

ENGAGING WITH GEOGRAPHICAL TOOLS AND SKILLS

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Geographical tools such as maps, graphs and statistics, spatial technologies and visual representations are the **tools** that enable students to develop **skills** in gathering, processing and communicating information. These skills are not only of benefit to geographers they are applicable to many other subjects and are also valuable for employment in a variety of occupations.

Providing students with tactile experiences in using geographical tools promotes understanding and application of the tools. It also engages students in fun, practical activities, many of which can be outside the classroom. Below are some hands on activities that can be used to explain aspects of these tools that students can utilise to gather, process and communicate information.

MAPS

Types of Maps

Activity

Exploring different types of maps can be done by creating a "My World Book" as shown in the image below. This lets students create different types of maps: political, landform, resource, population, picture or street map. This can be adapted for a variety of age groups using images, drawings or stickers to create different maps.



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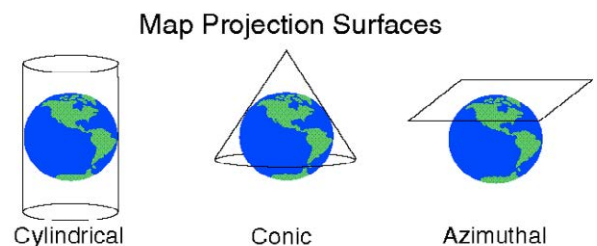
Map Projections

A map projection is a way to represent the earth's curved surface on a flat piece of paper. There are different types of projections; the three main ones are cylindrical, conical and azimuthal, though every flat map will distort the surface of the earth in some way.

Activity

A practical way to demonstrate a map projection is to wrap an orange in an A4 piece of paper to create a cylinder. The surface touching the paper around

the equator can be mapped accurately, the areas not in contact with the paper will be projected onto the paper and will be distorted.



Source: <http://www.ncgia.ucsb.edu/cctp/units/unit10/projsurfs.gif>

Latitude and Longitude

Latitude (shown as a horizontal line) is the angular distance, in degrees, minutes, and seconds of a point north or south of the Equator. Lines of latitude are often referred to as parallels of latitude. Longitude (shown as a vertical line) is the angular distance, in degrees, minutes, and seconds, of a point east or west of the Prime (Greenwich) Meridian Lines.

Activity

Using an orange as the globe is a hands-on approach and can be used in conjunction with Google Earth to establish the basic conventions of reading latitude and longitude.

1. Draw a line around the centre of their orange and name the Equator. Identify northern and southern hemispheres.
2. Draw a line halfway between the North Pole and the Equator and another halfway between the South Pole and the Equator, label the line 45°.

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3. Draw half way between the Equator and 45° latitude in both the northern and the Equator, label the Tropics of Cancer and Capricorn.
4. Ask students what they notice about the lines they have drawn (parallel and equidistant).
5. Teacher or students peel the orange and the segment lines can be used to identify lines of longitude and identify East and West hemispheres. Ask students what they notice about the segment lines. (Intersect at the poles and therefore not parallel).

Latitude and Longitude (continued)

Other activities include:

- making a latitude and longitude grid in the playground
- dividing the class room into hemispheres and students group desks into continents
- using pumpkins to make a globe.
- There are a myriad of websites and worksheets that can be used to assist in explaining latitude and longitude.
- Battleships game <http://passporttothenations.com/battleship-map-coordinates-game/>



Source: <http://www.nea.org/tools/tips/Pumpkin-Geography.html>

Topographic Maps

• Scale

The scale on a map is a statement of the relationship between the measurement on the map and the corresponding measurement on the earth's surface. Below are common scales used on topographic maps. A scale of 1:100 000 means 1cm on the map **represents** 100 000 cm on the ground.

Scale	Fraction	Meters	Kilometers
1:100 000	$\frac{1}{100000}$	1000m	1km
1: 50 000	$\frac{1}{50000}$	500m	.5km
1:25 000	$\frac{1}{25000}$	250m	.25km

Large scale maps show more detail while small scale maps cover more area. A map with a scale of

1:20 000 means that the features on the map are drawn at 1/20000 of their actual size. A map with a scale of 1:50 000 means that the features on the map are 1/50000 of their actual size. 1/20000 is a larger fraction than 1/50000 and so the map 1:20000 is a larger scale map.

Activity

- * Use the **"My World Book"** to investigate small and large scale maps.

- * Google Earth can also be used to zoom to show small and large scale maps.
- * Students measure and draw their classroom, bedroom, playground to scale.

• Area References and Grid References

Topographic maps show the specific details in a relatively small area on the ground, such as landform features and urban areas. Latitude and longitude is useful for locating places on small scale maps

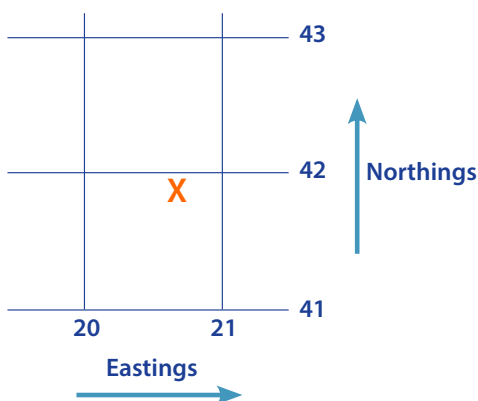
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MAPPING IT OUT: NSW Rural Fire Service media liaison officer Greg Potts with RFS members, 2009. Source: www.batemansbaypost.com.au/story/1030122/deua-fire-threat/

though on larger scale maps a grid system is used to locate specific features. The (horizontal) east-west axis grid numbers are called Eastings, and (vertical) north-south axis are called Northings. Eastings are always written before Northings. An area reference is located by using the bottom left hand corner of the grid square.

Area references are 4 figures: **eastings** before **northings**, bottom left hand corner of the grid.



For example the Area Reference for **X** is AR2041. Grid references are 6 figure references that provide a more specific location. The Grid Reference for **X** is GR207418.

Activity

Floor Map

Create a grid on the floor in the classroom or on a large sheet that can be folded up when not in use. Students use cards to place features on the map and record Area References and Grid References.

Materials

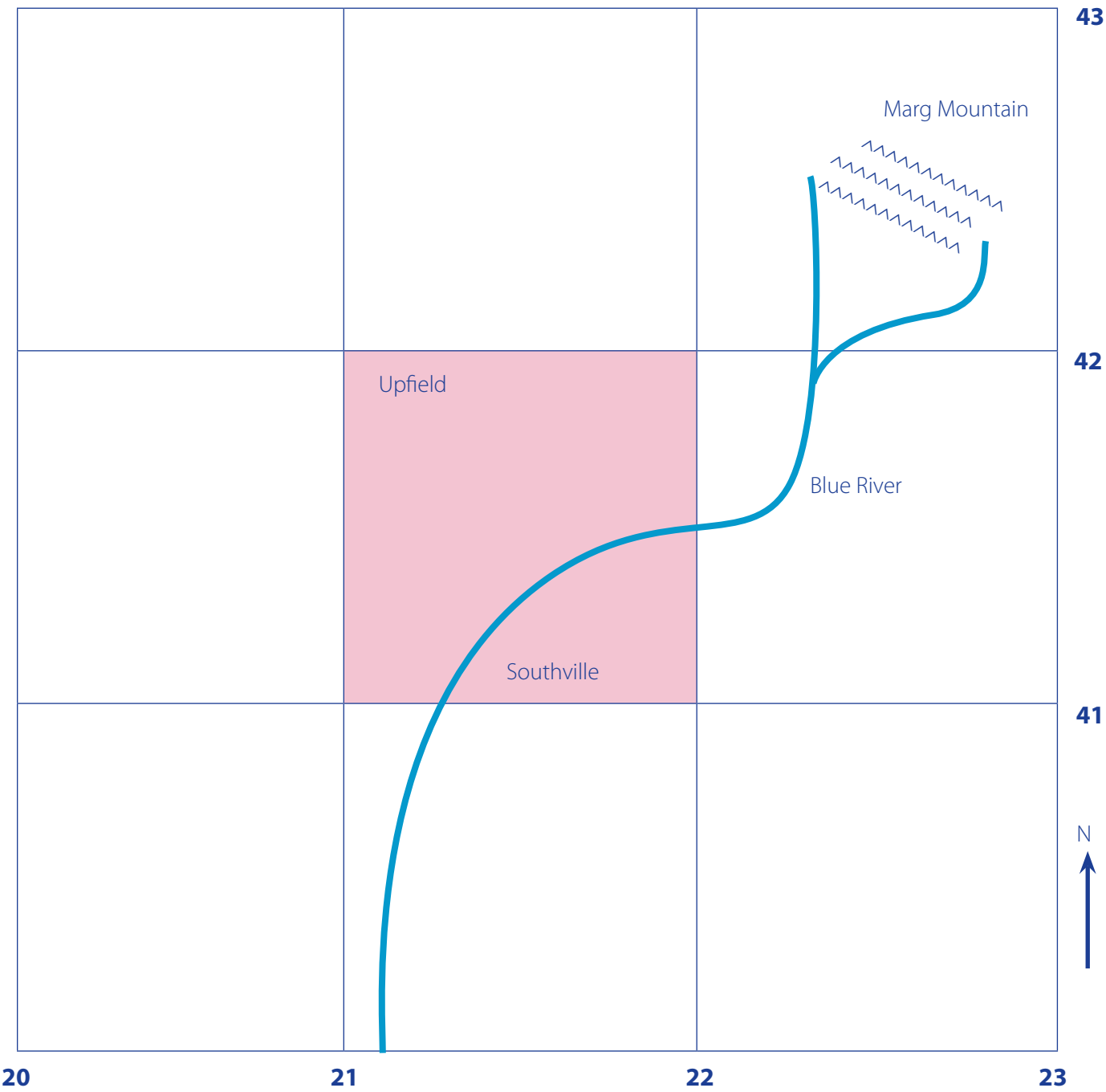
- Masking tape or string
- Grid numbers
- Packs of place cards labeled house, farm, mine, school, red, orange, and green environment cards.
- Marker cones or egg cartons for mountains
- Blue ribbon or streamers for rivers
- Worksheet

A floor map made using a large sheet can be reused



Activity: Floor Map

School Town



20 21 22 23

Scale 1cm: 500m

Legend

^^^^^^	Mountain
————	River
	Urban area
F	Farm
H	House
M	Mine
S	School

Worksheet for “School Town” Map

1. In the pack of cards you have been given, place the farm, house, mine and school cards on the floor map where you think is appropriate. Place a symbol for this feature on your map.

Feature	Symbol
Farm	
House	
Mine	
School	

2. In the table below record the Area Reference and Grid Reference of your cards.

Feature	Area Reference (4 figures)	Grid Reference (6 figures)
Farm		
House		
Mine		
School		

3. Look at where you have placed the house, school, farm and mine. In the table below list three environmental issues that could occur. Place a red card (severe environmental issue), orange card (potential environmental issue) and green card (no environmental issue) on the floor map.

	Environmental Issues
1	
2	
3	

4. Outline how you could prevent the red and orange environmental issue from occurring.

Red	
Orange	

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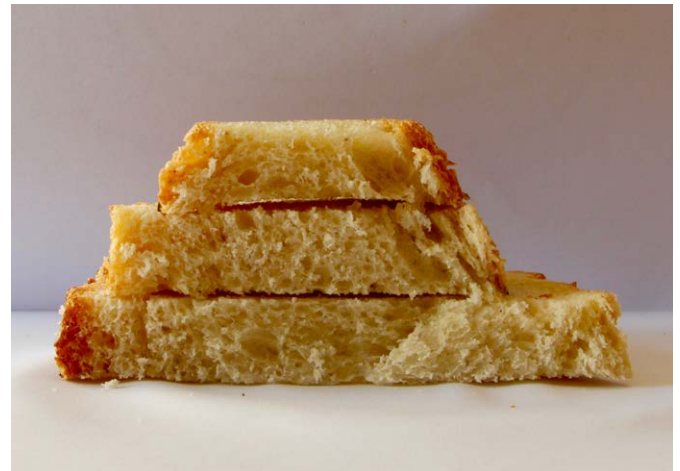
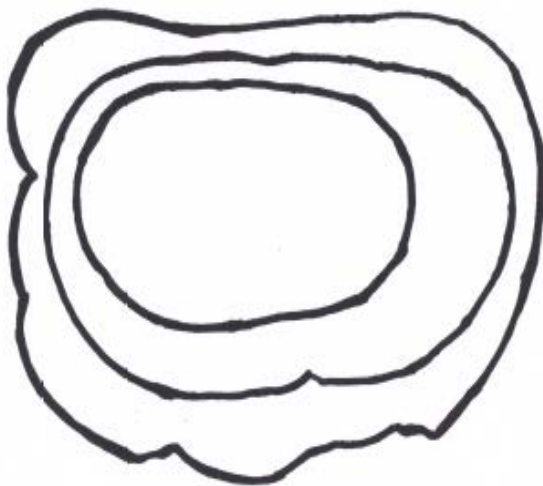
Contours

Contours join places of equal height and indicate the shape of the landforms.

Activity

A variety of products can be used to explain contours and landform features such as plasticine, Plaster of Paris, play dough, thick cardboard and bread.

Using three slices of sourdough or similar breads can create "Bread Hill". Students build "Bread Hill", and look at the bird's eye view of the landform. Dismantle the hill and then draw a line around each piece of bread to create a contour map. The hill can be constructed again, cut in half to create a cross-section view.



K Hilyard



K Hilyard

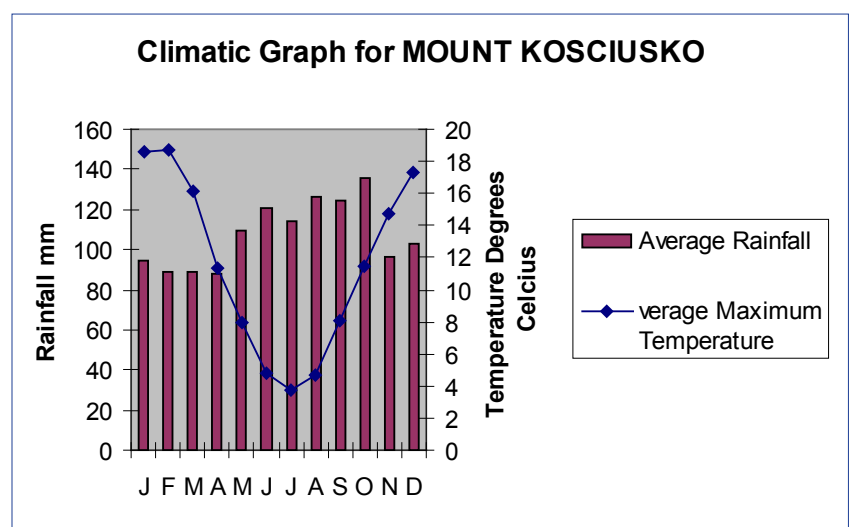
GRAPHS AND STATISTICS

Collecting statistics and creating graphs is a good way to incorporate fieldwork activities and use graphs to enable data to be communicated and interpreted.

Activity

Collect temperature, rainfall, wind information and create daily wall chart for the classroom. Simple instruments can be made such as the wind vane below. Students can look at patterns and also use the Bureau of Meteorology to look at longer term climate data. Climate graphs can be used to promote thinking and interpretive skills. The climate graph on page 18 and questions are adapted from David Leat's *Thinking through Geography*.

Living in Mount Kosciuszko



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1. Look at the climate graph on page 20, what patterns do you see?
2. Try to work out which month fits each of the five statements best.
3. Write down your reasons for choosing the month.

	Statement	Month	Reason
1	Today was the hottest day of the year		
2	There has been the most rain all year		
3	Today it was chilly and raining		
4	We have to keep fires burning all day to keep warm		
5	Many tourists come for bushwalks to Mount Kosciuszko		

VISUAL REPRESENTATIONS

Activity 1

This activity is applicable to natural and human features of the environment and factors that change places.

Divide students into small groups, each with an image from "Window" by Jeanie Baker.

Using the visible thinking routine ask each group to identify what they "see, think and wonder". Each group spends five minutes on each image. Groups then share their ideas.

Students can write a storyboard for the images or research change in their local area and create their own "window" into their area.



Activity 2

The thinking routine "think, puzzle, explore" can be used to start a topic and can be relevant to any topic. The images below on the timber industry in New Zealand would be a good starting point for Environmental Change and Management.



Picton, New Zealand (P McLean)



Napier, New Zealand (P McLean)

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FIELDWORK

Fieldwork provides numerous opportunities in using tools to develop skills in acquiring, processing and communicating information outside the classroom and outside the textbook. Below is an example of how a survey can be used to gather information. The “Liveability Survey” that can be adapted to use in the local area and is applicable to Stage 4 Place and Liveability.

Observe what is around you and complete the liveability survey.

Measurement	Method of data collection	Count
Amount of traffic	Count passing traffic for 5 minutes	
Shops nearby	Look on a map or observe main shopping street	
Schools nearby	Observe	
Parks nearby	Observe	
Bus stops/taxis/transport	Observe	
Litter	Count amount	
Noise	Measure using iPhone app such as deciBel	
Housing ambience	Visit the street and decide ambience on a scale of 1-5	
Trees and gardens	Visit the street and decide how green the street is on a scale of 1-5	
Paths	Visit the street and decide how good are the paths on a scale of 1-5	
Streetlights	Visit the street and decide how effective are the streetlights in providing a well lit street at night on a scale of 1-5	

Give each measurement a score out of 5, with 5 being **excellent** and 1 being **poor**.

Amount of traffic

Many cars make a street dangerous and noisy. They can also cause pollution. It is harder for people to meet their neighbours if they live on a busy road.

1 Poor	2 Fair	3 Average	4 Good	5 Excellent
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Access to shops

If shops are near to where you live you can easily get what you need.

1 Poor	2 Fair	3 Average	4 Good	5 Excellent
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Access to schools

If there is a school nearby, children can walk to school which is better for them.

1 Poor	2 Fair	3 Average	4 Good	5 Excellent
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Access to parks

Parks are places where children can play and people can do sport or walk the dog. They also look nice.

1 Poor	2 Fair	3 Average	4 Good	5 Excellent
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Fieldwork (continued)

Fieldwork equipment can also be made by students to gather data.

Weather vane



Source: http://www.education.com/activity/article/wind_vane_first/

Resources

Area References and Grid References

<http://www.screenr.com/mEG>

Bearing

<https://www.screenr.com/VEG>

<http://subscription.echalk.co.uk/Geography/geography.html>

Cross Section

Echalk – <http://subscription.echalk.co.uk/Geography/geography.html>

<https://www.youtube.com/watch?v=StDYPluk25M>

Latitude and Longitude

http://www.bbc.co.uk/bitesize/ks3/geography/geographical_enquiry/geographical_skills/revision/6/

<https://www.youtube.com/watch?v=swKBi6hHHMA>

<http://www.nea.org/tools/tips/Pumpkin-Geography.html>

<http://passporttothenations.com/battleship-map-coordinates-game/>

Map Projections

<http://www.ncgia.ucsb.edu/cctp/units/unit10/projsurfs.gifSource>

Synoptic maps

http://www.bom.gov.au/lam/Students_Teachers/pressure.shtml

<https://www.youtube.com/watch?v=sbqZSzbGZjA>

Triangular Graph

<https://www.youtube.com/watch?v=jluVWDTpNcg>

Visible Thinking

http://www.visiblethinkingpz.org/VisibleThinking_html_files/VisibleThinking1.html

Weather Instruments to Make

<http://www.metoffice.gov.uk/learning/weather-for-kids/weather-station/wind-vane>

<http://www.metoffice.gov.uk/learning/weather-for-kids/weather-station/rain-gauge>

http://www.education.com/activity/article/wind_vane_first/

References

Baker, J. (2002) *Window* Second edition, London, Walker Books

Leat, D. (2008) *Thinking Through Geography* Fifth Edition, London, Chris Kingston Publishing

AGTA CONFERENCE 2017



The **2017 AGTA Conference: Geography for an inter-connected world** will be held from 9–12 January 2017 at the University of Melbourne in Melbourne. The conference organisational arrangements are being undertaken by the Geography Teachers' Association of Victoria.

Details will be available on the AGTA website including an invitation to present a workshop or lead a fieldwork trip, sponsorship options, conference accommodation, details of the pre-conference tour and conference program, earlybird registrations and conference newsletter are available at <http://www.agta.asn.au/>

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Stage 1

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- Let's Go Walkabout

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- The Nature of Living Things
- The Wangal Walkabout

Stage 3

- Investigating the Mangrove Environment
- Bennelong and the Wangal

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- Landforms and Landscapes – A Coastal Wetland
- Place and Liveability – Sydney Olympic Park: a place to live, work, learn and play

Stage 5

- Changing Places – Sydney Olympic Park: a colourful past, a bright future
- Environmental Change and Management – Challenges Of An Urban Wetland

Senior Secondary Excursions

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- Urban Places – Urban Renewal Case Study
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