-face-food-riots-as-drought-pushes-prices-higher/>

What does the photograph definitely tell me?
People are protesting against 'high food prices' and 'tariff increase'.

What can I infer from the photograph? What guesses can I make?
They are unhappy about the high costs of living. Food prices may have increased due to droughts (inferred from source link).

What does the photograph not tell me?
*Why was there drought?
 Were there other reasons for the high food prices?*

What else would I like to find out? What other questions do I need to ask?
*Why were there food riots across Africa?
 What about the food security situation now?*

ACTIVITY 1: Photo Interpretation

A coastal fishing village in Mumbai, India 2016



Photo: L Chaffer

What does the photograph definitely tell me?

What can I infer from the photograph? What guesses can I make?

What does the photograph not tell me?

What else would I like to find out? What other questions do I need to ask?

ACTIVITY 2: Photo interpretation

Impact of flooding – Tuggerah Lakes, Central Coast 2021



Source: Central Coast Aero Club - Andy Smith Photography

What does the photograph definitely tell me?

What can I infer from the photograph? What guesses can I make?

What does the photograph not tell me?

What else would I like to find out? What other questions do I need to ask?

Fieldwork Investigations: Sensory mapping

Sydney Water

Fieldwork involves observing, measuring, collecting and recording information in the real world. Learn how to use sensory mapping to map experiences of an area.

When planning fieldwork, it's important to select fieldwork investigation methods or research tools that will help you gather data to meet your aim. You don't need fancy equipment to do quality fieldwork. You can use your skills of *observation*.

Sensory mapping is an example of an observational method you can use to investigate the importance of water in our *perceptions of liveability*.

Sensory mapping uses various senses to map the sounds and feeling in the area. Sensory Mapping is about drawing your own map on a particular day and time to describe the site in words and symbols.

Mapping our experiences of an area this way allows us to show how people are affected by the environment and present it as an *alternative form of communication*. The information gathered using senses other than our sight can inform an understanding of our environment that can often be overlooked. These sensory experiences add our overall perception of the place we enjoy.



Water plays a significant role in engaging our senses. So doing sensory mapping near a waterway will help us understand the **value of water** in our urban environment.

You can support thoughts and feelings recorded in sensory mapping by using fieldwork equipment to take atmospheric readings such as wind speed, humidity, sound, or light.

Some questions to think about while doing your sensory map:

- What role does water play in the way you're feeling?
- How important are your other senses when thinking about what you like about a place?
- Are there other ways you could record or quantify what you're thinking and feeling?



Parks and open spaces near waterways improve our wellbeing. Photos: Sydney Water

WATER AND LIVEABILITY: SENSORY MAPPING

What you'll need to do sensory maps?

- Piece of paper
- Clipboard, pen or pencil
- Mood chart, decibel scale, Beaufort scale
- Camera (optional)
- Equipment to record the environment such as –
Lux meter, anemometer, decibel meter

Sensory mapping can be done in a park or open area near or connected to a waterway.



How to make a sensory map?

Find a suitable place to do your sensory mapping near a waterway. Make sure you will be safe and not in the way of any other activity.

Part 1 – Explore your feelings

1. Sit down and close your eyes. Have your paper and pencil ready. Start in the middle.
2. Focus in on your senses of touch, sound, and smell.
 - Listen... what noises do you hear and what directions did they come from?
 - Feel ... is the sun on your face? Is the wind in your hair? What other things can you feel?
 - While you are sitting here how are you feeling? Are you happy? Relaxed? Annoyed? Bored?
3. Open your eyes and look immediately at your paper.
4. Use drawings or symbols and words to represent all the details your senses pick up.

Remember – every person's sensory map is as unique as they are.

Part 2 – adding some data

1. Use some geography skills to make some more detailed observations to complete your sensory map.
2. Use instruments or charts to assign values to our measurements.
3. What can you measure?

Light – on you and water reflections

- * With a lux measurement chart
- * With a lux meter instrument

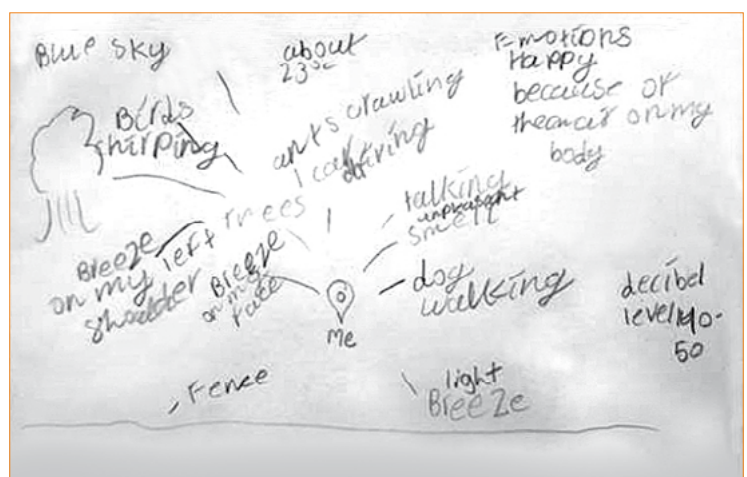
Wind – on you and the water/trees

- * With a beaufort chart
- * With an anemometer instrument

Sound – near you and focus on nature (water)

- * With a decibel chart
- * With a sound level meter instrument

4. What else can you record?
 - People's behaviour/use of space
 - Participatory observations of the area including the waterway
 - Field sketches
 - Annotated images taken with a camera



WATER AND LIVEABILITY: SENSORY MAPPING

Results

- What role does water play in the way you're feeling?
- How do our geographic observations and scientific measurement change the sensory experience?
- How does both making geographic observations and scientific measurements influence our values about the environment and perceptions of liveability?

Background information

Liveability is all those things that make a city enjoyable to live in.

Why do our senses and feelings matter?

How we value water connects us with our environment and each other. Water plays a vital role in creating a liveable city. Being near water, on the water or in the water can make many people feel relaxed, calm, and connected to the natural environment. How do you feel when you are near water?

How do we help improve liveability?

Clean water ways can make us feel better about where we live. Managing water and protecting the environment is very important to us. Sydney Water play a huge role in contributing to healthy waterways.

In Sydney we have access to clean, safe drinking water and the removal of wastewater (sanitation). That means our health and wellbeing are being cared for in the places we live.



Water and recreational space



Natural creeks and rivers add to our enjoyment of a liveable city

To further investigate the importance of water to liveability visit Sydney Water's [liveable cities](#) page.



A **Self-guided Fieldwork** Program from Sydney Water that follows could be used in Stage 4 (Liveability and Water in the world) or Stage 5 (Changing places).

Download the relevant support materials from the Sydney Water website.

Stage 4 – Water in the World Teacher lesson plan – Alexandra Canal at Tempe Reserve self-guide excursion		Sydney WATER	
The value of water - investigate the economic, cultural, spiritual and aesthetic values of water for people, including Aboriginal and Torres Strait Islander Peoples and/or peoples of the Asia region, for example: - description of the ways water is used by people eg agricultural, commercial, industrial and recreational uses - discussion of variations in people's perceptions about the value of water eg economic versus aesthetic		Class group: Time: Suggestion 3-4 x 60min class lessons - fieldwork 2-3 hours	
Outcomes - explains how interactions and connections between people, places and environments result in change GE4-3 - discusses management of places and environments for their sustainability GE4-5 - acquires and processes geographical information by selecting and using geographical tools for inquiry GE4-7 - communicates geographical information using a variety of strategies GE4-8		Geographical concepts - Place: the significance of places and what they are like - Environment: the significance of the environment in human life, and the important interrelationships between humans and the environment - Interconnection: no object of geographical study can be viewed in isolation - Sustainability: the capacity of the environment to continue to support our lives and the lives of other living creatures into the future - Change: explaining geographical phenomena by investigating how they have developed over time	
Geographical enquiry skills Acquiring geographical information - collect, select and record relevant geographical data and information, using ethical protocols, from appropriate primary data and secondary information sources Processing geographical information - evaluate information sources for their reliability and usefulness - represent data in a range of appropriate forms, with and without the use of digital and spatial technologies - apply geographical concepts to draw conclusions based on the analysis of the data and information collected Communicating geographical information - present findings, arguments and ideas in a range of communication forms selected to suit a particular audience and purpose; using geographical terminology and digital technologies as appropriate - reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic and social considerations, and predict the expected outcomes of their proposal		Geographical tools Maps – M - maps to identify direction, scale and distance Fieldwork – F - observing, measuring, collecting and recording data, developing and conducting surveys and interviews Spatial technologies – ST - satellite images, global positioning systems (GPS), geographic information systems (GIS) Visual representations – VR - photos, aerial photos, illustrations, annotated diagrams, multimedia, field sketches, web tools	

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Teaching and learning	Resources
Lesson 1 - Introduction Q. What do we think about when I say “Sydney’s waterways”? are they natural or have they been changed by humans? Are they just the harbour and beaches? A . It’s also the rivers, creeks, wetlands and even stormwater drains. Do - Let’s find some – open google maps over Sydney, and look for the blue! 1. Find the Parramatta River - Look for its tributaries - Duck Creek, Haslams Creek, Powells Creek, Whites Creek, Johnsons Creek 2. Find the airport - Find Cooks River to the west of the Airport - From the Cooks River find Tempe Reserve and Alexandra Canal Q. Why do some of these creeks have straight sections? Look at google earth and zoom in. What do you see? (walls, wharves, bridges, roads, paths) A. Over time, as Sydney has grown, our uses for waterways has changed. Natural creeks were turned into canals for transport of goods and people. Some creeks were redirected around the places we wanted to build houses and industry. Some creeks have become hidden underground. All of them have become stormwater drains. A stormwater drain collects the water that falls on roads and pathways. Do – take a look at the catchment (all the water runs to a common point) on our stormwater catchment map to see where water flows from, into Alexandra Canal. Advanced – estimate the area of this catchment Q. So who is responsible for looking after these waterways? A. Sydney Water and a range of other agencies are responsible for managing the urban water cycle in Sydney, the Blue Mountains and the Illawarra.	Online links Education summary of stormwater http://www.sydneywater.com.au/SW/education/Watermanagement/Stormwater/index.htm Stormwater networks http://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/stormwater-network/index.htm current stormwater project summary http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/current-projects/managing-stormwater/index.htm Stormwater catchment map http://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/stormwater-catchment-map/index.htm Area measurement instructions for google maps https://support.google.com/mymaps/answer/3502610?co=GENIE.Platform%3DDesktop&hl=en Urban water management http://www.sydneywater.com.au/SW/education/Watermanagement/Urbanwatermanagement/index.htm

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Lesson 2 – Secondary research Sydney Water manages a variety of projects that aim to improve the liveability of our city. Urban waterways play an important role in the cityscape. They can be modes of transport, help to reduce the impact of flooding, increase the value of property, be a source of recreation and simply make a park or open space a nice place to spend time. Alexandra Canal is an example of a waterway that is managed by Sydney Water. Using the PowerPoint presentation “Sydney Water and Alexandra Canal”, you may like to have the students either: • Make a timeline of human interactions with Alexandra Canal waterway. • Work in groups to investigate the information provided and report back to the class. The presentation includes information about the value the waterway has had over time. There are sample student questions, web links and additional information in notes section of the PPT presentation.	Education resources PowerPoint presentations • Sydney Water and Alexandra Canal Worksheets • Class worksheet - Alexandra Canal timeline Online links – many more links are available in PPT notes Alexandra Canal heritage information http://www.sydneypwater.com.au/SW/water-the-environment/what-we-re-doing/Heritage-search/heritage-detail/index.htm?heritageid=4571712
Lesson 3 – Fieldwork This is a program you can deliver yourself at a public site linked to a Sydney Water project. Please see the Alexandra canal Tempe Reserve Field Worksheet teachers answers document for instructions. Students will investigate the aesthetic, recreational and any other observable value of Alexandra Canal near Tempe Reserve. There are a number of field techniques used. - Aerial photograph annotation - plot where to investigate and hypothesise investigation outcomes. - Site evaluation for the landscape and waterway – looking at uses of the space by people, and animals, vegetation, litter, environmental quality (observation) and identify human modifications - Field sketch – identifying a water based view with potential appealing aesthetic value (Note – most of the text books currently published offer in text or online field sketch instructions). - Annotated photographs – identifying evidence of the different values placed on this waterway over time. - Sensory mapping – using various senses to map the sounds and feeling in the area (use an online guide before going into the field. It is a good practice to go into the playground to try this first).	Education resources Worksheets • Alexandra Canal Tempe Reserve Field Worksheet students • Alexandra Canal Tempe Reserve Field Worksheet teachers answers Online links Plant and animal ID https://www.ala.org.au/fag/species-identification/ Sensory mapping http://sensorymaps.com/ https://makingmaps.net/tag/sensory-mapping/ Field Sketch https://www.geogspace.edu.au/verve/resources/2.1.2.3_1_field_sketching.pdf

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Lesson 4 – Reporting Discussion points • Values of waterways change according to its uses. How has the value of Alexandra Canal changed over time? • Brainstorm answers from the class. Have the students put the changing values in order of the impact on Alexandra Canal. • Class discussion and sharing - Why do those values change? What do you think is the value of this waterway today? • Evaluation – how have our changing values for this waterway shown a changing attitude to sustainability? Final product options • Create a field report • Create an investigative news report • Develop a mapping app to take people on a guided walk of the waterway • Create an illustrated timeline of the waterways changes over time	Education resources Note - Available on Sydney Water website by Term 2 2018. For now, refer to your syllabus support documents or textbook online support.
Extension Lesson 5 – Future planning Use your field report findings to design the next stage in the rehabilitation and naturalisation of Alexandra Canal - What's your plan? How should this waterway look to you? Use the "Future plans for Alexandra Canal" worksheet and use photographs of the site to help you create a design for the future. - How might we use this waterway in the future? How could we manage it better? - What animals would you like to see here? - Could we use it in a totally different way than anything before? - How can we recognise the past here too? Present your design – depending on your resources, this may be a drawn example, or you could generate in GIS to show layering of changes over time..... Be creative... Use any format! Share your design with Sydney Water and have a real stormwater expert evaluate your design	Education resources Worksheets • Class worksheet - Future plans for Alexandra Canal Engage with us Email education@sydneywater.com.au Facebook Sydney Water Twitter @sydneywaternews Instagram @sydneywater Hashtag #sydneywatereducation

Visualise the Water Cycle: Make a model

Louise Roberts, Sydney Catholic Education Office

Try this experiment to make a simple, miniature model of the natural water cycle.

The natural water cycle

The natural water cycle is the continuous movement of water around the world through the processes of evaporation, transpiration, condensation, precipitation, run-off, infiltration and percolation.

Try one of these models to see if you can replicate what happens in nature.

Model 1 – a water cycle terrarium

What you'll need:

- Large soft drink bottle or glass jar with lid
- Seeds or small plant
- Potting mix
- Layer of pebbles, gravel and sand
- Gloves
- Water



Image source: UnSplash

ACTIVITY:

1. Cut a two-litre soft drink bottle in half about eight centimetres from the base.
2. Add a layer of pebbles, gravel and sand then the potting mix to your jar.
3. Plant seeds or a small plant in potting mix in the bottom half of the bottle.
4. Water the plant (or seeds) enough to moisten the soil but not so much as to flood the container. Place the lid on the jar or squeeze the top half of the bottle inside the bottom to make a dome. You can also just tape the two pieces back together with clear packaging tape.
5. Put the terrarium beside a window - not too sunny or you'll bake the plants.
6. What do you think will happen in our mini Earth? Will water disappear? Will it rain? Does the plant play a role in the terrarium? What's your prediction?
7. You should notice, as time goes by, that the inside of the dome gets misty and the plants will continue to grow without additional water.
8. Did you see the changes as the terrarium warmed and cooled? Why or why not?
9. If you didn't see condensation or precipitation or your plants look wilted or dry add more water to your terrarium. If there's too much water open the lid and let some of the water vapour out.
10. As a control, you could create two terrariums and leave the lid off one. Think about what the difference will be. What would happen if your terrarium didn't have sunlight? Make a prediction about what will happen.
11. Observe the results and discuss what is happening to the water in the terrarium.

WATER IN THE WORLD: THE WATER CYCLE

Model 2- Water cycle in a bag

What you'll need:

- 2 clear plastic bags – a zipper (sandwich size) style works best
- Tablespoon
- Rubber band or twist-tie
- Blue food colouring (optional)
- Masking tape



ACTIVITY:

1. Draw the water cycle on two zip lock bags.
2. Pour six tablespoons of water into each clear plastic bag. Add a few drops of food colouring.
3. Blow air inside the bag with your mouth and quickly seal the bag closed with a rubber band twist-tie or zipper-closure.
4. Place one bag on a sunny window ledge or tape directly to the window pane and another one in the shade.
5. Observe and compare the two bags over several days and record the changes.
6. Did they react the same? What was different and why?

Variation

For instant results, make two bags. Put cold water in the first bag and warm water in the second bag. Compare the two bags.



Image source: Clem Onojeghuo, Unsplash

What's happening?

You should be able to watch water change state as it heats up in your model.

When the sun shines on the water and heats it, it will turn into a gas called water vapour which rises. This is called **evaporation**.

When the sun stops shining on the water and it cools, the water vapour turns back into tiny liquid water droplets. This is called **condensation**.

When the water droplets are heavy enough, they will run down your bottle or bag, like rain. This is called **precipitation**.

In your terrarium, the water will soak down into the soil. This is called **infiltration**.

When the sun comes up the next day, the whole cycle starts all over again!

Weather and Climate Skills

Activities created by Lorraine Chaffer, Vice President GTANSW & ACT

A student worksheet for this activity is in Appendix 1 on the GTA NSW & ACT website with this edition

SYNOPTIC CHARTS

1. **Synoptic Charts** show weather conditions and *climatic graphs* show features of climate.

Explain the difference between weather and climate.

2. **Refer to Source A**

a. What evidence suggests that this is a summer weather map?

b. State the air pressure at:

- 30 South, 160 degrees East
- Melbourne

c. State the wind direction and wind speed at:

- Perth
- Adelaide

d. Identify the feature at 15 degrees South, 150 degrees east

e. Explain why it has rained in the past 24 hours:

- along the east coast of Australia
- in the southwest corner of Western Australia

Refer to types of rainfall, wind direction and air masses in your answer

f. Describe how the weather condition at Perth would have changed over the previous day with the passing of the cold front. Refer to air pressure, wind direction, wind, temperature, and precipitation in your answer

Challenge question

There is a low-pressure cell south of the cold front, that cannot be seen on the map.

Explain why this cell would be a low pressure cell and not a high pressure cell.

3. **Refer to Source B**

a. State the air pressure at:

- Perth
- Alice Springs

b. Where is the highest air pressure on the map?

c. Where is the lowest air pressure on the map?

d. State the wind direction and wind speed at:

- Port Headland
- Alice Springs

WATER IN THE WORLD: WEATHER AND CLIMATE

e. Describe what the weather would be like at:

- Perth
- Townsville.

Give reasons for your answers.

f. Describe the spatial pattern of rainfall in the past 24 hours.

- Explain why it has rained in this location.
- Predict the weather in the next 24 hours.

CLIMATE GRAPHS

4. Refer to Source C

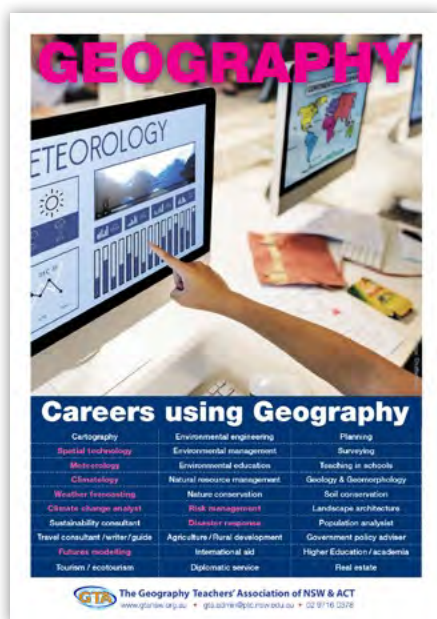
- Identify the hottest and coldest months of the year
- Calculate the average daily temperature for the month of May
- Describe the annual rainfall distribution.
- Calculate the Annual Precipitation
- Give a reason why station X would be located in coastal Queensland and not in Tasmania or Japan.

5. Refer to Source D

Graph the climate statistics for STATION Y using the template provided

6. Refer to Source E

Describe the climate at STATION Y using terminology in the Describing Climate guidelines.

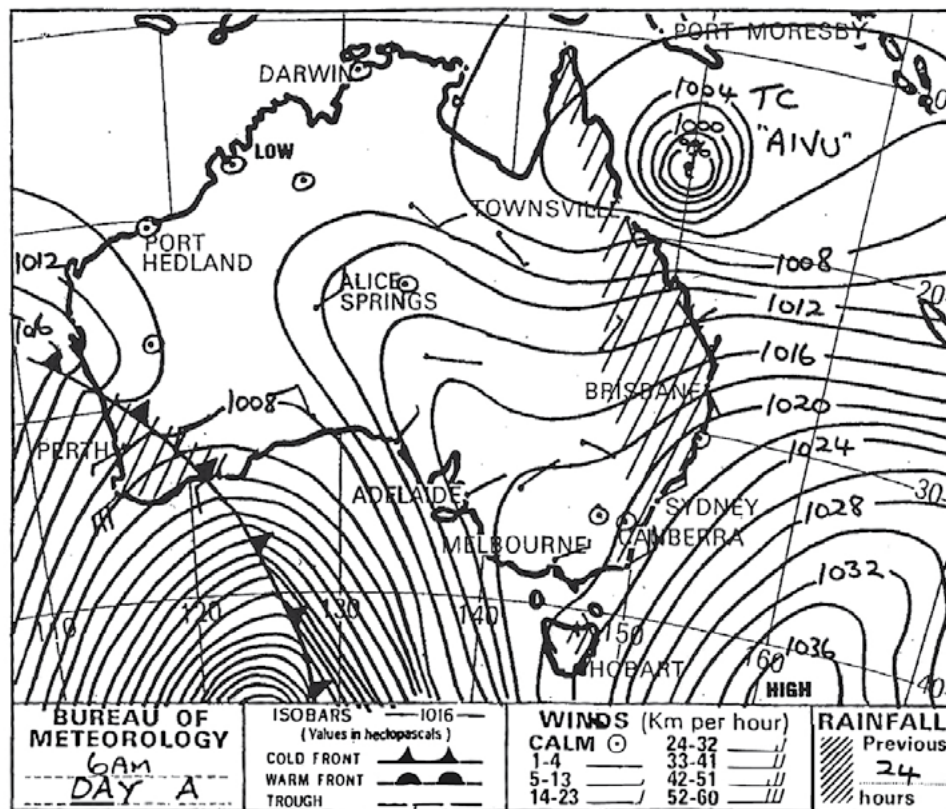


There are many careers that use skills related to weather and climate. When doing these activities refer students to posters such as the GTA NSW & ACT Geography Careers posters

WATER IN THE WORLD: WEATHER AND CLIMATE

SYNOPTIC CHARTS

SOURCE A



Source unknown

SOURCE B

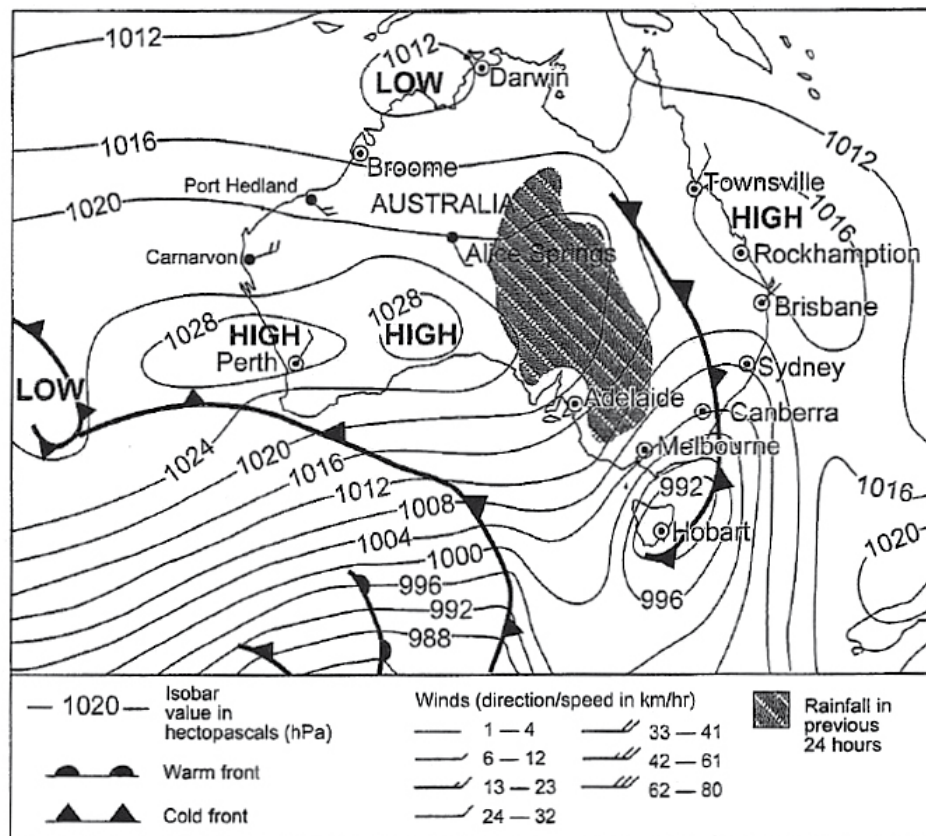
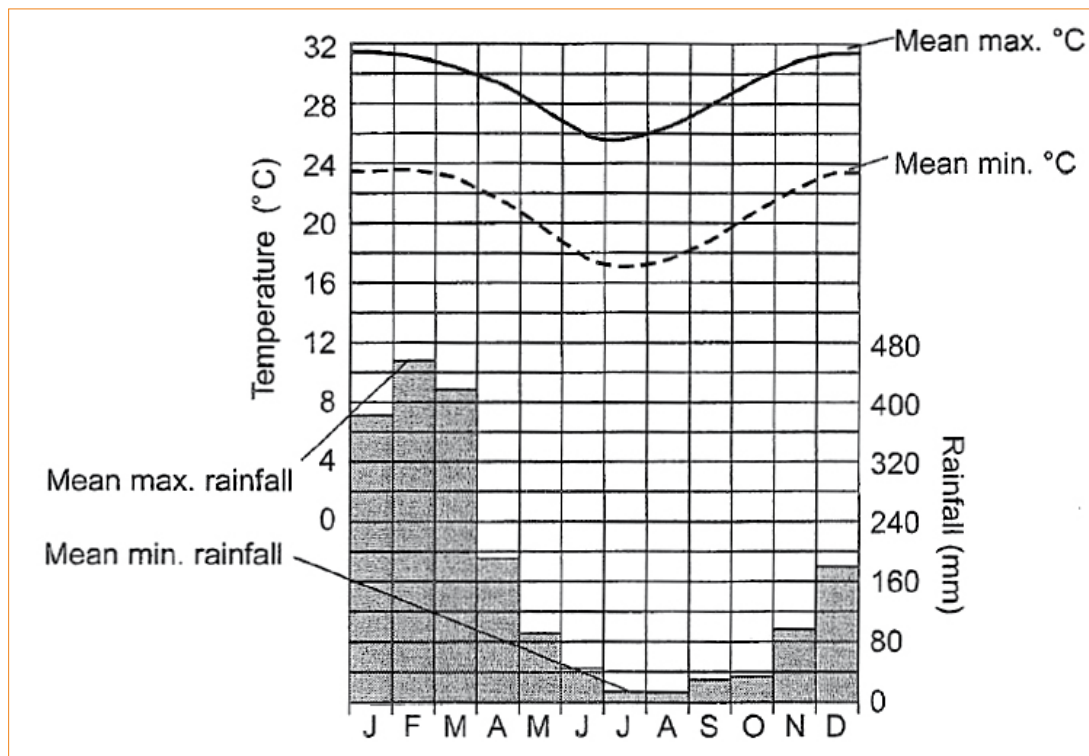


Image source: POWERPOINT GEOGRAPHY, Blake Education 2007

WATER IN THE WORLD: WEATHER AND CLIMATE

CLIMATE GRAPHS

SOURCE C: STATION X



mage source: Source: POWERPOINT GEOGRAPHY, Blake Education 2007

SOURCE D: STATION Y – 33.28° S, 151.57° E. Altitude 3 metres

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Temp Max C	25.4	25.8	24.6	22.9	19.9	18.1	17.2	18.8	20.9	22.4	23.3	24.8
Temp Min C	19.4	19.9	18.7	15.8	13.2	10.8	9.8	10.6	12.8	14.7	16.5	18.4
Rainfall mm	73.1	94.8	109.6	122.8	163.5	130.8	99.0	74.5	70.8	56.6	83.4	59.2

Source: Australian Bureau of Meteorology

WATER IN THE WORLD: WEATHER AND CLIMATE

SOURCE E: Describing climate

Terminology needed to describe the climate of places.

Average monthly temperatures	
Temperature range	Description
above 30°C	very hot
20°C–30°C	hot
10°C–20°C	warm
0°C–10°C	cool
–10°C–0°C	cold
below –10°C	very cold

Describing average monthly temperatures

Annual temperature range	
Temperature range	Description
below 5°C	small
5°C–15°C	moderate
15°C–30°C	large
above 30°C	very large

Describing annual temperature range

Annual precipitation		
Cold to warm climates	Description	Hot to very hot climates
below 250 mm	slight	below 375 mm
250 mm–500 mm	small	375 mm–625 mm
500 mm–1000 mm	adequate	625 mm–1125 mm
1000 mm–1500 mm	large	1125 mm–1750 mm
above 1500 mm	very large	above 1750 mm

Describing annual precipitation (rainfall)

Monthly average rainfall	
Amount	Description
below 50 mm	dry month
50mm to 150 mm	wet month
above 150 mm	very wet month

Describing monthly averages

Rainfall distribution	
Summer rainfall maximum: over 60 per cent in the summer half of the year	
Winter rainfall maximum: over 60 per cent in the winter half of the year	
Evenly distributed rainfall: no summer or winter maximum	

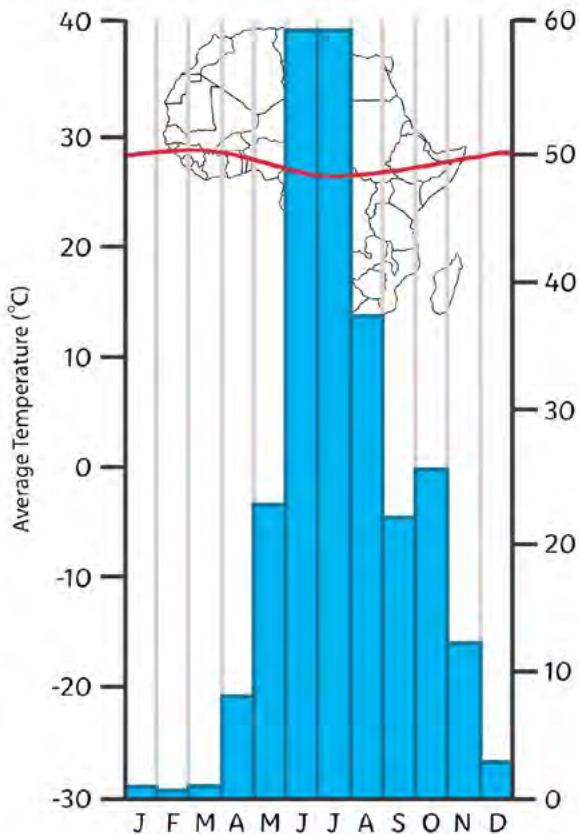
Describing rainfall distribution

Comparing Climate Graphs

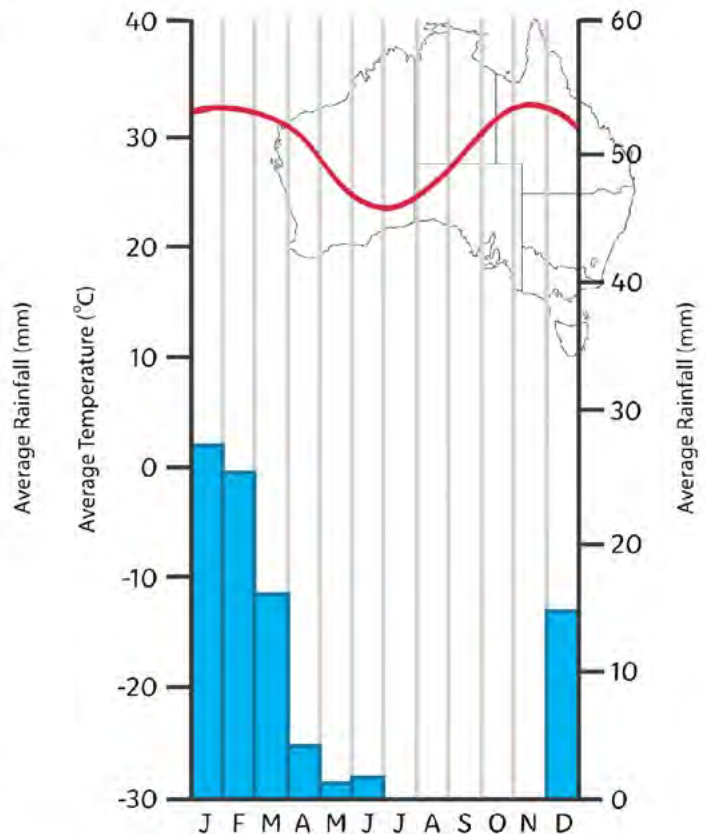
Study the two climate graphs below. They show very different climates!

Can you work out which statement describes each climate graph?

Colour code your answers and complete the key.



A. Monrovia, Liberia



B. Normanton, Australia

The peak rainfall is 28mm in January.

The annual range of temperature is very low – approximately 3°C.

The peak rainfall is 60mm in June and July.

The annual range of temperature is approximately 10°C

The total annual rainfall is 300mm.

Temperature is fairly constant all year.

There is a dry season from December to April.

There is a dry season from July to November.

The total annual rainfall is 94mm.

The lowest temperature is 24°C in June.

Key:



Climate Graph A



Climate Graph B

LANDSCAPES AND LANDFORMS

The Grand Canyon: Explaining features and processes / predicting futures

Lorraine Chaffer, Vice President GTA NSW and ACT

Students develop geographic inquiry skills to investigate places. These skills include interpreting and analysing maps, photographs and visual representations and applying these skills and their content knowledge and understanding in new contexts.

These activities are presented as student worksheets in the Appendix that accompanies this edition on the GTA NSW & ACT website.

Introduction

View this short video clip to start students thinking about the Grand Canyon in the context of the formation of landscapes and landforms in general.

Show the short video clip without comment

How was the Grand Canyon formed? <https://www.youtube.com/watch?v=t6lBg4Srb6E>

ACTIVITY 1: ANNOTATED DIAGRAM

Annotate the diagram with examples of landscapes and / or landforms caused by each of the geomorphic processes shown. Name places in your answer.



Source: Shutterstock

LANDSCAPES AND LANDFORMS: THE GRAND CANYON

ACTIVITY 2: PHOTO AND MAP INTERPRETATION. THE GRAND CANYON

- a. What is it?** Describe the landscape you see in these photographs of the Grand Canyon. Using geographical language and refer to any distinctive landforms you can observe.



Source: Shutterstock



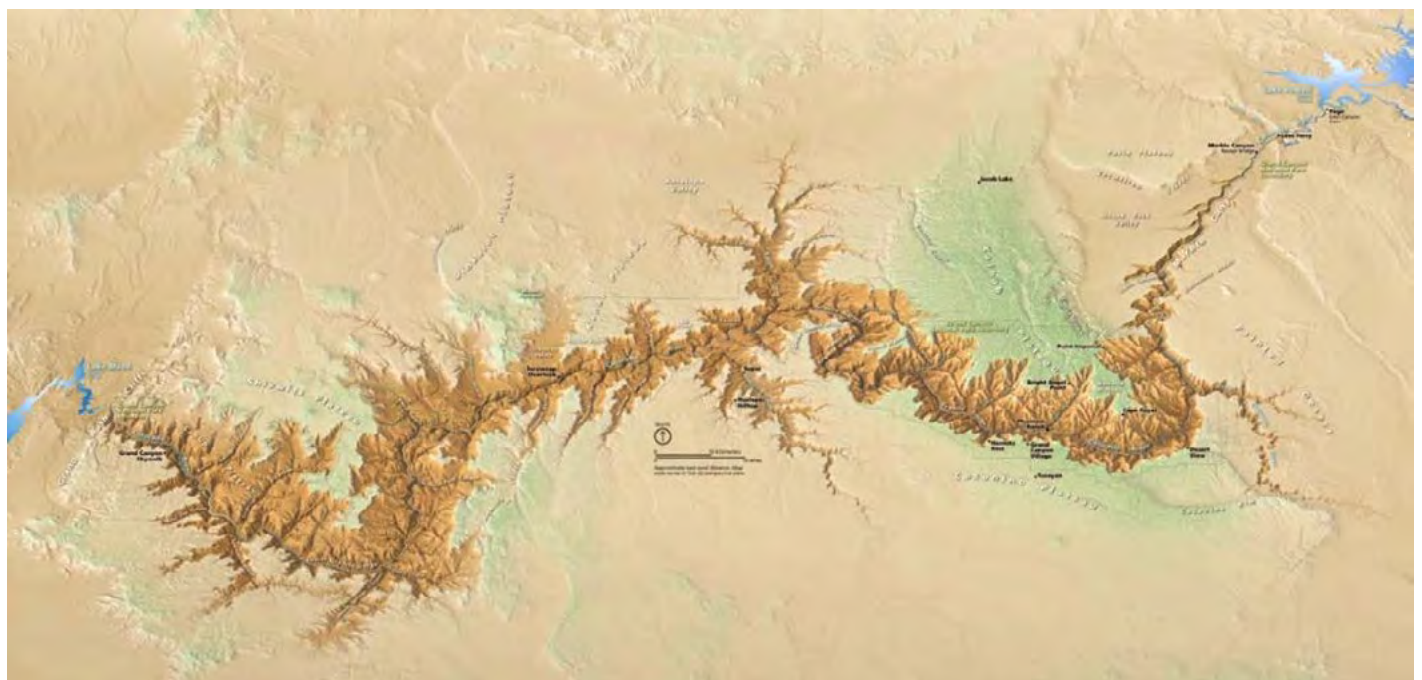
Source: Dreamstime



Source: Shutterstock



Source: Knowable magazine NPS PHOTO by Mark Lellouch
<https://knowablemagazine.org/article/physical-world/2019/deeper-understanding-grand-canyon>



Source: <https://www.usgs.gov/media/images/grand-canyon-national-park-map-0>

LANDSCAPES AND LANDFORMS: THE GRAND CANYON

b. Where is it?

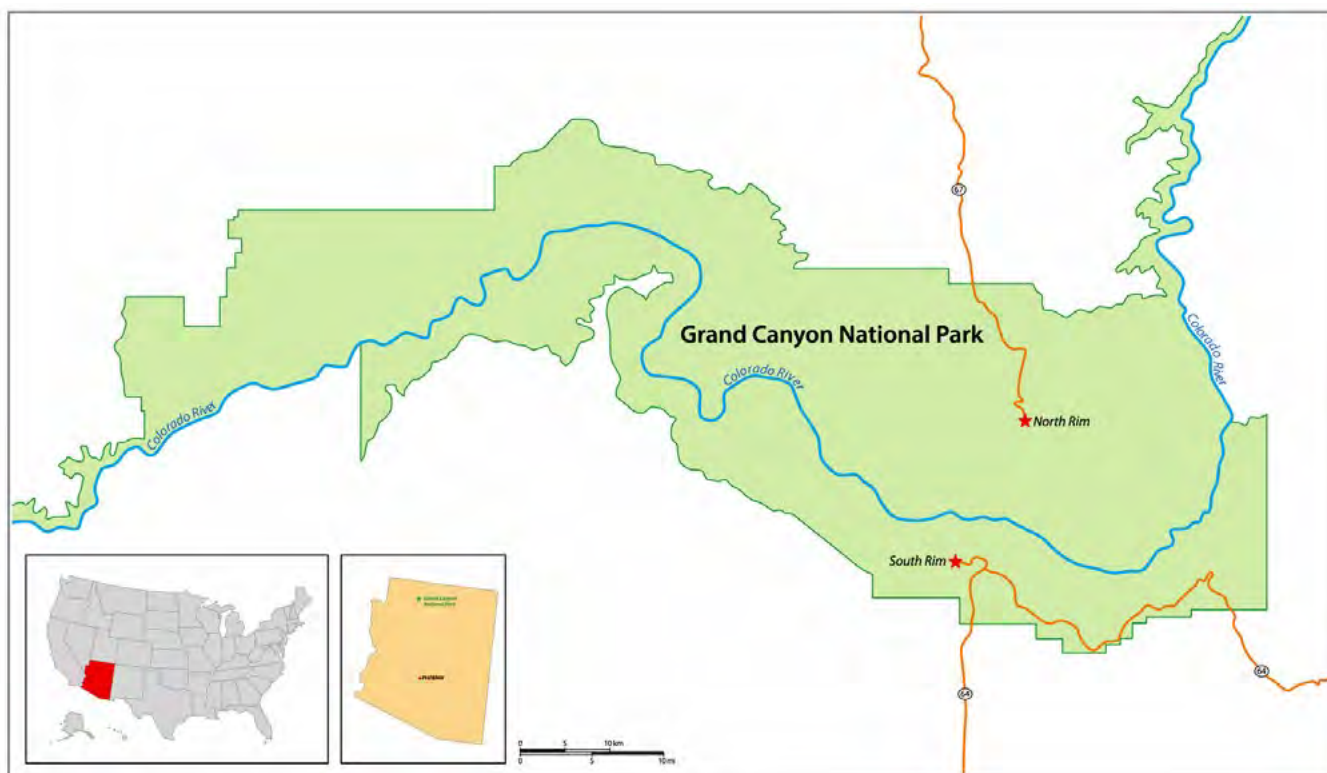
Describe the location of the Grand Canyon using the following map collection. Refer to places, distances, and directions in your answer.

c. Why is it there?

Develop your own explanation of how this landscape was formed. Use geographical terms in a written answer.



Source: <https://www.britannica.com/place/Grand-Canyon>



Source: Shutterstock



Source: Extract from map at <https://grandcanyoncvb.org/area-map/>

LANDSCAPES AND LANDFORMS: THE GRAND CANYON

ACTIVITY 3: EXPLAINING CHANGE OVER TIME

- a. Match the diagrams** with the text boxes that explain the formation of the Grand Canyon over time. (Diagrams from Knowable magazine)
- b. Predict what the landscape will look like** in another 50 million years under two scenarios:
- The future climate is wetter than today with 1000 mm additional rainfall a year.
 - The continent experiences a new tectonic uplift of 1000 metres. Explain your predictions.

1

1.72 billion years ago

Vishnu Mountains



2

1.25 billion years ago

Erosion surface



3

500 million years ago

Cambrian Sea

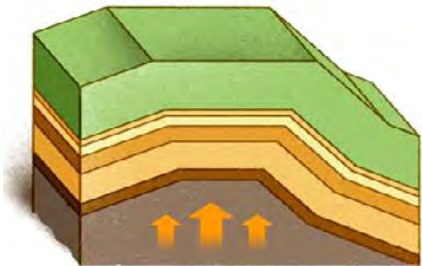
sea level

Grand Canyon Supergroup



4

60 million years ago



5

Today

The Colorado River carved down through the plateau, exposing ancient layers of rock.



EXPLANATION	
1	The Colorado River carved down through the plateau exposing the ancient layers of rock seen today.
2	Erosion levelled the mountains and created a flat plain on which new layers were deposited.
3	Basement rocks form deep below a mountain range.
4	Layers of rock are tilted by tectonic forces; the area was covered by water and more layers deposited.
5	Colliding tectonic plates pushed upwards creating the Colorado Plateau at a high elevation.

Learn more

- A Brief History of Colorado Through Time (Geology of Colorado)
<https://www.youtube.com/watch?v=i5QeyztIIT8>
- Knowable magazine (Source of diagrams)
<https://knowablemagazine.org/article/physical-world/2019/deeper-understanding-grand-canyon>

LANDSCAPES AND LANDFORMS: THE GRAND CANYON

ACTIVITY 4: THE PHYSICAL ENVIRONMENT

a. Refer to the climate statistics for Page below.

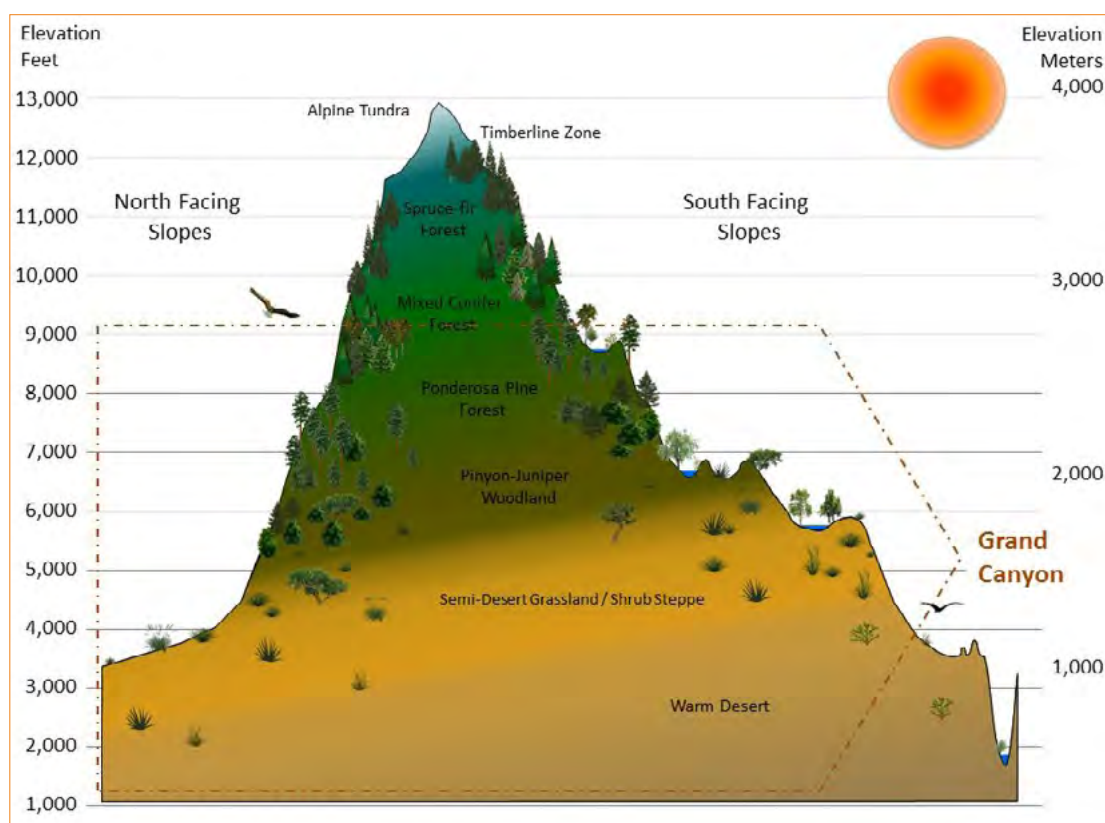
- Calculate the annual precipitation and number of rainy days.
- Describe the variation in temperatures between January and July.
- What would be the best time of year for a hiker to visit the Grand Canyon? Explain.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temp °C	2.2 °C	4.7 °C	9.8 °C	14.3 °C	19.9 °C	26.6 °C	29.1 °C	27.2 °C	23 °C	15.6 °C	8.2 °C	2.3 °C (36.2) °F
Precipitation (mm)	23 (0.9)	22 (0.9)	17 (0.7)	13 (0.5)	10 (0.4)	3 (0.1)	7 (0.3)	11 (0.4)	15 (0.6)	20 (0.8)	13 (0.5)	19 (0.7)
Rainy days (d)	4	4	3	3	2	1	2	2	2	2	2	3
Avg. Sun hours (hours)	7.2	8.6	10.3	11.6	12.6	13.2	12.9	12.1	11.0	9.5	8.1	6.9

Source: <https://en.climate-data.org/north-america/united-states-of-america/arizona/page-16315/#climate-graph>

b. Refer to the vegetation profile:

- Describe the change in vegetation from the bottom to the top of the south facing slopes of the Grand Canyon (0 to 4,000 metres altitude)
- Suggest why the higher areas are more vegetated.



Source: Natural resources of the Grand Canyon <https://www.nps.gov/im/scpn/grca.htm>

c. Synthesis

- How does the climate of the Grand Canyon affects the landscape of the Grand Canyon that you have observed in photographs and maps?
- Where do you think the water in the Colorado River comes from?

Learn more

- Inside Grand Canyon National Park – <https://www.youtube.com/watch?v=IVqdES5-Y4I>

LANDSCAPES AND LANDFORMS: THE GRAND CANYON

ACTIVITY 5: TOPOGRAPHIC MAPPING

Visit the following website https://commons.wikimedia.org/wiki/File:NPS_grand-canyon-south-rim-east-topo-map.pdf to use or download a topographic map of the Grand Canyon.

- a. Locate** the following places – Grand Canyon Village
- Colorado River
 - Clear Creek
 - Bright Angel Canyon
 - Granite Gorge
 - Lyell Butte and Pattie Butte

- b. Study** the patterns of contour lines on the map.

What does the pattern of contour lines tell you about the following?

- the landscape northeast of Grand Canyon Village compared to south of the village.
- the width, depth and shape of Granite Gorge and Bright Angel Canyon?
- the size and shape of buttes.

- c. You take a helicopter flight** from the Visitor Centre in the Grand Canyon Village to Phantom Ranch in Bright Angel Canyon.

- i. Calculate the straight-line distance you travelled (km)
- ii. State the direction you travelled
- iii. Describe the landscape you observed along the way. Your description should refer to landforms and vegetation.

The following video may assist you to visualise and describe your flight:

- Grand Canyon – US National Parks 3D Maps https://www.youtube.com/watch?v=eTzj7yyha_M

- d. State three pieces of evidence** that this area caters for tourists.



Source: Dreamstime

Grand Canyon Southeast Rim. Source: <http://npmaps.com/wp-content/uploads/grand-canyon-south-rim-east-topo-map.jpg>

Topographic Mapping Skills

Activities created by Lorraine Chaffer, Vice President GTANSW & ACT

These activities are presented as student worksheets in the Appendix that accompanies this edition on the GTA NSW & ACT website.

Refer to Figure 1 to answer the following questions:

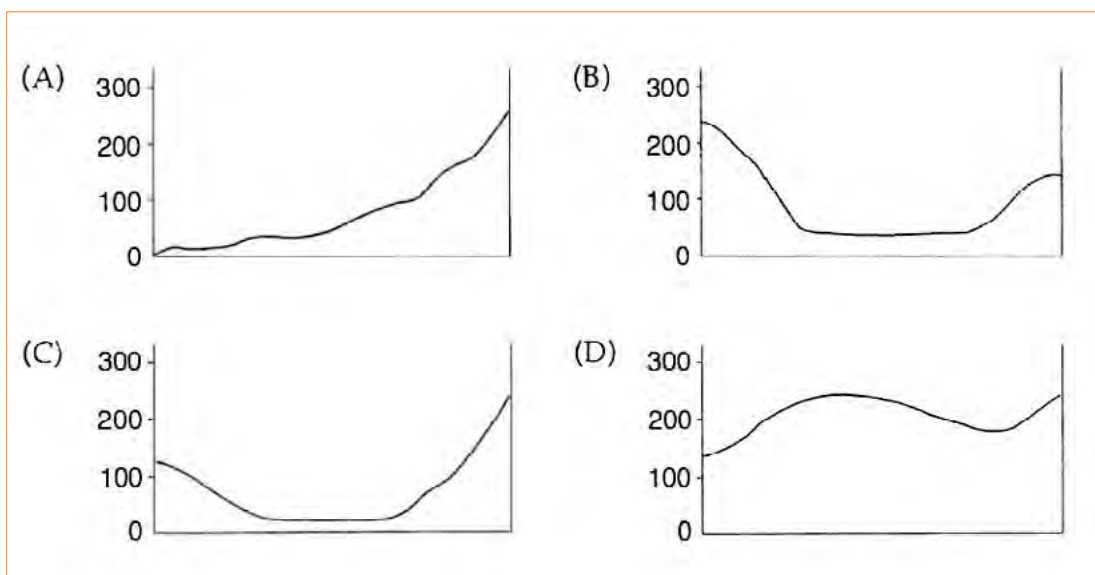
- Use the pattern of contour lines to identify two landforms on the map.
- Give an Area Reference for the shipwreck.
- State the direction of Point A from Point C.
- Determine the bearing of the shipwreck from Point C.
- Calculate the straight-line distance between Point B and Point C.
- Calculate the gradient of the slope between Point A and Point B.
- State the aspect of the slope along A to B.
- Draw a cross section between points Point A and Point B.
- Describe your journey as you walk from A to B to C.

Challenge questions

- Calculate the Vertical Exaggeration of your cross section
- Represent the scale of the map as a ratio.

Refer to Figure 2 Rivertown:

- State the direction of the train station from the bridge.
- Calculate the distance from the northernmost trig station to the bridge.
- Calculate the area of land covered by pine forest.
- Give a grid reference for a location on the map to plant a tree. The tree requires a slope with a NW aspect and a well-drained soil.
- Identify the cross section that best represents the topography travelling south-east from the trig station in AR 2240 to the trig station in AR 2436



LANDSCAPES AND LANDFORMS: MAPPING SKILLS

Refer to Figure 3 Lloyds Inlet

- Give a Grid Reference for:
 - the bridge
 - the steepest slope on the map
- What is the straight-line distance between
 - Point A and Point B
 - Point C and Point D
- State the direction from the bridge to Point A
- Compare the direction water flows in Clear Creek and Pine Creek.
- Calculate the gradient between Point C to Point D
- Calculate the approximate area of the lagoon.
- Label the cross section with features located at each arrow.
- Explain why the following locations are unsuited to crop growing – GR 020567 and GR 021562

Refer to Figure 4

Draw connections between the pattern of contour lines with the landform they represent.

Figure 1: Map

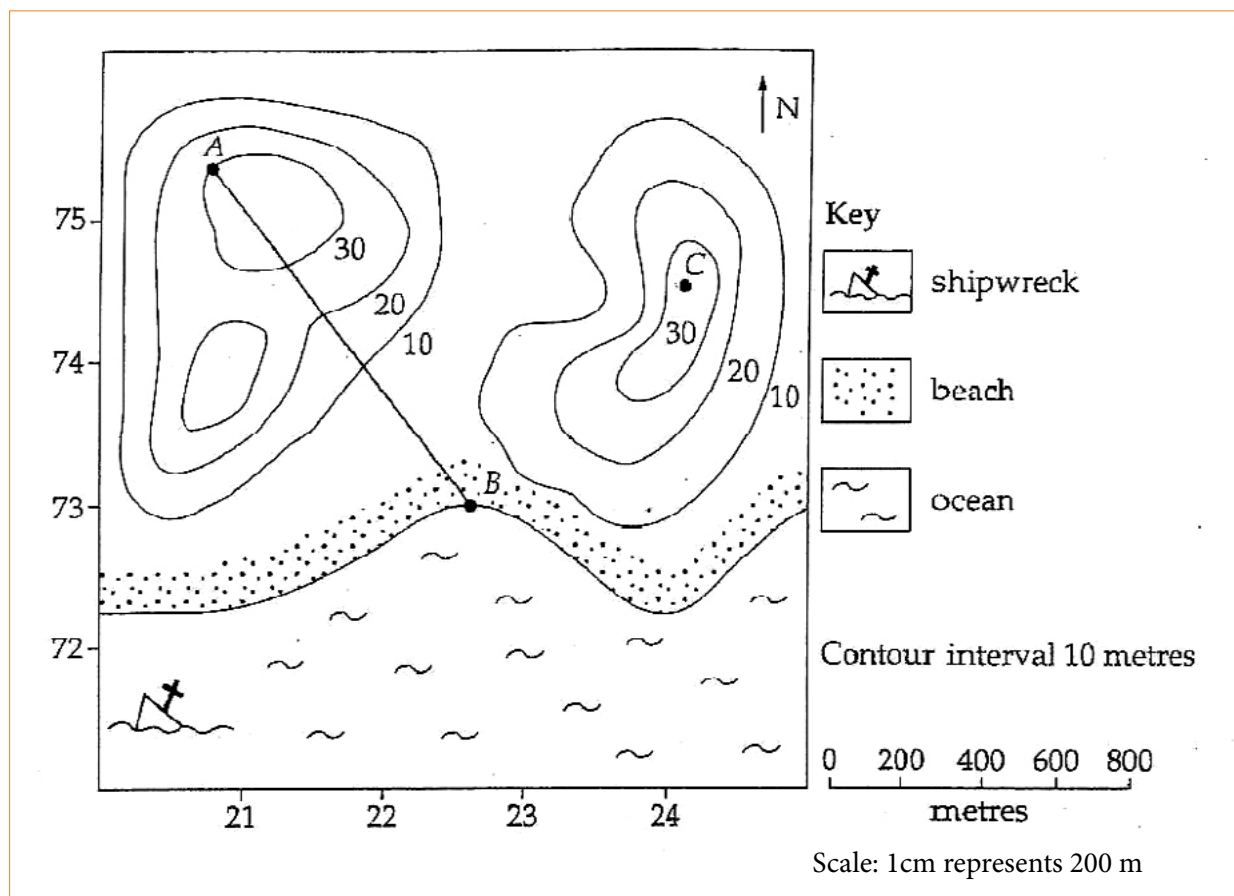
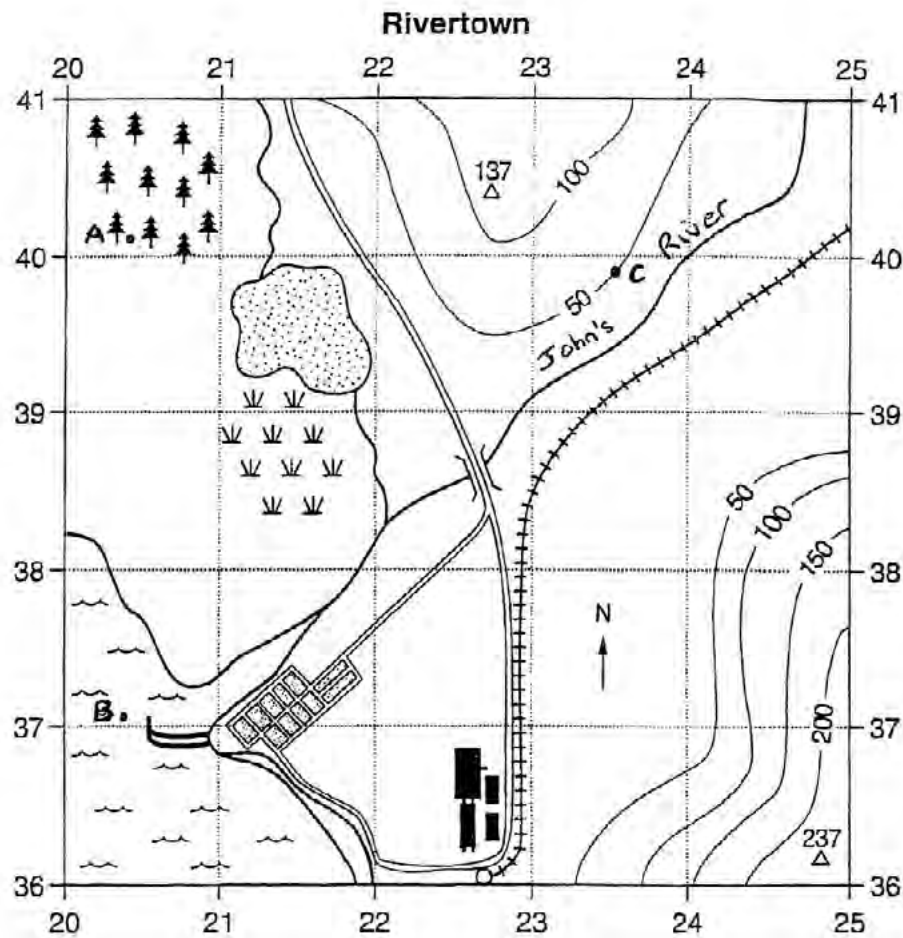


Image source: BOSTES Australian History, Geography, Civics and Citizenship Test.

LANDSCAPES AND LANDFORMS: MAPPING SKILLS

Figure 2: Rivertown map



Scale: 1cm represents 1 km

	Pine forest		Road
	River		Factories
	Lake		Housing
	Swamp		Train station
	Ocean		Train line
	Wharf / Marina		Trig station
	Bridge		Contour line

Image source: BOSTES 2001 Australian History, Geography, Civics and Citizenship Test.

LANDSCAPES AND LANDFORMS: MAPPING SKILLS

Figure 3: Lloyd's Inlet Map

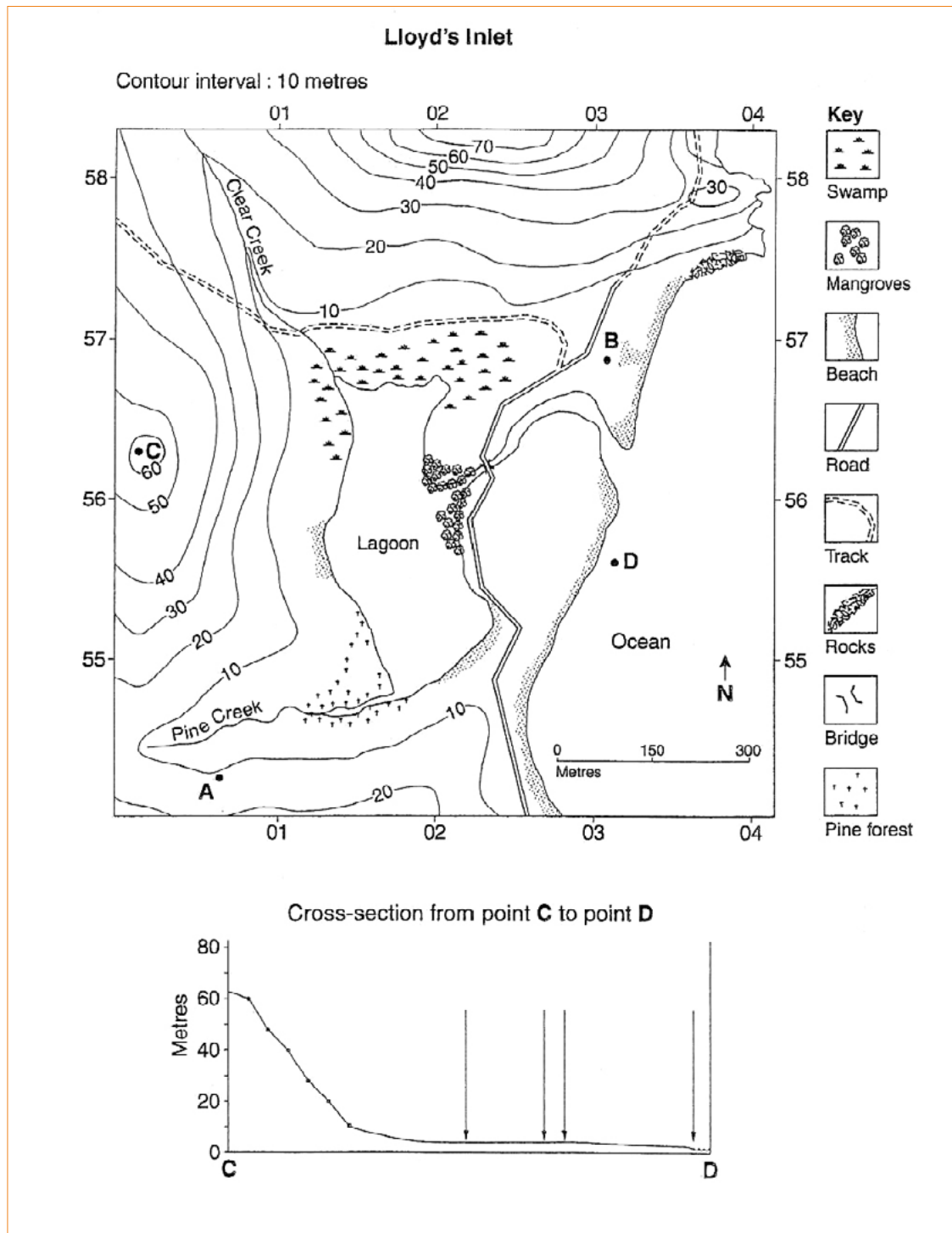
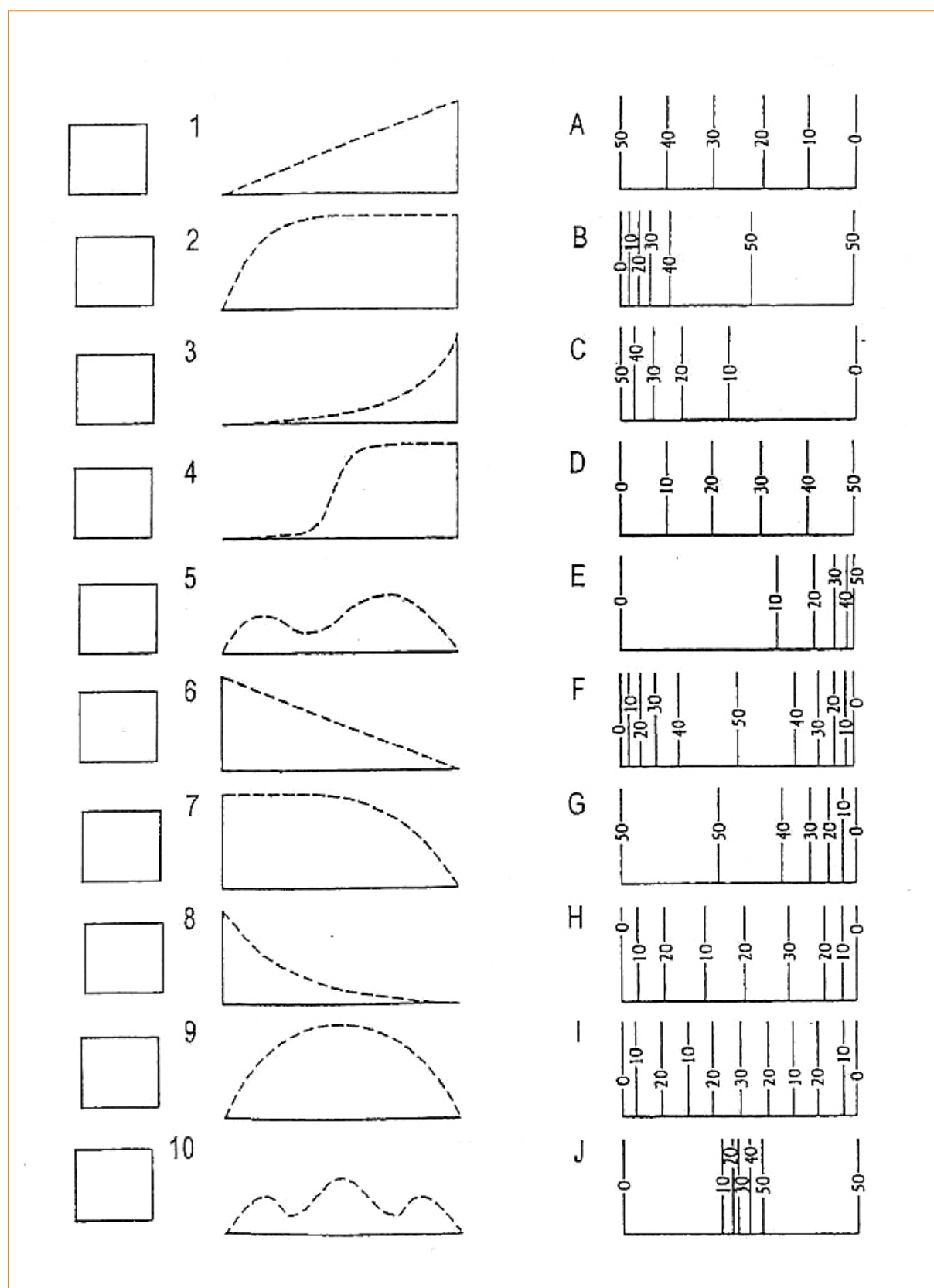


Image source: BOSTES 2003 Australian History, Geography, Civics and Citizenship Test.

LANDSCAPES AND LANDFORMS: MAPPING SKILLS

Figure 4: Contour lines



Source: Geographers Toolbox

LANDSCAPES AND LANDFORMS

Escape Rooms in Geography

Chad Cary, Casula High School

My name is Chad Cary and I have been a HSIE teacher at Casula High School for ten years. History (7–10), Ancient and Modern History are my main teaching areas, however, I have had numerous Geography classes over the years. Because it is not a subject that comes naturally to me, I always make it a personal mission to design lessons which gets students working collaboratively.

Recently I have been experimenting with the use of Escape Rooms to generate high levels of engagement within my HSIE classrooms. I have had tremendous success with this with History classes, but I hadn't had the chance to try one out for a Geography class. This year I was given a mixed ability stage 4 Geography class and decided to trial out an Escape Room as a way of preparing students for an upcoming assessment task. In order to 'escape', students needed to complete various challenges which incorporated both content (Landscapes and Landforms) and geographical skills.

The theme was that our librarian was abducted and locked up somewhere in the school. One of the biggest difficulties I have had in the past with escape rooms is the number of students participating. The ideal number for a group is 8–12 students. The best part of this lesson was that the students were split into three groups and needed to work simultaneously to complete colour coded tasks to find the final map and key to save our librarian before the period ended. This allowed the lesson to easily cater for a larger cohort. It took them 40 minutes and she was saved.

CASULA HIGH SCHOOL LOWER LEVEL

Welcome to Mr Cary's Geography Escape Room

Attention Year 8!!!
I have captured your beloved teacher librarian Ms Milliken and hidden her somewhere in the school.

You will need to use your Geographical skills and content awareness that you have developed this term to find and free her. You will need to work collaboratively with your peers if you are going to have any chance of finding her. You will have 45 minutes to work in your allocated groups, pay attention to what colour you are in.

Your first task is to find the code.
Using the school map and starting in your current location, go south and stop on the first number you reach.
Then go west and stop on the first number you encounter. Hopefully this has provided you with the code you require to proceed

MISSING

Note - If you go to a clue that you are not up to yet you will receive a strike. 3 strikes and you will be unable to escape!!!

- The world coins can be handed into the Mr Cary for a more explicit clue if you become stuck, use them wisely!!!

The Missing Librarian

LANDSCAPES AND LANDFORMS: ESCAPE ROOMS

I have developed a photo collage to provide a rather comprehensive visual understanding of how the lesson worked. Some of these are included in this article. The full photo collage can be located on the '*Community of Geography Teachers Australia*' Facebook group under a post I shared. Amazon and Breakout EDU have been really helpful in regard to accumulating resources in order to put everything together.

Engagement has always been at the forefront of what I do regardless of what subject I am teaching. I have found the integration of Escape Rooms into my Teaching and Learning programs to be one of the best ways at engaging my students and motivating myself.

I am a firm believer in sharing resources with the teaching community so if I ever develop something that has been successful in the classroom, I always ensure that it is shared with my colleagues. The reason for this is simple, I would not have developed half of the engaging lessons I have without the inspiration provided to me by other teachers when they share their stories and experiences. If anyone would like to utilise the resources put together for this escape room, please find below a link to the google drive (can also be found on the Facebook group post). I am always happy to offer support, share resources and bounce ideas of people too.

Resources link

<https://drive.google.com/drive/folders/1rQvQ3cjUQ8EsEhqV9ir88lh6yodhBqcb?usp=sharing>

Contact details: Chad.cary1@det.nsw.edu.au

What this looks like in the classroom

- Students are placed into 3 colour-coded groups. Note: I group them beforehand using a random group creator website with each group designated a colour.
- There are a series of challenges/tasks already set up which have a colour placed upon them.
- The students are told that they need to work together and complete these challenges to find their group's respective key.
- Three keys are required to unlock the coordinates of where the abducted librarian can be found.
- Small, coloured stickers are attached to various challenges (mainly lockboxes with different styles of locks), this alerts the groups as to which challenge, they need to work on.
- Each challenge is designed to reveal a code or message which points them in the direction of the next clue. They will be unable to attempt other challenges because they will lack the necessary information to unlock a challenge.
- If students become stuck, they can request a more explicit clue.
- Each group is given 3 world coins which they can use at any point for guidance.



Locked boxes



World 'help' coins (3 per team)

LANDSCAPES AND LANDFORMS: ESCAPE ROOMS

Landscapes and Landforms Tasks

Task 1/Group 1 – There is an area reference sheet with an instruction sheet. Students need to figure out the area reference to give them a 4-digit code which will unlock a padlock which will provide them with the next challenge.

Task 1/Group 2 – Landscapes/Landforms find-a-word. Once the words are all located, the remaining letters will reveal a secret word which will unlock a word-padlock.

Task 1/Group 3 – Geography Crossword.

Students complete the crossword, which has a number of boxes highlighted, once the crossword is completed, a secret word will be revealed.

Task 2/Group 1 – Image and Legend task.

Students are given a bunch of images of various landscapes. Students use the legend to add the values of the images together to given them a 3-digit number which will unlock a padlock.

Task 2/Group 2 – Code cracker which reveals a sentence directing students to a world map on the back wall.

Task 3/Group 3 – Cardinal direction task using a world map. Students use the map and their understanding of directions to solve a directional task. They then input this series of directions into a directional padlock.

Task 4/Group 1 – Longitude and Latitude task.

Students given a location and need to find the longitude and latitude to unlock another padlock.

Task 4/Group 2 – Students put together a jumbled image of Australia. Once this is completed, a secret message will be revealed (written in invisible ink, they are provided with a UV torch).



Students engaged in fun activity to revise topic knowledge, understanding and skills



Happy teacher



Rescued librarian

The Distribution and Physical Characteristics of Biomes

Article – Katerina Stojanovski, Stella Maris College

Teaching Resource: PowerPoint – Christina Kalinic, Stella Maris College

Outcomes

- GE5-1** explains the diverse features and characteristics of a range of places and environments
- GE5-7** acquires and processes geographical information by selecting and using appropriate and relevant geographical tools for inquiry
- GE5-8** communicates geographical information to a range of audiences using a variety of strategies

Inquiry Questions

What is the spatial distribution of the world's biomes?

What are the main characteristics that differentiate the world's biomes?

Concepts – Space and Sustainability

Key Terms – Biomes, anthromes, anthropogenic

Content – Investigate the distribution and physical characteristics of biomes

Sustainable Biomes is an exciting topic. At our school we deliver this unit to Year 9 in Term 2. We spend several lessons investigating the spatial distribution of Biomes and the main characteristics of the world's biomes. We are fortunate to have in our HSIE department, Christina Kalinic. Christina develops and shares with the team unique, well-structured and visually appealing resources that engage our students. Christina also teaches Society and Culture and History. Christina is a regular contributor to *Culturescope*, the journal of the Society and Culture Association. This year Christina was the recipient of the Dr David Dufty Award for Excellence in Teaching and Learning in Society and Culture <https://sca.nsw.edu.au/2021-society-and-culture-awards/>.

The following PowerPoint Presentation “*An Introduction to Biomes*” was developed by Christina and incorporates a good balance of content and skills. I have mapped the tools and skills according to the K–10 Tools continuum to suggest ways to integrate tools and skills with the content. Sample student work from Christina's Year 9 Geography class is included. The PowerPoint presentation and world map will be available as Appendix items on the GTA NSW & ACT website.



Image Source: UnSplash

SUSTAINABLE BIOMES: DISTRIBUTION & CHARACTERISTICS

Tools and Skills

K-10 TOOLS CONTINUUM	TOOLS AND SKILLS	ACTIVITY
Maps	Mapping Task	Label a map of the world's biomes using coloured pencils or the drawing toolbar in Microsoft Word.
Fieldwork	Developing and conducting interviews and surveys	Using primary research (interview, questionnaire), describe how your biome has been changed by anthropogenic forces.
	Virtual Fieldtrip	Visit and choose https://askabiologist.asu.edu/explore/Virtual-360-Biomes to go on a virtual tour for one of the following; Desert, Rainforest or Temperate Forest.
Spatial Technologies	Virtual Reality (VR)	Draw and fill in a Y-chart – looks, feels, sounds like.
Graphs and Statistics	Pie Graph	Construct a pie graph using a compass or excel to demonstrate the world coverage of biomes
	Statistics to find patterns and trends	
	Graphs presented on a geographical theme	
	Data Table	Record the temperature range and average rainfall for each biome
Virtual Representations	Multimedia	View a video of the world's biomes (3 minutes) and construct a data table, recording temperature, rainfall, plants and animals of each biome
	Web Tools	Using secondary research (e.g. websites) describe how your biome has been changed by anthropogenic forces.

See Appendix 1 for an Introduction to Biomes mapping and graphing worksheet.

SUSTAINABLE BIOMES: DISTRIBUTION & CHARACTERISTICS

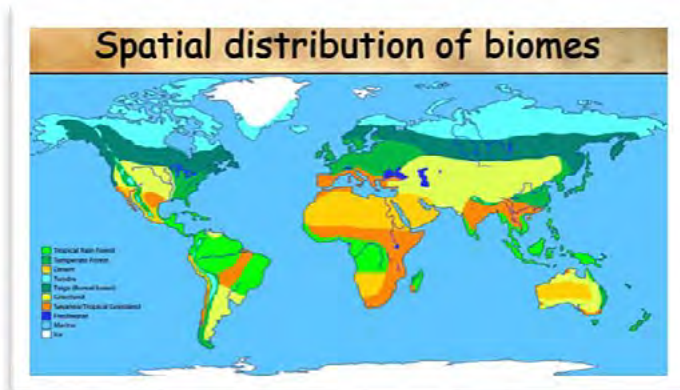
PowerPoint Presentation

PPT available as an Appendix on the GTA NSW & ACT website with this edition.



Defining Biomes

- The world is home to different environments or biomes, which are large ecosystems, each characterised by a particular climate and its dominant plants and animals.
- Biomes are divided into two broad groups:
 - 1) Aquatic or water-based ecosystems: oceans, rivers, lakes and wetlands
 - 2) Terrestrial or land-based ecosystems: deserts, rainforests, tundra, grasslands, woodlands and forests



Geographical Skill- Drawing a Pie Graph

- 1) Convert data into degrees using the formula:

$$\text{sector size} = \frac{\text{total sample size}}{\text{total sample size}} \times 360$$
- 2) Draw a circle using a compass
- 3) Draw a line from the centre of the circle to the 12 o'clock position on the circumference.
- 4) Use a protractor to divide the circle using your data and the centre point
 USEFUL TIPS:
 - Work clockwise from 12 o'clock
 - Draw the largest sector first
- 5) Colour/shade each sector in a different colour, add labels and a title

BIOME TYPE	COVERAGE (%)	DEGREES (°)
Desert	19	68.4
Boreal Forest	17	61.2
Tropical Forest	13	46.8
Temperate Grassland	13	46.8
Tundra	11	39.6
Savanna	10	36
Temperate Forest	8	28.8
Mountain	6	21.6
Scrub	3	10.8

HINT: this should total to 100
HINT: this should total to 360

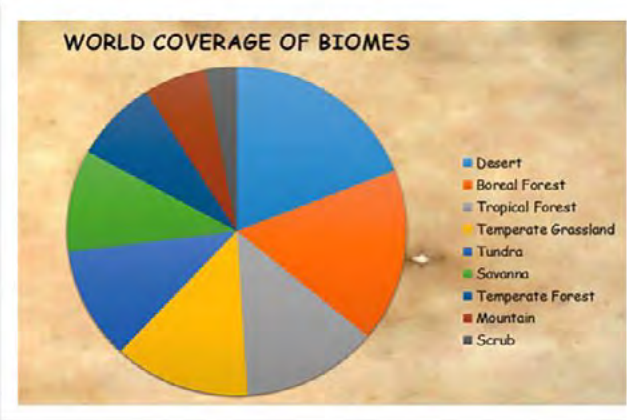
Investigating Biomes

Earth is a world of many beautiful places!

TASK:

- 1) Draw the table below in your Geography exercise book.
- 2) Record the temperature range and average rainfall for each biome.
- 3) Choose one plant and one animal for each biome type and name and sketch it.

BIOME TYPE	TEMPERATURE	RAINFALL	PLANTS	ANIMALS
Desert				



Sustainability

- Over time, humans have restructured biomes for agricultural, mining and urban function
- Modified biomes are called anthropogenic biomes or anthromes
 - This covers more of the Earth's surface than natural ecosystems!

The United Nations has stated that biomes need to be protected to meet the needs of the present, without compromising the ability of future generations to meet their own needs.

TASK:

- 1) What biome do you live in?
- 2) Using primary and secondary research, describe how your biome has been changed by anthropogenic forces.
 Primary research examples: interview, questionnaire, etc.
 Secondary research examples: books, websites, etc.

Investigating Biomes continued...

TASK:

- 1) Visit and choose <https://askbiologist.asu.edu/explore/Virtual-360-Biomes> to go on a virtual tour for one of the following:
 - Desert- South Western United States of America
 - Rainforest- Panama
 - Temperate Forest- Arizona and Colorado
- 2) Draw and fill in a Y-chart in your Geography exercise book.

LOOKS- what do I see?	FEELS- how do I feel?	SOUNDS- what can I hear?

Image source: <https://askbiologist.asu.edu/explore/biomes>

SUSTAINABLE BIOMES: DISTRIBUTION & CHARACTERISTICS

World Map – Spatial distribution of biomes

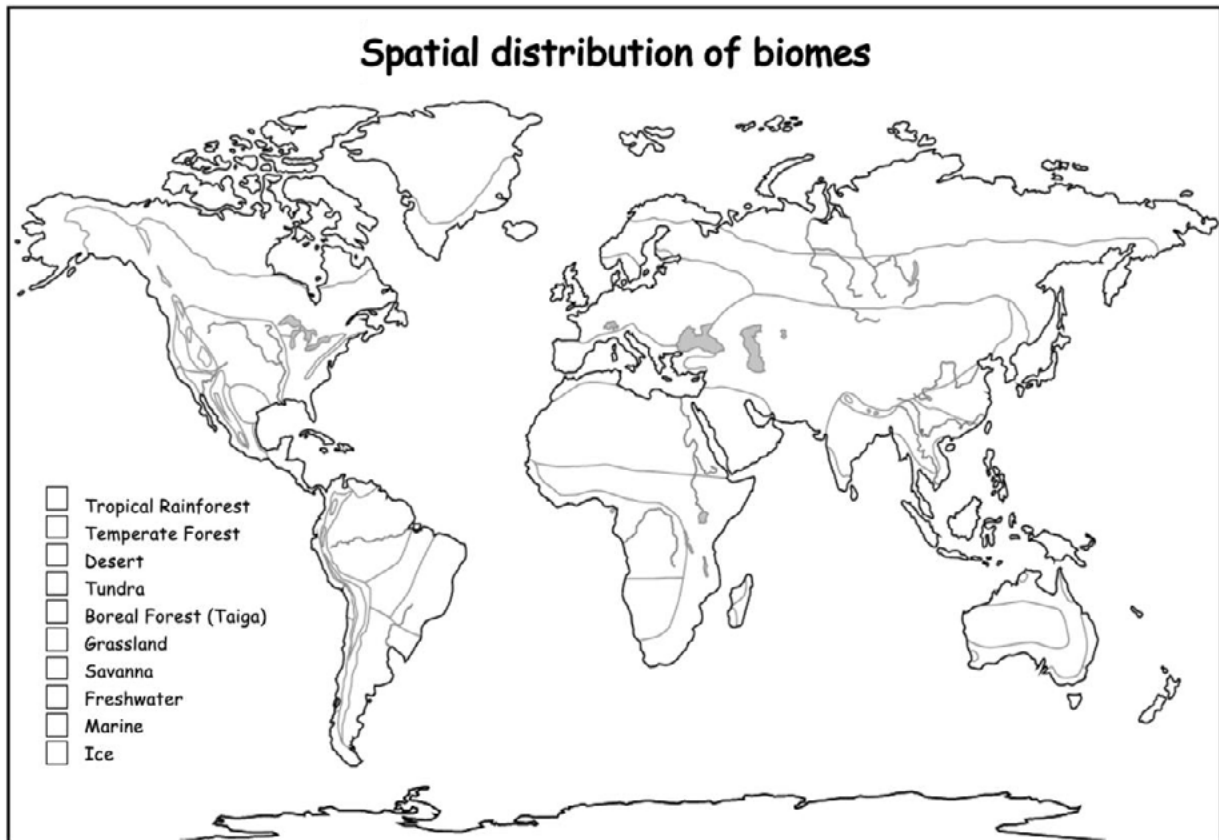
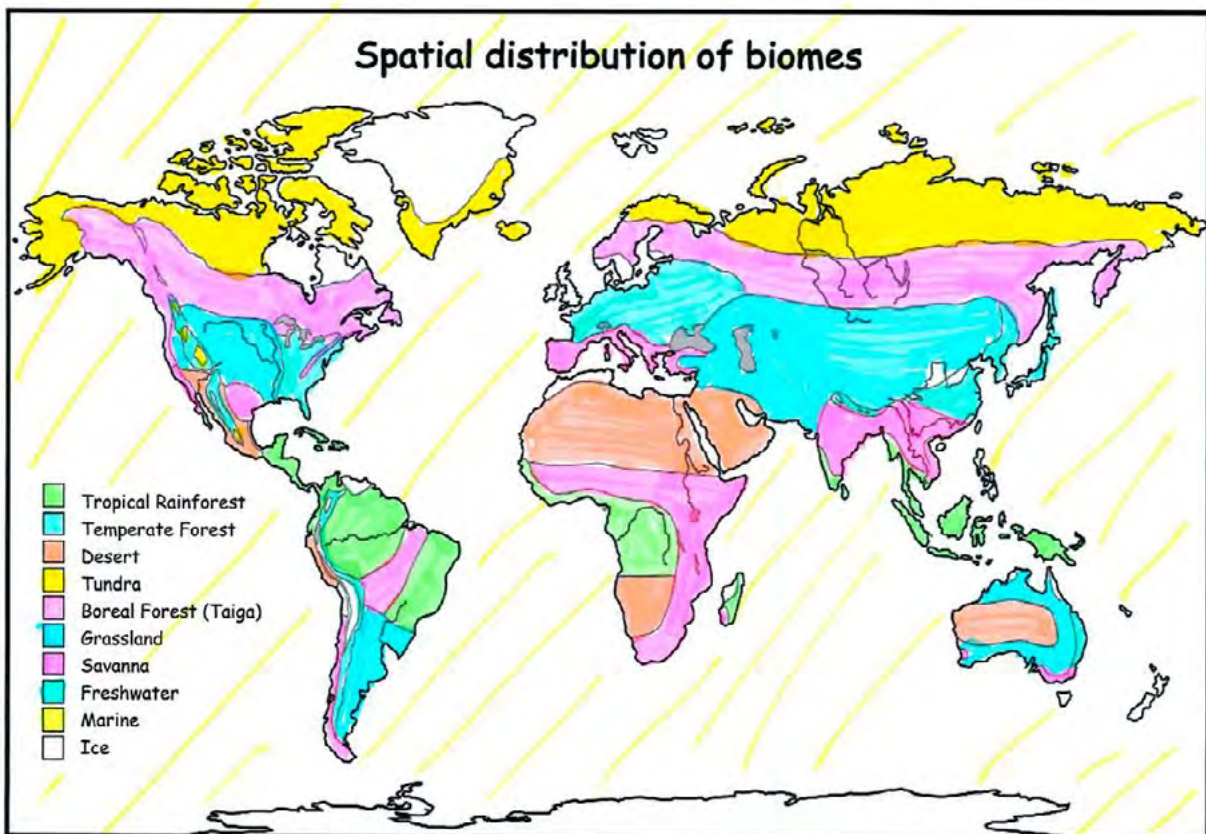


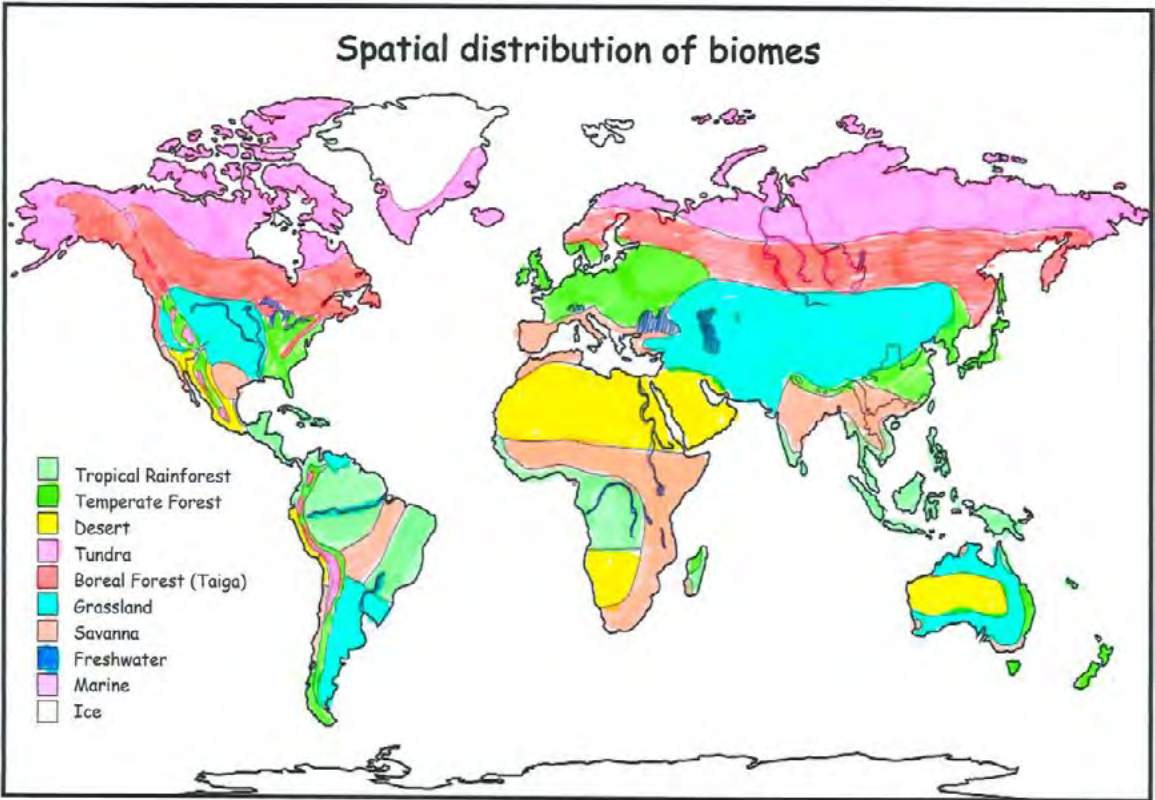
Image Source: https://askabiologist.asu.edu/sites/default/files/resources/coloring_pages/pdf/aab-biome-activity.pdf

Sample student work

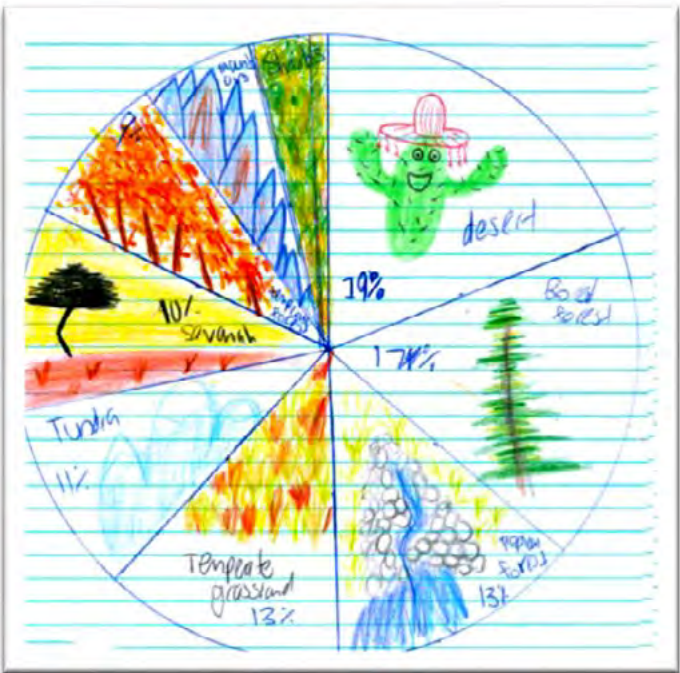


Tarryn Sargent – Year 9 Geography 2022

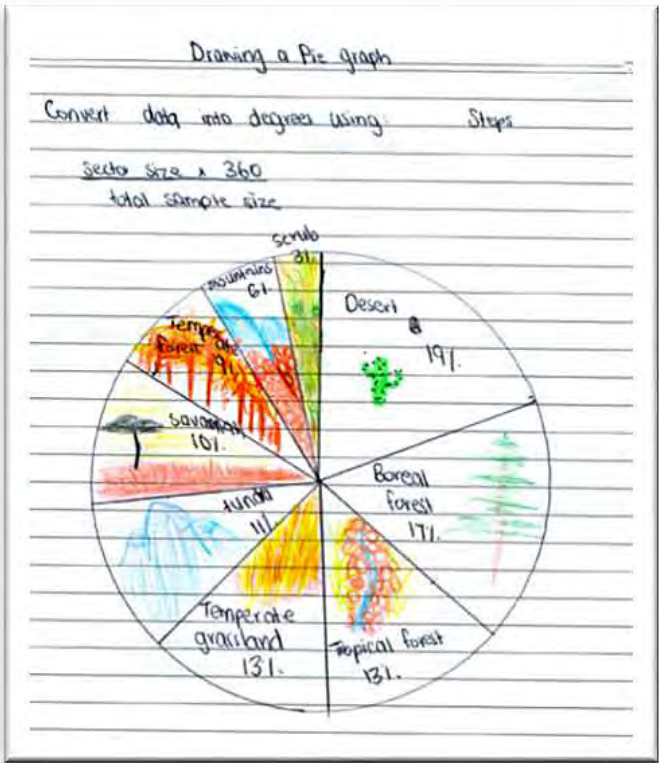
SUSTAINABLE BIOMES: DISTRIBUTION & CHARACTERISTICS



Elisha Cuthbert - Year 9 Geography 2022

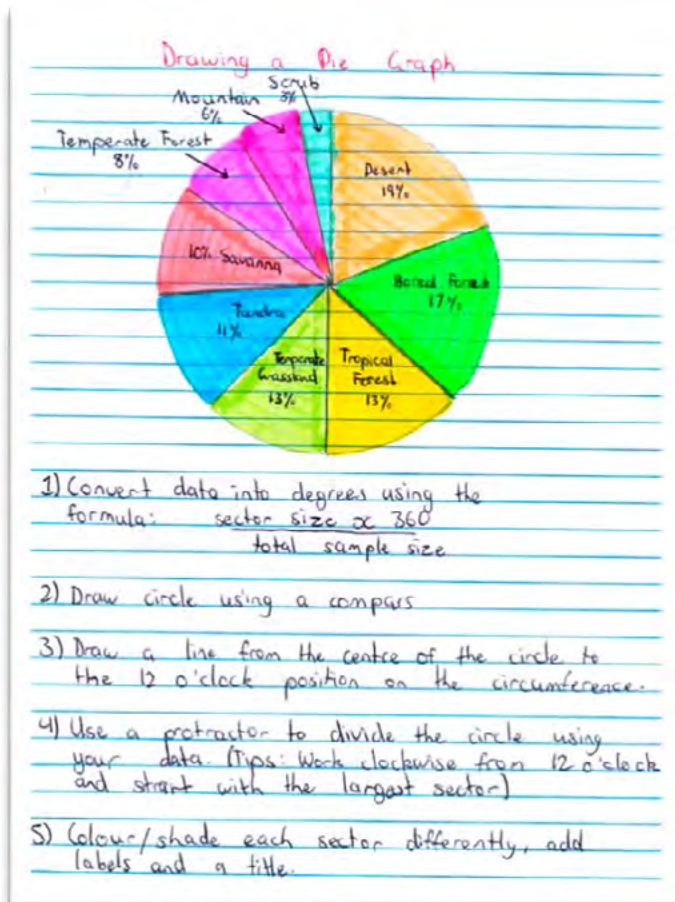


Celeste McConachie – Year 9 Geography 2022

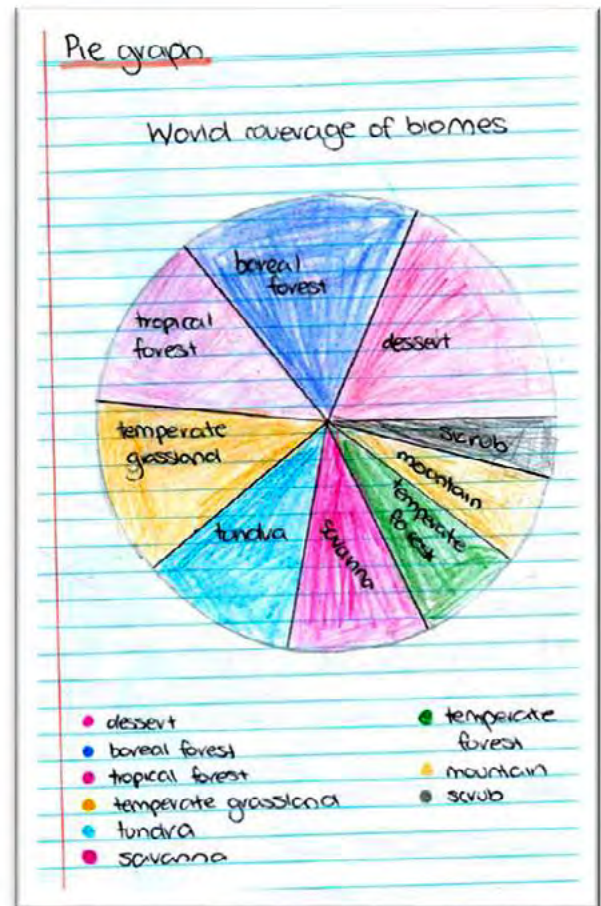


Talia Stedman – Year 9 2022

SUSTAINABLE BIOMES: DISTRIBUTION & CHARACTERISTICS



Zoe Rigato – Year 9 Geography 2022



Kate Naylor – Year 9 2022

Investigating biomes

biome	temp	rainfall	plants	animals
desert	33°C	10 inches	cacti	kit fox
boreal forest	-30 + -65°F	40 inches	willow	snow goose
tropical forest	20°C	70 - 300"	rafflesia	toucan
temp grassland	-20°C	35 inches	sunflower	deer
tundra	-34°C	10 inches	bearberry	penguin
savanna	68 - 86°F	30 - 40 inches	rhode grass	elephant
tempeforest	10°C	30 - 150 inches	mosses	chloe
mountain	5°C	1000 mm	spruces	bear
scrub			shrubs	lizards

Kate Naylor – Year 9 2022



Kate Naylor – Year 9 2022

BIOMES: Place, Space and Change

Activities created by Lorraine Chaffer, Vice President GTA NSW & ACT

Skill Focus: Application of knowledge and understanding / Critical thinking

Outcomes

GE5-2 explains processes and influences that form and transform places and environments

GE5-3 analyses the effect of interactions and connections between people, places, and environments

A student worksheet for this activity is in Appendix 1 on the GTA NSW & ACT website with this edition

A. GRAPH STUDY: The where and why of Earth's biomes

TASK: Use your knowledge and understanding about biomes to identify the factors that influence the global location of biomes.

Refer to Figure 1

- Describe how biomes change from low to high altitude locations.
- Why is there a change in biomes as altitude increases?
- Name the type of forest biome found closest to the equator (at low latitude).
- What factor is the main cause of the change from forest at the equator to tundra near the ice caps?
- State one key factor that would influence the location of desert and grassland biomes.
- Predict what might happen to the zonation of biomes with climate change.

Refer to Figure 2

- Name the biome that can be found where average yearly temperatures reach minus 10°C and annual precipitation is less than 20 cm (200 mm).
- State the climatic conditions that influence the biomes at places A and B.

B. PHOTO STUDY: People change biomes to produce food

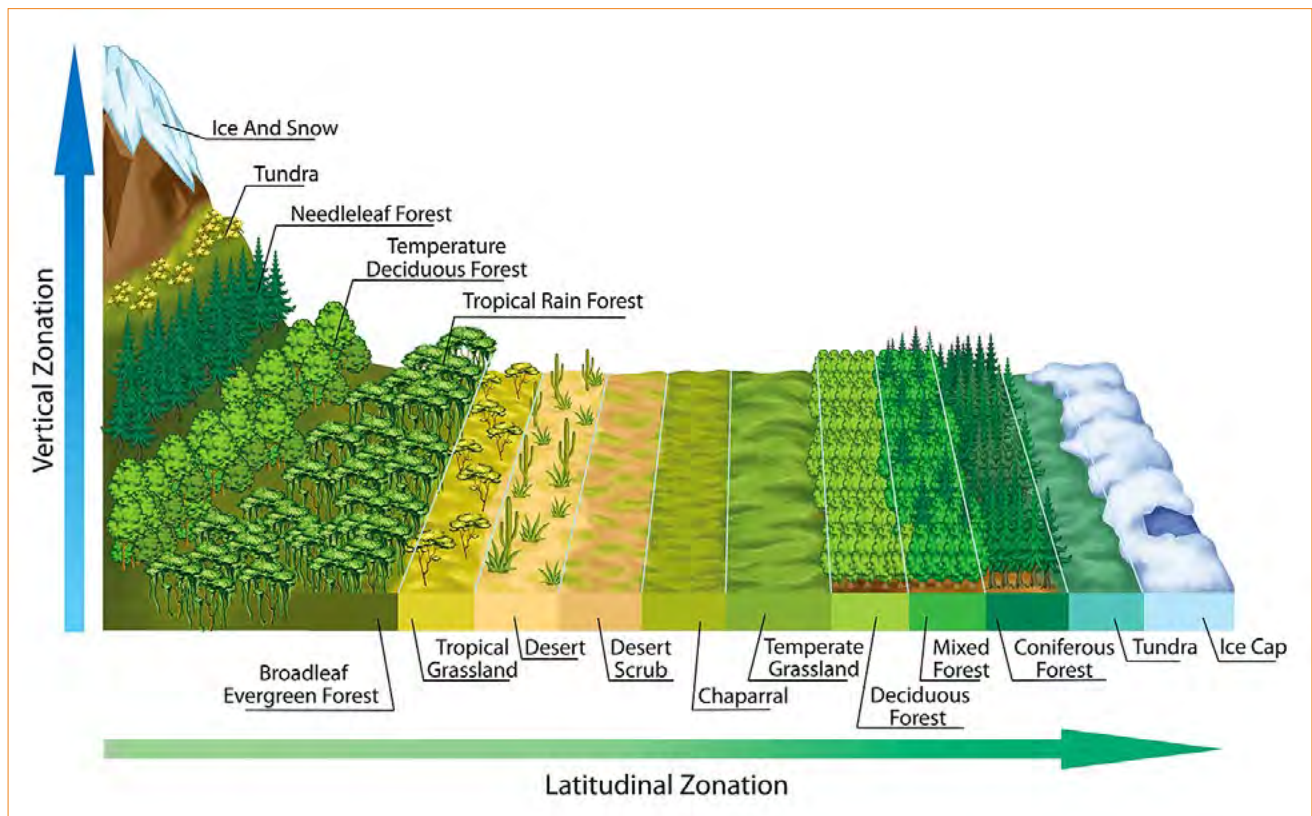
TASK: Use your understanding of geographical concepts and biomes to explain how people have changed or created biomes to produce food and analyse the consequences of change.

For each photograph set shown in Figures 3 to 5

- Suggest the natural biome that once occupied this location. You may refer to Figure 1 to guide your response. Give a reason for your answer.
- Explain how the biome was changed to produce food. Use geographical concepts.
- Name a country or place you know where a biome has been changed in a similar way.
- Explain possible consequences of the change (positive and negative). Present your ideas in a flow diagram or consequence chart.
- Propose a solution to ONE negative consequence of change.

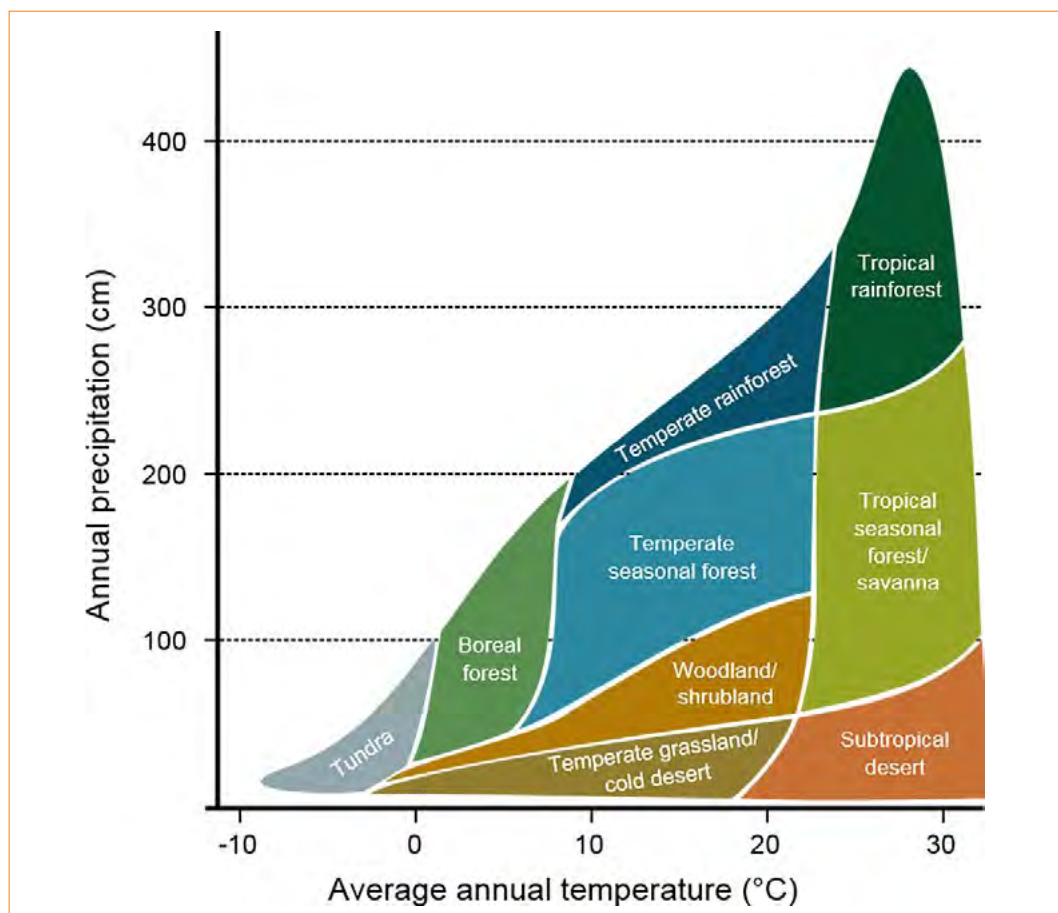
SUSTAINABLE BIOMES: PLACE, SPACE AND CHANGE

Figure 1



Source: Shutterstock

Figure 2



Source: <https://openoregon.pressbooks.pub/envirobiology/chapter/3-3-terrestrial-biomes/>

SUSTAINABLE BIOMES: PLACE, SPACE AND CHANGE

Figure 3



Image source: Shutterstock



Image source: Shutterstock

Figure 4

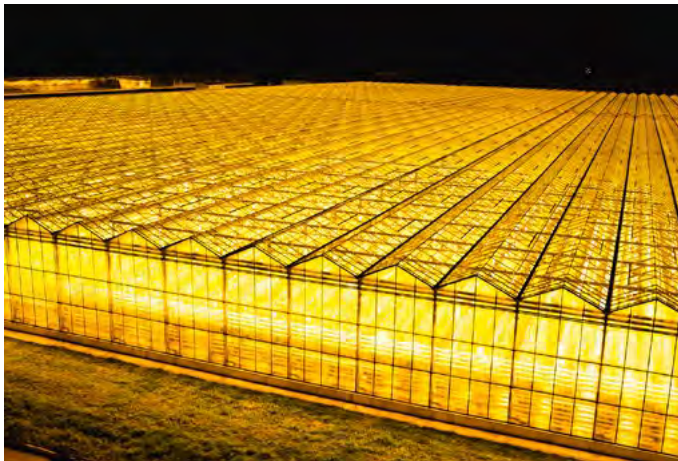


Image source: Shutterstock



Image source: Shutterstock

Figure5



Image source: NASA Earth Observatory



Image source: Agrico <https://www.agrico.co.za>

SUSTAINABLE BIOMES: PLACE, SPACE AND CHANGE

C. PHOTO STUDY: The fascinating world of food production

- Complete a **Layers of Inference** template for each photograph.
- Complete a table for each image.
 - **Match** photographs 1 – 5 with the relevant description A – G
 - **Name the country** where you think this photo was taken.
 - **Give reasons** for your answers
 - **Write two questions** you have about the production of this food.
- Choose ONE of these food producing stories as the basis for a **geographical inquiry** using your questions as a starting point.

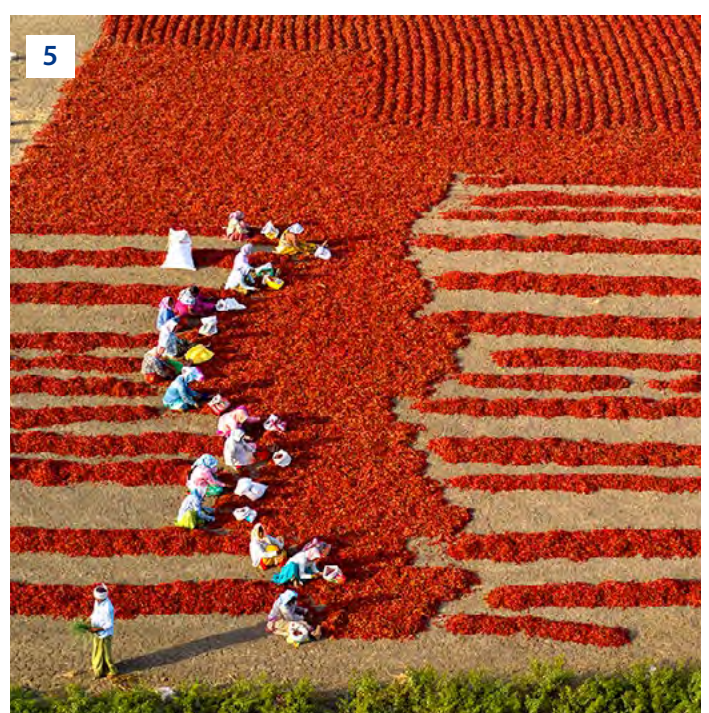
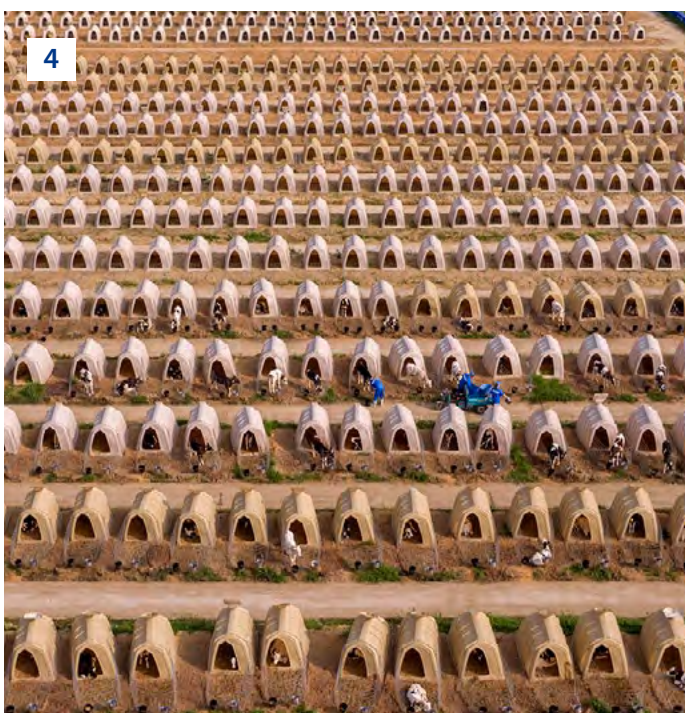
What does the photograph definitely tell me?	PHOTO	DESCRIPTION	COUNTRY
What can I infer from the photograph? What guesses can I make?			
What does the photograph not tell me?	Reason for my choices		
What else would I like to find out? What other questions do I need to ask?	My questions		

COUNTRIES USA China Kenya India Japan Kiribati Canary Islands	A. Chillies are being sundried on a small farm. The chillies are being sorted by hand Chillies are spices used in cooking in most countries around the world.	B. Seaweed is grown on nylon ropes staked into shallow sand. The harvest is floated to shore on small rafts and dried for export to be used in a range of food products.	C. Wine grapes are being harvested in this volcanic landscape. Pits are used to protect the plants from trade winds and allows them to thrive in the moist inner soil.
About the photographer All images and information from award winning photographer George Steinmetz who has a ' <i>passion for the unknown</i> ' George is a regular contributor to National Geographic and the New York Times. Read more about George and his books on his photographic publications on his website www.georgesteinmetz.com Learn more about how food is produced in different locations around the world on George's Instagram account Feed the Planet .	D. Lettuce seedlings are planted in a rotating hydroponic farm. Seedlings are planted in nutrient rich water in the centre and rotate for a month before reaching the outer edge for harvesting	E. Calf hutches at one of the world's largest dairy farms with 39,000 cows. The cows were imported from Australia the semen for artificial insemination comes from Canada and most feed also comes from overseas.	

A worksheet with templates for this activity is in the appendix on the GTANSW & ACT website with this edition.

SUSTAINABLE BIOMES: PLACE, SPACE AND CHANGE

Figure 6



Creating text using infographics

Activities created by Lorraine Chaffer, Vice President GTANSW & ACT

Visual representations allow us to understand complex changes more easily. Often, visuals such as diagrams and infographics are used to support text but in doing so it is easy to skim over the details presented in a visual resource. Using visuals to create a text requires skills in interpretation, calculation, and critical thinking.

This activity can be completed by students individually or in groups. Use the PDF of images in Appendix 3 on the GTA NSW & ACT website for easy-to-read infographics.

A student worksheet for this activity is in Appendix 1 on the GTA NSW & ACT website with this edition

THE BIG TASK

You are going to *write an article for a digital magazine*. The article, about *change to the Earth's surface over time*, will include the infographics used in this activity.

ACTIVITY 1: Put it into words

For each image **create a descriptive paragraph** using your own words to highlight the key ideas and facts presented. Use geographical concepts and avoid copying text directly from the infographic.

To help you unpack the infographics try answering the guiding questions below.

- How many years ago was 1800?
- How many years are covered by this series of infographics?
- What is meant by habitable land?
- What are the two main components of habitable land?
- What is an essential requirement for people to use habitable land?
- How much of Earth's surface is uninhabitable – Why?
- How much of Earth's habitable land had been cleared for urban landuse, cropping, and grazing by 1800.

ACTIVITY 2: Make some calculations

Use the statistical information in the infographics to **calculate change**, such as - absolute change, percentage change and rate of change over time.

This information will assist you with Activity 3. Try these calculations:

- What do the letters M and B beside some statistics represent?
- By how much did the area of forests change between 1800 and 2018? (Hectares and as a % of habitable land).
- What happened to Earth's grasslands over time?
- What was the status of Earth's grasslands in 2018?
- Calculate the percentage change in habitable land occupied by forests from 1800 to 2018?
- Calculate the annual rate of change in forest cover over the last 10,000 years.

ENVIRONMENTAL CHANGE: USING INFOGRAPHICS

ACTIVITY 3: Organise your ideas

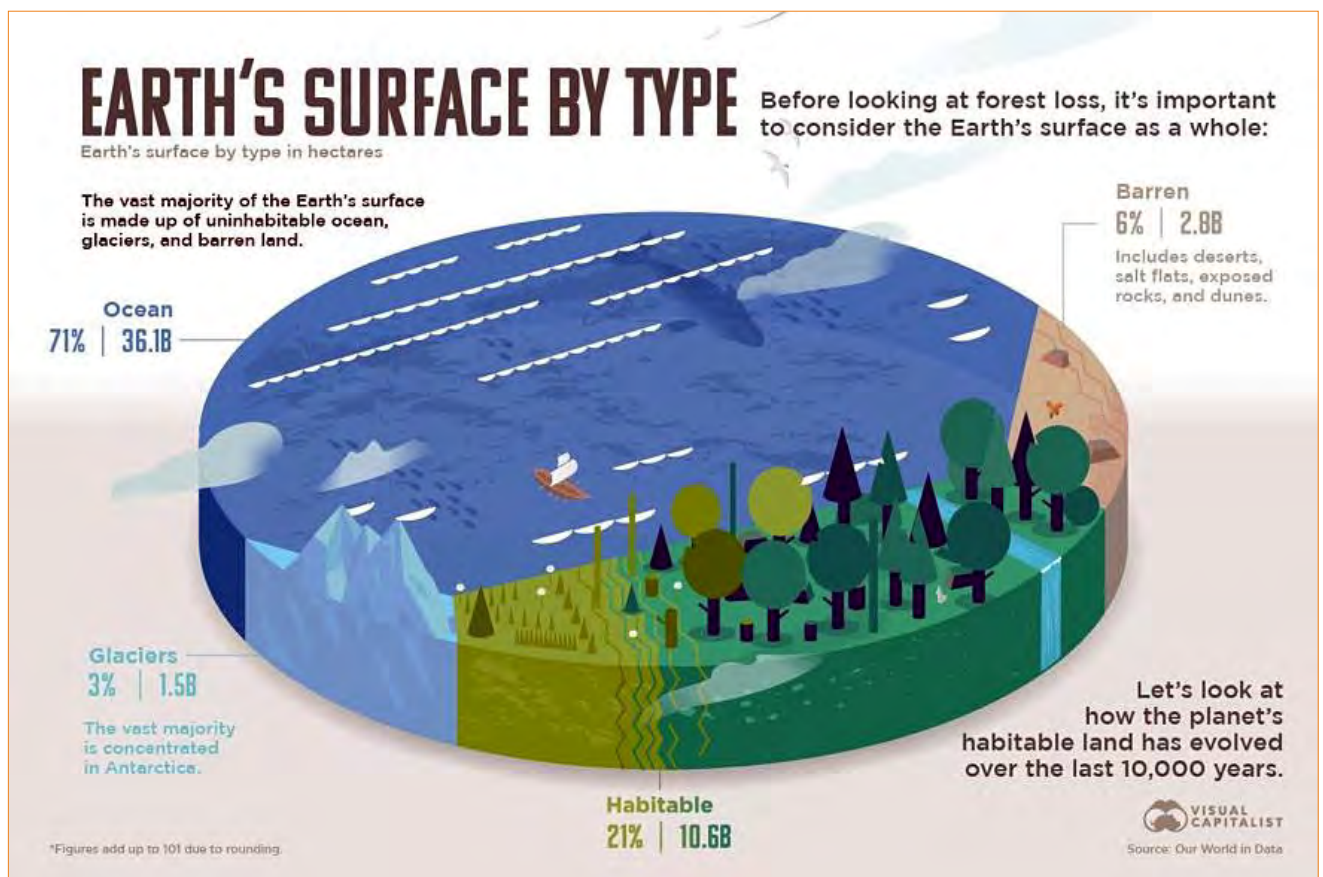
Create a heading, an introduction and conclusion to accompany the paragraphs you have written about each infographic. What is your key message?

ACTIVITY 4: Create your article

Present your article as a complete product that incorporates the infographics, your details as the author and the source of your information.

The article can have a traditional magazine format or be presented as a StoryMap.

Figure 1



Images licensed for use from Visual Capitalist by GTANSW & ACT. The full PPT of 9 images appears as Appendix 3 with Edition 2 on the GTA NSW & ACT website.

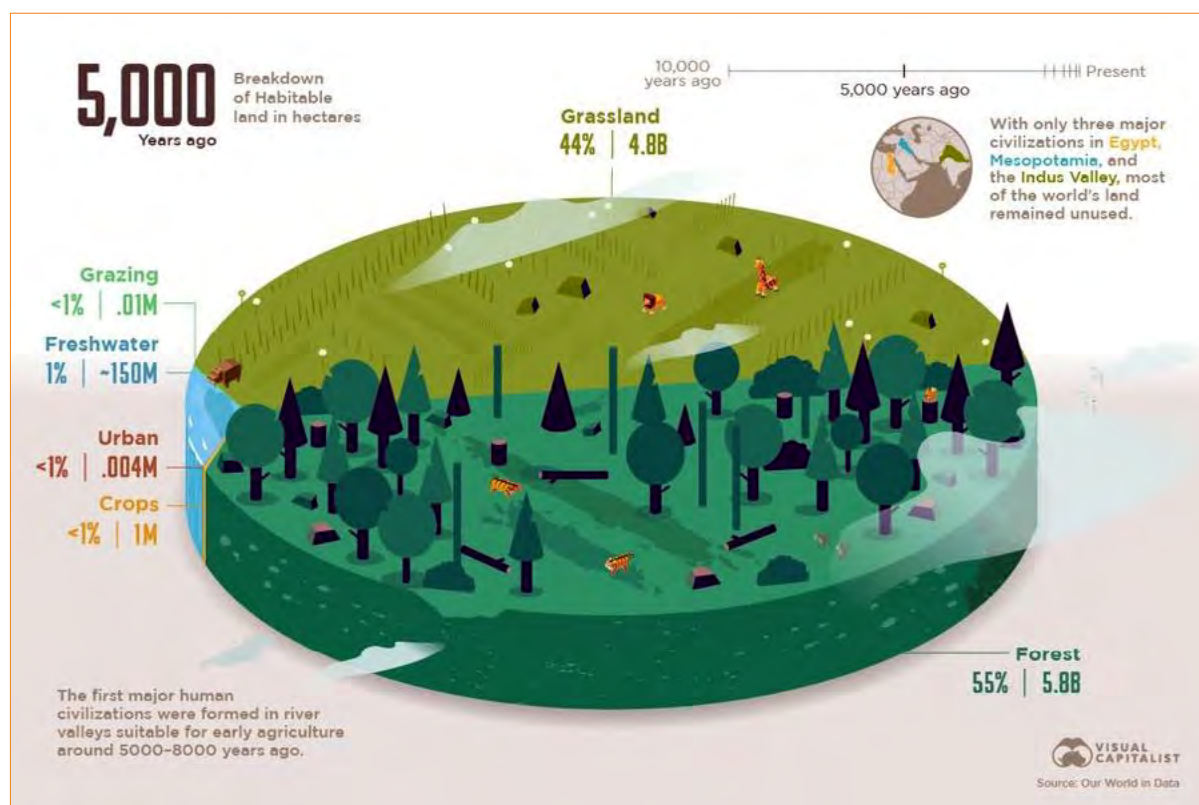
The images form the basis of the article "Visualising the Worlds Forest Loss since the ice age"
<https://www.visualcapitalist.com/visualizing-the-worlds-loss-of-forests-since-the-ice-age/>

ENVIRONMENTAL CHANGE: USING INFOGRAPHICS

Figure 2



Figure 3



ENVIRONMENTAL CHANGE: USING INFOGRAPHICS

Figure 4

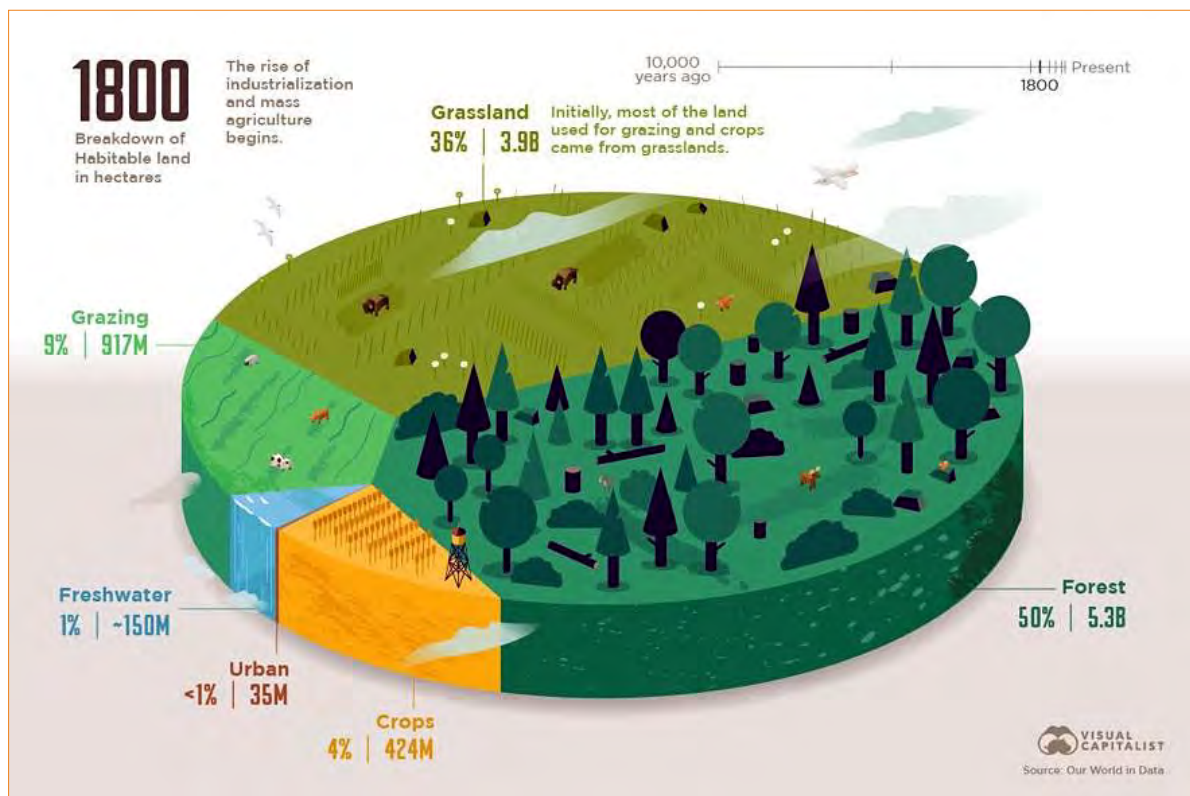
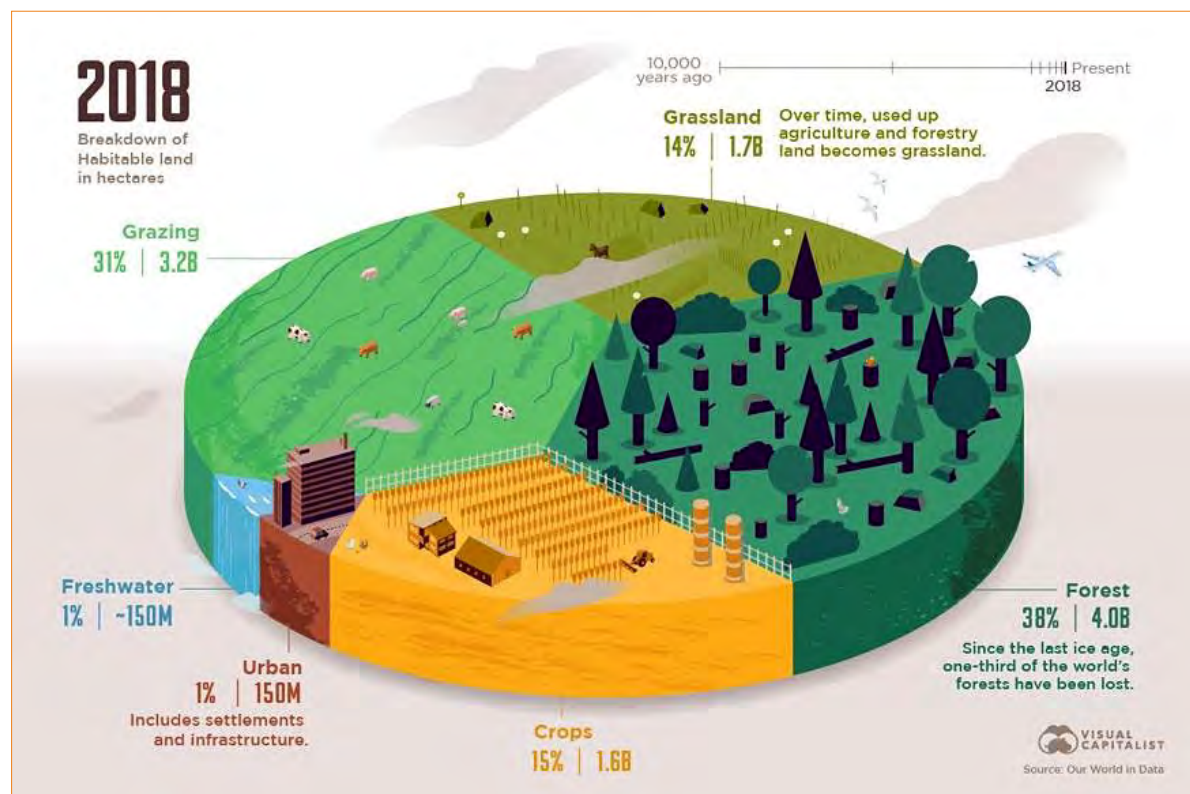


Figure 5



ENVIRONMENTAL CHANGE

Applying Knowledge and Understanding

Activities created by Lorraine Chaffer, Vice President GTA NSW & ACT

SCENARIO: There is a proposed major expansion of the industrial estate at point A on the transect shown below.

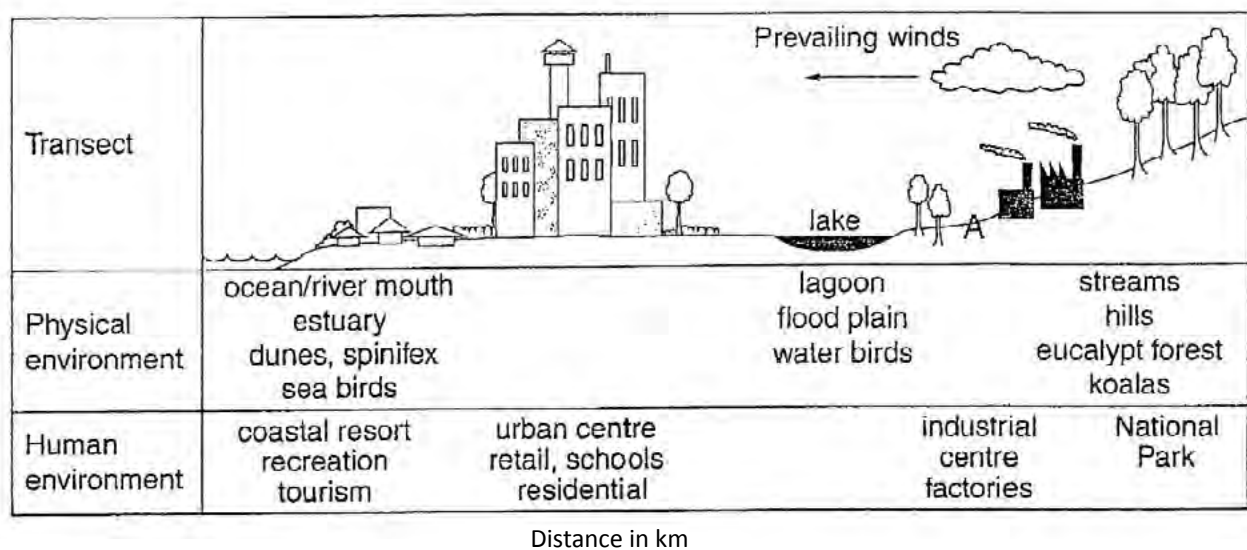


Image source: BOSTES 2001 Australian History, Geography, Civics and Citizenship Test.

Activities

1. Explain how the proposed industrial expansion could impact on ONE part of the surrounding physical environment and ONE part of the surrounding human environment. Use geographical concepts in your answer.
2. You are a consultant working for a residents' action group concerned about the proposed expansion of the industrial estate. Describe TWO **fieldwork techniques** you could use to investigate the potential impacts of the proposed industrial expansion.
3. Outline ways that individuals opposed to the industrial expansion could influence decision making about the proposal.
4. What do the concepts 'informed **citizenship**' and 'active **citizenship**' mean to you?

A student worksheet for this activity is in Appendix 1 on the GTA NSW & ACT website with this edition

Human Wellbeing at a range of scales

Gretchen Wiseman, Central Coast Grammar School

A. MAPPING HUMAN WELLBEING AT A GLOBAL SCALE

Collect the data to create a choropleth map

1. Use [CIA World Factbook](#) to collect data and fill in the table below:

	Life Expectancy (years)	Infant Mortality Rate (per 1000 live births)	Birth Rate (per 1000 population)	Obesity – adult prevalence rate (%)	Literacy (%)	GDP – per capita (PPP)
Australia						
India						
Norway						
Sudan						
Peru						
Iran						
Canada						
Indonesia						

2. Use the data collected above to decide on differing levels for each indicator on the table below:

	Life Expectancy (years)	Infant Mortality Rate (per 1000 live births)	Birth Rate (per 1000 population)	Obesity – adult prevalence rate (%)	Literacy (%)	GDP – per capita (PPP)
Low						
Medium						
High						

3. Choose 2 indicators to create a choropleth map using **the world map in the Appendix**. On the map you will need a key with high, medium and low for each indicator [you could use colour for one and shading/patterns for the other]. Remember BOLTSS.
4. Explain your choropleth map. Hint: consider interconnections between indicators.

NOTE: Worksheets for these activities, including the base maps and tables, are in the Appendix with this edition on the GTANSW & ACT website.

HUMAN WELLBEING AT A RANGE OF SCALES

B. SPATIAL VARIATIONS in HUMAN WELLBEING WITHIN INDIA

1. Colour the **flag of India**.
2. **On the map of India** label the state and territories of India, and the cities of Mumbai, New Delhi and Kolkata.
3. **Complete the table** with data for the states of Bihar and Kerala.
Bihar <https://globaldatalab.org/profiles/region/INDr103/>
Kerala <https://globaldatalab.org/profiles/region/INDr110/>
4. **Represent the statistics in a graph** using a tool such as Excel.
5. **Collect media reports** on inequality in India. On a copy of the article highlight references to inequality and annotate the nature of the inequality e.g., housing, education, health care.

	Kerala value	Bihar value
Level of development	Value	Value
Subnational Human Development Index		
International Wealth Index (IWI)		
Gross National Income per capita (\$)		
Poverty	Value	Value
Percentage poor households (IWI value under 70)		
Percentage poorer households (IWI value under 50)		
Percentage poorest households (IWI value under 35)		
Educational attendance	Value	Value
Educational attendance children aged 6-8 (%)		
Educational attendance children aged 15-17 (%)		
Position of women	Value	Value
Total fertility rate		
Mean age at first marriage of women aged 20-50		
Mean age at first birth of women aged 20-50		
Position of children	Value	Value
Infant mortality rate		
Percentage underweight children		
Percentage overweight children		
Asset ownership	Value	Value
Percentage households with a TV		
Percentage households with a refrigerator		
Percentage households with a washing machine		
Percentage households with a motorbike		
Access to public services	Value	Value
Percentage of households with piped water		
Percentage of households with electricity		
Percentage households with a phone		
Population	Value	Value
Percentage population in urban areas		
Quality of housing	Value	Value
Percentage households with flush toilet		
Percentage households with a natural floor (earth, sand, dung etc.)		
Percentage households with three or more sleeping rooms		
Percentage households cooking on wood, straw, grass, dung etc.		

HUMAN WELLBEING AT A RANGE OF SCALES

C. VARIATIONS IN HUMAN WELLBEING IN AUSTRALIA: EDUCATION

There are spatial variations in Human Wellbeing within countries. For this task you are to choose **ONE area from List A** and compare it to **ONE area within List B**.

List A	List B
Ceduna, SA	Berrimah, NT
Moree, NSW	Portsea, VIC
Charleville, QLD	Toorak, VIC
Buloke, VIC	Cottesloe, WA
Croydon-Ethridge, QLD	Bellevue Hill, NSW
Yuendumu – Anmatjere, NT	North Adelaide, SA
Halls Creek, WA	Ascot, QLD
Anindilyakwa, NT	Sandy Bay, TAS
Orbost, VIC	Balmain, NSW
Fairfield, NSW	Forrest, ACT

NB, ABS Quickstats search using Statistical area (**SA2**).

Nelson Mandela once said, “Education is the most powerful weapon which you can use to change the world.” Education is the key to eliminating gender inequality, to reducing poverty, to creating a sustainable planet, to preventing needless deaths and illness, and to fostering peace.

The main focus is a **comparison** of education in your two areas. Consider:

- Collecting statistical data on education from reputable sources eg, a good place to start would be the Australian Bureau of Statistics both Quickstats and the Socio-Economic Indexes for Areas (SEIFA).
- Dig deeper into the factors (causes) that hinder education (why can’t all children access school? eg, domestic violence, disability, hunger, distance to school)
- Research rates of tertiary education eg, TAFE or university. How does tertiary studies link to income levels?
- Education scoring eg, HSC and NAPLAN results

Part 1: Collecting Data

For your TWO areas, you must collect data that will best represent education in your areas. You must show 10 different statistics in the table below:

Part 2: Analyse the Data

You will now use the data you collected in Part 1 to analyse the difference between the two areas in 700 words.

NOTE: Worksheets for these activities, including tables, are in the Appendix with this edition on the GTA NSW & ACT website.

	Name of statistic:	From List A – Name:	From List B – Name:	Source:
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

D. SPATIAL VARIATIONS IN WELLBEING: CENTRAL COAST NSW

A. Collect data to complete figure 1 and figure 2

B. Interpret the data and communicate your findings

Use the data to answer the following questions:

1. Using data explain the differences in EDUCATION across the Central Coast.
2. Use the interactive map (<https://www.smh.com.au/education/where-you-live-is-determining-your-school-s-naplan-score-20181126-p50ibq.html>) from Macquarie University to identify areas that:
 - a. Perform above the average for Year 5 writing results
 - b. Perform below the average for Year 5 writing results
3. Using data explain the differences in EMPLOYMENT across the Central Coast.
4. Using data explain the differences in INCOME across the Central Coast.
5. Using data explain the differences in HOUSEHOLD mortgage and rent repayments across the Central Coast.
6. Outline any general trends you can identify between the different categories of human wellbeing.

REFER TO FIGURE 3: Indigenous population on the Central Coast

7. Using statistics describe the profile of indigenous males and females aged 0-29 years as compared to the non-indigenous profile.
8. Using statistics describe the profile of indigenous males and females aged 30 years + as compared to the non-indigenous profile.

REFER TO FIGURE 4: Aboriginal

9. Refer top Figure 2 Describe the differences in average weekly household incomes between Aboriginal and "others" on the Central Coast.

REFER TO FIGURE 5: Aboriginal hospitalisations

10. Using data, describe the hospitalisations in our region for Aboriginal peoples.
11. Make a judgement based on statistics collected about human wellbeing on the Central Coast.



Image source: Rob Freijjs, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=46568109>

HUMAN WELLBEING AT A RANGE OF SCALES

Figure 1: Census data

Complete the data table using this link –

<https://www.abs.gov.au/websitedbs/censushome.nsf/home/quickstats?opendocument&navpos=220>

Figure 2: Income variation: Macquarie University Interactive map

Use the interactive map from Macquarie University to complete the table (<https://www.smh.com.au/education/where-you-live-is-determining-your-school-s-naplan-score-20181126-p50ibq.html>)

	% of income earners in top income bracket (\$3000/week)
Central Coast	
Hornsby	
Mosman	
Parramatta	
Fairfield	
Waverly	
Southerland Shire	

	Woy Woy-Blackwall (SA2)	Terrigal-North Avoca (SA2)	The Entrance (SA2)	Gorokan-Kanwal-Charmhaven (SA2)	Monrisset-Cooranbong (SA2)	NSW %	Australia %
Age							
-0-14 years							
-15 years +							
Education							
University or tertiary institution							
Level of education							
Bachelor's degree							
Year 12							
Year 10							
Year 9 or below							
Employment							
35 hours or more							
Professionals							
Managers							
Technicians/Trades							
Labourer							
Clerical/ Admin							
Top industry of employment (Name of industry)							
Income							
Personal							
Family							
Employment status- both not working							
Household income - <\$650/week							
- \$650-\$1000/week							
Household							
Median monthly mortgage repayments							
Median weekly rent							

Figure 3: Population profiles

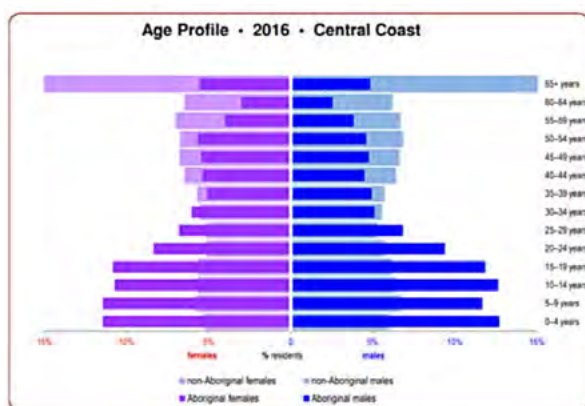
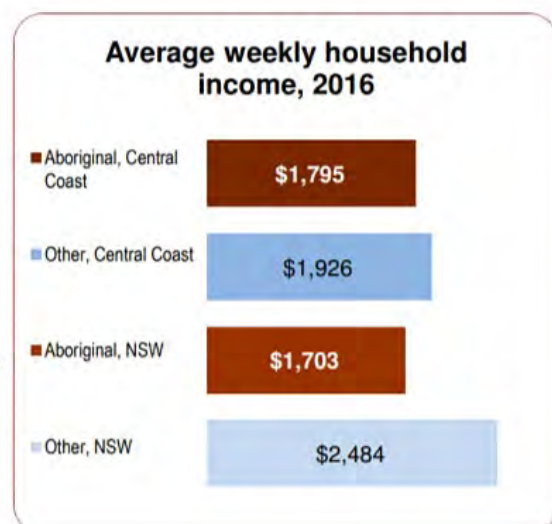


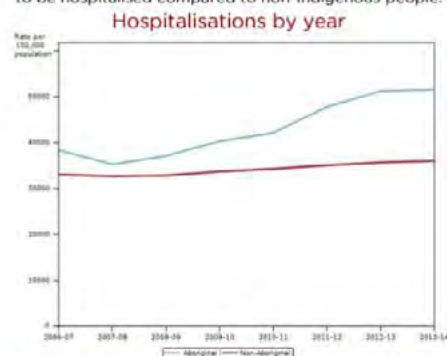
Figure 5: Hospitalisations



Figure 4: Household income



THE HIGHEST CAUSE OF HOSPITALISATIONS FOR ABORIGINAL PEOPLE IS DIALYSIS, where they are almost four times as likely to be hospitalised compared to non-Indigenous people.



HOSPITALISATIONS FOR ABORIGINAL PEOPLE ARE INCREASING OVER TIME compared to non-Indigenous people which remain constant.

Sustainable Development Goals: Making Progress

Activities created by Lorraine Chaffer, Vice President GTANSW & ACT

A student worksheet for this activity is in Appendix 1 on the GTA NSW & ACT website with this

Refer to SOURCE A

1. Identify the SDG that targets Gender Equality.
2. Explain in your own words the meaning of Gender Equality.
3. *The United Nations' calls on countries to pursue gender equality in all aspects of society, including equal access to education, health care, decent work, and political representation and states gender equality would help to achieve all 17 of the Global Goals*

Choose ONE SDG from the infographic and explain how gender equality could help to achieve the selected goal.

Refer to SOURCE B

4. The UN has 9 Targets and 14 Indicators for Gender Equality.
Targets state a goal and indicators measure if targets are achieved.
Example:
Goal: By 2030 give women equal rights to economic resources and access to ownership and control over land and other forms of property.

Measure the percentage of women who solely own land legally registered to their name

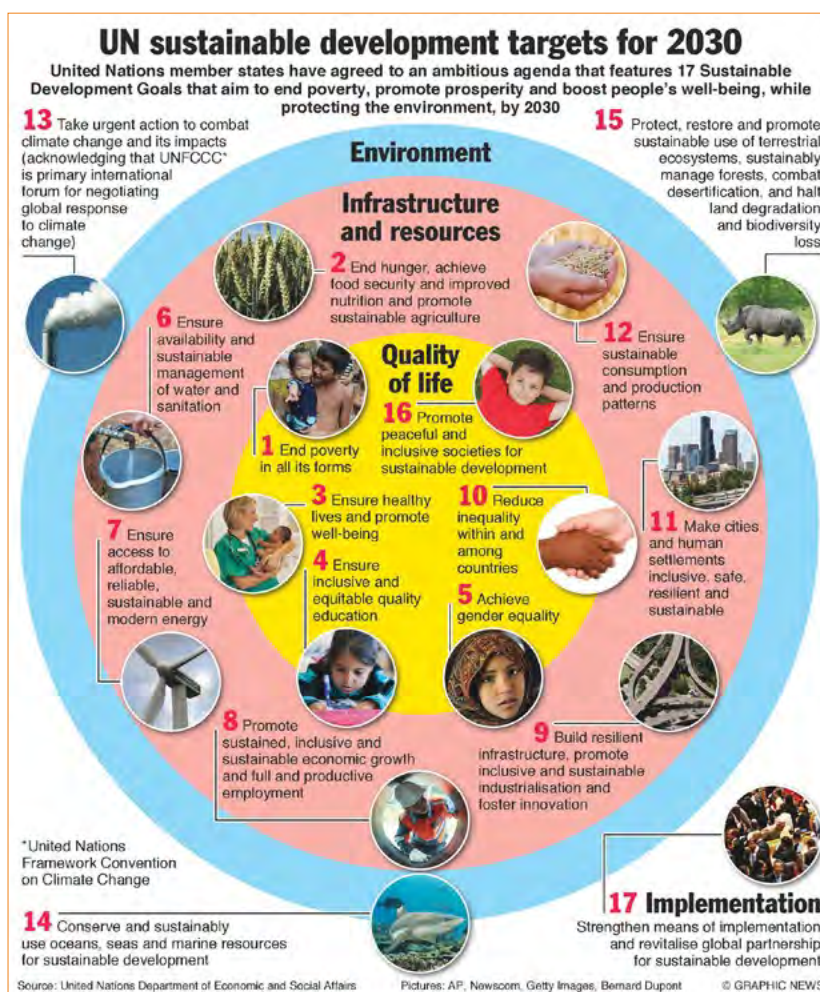
- a. Name the country in Source B that performed the worst on female land ownership.
- b. Name the country in Source B where land ownership is most equal.
- c. Describe the global location of the countries shown in the graph.
- d. Write a statement describing gender equality in the countries shown on the graph.
- e. True or false – *The countries closest to the diagonal line have similar rates of land ownership between men and women.*

Refer to SOURCE C

5. Gender Inequality Index (GII) is a measure of gender equality that measures inequalities in several aspects of human development including reproductive health; empowerment, secondary education; and economic status.
 - a. How many countries achieved scored over 90 on the GII in 2021
 - b. Name four countries that achieved scores of 50-60 on the GII in 2021
 - c. Calculate the % women and girls living in countries that scored very poorly on the GII
 - d. Describe Australia's score on the 2021 GII at a global scale and within countries that scored a good result.
 - e. Calculate the difference in performance on the GII between Denmark and Chad.
 - f. Explain why the infographic is titled 'World off track on gender equality targets.'

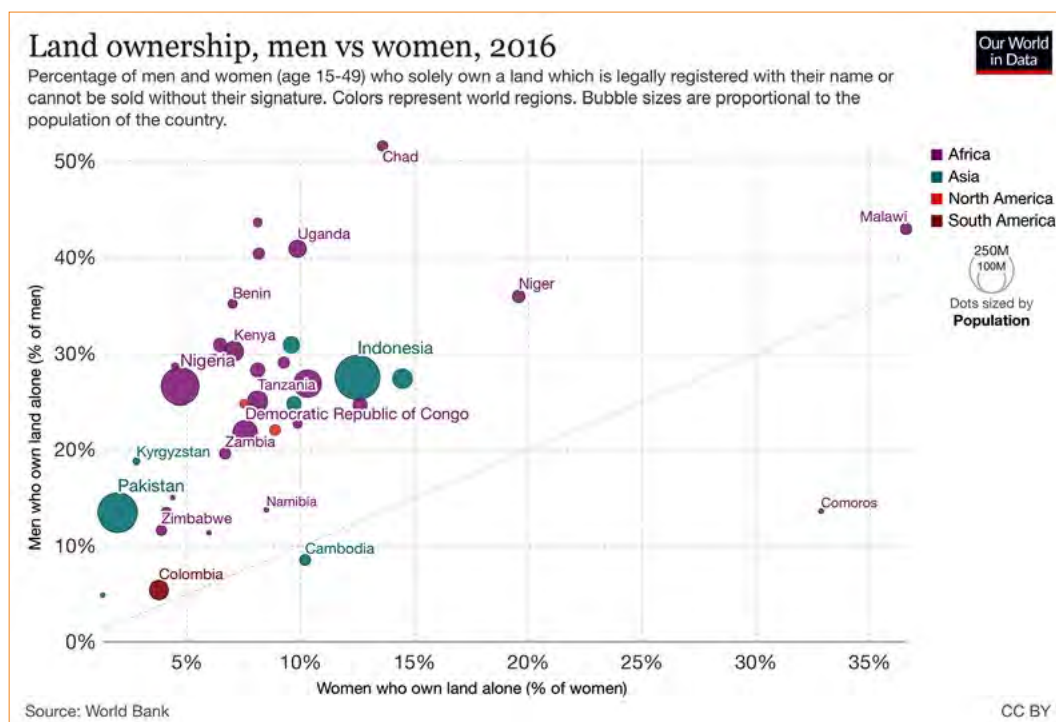
HUMAN WELLBEING: SUSTAINABLE DEVELOPMENT GOALS

SOURCE A: SUSTAINABLE DEVELOPMENT GOALS



Source: Graphic News

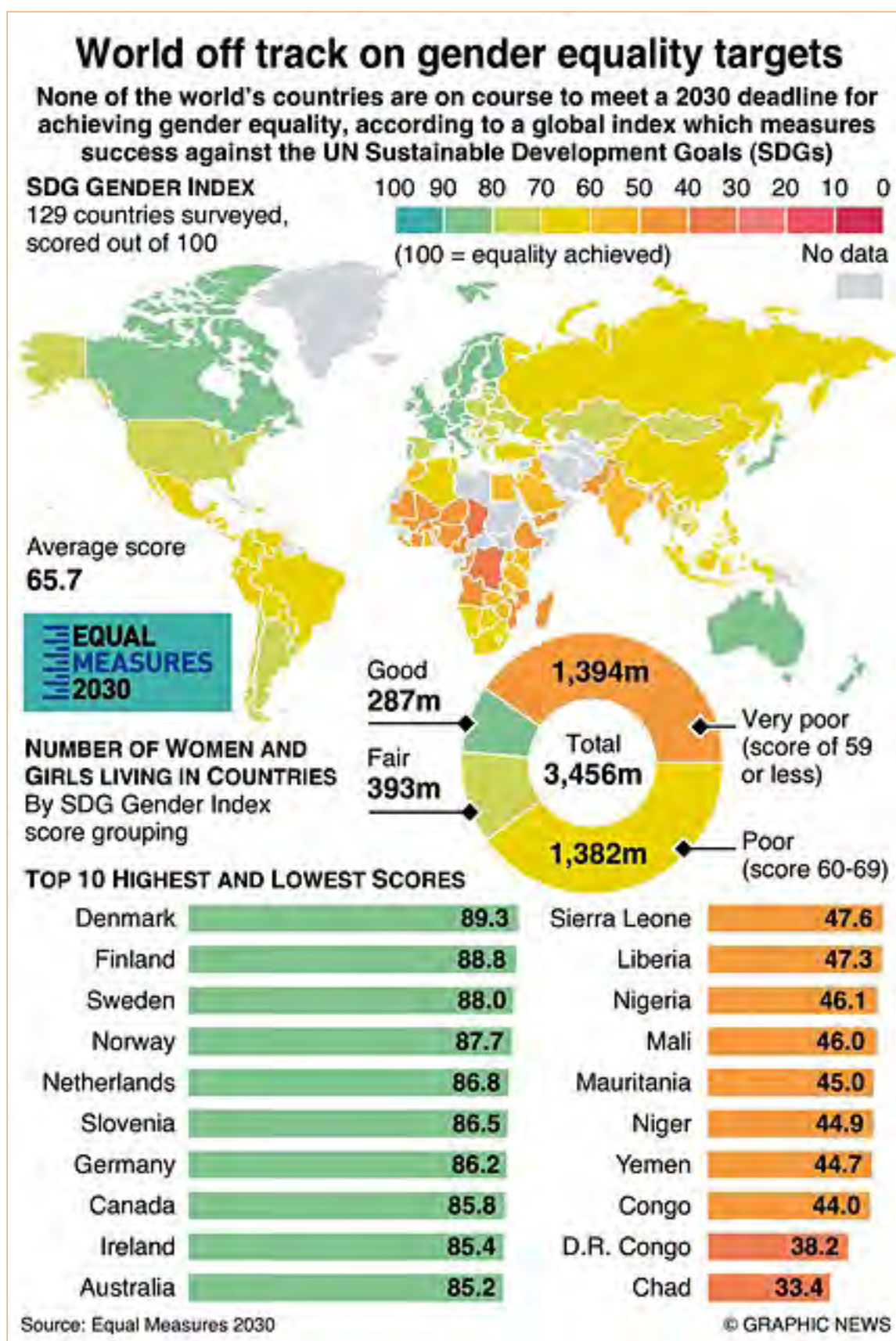
SOURCE B: GENDER EQUALITY: LAND OWNERSHIP



Source: Screen capture from <https://sdg-tracker.org/gender-equality>

HUMAN WELLBEING: SUSTAINABLE DEVELOPMENT GOALS

SOURCE C: GENDER EQUALITY INDEX



Source: Graphic News (Licenced)

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

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