Geographical Skills

Stage 4, 5, and 6
"HSC *Exam Success*"

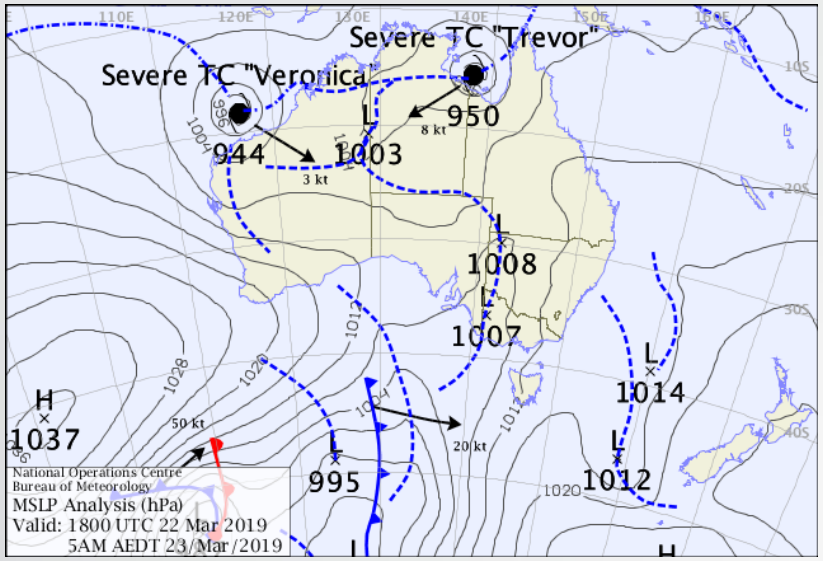
Drew Collins - Head of Global Studies | Newcastle Grammar

David Latimer - Head of HSIE | MLC

GTANSW Councillors

Syllabus;

H10 applies maps, graphs and statistics, photographs and fieldwork to analyse and integrate data in geographical contexts



What season?

What winds?

What about your weekend?

Never miss an opportunity

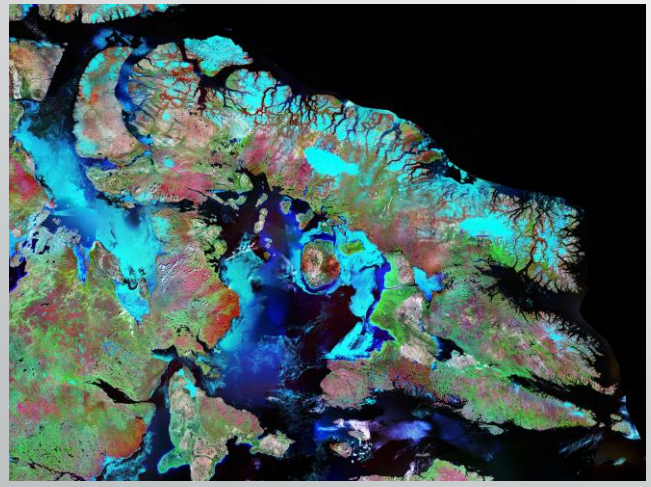
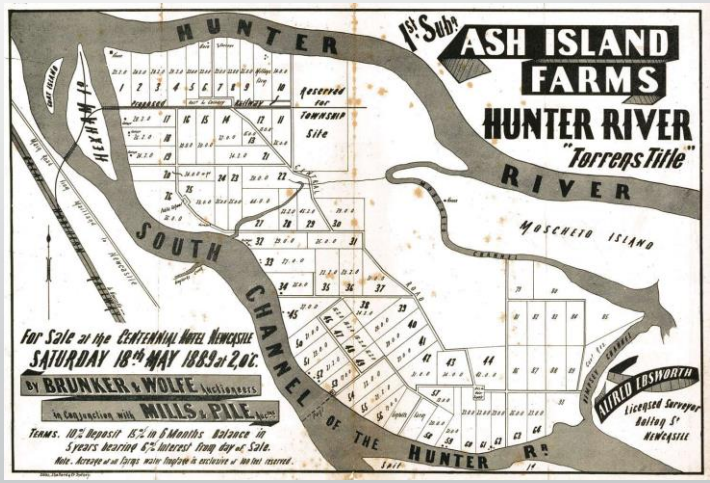


Image from Alamy

What type of photograph is this?

What do the colours represent?

Who might use these types of images in their vocation?



Living Histories

PART A : GRAPHS AND STATISTICS

PART A: GRAPHS AND STATISTICS

- → Calculating the **rate of increase or decrease** between two points
- → Calculating **proportional** or % change
- → Estimating the **value of proportional circles** of different size using a key
- → Estimating the value of particular segments **in pie graphs** of different size
- → Identifying the three elements depicted in **a ternary graph** and the line scale of each
- → Stating the 'mix' of elements at any point on a **ternary graph**
- → Identifying clusters and patterns on a **ternary graph**
- → Constructing and interpreting **proportional divided circles**
- → Interpreting **frequency distributions and diagrams**
- → Reading and interpreting **logarithmic and semilogarithmic graphs**
- → Interpreting and analysing **population pyramid** data.
- → **Climatic** graphs

1. CALCULATING RATE OF CHANGE
(INCREASE OR DECREASE)

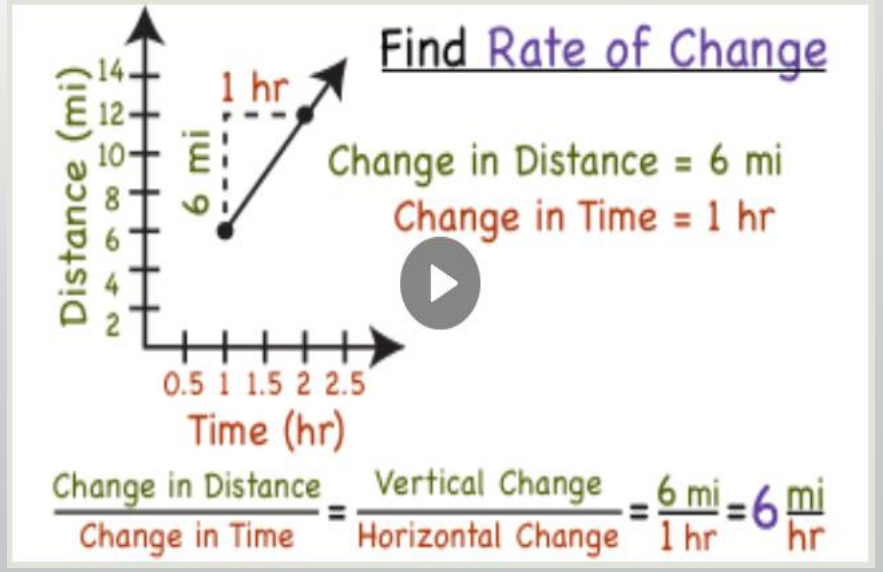
You are calculating the speed at which change occurred

Rate of change = $\frac{\text{Change in one variable}}{\text{Charge in time (Hours, days, years)}}$

Example: Population increased from 2mill to 3mill people from 2010 to 2015

Rate of change = $\frac{\text{1,000,000 people}}{\text{5 years}}$

= rate of 200,000 per year



TRY THIS	A population increases from 500,000 to 1.5 million between 2012 and 2016. What was the rate of the population increase? $\frac{\text{Change 1}}{\text{Change 2}} = \_\_\_\_\_$ = A person travels 800 km. It takes them 4 hours. What was the rate of change? $\frac{\text{Change 1}}{\text{Change 2}} = \_\_\_\_\_$ = A population changes from 1 million to 600,000 between 1980 and 2010 What was the rate of decrease in the population over that time? $\frac{\text{Change 1}}{\text{Change 2}} = \_\_\_\_\_$ =

TRY THIS	A population increases from 500,000 to 1.5 million between 2012 and 2016. What was the rate of the population increase? $\frac{\text{Change 1}}{\text{Change 2}} = \frac{1{,}000{,}000}{4}$ $= 250{,}000$ / year A person travels 800 km. It takes them 4 hours. What was the rate of change? $\frac{\text{Change 1}}{\text{Change 2}} = \frac{800}{4}$ $= 200$ km / hour A population changes from 1 million to 600,000 between 1980 and 201 What was the rate of decrease in the population over that time? $\frac{\text{Change 1}}{\text{Change 2}} = \frac{400{,}000}{30}$ $= 13{,}333$ per year

2. CALCULATING PROPORTIONAL OR % CHANGE

You are calculating the proportion by which change has occurred.

$$\text{Proportional or \% change} = \frac{\text{Change}}{\text{Starting figure}} \times 100$$

$$\frac{\text{(NEW – OLD)}}{\text{OLD}} \times 100$$

Example: The population increased from 2mill to 3mill people from 2010 to 2015.

$$\text{Proportional or \% change} = \frac{1 \text{ million}}{2 \text{ million}} \times 100$$

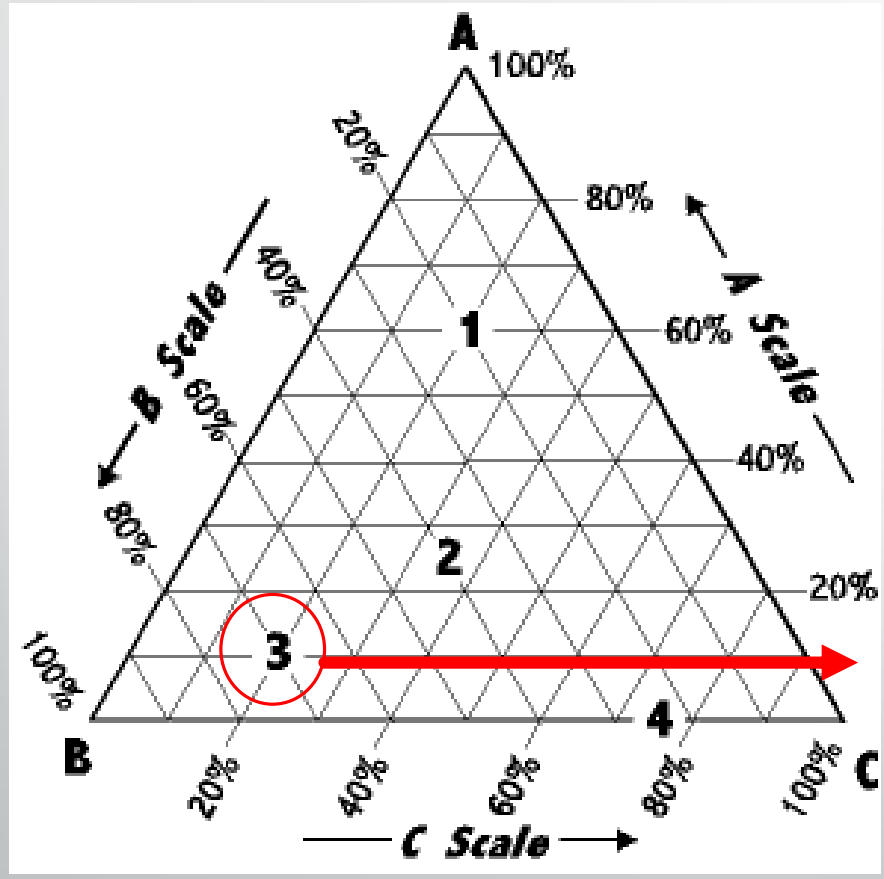
= 50% increase (half or 50% of the starting figure)

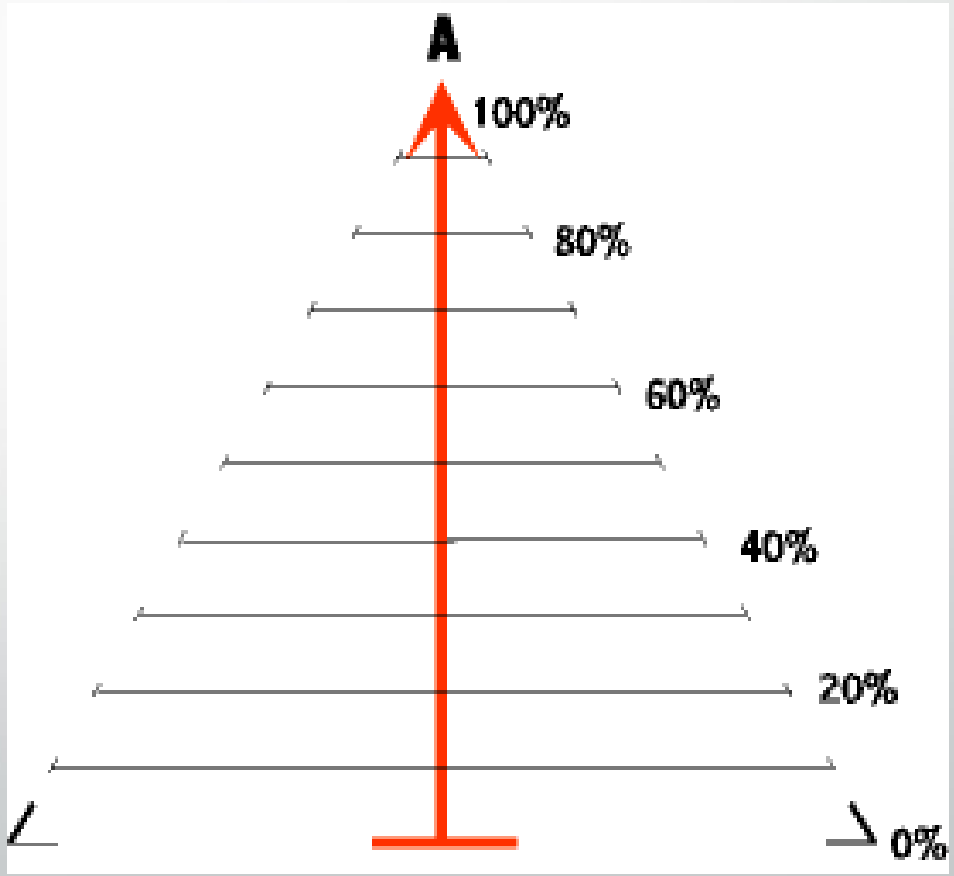
TRY THIS	A population increases from 500,000 to 1.5 million between 2012 and 2016. Calculate the percentage change in population? $\frac{\text{Change}}{\text{Starting figure}} = \text{X} \frac{100}{1}$ = This means …… ……
	A population changes from 10.2 million to 50.5 million between 1990 and 2015. Calculate the percentage change. This means …… ……

TRY THIS	A population increases from 500,000 to 1.5 million between 2012 and 2016. Calculate the proportional change. $\frac{\text{Change}}{\text{Starting figure}} = \frac{1{,}000{,}000}{500{,}000} \times \frac{100}{1}$ $= \frac{10}{5} \times \frac{100}{1}$ $= \frac{1000}{5} = 200\%$ This means the population increased by twice the starting figure
	A population changes from 10.2 million to 50.5 million between 1990 and 2015. Calculate the percentage change. $\frac{\text{Change}}{\text{Start}} = \frac{40.3}{10.2} \times \frac{100}{1}$ $= \frac{4030}{10.2}$ $= 395\%$ This means the population increased by almost 4 times the original starting figure

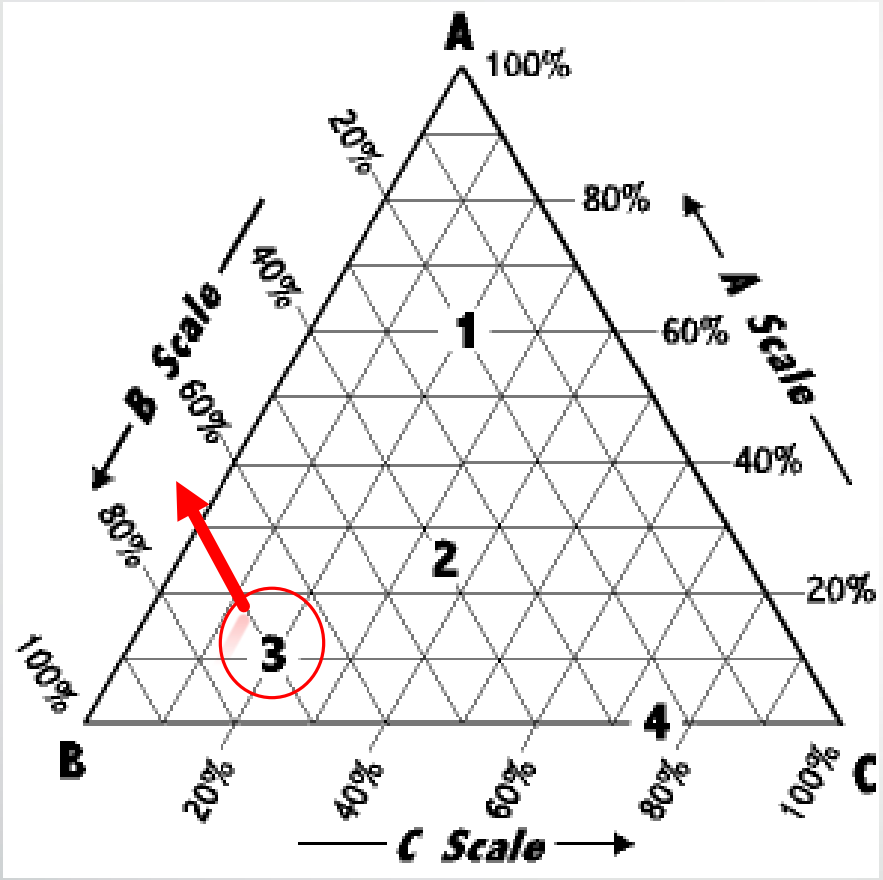
3. TERNARY GRAPHS

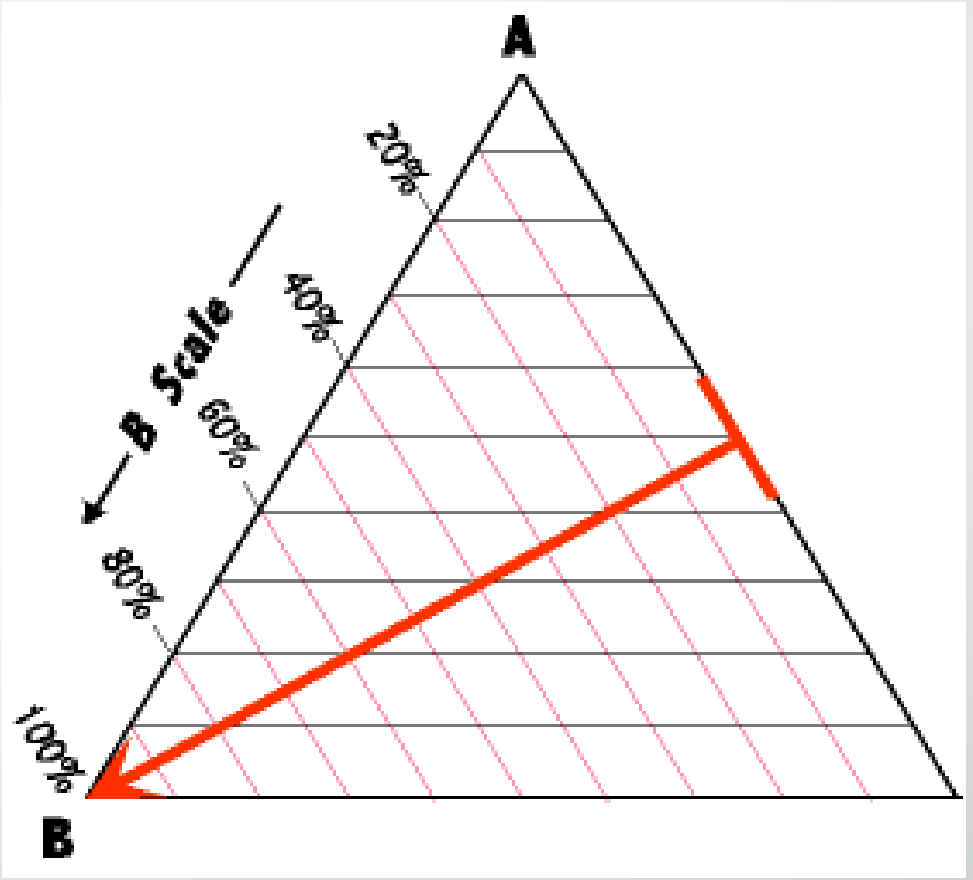
Ternary / triangle graphs are used to illustrate 3 sets of data adding to 100%.



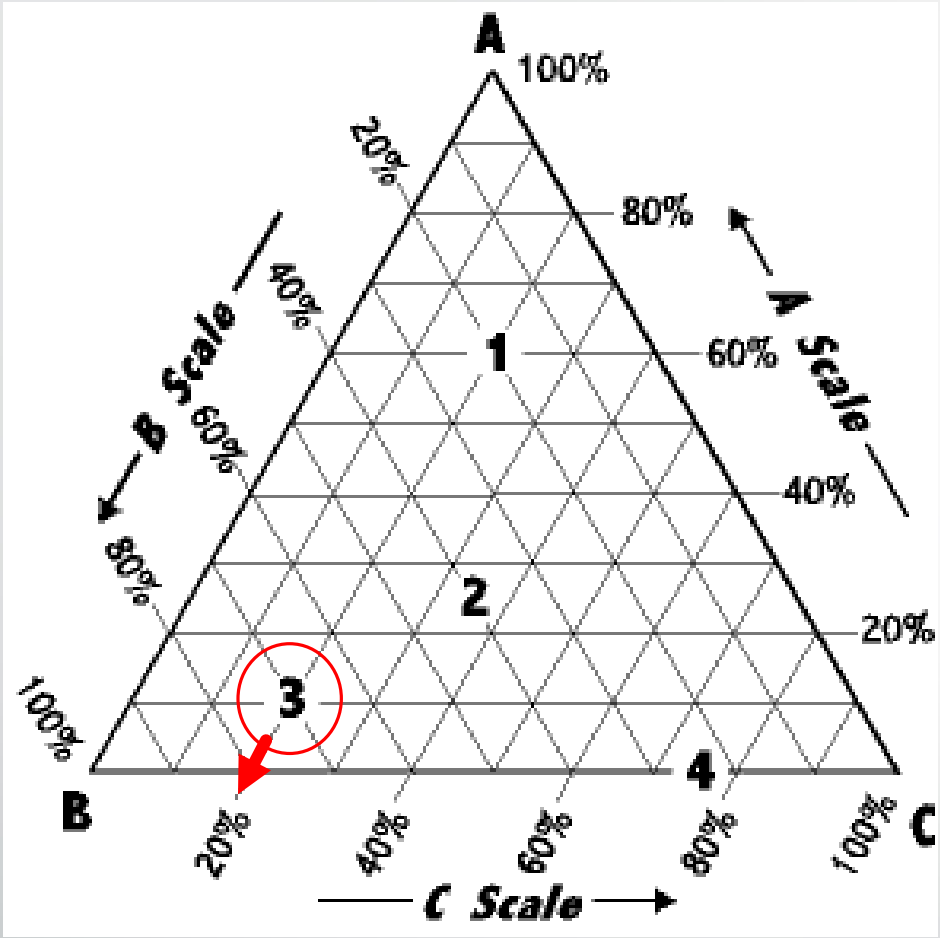


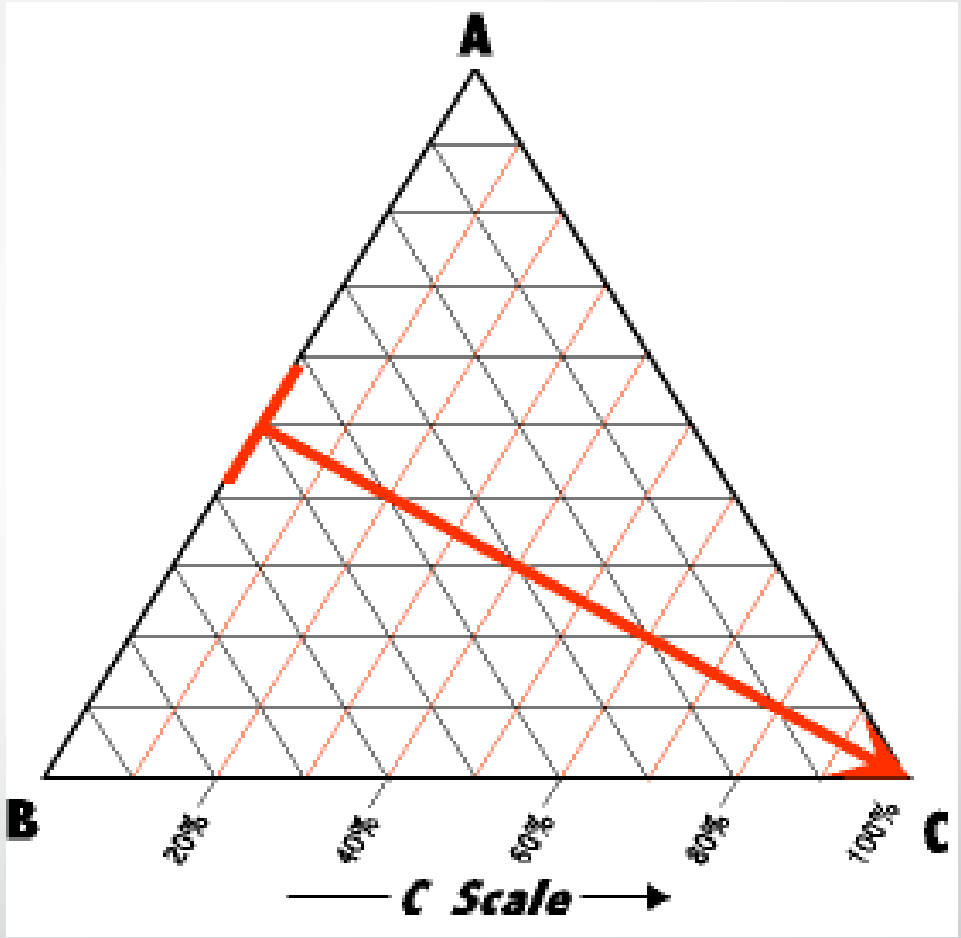
Place 3 on the A scale is 10%



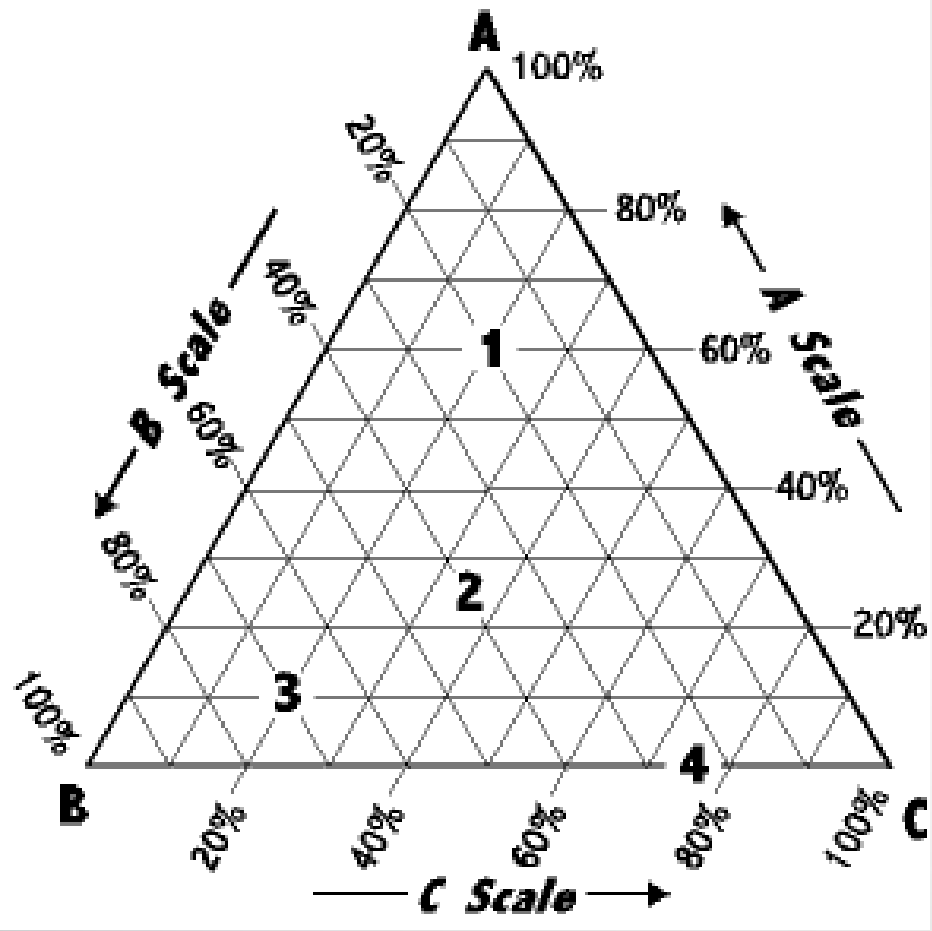


Place 3 on the b scale is 70%





Place 3 on the C scale is 20%



TRY THIS

Place 2

B scale

Place 1

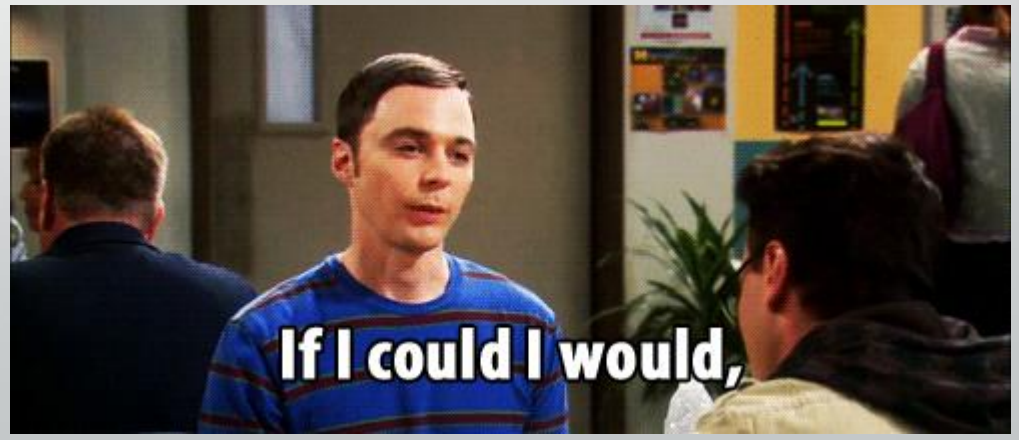
A scale
B Scale
C Scale

Place 2

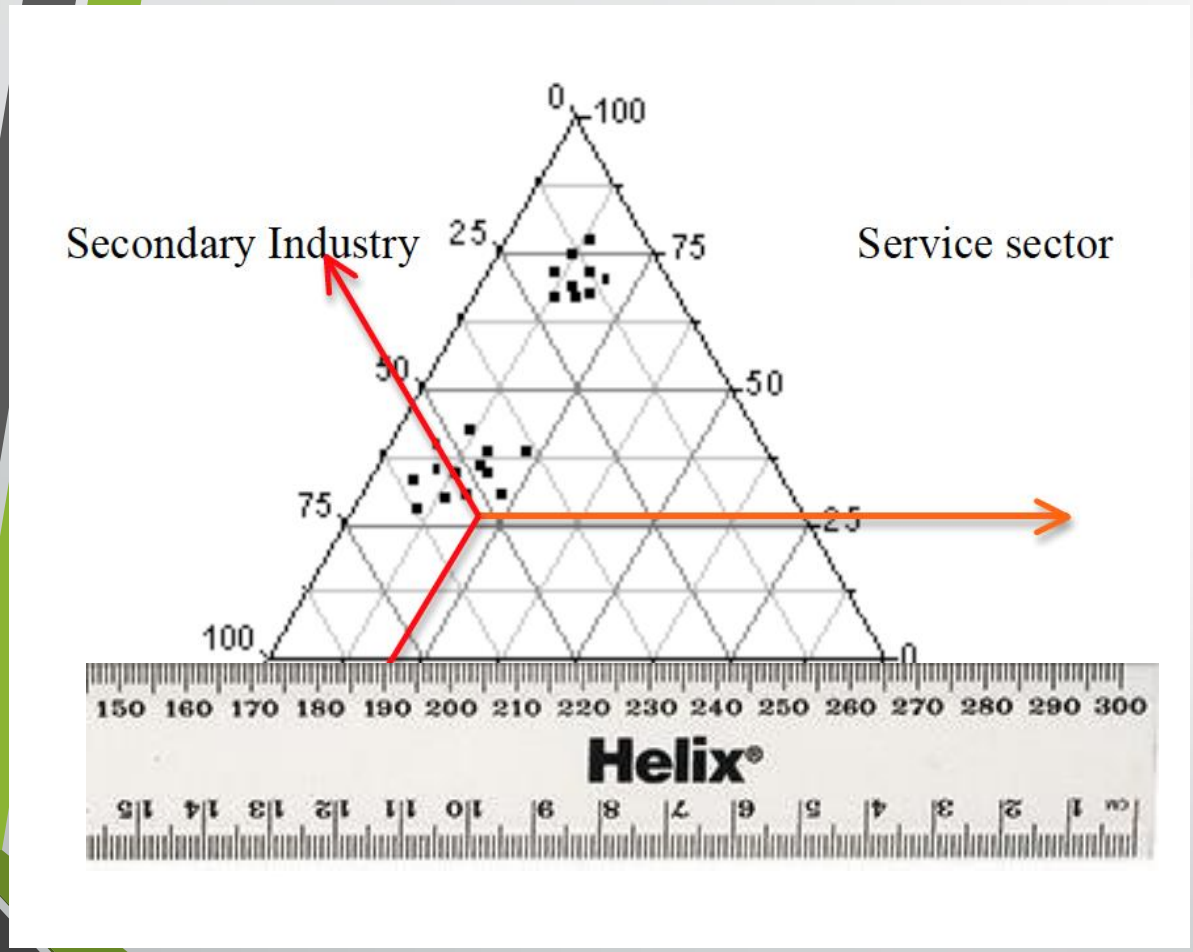
B scale 40%

Place 1

A scale 60%
B Scale 20%
C Scale 20%



MY METHOD



- Using a ruler
- Read the horizontal lines across to the right – the direction the scale goes up (Services sector).
- Swap sides to ensure numbers add up ~100%

NB: Its always the long line!

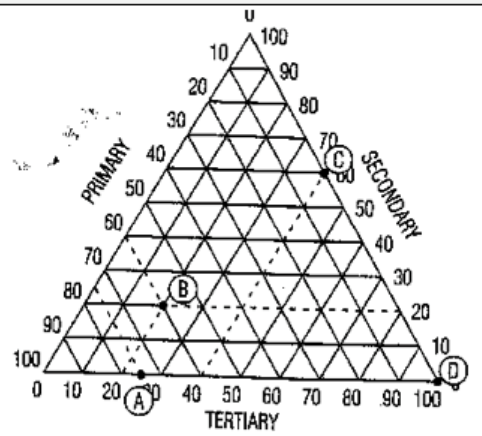
OBTUSE ANGLES

TRY THIS

Graph A
Identify the MIX of workplace elements at the following places

A Primary
Secondary
Tertiary
B Primary
Secondary
Tertiary

Graph 6A



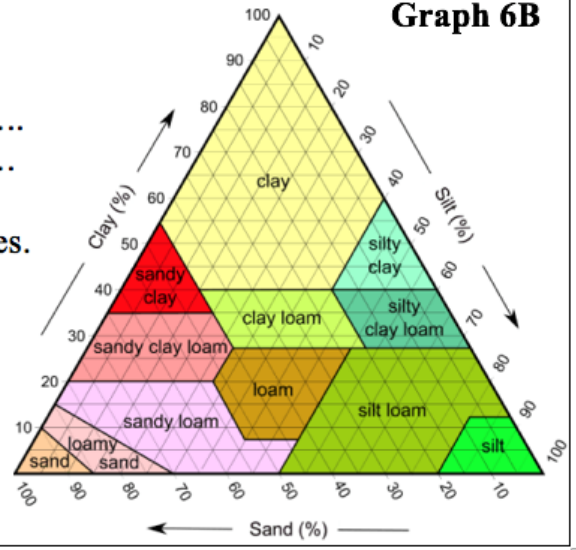
In which place might tourism be the principal economic activity? ……
Explain ……
……
Would Australia be closer to place D or A? ……
Explain ……

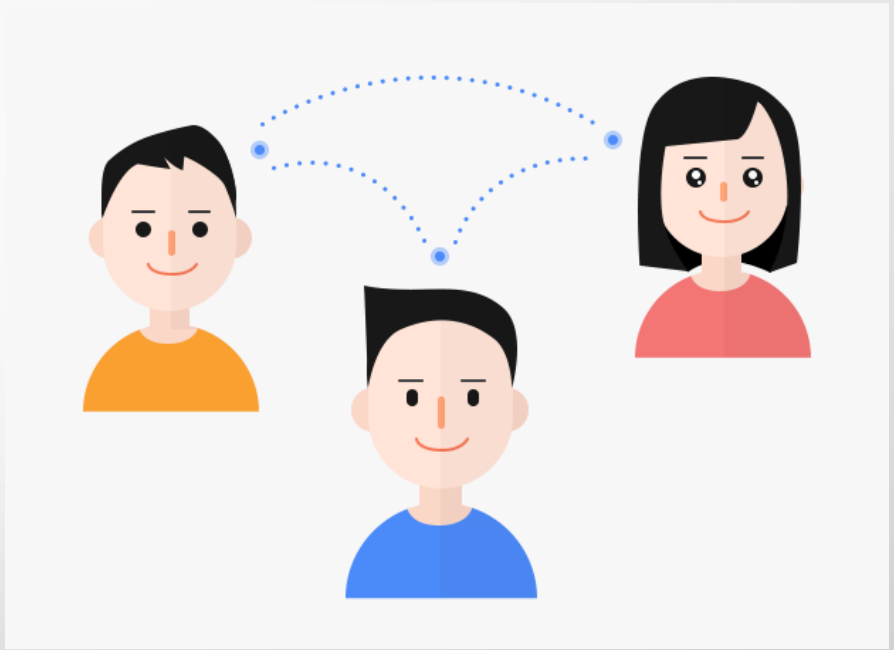
Graph 6B

Graph B:
Describe the features of a clay loam soil.
……
……

Soil type is a biophysical factor influencing economic activities. Name an economic activity in which soil type would be important……

Explain ……
……
……



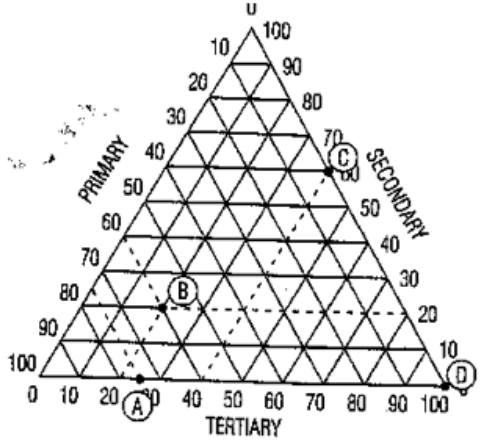


TRY THIS

Graph A
Identify the MIX of workforce elements at the following places

A Primary 75%
Secondary 0%
Tertiary 25%
B Primary 60%
Secondary 20%
Tertiary 20%

Graph 6A



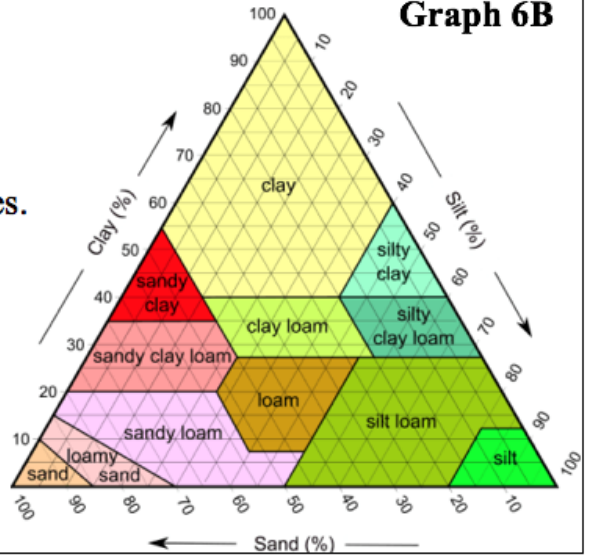
In which place might tourism be the principal economic activity? Place D
Explain Tourism is a service based industry and for some countries eg island nations, it contributes 100% of their GDP
Would Australia be closer to place D or A? Closer to D
Explain Australia has a large tertiary workforce and small % in secondary and primary

Graph B:
Describe the features of a clay loam soil.
A clay loam soil has 30-40 % clay, 20-50% sand, 20-50% silt

Soil type is a biophysical factor influencing economic activities.
Name an economic activity in which soil type would be important dairy farming

Explain: Dairy cow need good pasture that retains moisture but does not become too waterlogged. Silt and clay retain moisture and sand provides good drainage

Graph 6B



Where are you at?

LOST ME COMPLETELY

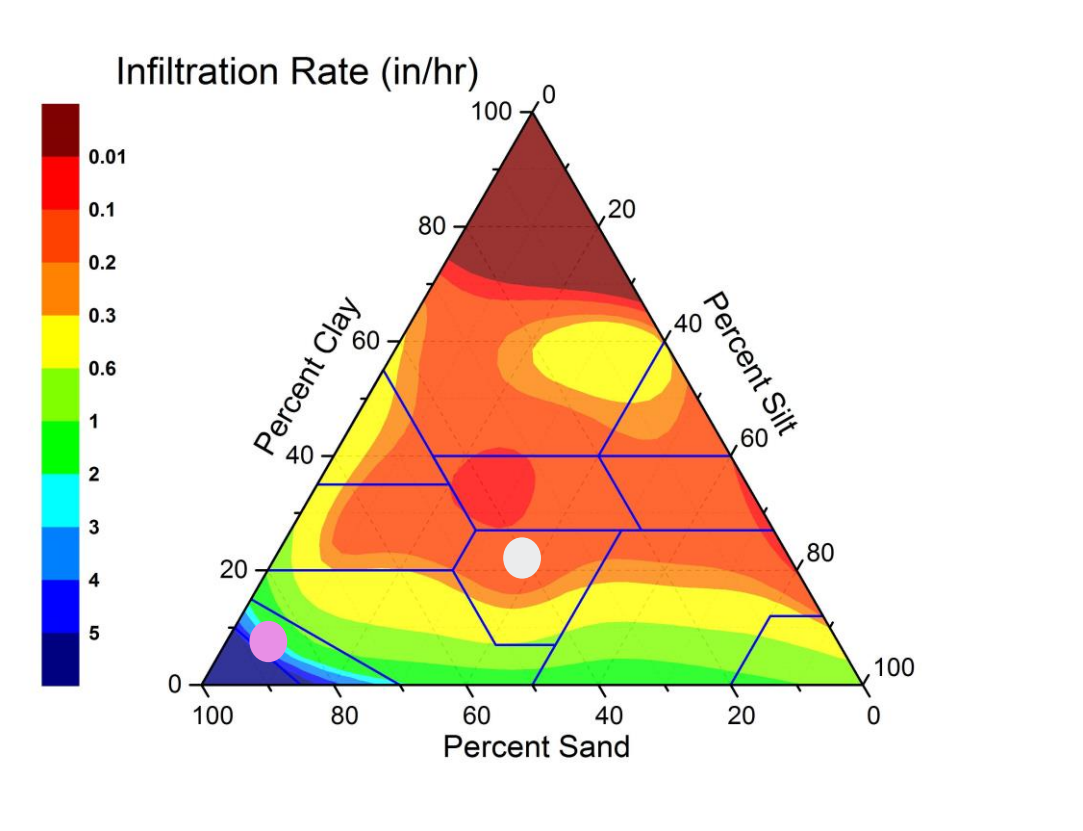
NEED HELP

THINK I'VE GOT IT

READY TO MOVE ON

GOT IT

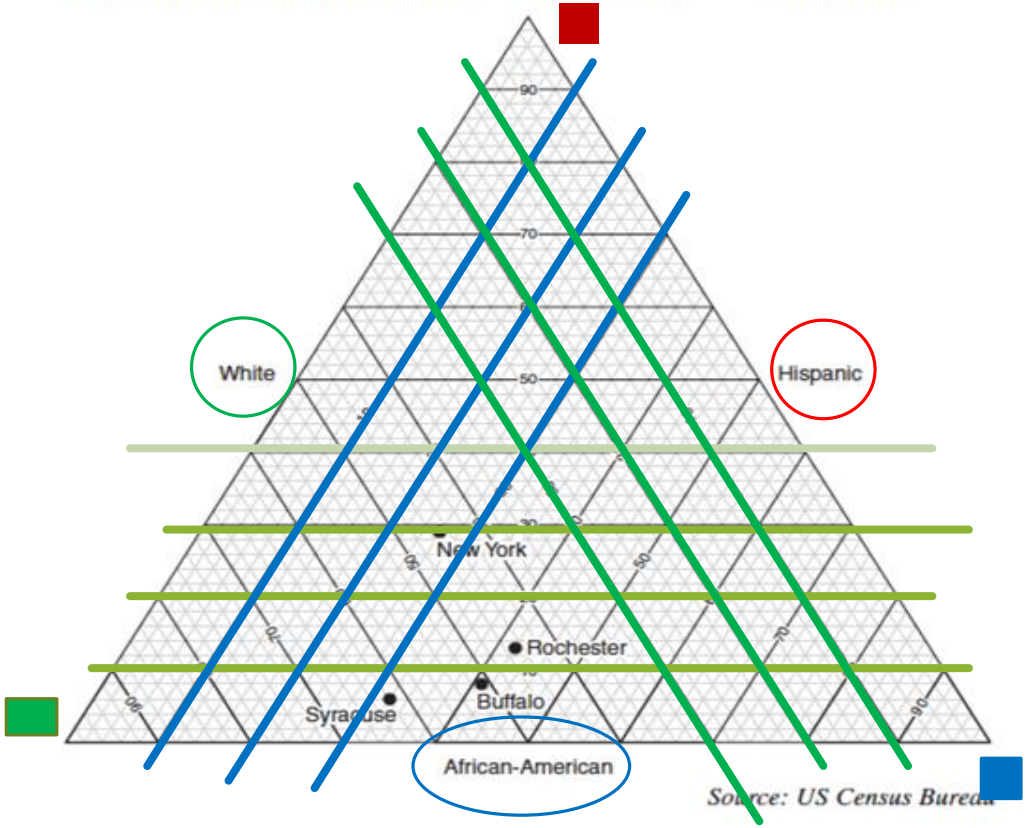
ALL GOOD !



Which would be the better soil for farming?

OR

Percentage of Population by Ethnicity – selected cities in New York State (2005)



Source: US Census Bureau

What percentage of people living in Buffalo in 2005 were Hispanic?

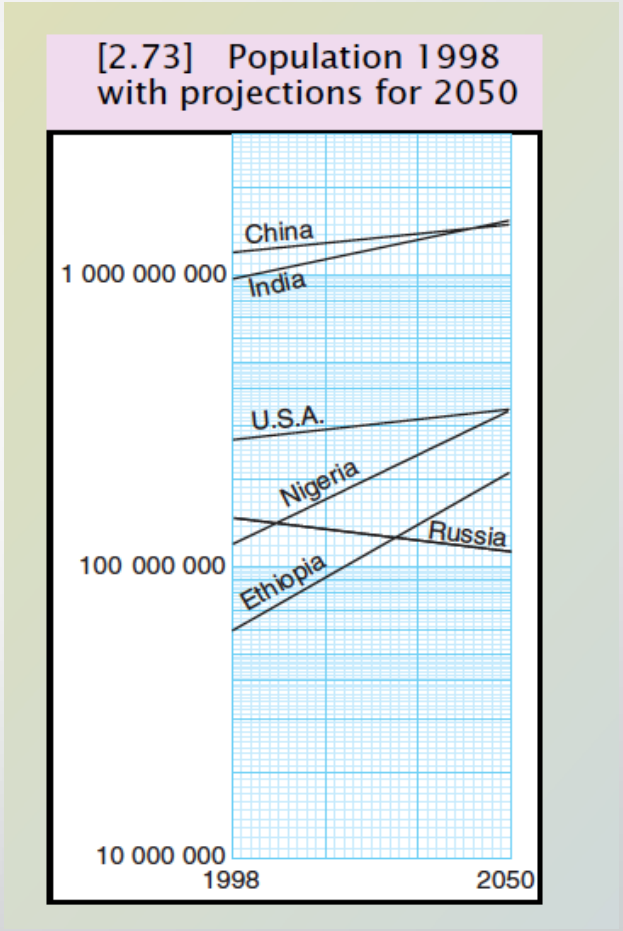
A ✓ 8%
B ✗ 13%
C ✗ 41%
D ✗ 51%

4. SEMI-LOGARITHMIC GRAPHS

These graphs are used to show data which can have a large range of values.

To do this one (or both) scale is not arithmetic (linear) but increases in cycles. In these graphs the cycles increase by a value of 10.Values within a cycle vary.

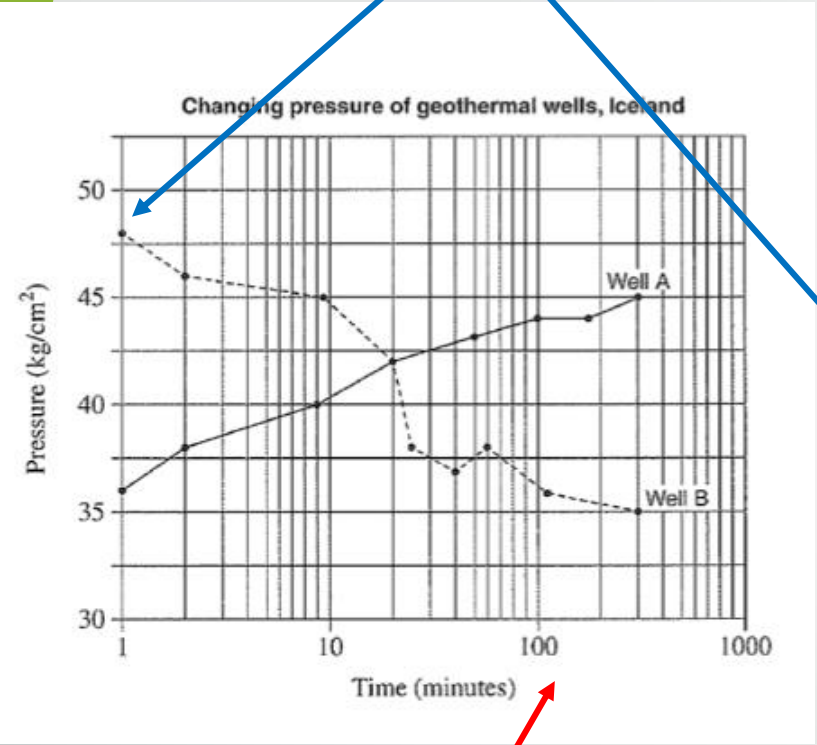
- Useful for studying data that changes exponentially
- Can display a much larger range of data.
- Useful for showing **rate of change**.

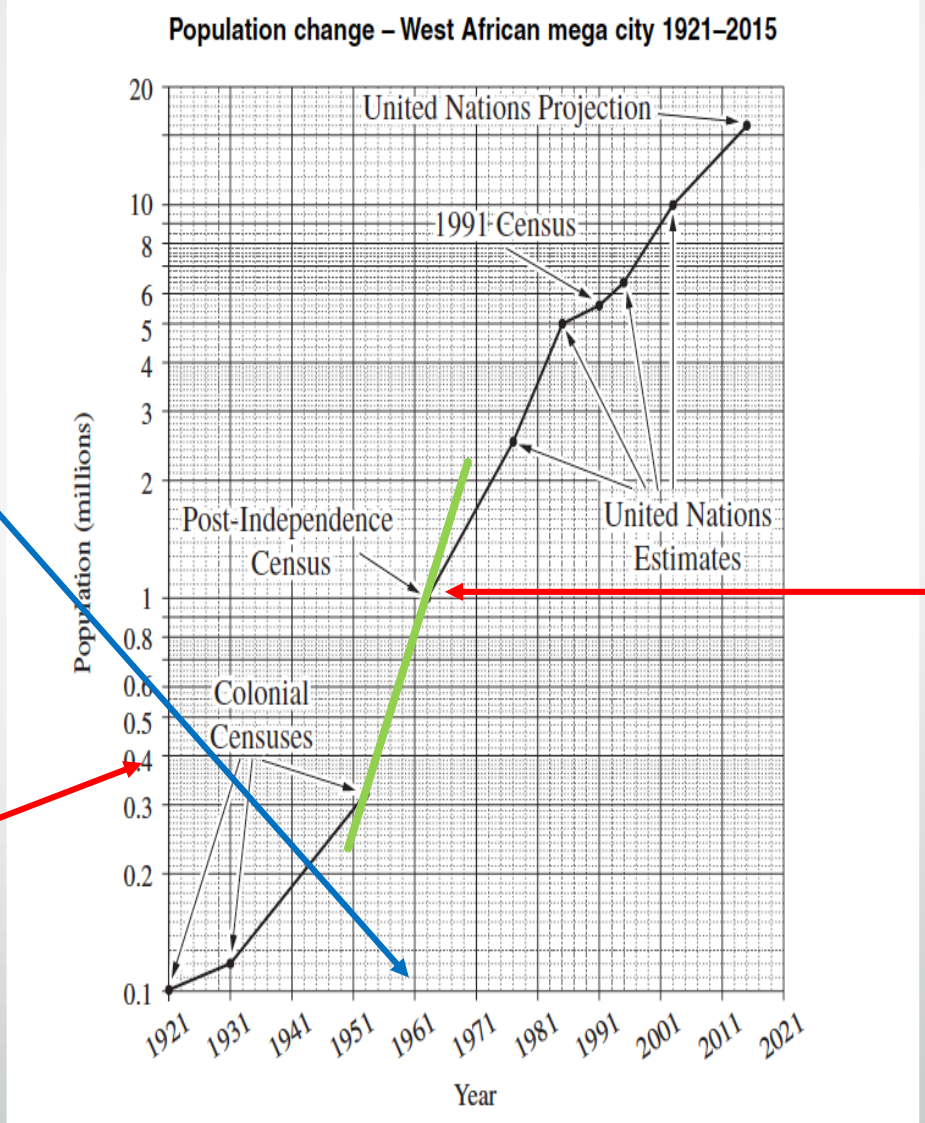


SEMI-LOGARTHMIC IS MOST COMMON

Instantly recognizable

Arithmetic scale





Logarithmic scale

Rate of change = steepness of line

In these examples, each cycle is 10 times the first

TRY THIS

Graph 4A

The fastest rate of change between 1998 and 2050 will be experienced by…… and the slowest rate of population growth by ……..

India's population is projected to overtake that of China. What does that tell us about the comparative rate of population change between the two countries?

……

Graph 4B

What was the population of the west African city in:

1963

2003

State the 10-year period that experienced the greatest rate of change in population

……..

Calculate the proportional change in population from 2003 to 2015

Graph 4C

State the time and pressure when Well A and Well B experienced the same well pressure.

Time ……

Pressure ……...

Over how many hours was the well pressure monitored? ……..

At what time did the fastest rate of decrease begin in Well B? ……

Suggest why a semi log graph was used for this data

……

Think-share

Think-pair-share

TRY THIS

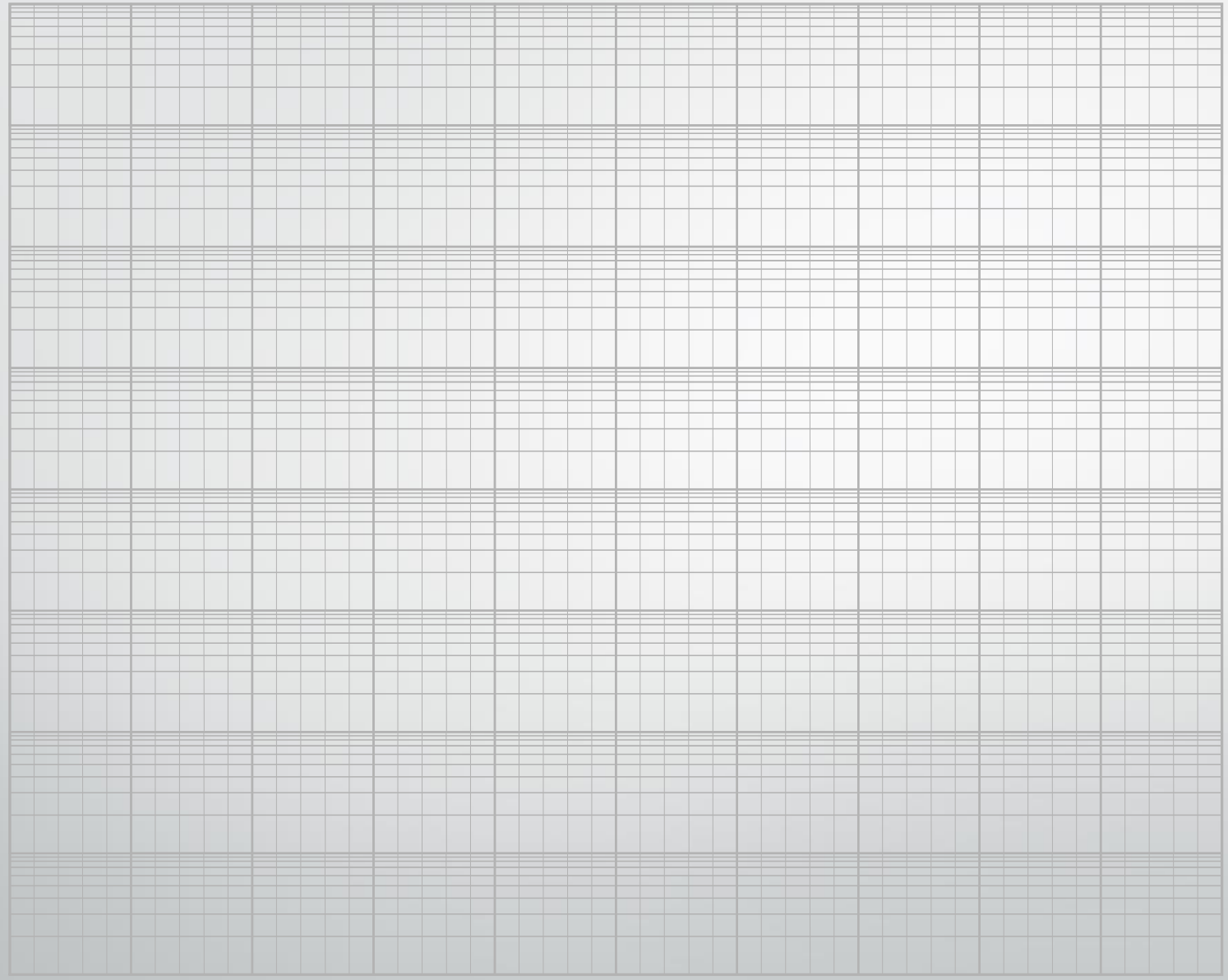
Graph 4A the fastest rate of change between 1998 and 2050 will be experienced by Ethiopia (steepest slope) and the slowest rate of population growth by USA (flattest slope)

India's population is projected to overtake that of China. What does that tell us about the comparative rate of population change between the two countries?
India's population is growing at a faster rate if it is to overtake China.

Graph 4B
What was the population of the west African city in?
1963 1 million
2003 10 million
State the 10-year period that experienced the greatest rate of change in population
1953 – 1963
Calculate the proportional change in population from 2003 to 2015

$$\frac{\text{Change}}{\text{Starting figure}} \times 100 = \frac{(16-10)\,6}{10} \times 100 = 60\%$$

Graph 4C
State the time and pressure when Well A and Well B experienced the same well pressure.
Time 20 minutes
Pressure 42.5 kg/cm^2
Over how many hours was the Well pressure monitored? $\frac{1 \text{ to } 300}{60} = \frac{299 \text{ minutes}}{60} = 4.98$ hrs
At what time did the fastest rate of decrease begin in Well B? At 20 minutes
Suggest why a semi log graph was used for this data
Changes in pressure are exaggerated over short period of time eg at Well B between 10 and 20 minutes. In an arithmetic graph that might change not be as noticeable



When you do a population or megacities study get students to plot some data on a semi logarithmic graph.

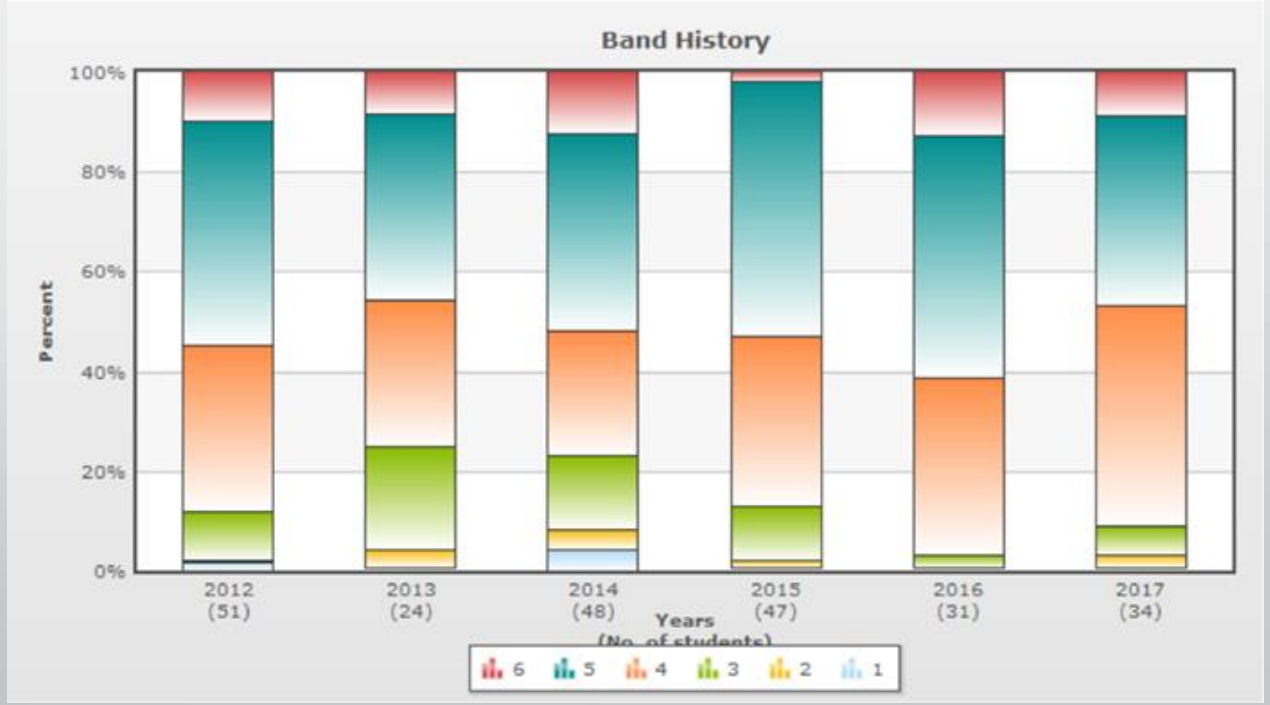
See template on the back page of your handout

COMPOSITE GRAPHS

These graphs are used to show data as part of a total.

Often catches students out because they just use the total at the top of the section

The same questions can be asked: absolute change, relative change



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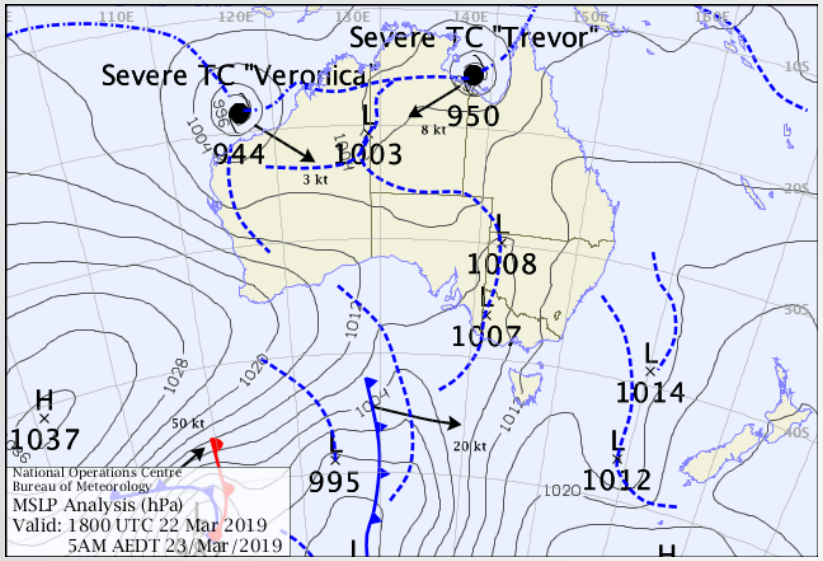

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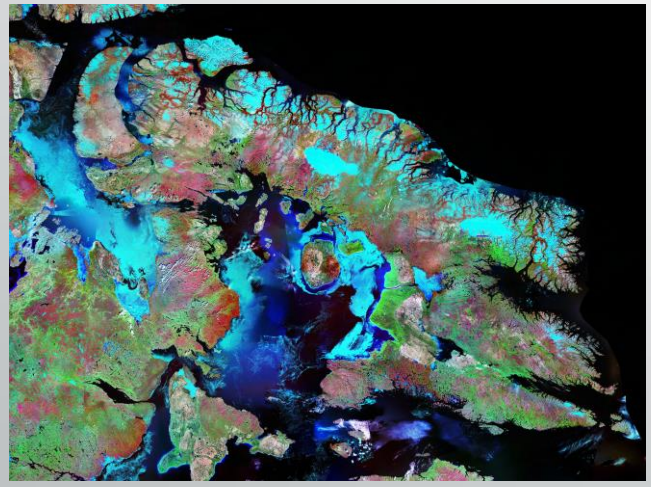

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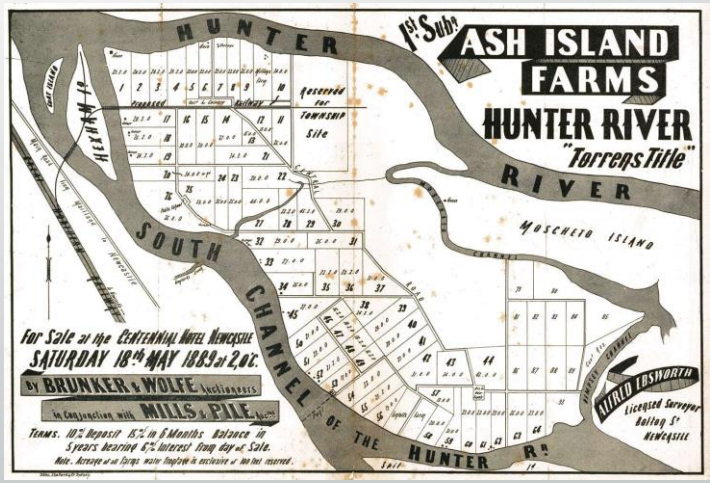


Living Histories

PART B: MAPS & PHOTOGRAPHS

PART B: MAPS

- → Locate features using degrees and minutes of **latitude and longitude**
- → **Area** and **Grid** references
- → Distinguish between **large-scale and small-scale maps**
- → **Scale** and direction
- → Calculate the **area** of a feature
- → Calculate the **density** of a feature
- → Measure **bearings** on a map
- → Calculate **local relief**
- → Determining **sight lines** between two points
- → Calculate the **gradient** of a slope as a ratio
- → Identify the **aspect*** of a slope
- → Construct a **cross-section**
- → Calculating the **vertical exaggeration** of a cross-section
- → Constructing a **transect** between two points and describing the changes along it
- → **Describing** patterns, relationships, networks, linkages and evidence of change within and between regions or areas
- → Construct a **land-use map**
- → Calculate Speed, Distance and **Time**
- → Recognising the key features of **changing pressure patterns** on synoptic charts
- → Reading, constructing and interpreting **type of maps**
- → Designing and interpreting **flow charts**

ıich a photograph was taken

ıotographs and satellite images

interactions and change

an aerial photograph or satellite image (see part B)

systems (GIS) to examine spatial / ecological issues.

ıestion or issue for study

ding geographical data from **primary** sources

sing geographical data from **secondary** sources

ch records the development of a fieldwork activity

g the fieldwork activity.

1. SCALE – starting on page 12

Scale as a ratio: On a topographic map scale is shown as a ratio

TRY THIS	1: 100,000 means …… 1: 250,000 means …… 1:50,000 means …… Convert the following scales to ratios 1cm represents 3,000 metres …… 1 centimetre represents 200 metres ……

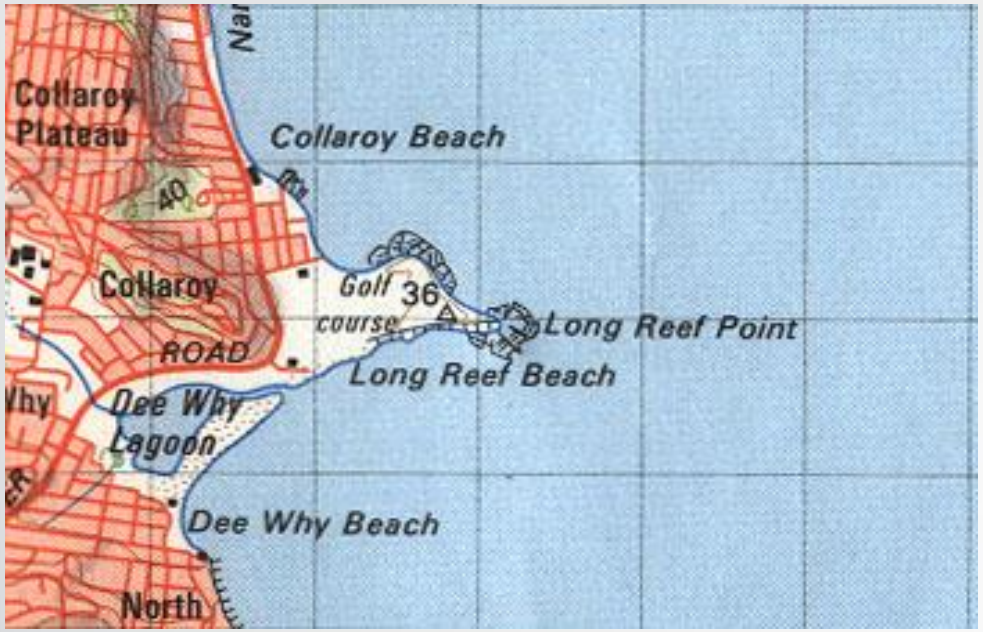
TRY THIS	1: 100,000 means 1cm represents 1km or 1000 m 1: 250,000 means 1cm represents 2.5 km 05 2,500 m 1:50,000 means 1cm represents ½ km or 500 m Convert the following scales to ratios 1cm represents 3,000 metres 1:300000 1 centimetre represents 200 metres 1:20000

Large scale vs small scale maps

For larger scale maps: e.g. 1:25 000	JUST A COMPARISON	For smaller scale maps e.g. 1: 1,000,000
Larger	FRACTION	**Smaller**
Smaller	AREA	**Larger**
Larger	DETAILS	**Smaller**
Smaller	NUMBER	**Larger**

My TRICK ….

- Larger scale maps show small areas in large detail (larger ZOOM IN)
- Smaller scale maps (no ZOOM)



TRY THIS	a. Which of the maps above has the smallest scale, Collaroy OR Japan? Japan b. Which of the following represents the largest scale? 1:100,000 OR 1/ 50,000 OR 1cm represents 25 km 1:50,000 (Largest number) Use piece of cake analogy

SCALE and AREA

To calculate the area of a feature

1. **Regular shape**: Place a box around the feature, use the scale to measure the dimensions and calculate the area using Length X Breadth

2. **Irregular shapes**: Use the scale to determine the area of 1 grid square. Count how well the feature fills one or more grid squares

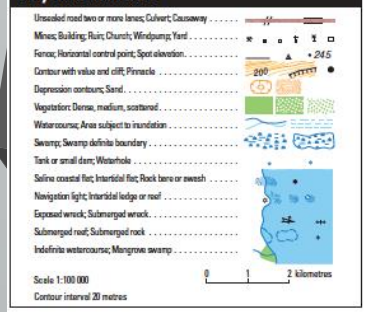
3. **For larger irregular** areas calculate the number of complete squares and the number of incomplete grid squares divided by two, **OR**

4. **Estimate** by counting the ones taking up more than half square, leave the rest

5. Make **conversions** to different units of measurements for area as needed
*$1km^2 = 100ha$ 1 hectare(ha) = $10,000m^2$ ($100m \times 100m$)

Source D – Topographic Map Extract of Barrow Island

Key for Source D



Source E

Until West Australian Petroleum Pty Ltd (Wapet) arrived on Barrow Island to explore for oil in 1964, the island had never been permanently occupied by humans.

Its abundant wildlife, particularly marsupials, escaped the effects of introduced species.

The environment retained its natural integrity, an outcome probably unique in Australia.

For these reasons, Barrow Island has been called a living museum and is rated one of the most important wildlife refuges in Australia.

Page 2

TRY THIS	Refer to the 2002 HSC Stimulus on Barrow Island Map p.2 What is the scale of the map? ……. What does this mean in metres and km? ……. What is the area of ONE grid square? ……. What is the approximate area of scattered forest in the SW quadrant of the map …….. What is the density of buildings in AR2894? …….

TRY THIS	Refer to the 2002 HSC Stimulus on Barrow Island Map p.2 What is the scale of the map? 1:100 000 What does this mean in metres and km? 1cm represents 1000 metres or 1km What is the area of ONE grid square? 1km^2 1km x 1km) What is the approximate area of scattered forest in the SW quadrant of the map ~ 2km^2 What is the density of buildings in AR2894? 5

AREA and DENSITY

Density questions often follow area questions

Density is the number of a stated features in a set area e.g. houses per **1 km^2**

'*Usually*' 1 grid square represents 1km^2. However, I have seen 2km x 2km = 4km^2

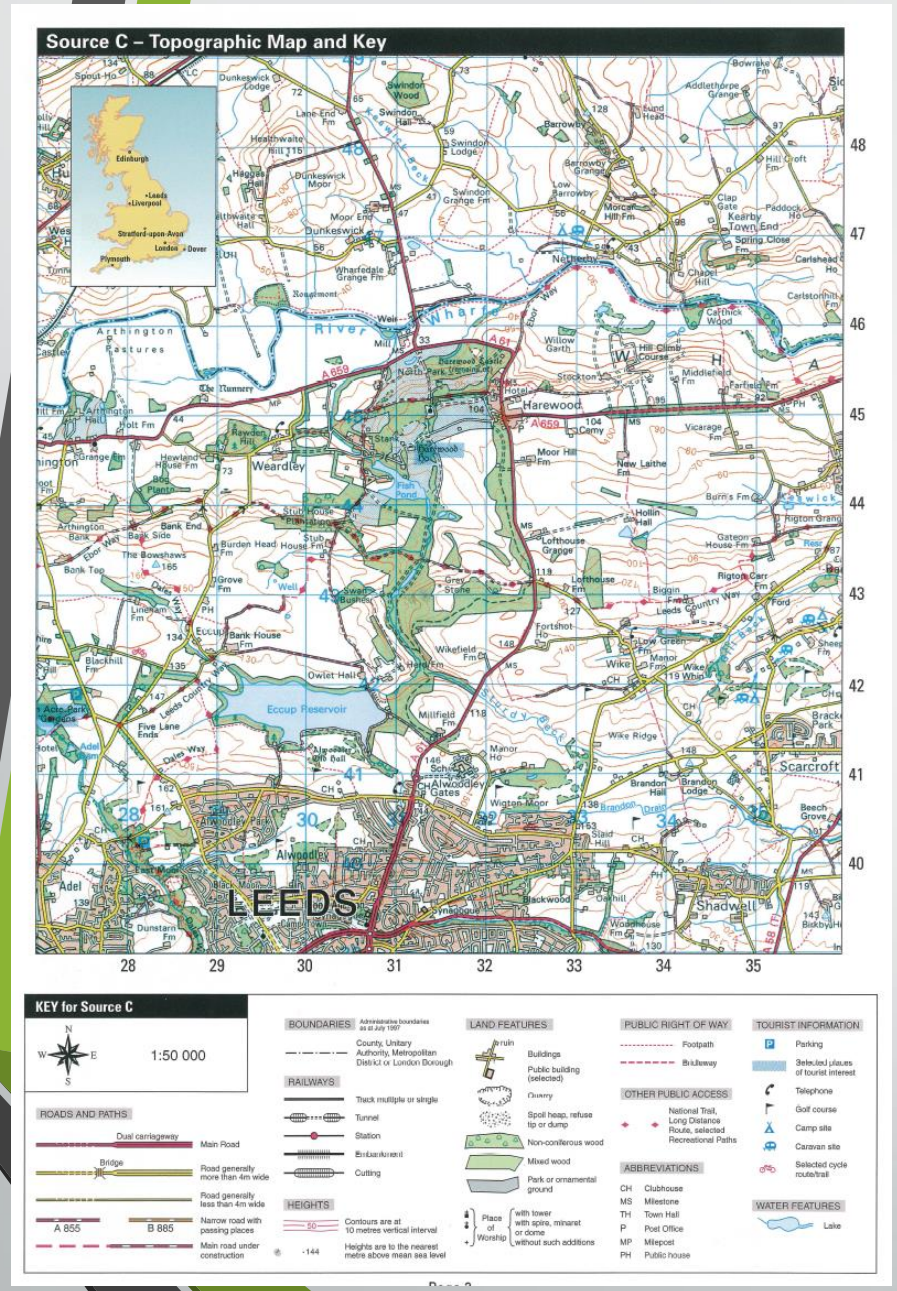
For example

ONE grid square on a 1:100,000 map is 1km^2.

The grid squares will be 1cm x 1cm = 1km x 1km

ONE grid square on a 1:25,000 map is also 1km^2

The grid squares will be 4cm x 4cm = 1 km x 1km



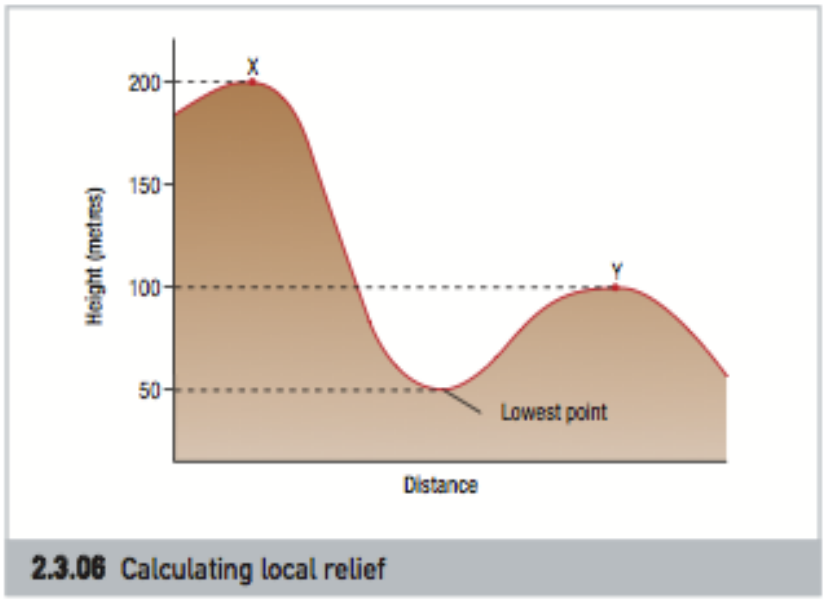
TRY THIS	Refer to the 2003 HSC Stimulus Booklet Leeds map p.2 What is the scale of the map? …….. What is the area of one grid square? …….. What is the density of farms in AR 3444 ……..

TRY THIS	Refer to the 2003 HSC Stimulus Booklet Leeds map p.2 What is the scale of the map? 1:50,000 What is the area of one grid square? 1km^2 What is the density of farms in AR 3444 2 per km^2

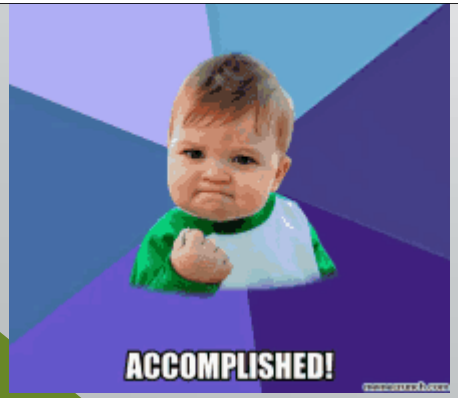
2. LOCAL RELIEF and SIGHT LINES

Local relief is the difference between the highest and lowest points along a transect.

TRY THIS	What is the local relief between X and Y? 150 metres Can a person standing at A see place B? No Why would understanding local relief be important for: - a farmer Where can he view fields, crop & livestock decisions, flooding - a town planner Zoning landuse and infrastructure plans



2.3.06 Calculating local relief



TRY THIS	What is the local relief between X and Y? Why would understanding local relief be important for: - a farmer - a town planner - a tourist operator

3. GRADIENT

Gradient is the slope of the landform between two given points.

Gradient (G) = Change in height (VR) divided by distance (HR)

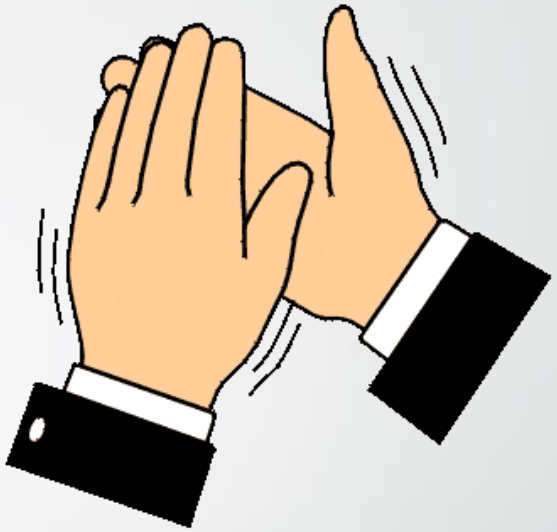
G = VR (Vertical rise) – use contours
HR (Horizontal run) – use map scale to calculate

The gradient of a slope that rises 200m between two places 6.4 km apart

$$\frac{VR}{HR} = \frac{200m\ (RISE)}{6400m\ (RUN)} = \frac{1}{32} \text{ or } 1 : 32$$

This means that for or every 32m travelled you go up/down 1m

My HSC way ……



End in a ratio : so start as a ratio!

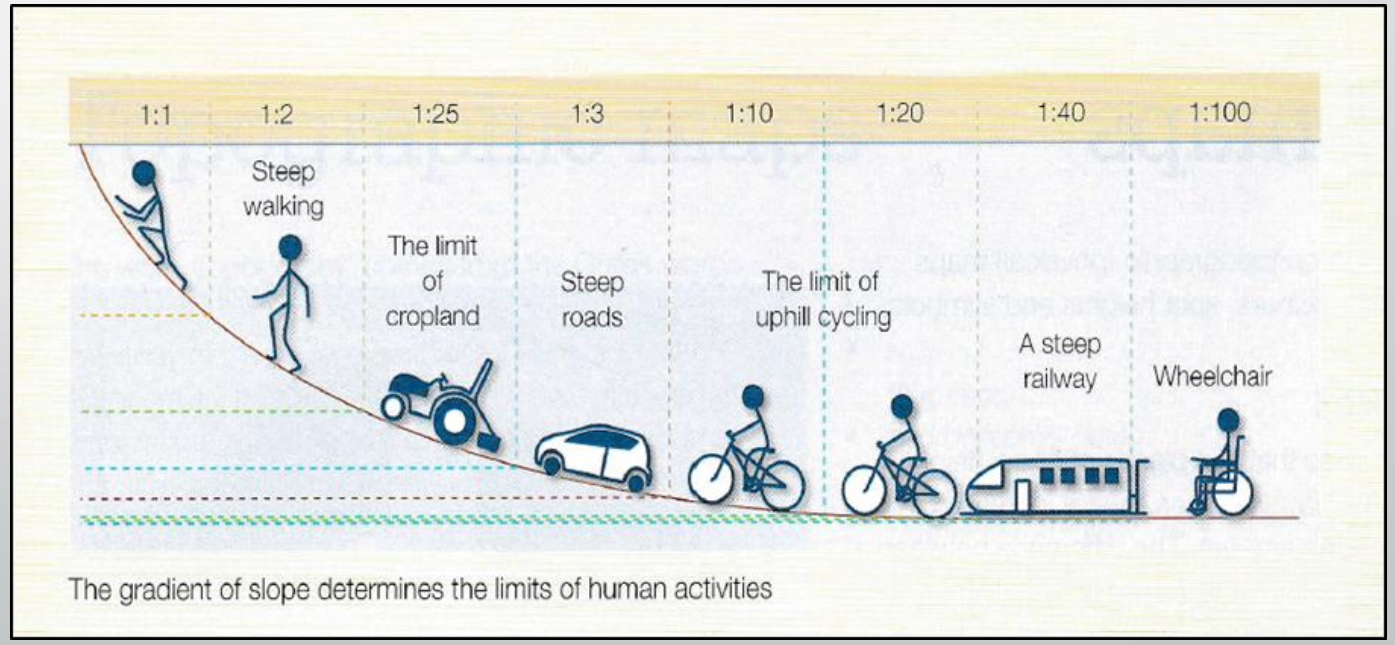
RISE : RUN

200m : 6400m *rise needs to be 1 : ……*

~~200~~ : 6400

200 : 200

1:32

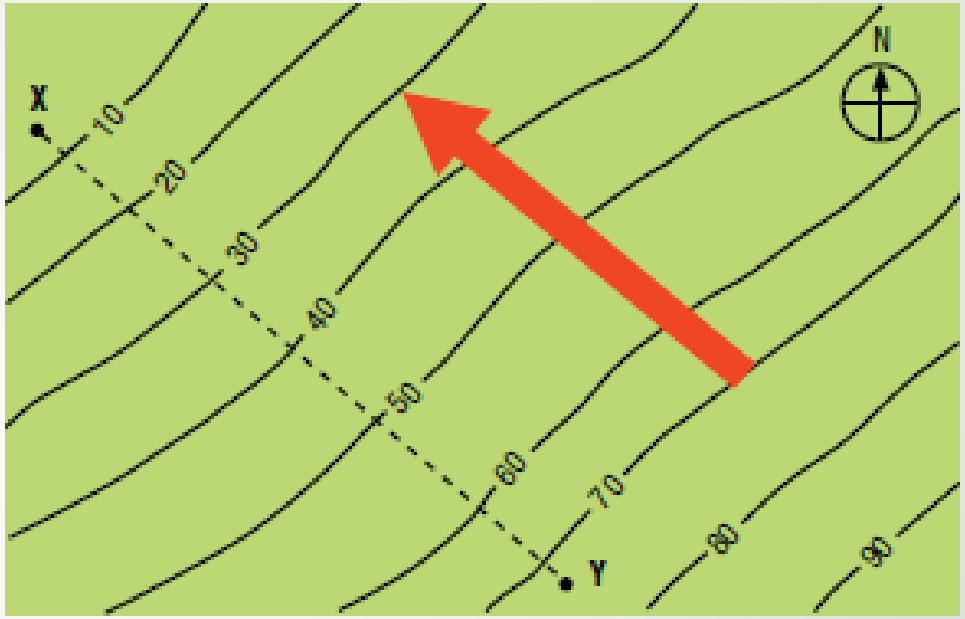


The gradient of slope determines the limits of human activities

4. ASPECT

The direction a slope is facing.

Which way is straight downhill?



TRY THIS	Calculate the gradient of a slope that rises from 100 metres to 900 metres over a distance of 10 kilometres. 800 : 10,000 = 1 : 12.5 …… What is the aspect of the slope in the diagram? NW (Where is it facing?) …… Why is this useful knowledge? Available sunlight for farming; views for housing ……

Where are you at?

LOST ME COMPLETELY

NEED HELP

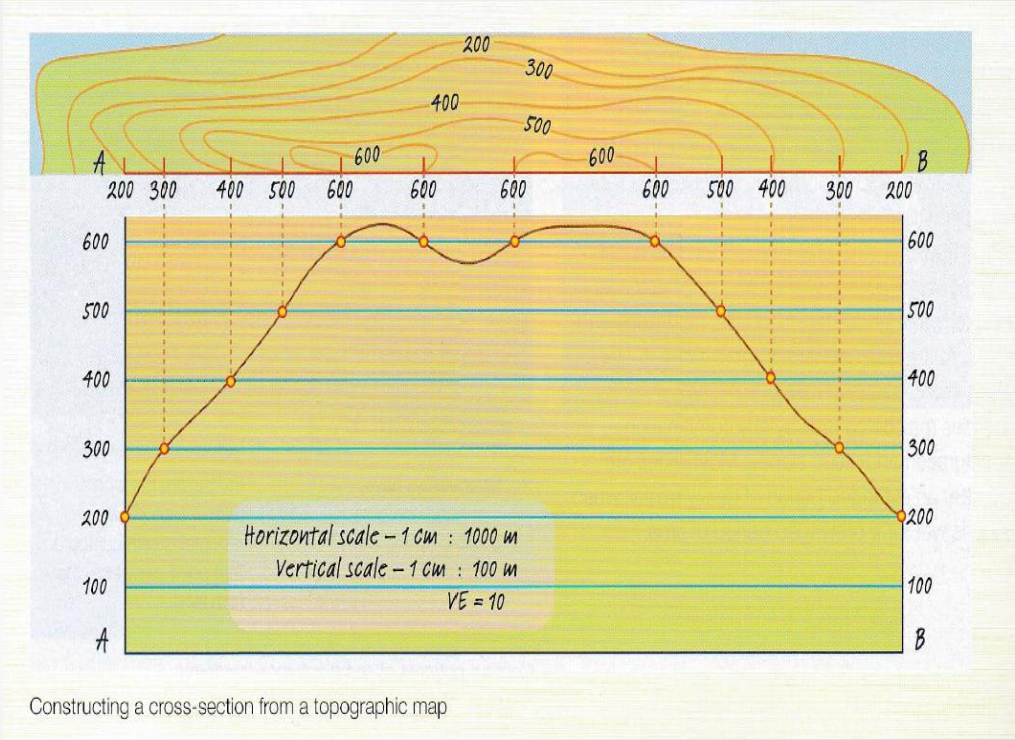
THINK I'VE GOT IT

READY TO MOVE ON

GOT IT

ALL GOOD !

5. CROSS SECTION & VERTICAL EXAGGERATION



Constructing a cross-section from a topographic map

When a cross section is constructed the scale on the vertical axis is selected to show up the shape of the land.

It is usually different to the scale on the horizontal axis which comes from the map.

This **exaggerates** the landforms in a vertical direction.

To calculate vertical exaggeration – TEXTBOOK VERSION

$$\text{V.E.} = \frac{\text{V.S (the scale from the graph)}}{\text{H.S (the scale from the map)}}$$

Example:

V.S. = 1 cm represents 20m
H.S. = 1 cm represents 100000 i.e. 1000m

$$\text{V.E.} = \frac{1/20}{1/1000}$$

$$= 1000 / 20$$

$$= 50$$

There is a shortcut !

Shortcut version (WARNING = just show working)

$$\text{V.E.} = \frac{\text{H.S (only using what 1cm represents)}}{\text{V.S (only using what 1cm represents)}}$$

Example:

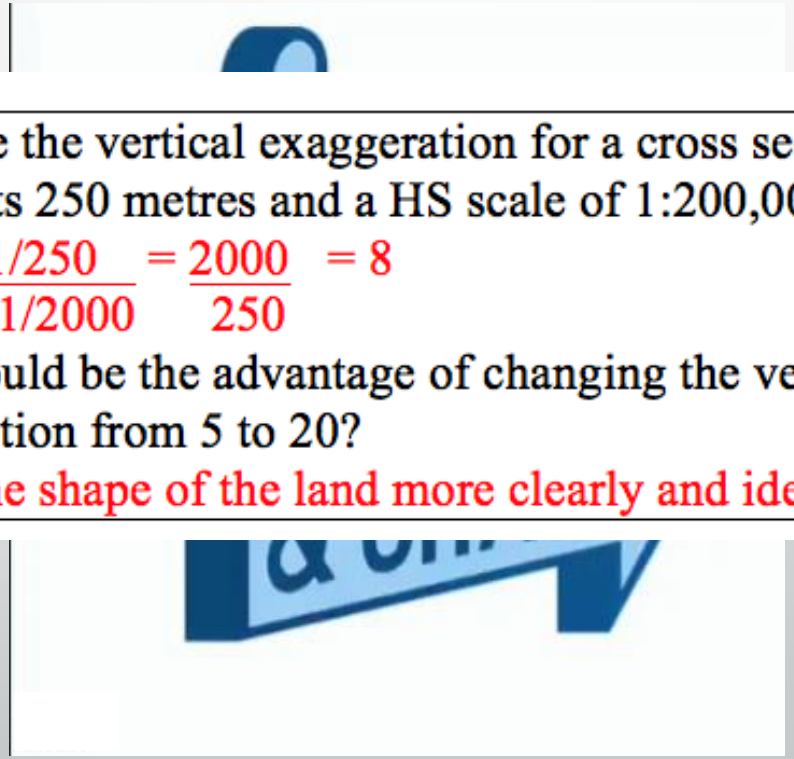
H.S. = 1 cm represents 100,000 i.e. 1kmm
V.S. = 1 cm represents 20m

$$\text{V.E.} = \frac{1000\text{m}}{20\text{m}}$$

$$= 50 \text{ (times)}$$

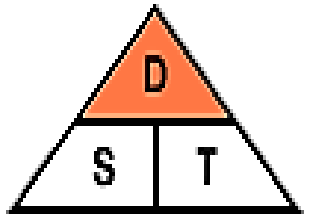
7-10 is an accurate representation

TRY THIS	Calculate the vertical exaggeration for a cross section with a VS of 1 cm represents 250 metres and a HS scale of 1:200,000 What would be the advantage of changing the vertical exaggeration of a cross section from 5 to 20?

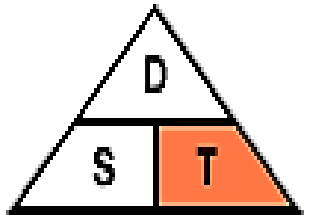


TRY THIS	Calculate the vertical exaggeration for a cross section with a VS of 1 cm represents 250 metres and a HS scale of 1:200,000. Show working $\frac{VS}{HS} \quad \frac{1/250}{1/2000} = \frac{2000}{250} = 8$ What would be the advantage of changing the vertical exaggeration of a cross section from 5 to 20? To see the shape of the land more clearly and identify steep slopes

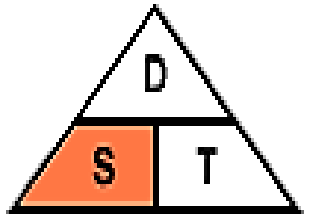
6. CALCULATING - SPEED, DISTANCE, and TIME



Distance = Speed x Time



$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$



$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

TRY THIS	1. Time: You travelled 260 kilometres at a speed of 100 kph. How long (TIME) did your journey take? T=D/S T = 260/100 = 2.6 hours or 156 minutes 2. Speed: It took you 4 hours to travel 320 km between two towns. How fast (SPEED) were you travelling? S = D/T = 320 / 4 = 80 kph 3. Distance: You travelled at 80 kph for 6 hours. How far did you travel (DISTANCE)? D = S X T = 80 x 6 = 480 km 4. Use the map of Barrow Island Calculate the time it would take you to travel from Wapet Cove (GR 380962) to the Landing ground (GR 340920 travelling at 100 kph) Distance 6 km T = D / S = 6 km / 100 km / hr = 0.06 hour = 3.6 minutes 5. How far would you get travelling for 6 minutes at 60 kph on the same road? D = S X T = 60 x 0.1 hr = 6 km

Where are you at?

LOST ME COMPLETELY

NEED HELP

THINK I'VE GOT IT

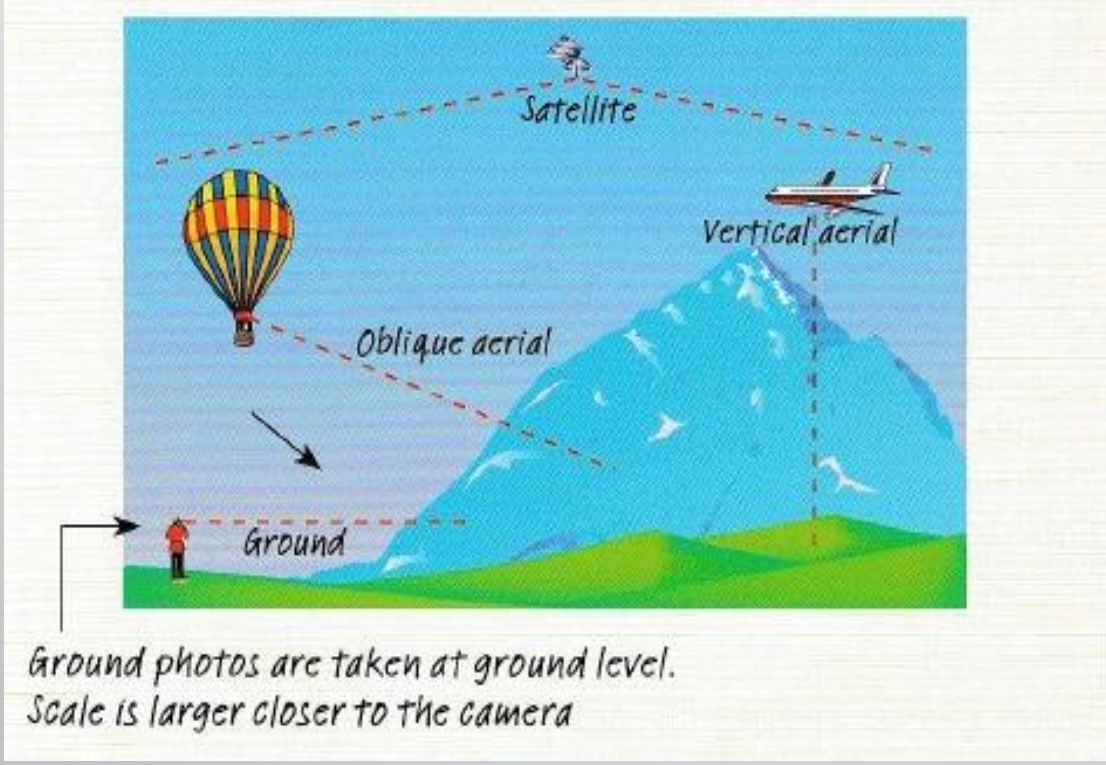
READY TO MOVE ON

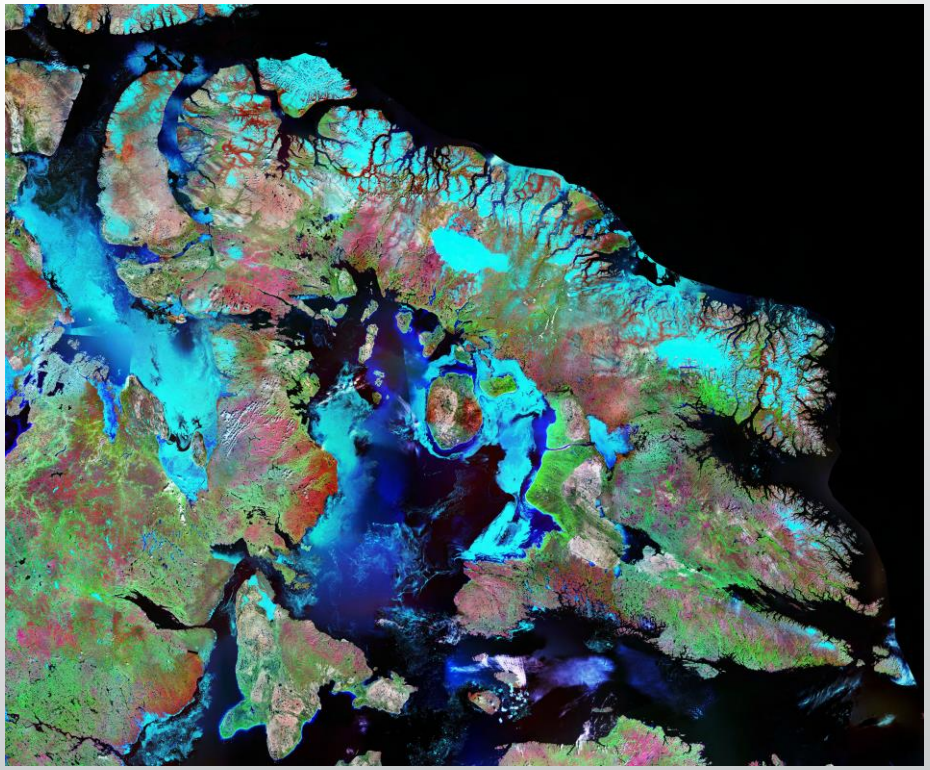
GOT IT

ALL GOOD !

7. PHOTOGRAPHS

7a. Types of photographs



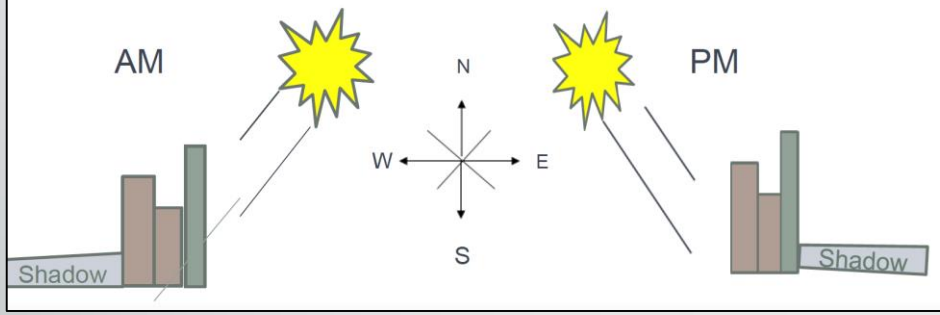


7b. ESTIMATING TIME OF DAY

Time of day

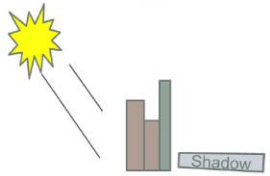
- To determine the time of day in a photograph:

- Remember:
  In the northern AND southern hemisphere:
  - *the sun rises in the EAST and sets in the WEST.*

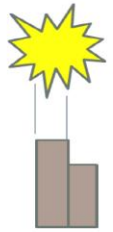


Length of shadow:

- *The **length** of the shadow is **longer** in the early and later hours of the day.*



- *At **midday** the shadows are **shorter.***



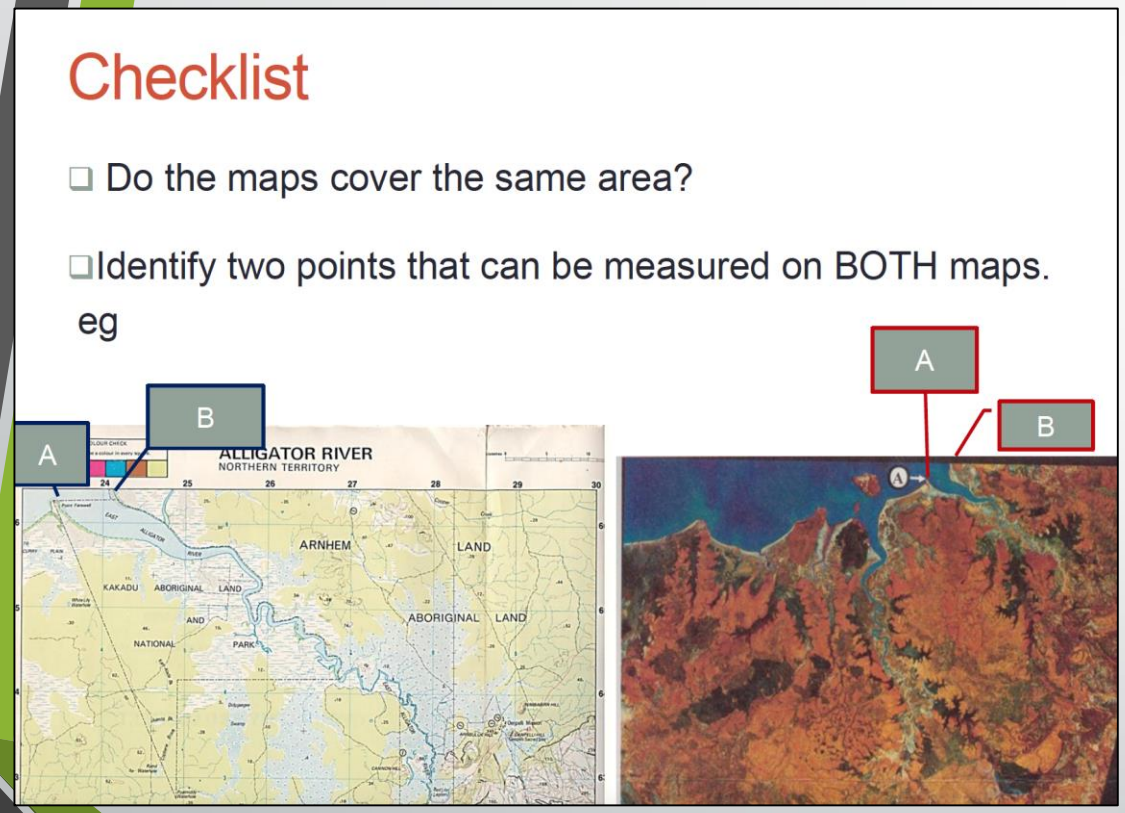
- Shadows are the only information you need to observe.
- The sun always rises in the east and sets in the west… in both hemispheres
- Latitude can influence the accuracy of your answer

7c. ORIENTATING A PHOTO / DIRECTION PHOTO IS FACING

- **Identify** features in the photograph to your **left, right and the main feature**
- **Find** these places on the map and **identify North** direction.
- Imagine yourself on the map with features identified to your left and right and in front of you. You may need to **turn the map around** to orientate it to the photograph.

TRY THIS	Use the Barrow Island and photograph 1 on page 3 a. Determine the direction the photographer was facing……**NE** b. Identify the map quadrant the photographer was located in……**SW**

7d. ESTIMATING SCALE OF A PHOTO FROM MAP

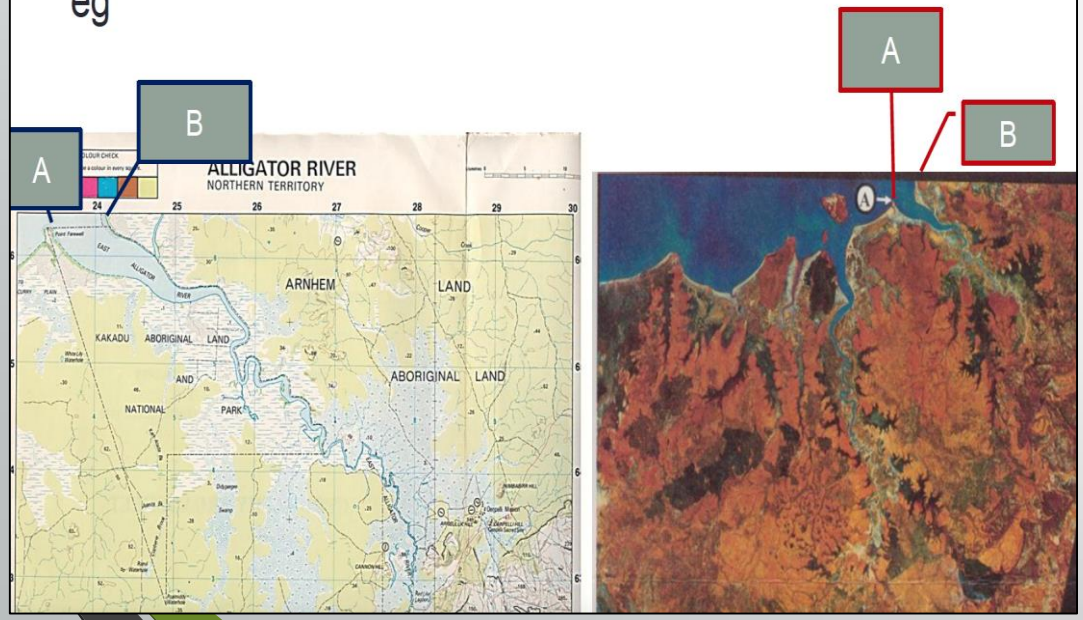


- On the map **find two points** that also appear on the photograph.
- Measure the distance and note the measurement on the map and the real-life distance.
- Now measure the distance between the same two points on the photograph in cm.
- This answer represents the real-life distance you measured using the map in km

Checklist

- ❑ Do the maps cover the same area?
- ❑ Identify two points that can be measured on BOTH maps.

eg



- The two features must appear on both the map and aerial photograph.
- Use human features eg. road junctions, buildings. As these wont change like a sandbar or river might.
- A greater distance between the two features will produce a more accurate answer.
- Try and measure a distance on the photo that is a whole number

EXAMPLE - Map Scale is 1:50 000

1. Measure the direct distance between the same two points on the aerial photo e.g. 10cm

2. Measure the direct distance between two points on the map eg. 6.5cm

3. Ratio of Scales = Ratio of Distances

$$\frac{\text{Scale of Photo}}{\text{Scale of Map}} = \frac{\text{Map Distance}}{\text{Photo Distance}}$$

$$\frac{\text{Scale of Photo}}{50\,000} = \frac{6.5\text{cm}}{10\text{ cm}}$$

$$\text{Scale of Photo} = \frac{6.5 \times 50\,000}{10}$$

$$= \frac{325\,000}{10}$$

$$= 32\,500$$

$$\text{Scale of Photo} = 1:32\,500$$

The aerial photo has a LARGER SCALE than the map.

TRY THIS	a. Calculate the scale of the Vancouver photograph P 3 2007 HSC b. Use the scale to calculate the area covered by the photograph.

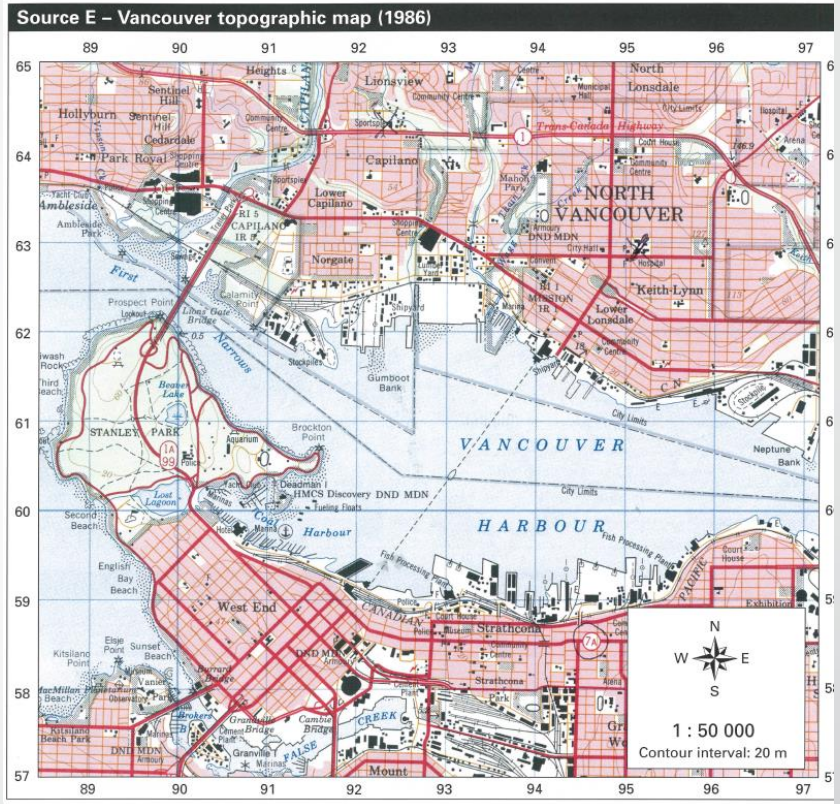
$$\frac{\text{Photo scale}}{50{,}000} = \frac{1\text{cm}}{2\text{cm}}$$

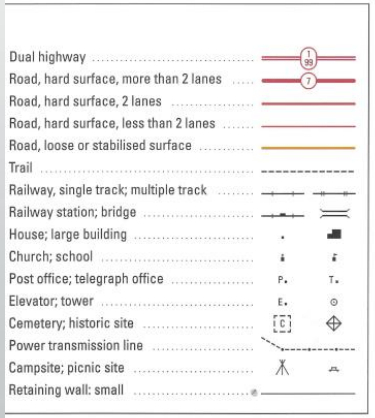
$$\text{Photo scale} = \frac{1 \times 50{,}000}{2}$$

1 : 25,000

TRY THIS	a. Calculate the scale of the Vancouver photograph P 3 2007 HSC (Use the map and photo of Vancouver – separate printout) Map 1cm rep 500 m Photo 1cm rep 350 metres 1:35,000 b. Use the scale to calculate the area covered by the photograph. 9.5 cm (3, 325 m / 3.325 km) x 8cm (2,800m / 2.8 km) Area 9.32 km^2

Source E – Vancouver topographic map (1986)





Source G – Vancouver

Where are you at?

LOST ME COMPLETELY

NEED HELP

THINK I'VE GOT IT

READY TO MOVE ON

GOT IT

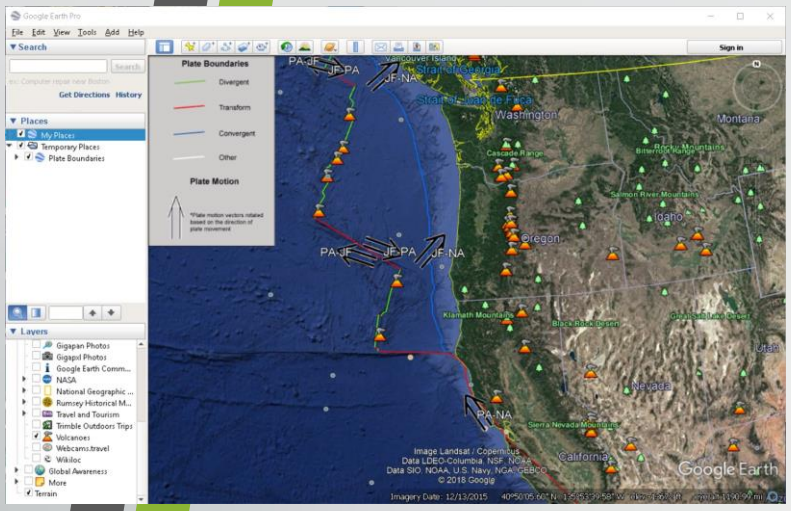
ALL GOOD !

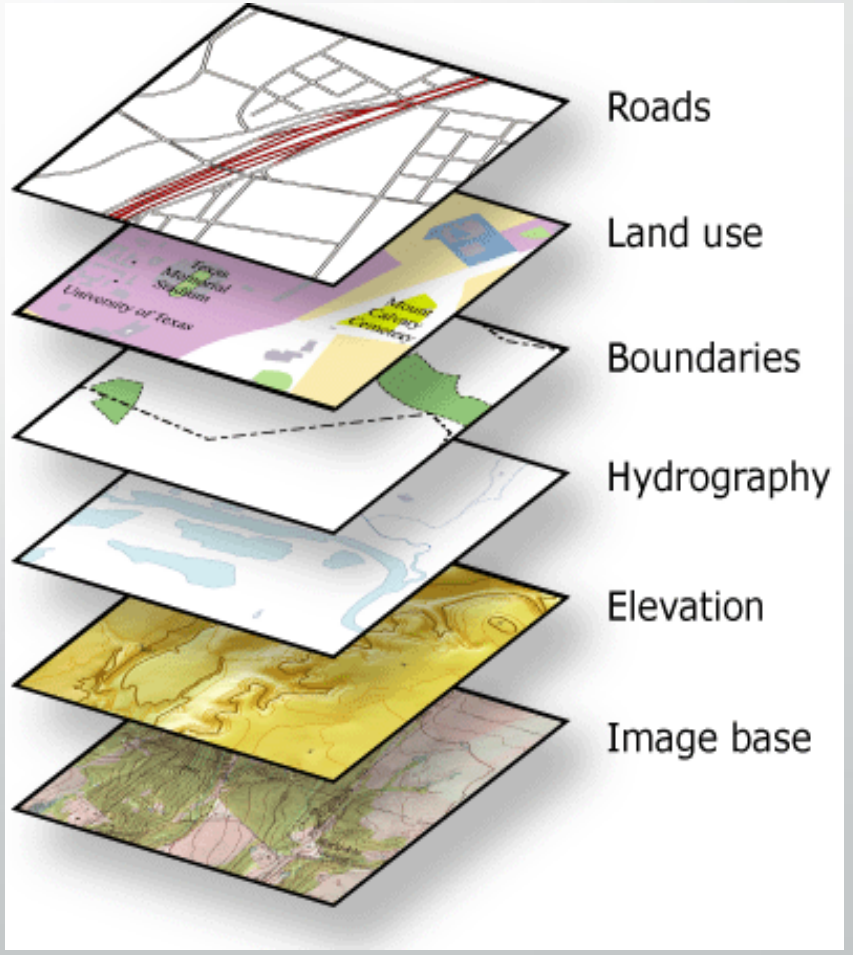
8. GIS (Geographic Information Systems)

Statistical data shown by layers of info

=

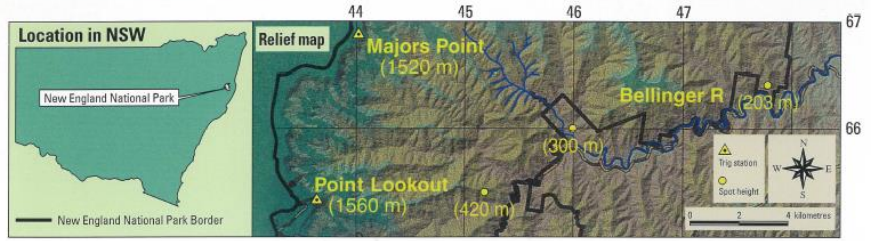
spatial data

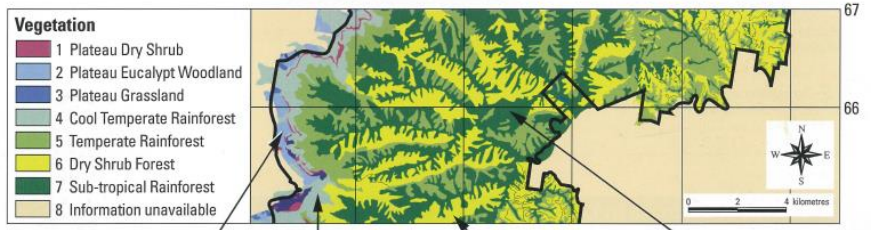




Exam examples of GIS

Source F – A New England National Park Geographic Information System (GIS)

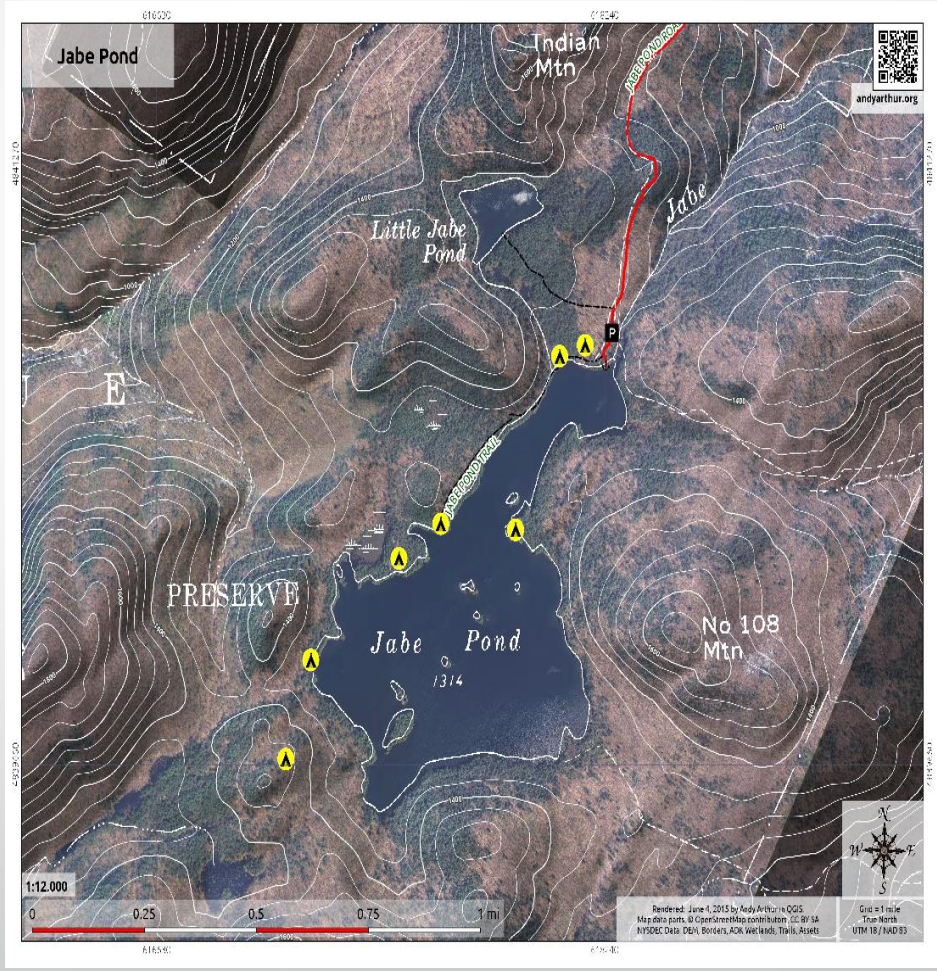




Source G – Vegetation Types

Source H – Fact file

New England National Park is located between 30° 22' S and 30° 44' S and has unique biophysical features. Within its area it has the geographic boundaries of both tropical and cool temperate rainforest species. It also has one of the steepest gradients along the east coast of Australia. Cool Temperate Rainforest (4) occurs in sheltered valleys of the escarpment. Antarctic Beech is the dominant species in (4) and today it is more commonly found in Tasmania. It is very sensitive to bushfires. Thus contemporary management practices, such as fire hazard reduction, have resulted in it now invading the Eucalypt Woodland (2).



TRY THIS	Use the printout from the 2003 HSC examination

Refer to Source F and Source G.

(a) State the relationship between relief and average annual temperature.

.....

.....

(b) A ridge runs from GR 443660 to GR 446660. Identify a type of vegetation immediately north and immediately south of this ridge.

North

.....

South

.....

(c) Suggest ONE reason for the difference in vegetation types on either side of the ridge identified in part (b).

.....

.....

Refer to Sources F, G and H.

(d) Explain TWO geographic factors that contribute to the distribution of the Antarctic Beech ecosystem.

.....

.....

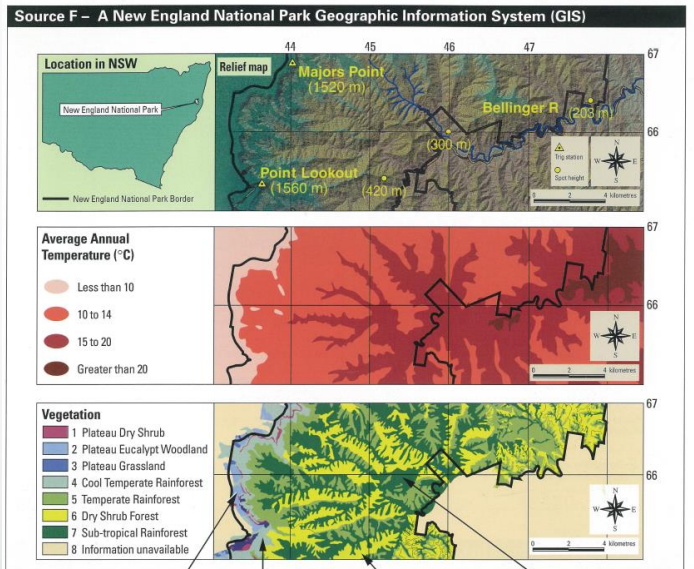
.....

.....

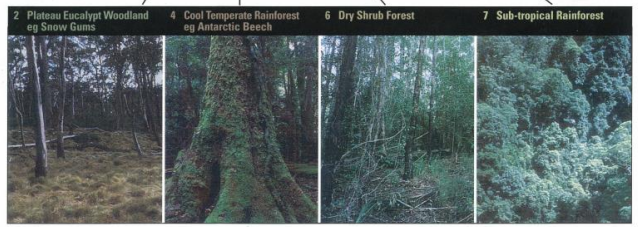
Explain ONE benefit of GIS for environmental monitoring and management

.....

Source F – A New England National Park Geographic Information System (GIS)



Source G – Vegetation Types



Source H – Fact file

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- GTANSW FACEBOOK GROUP
  - Resources
  - Google Drive folder
- GTANSW WEBSITE : PPT PRESENTATIONS AND RESOURCES
  - SPECIAL EDITIONS – bulletin
- Contact Us

Skill	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
AR/GR			Q5		Q1		Q10		Q1	Q8,19		Q3	Q13,14				
Aspect/Relief				Q5,6		Q6		Q11	Q2				Q12,21	Q14		Q9	Q12,13
Sight Line						Q7											Q11
Quadrant						Q8								Q8			
Density				Q8	Q6					Q7			Q7	Q7			Q6
Lat/Long				Q13					Q5	Q2	Q14	Q2					
Bearing			Q6		Q7		Q5		Q6	Q10	Q6	Q4	Q9	Q9	Q11		
Gradient	Q5		Q15		Q2		Q7	Q10	Q4			Q21	Q21	Q15	Q21	Q13	Q21
VE			Q16	Q16	Q3		Q16	Q13	Q19			Q21	Q21		Q21	Q19	Q21
Weather/ synoptic	Q8,9	Q10,11,13		Q10,11,12		Q2,3,5		Q6,7		Q11,12		Q10,11,12,13,	Q4,5,6		Q3,4	Q4, 5	Q4
Graph Reading	Q2,4,11,13,14	Q2,12,14,15	Q1,2,18	Q9,14,15	Q13,14,	Q4,11,12,14	Q2,3,13,14,15	Q2,3,8,14,15	Q9,10,12,13,15		Q17,18	Q6,7,8,9,18,19,20	Q1,16,17	Q1,2,3,12,13,19,20		Q6	
Definition/Fieldwork	Q3,12,15	Q3,5,9	Q3,13	Q1,4	Q4,11	Q1	Q16			Q14,20	Q1,2,3,4,5,11,16	Q1,17	Q3	Q11			
Time Dist Speed	Q6	Q7	Q8				Q9	Q12	Q8	Q1,4,5,6	Q8,10	Q14	Q10	Q10	Q13	Q12	
Time of Day							Q12								Q19		Q18
Photograph Type														Q4		Q8	
Photographer Facing	Q7	Q8					Q11	Q9	Q11	Q18		Q15	Q15		Q17	Q14	
Direction		Q6	Q14	Q7	Q9		Q6	Q1		Q3	Q6,13		Q11	Q6	Q12	Q11	
Area/Ratio			Q7	Q3	Q5		Q8		Q3		Q9	Q5	Q8		Q14	Q10	
Scale	Q10		Q4		Q8,10					Q13		Q16	Q20		Q15	Q20	Q14
Ternary			Q17		Q18		Q17				Q19,20		Q18,19			Q16	
Increase/Decrease	Q1	Q1,4	Q9,10,11,12	Q2	Q12,15	Q9,13,15	Q4	Q4,5	Q13	Q15,16,17			Q2				
Map Type and drawing	Q17					Q10	Q1		Q7		Q12			Q5			
Transect/Cross Sec			Q16			Q16				Q9	Q15	Q21			Q21	Q7	Q21, 7, 8
Log/Semi Log			Q19			Q17								Q16,17,18		Q16	Q20
Precis									Q17								Q22

Geographical Skills
GTANSW Annual Conference

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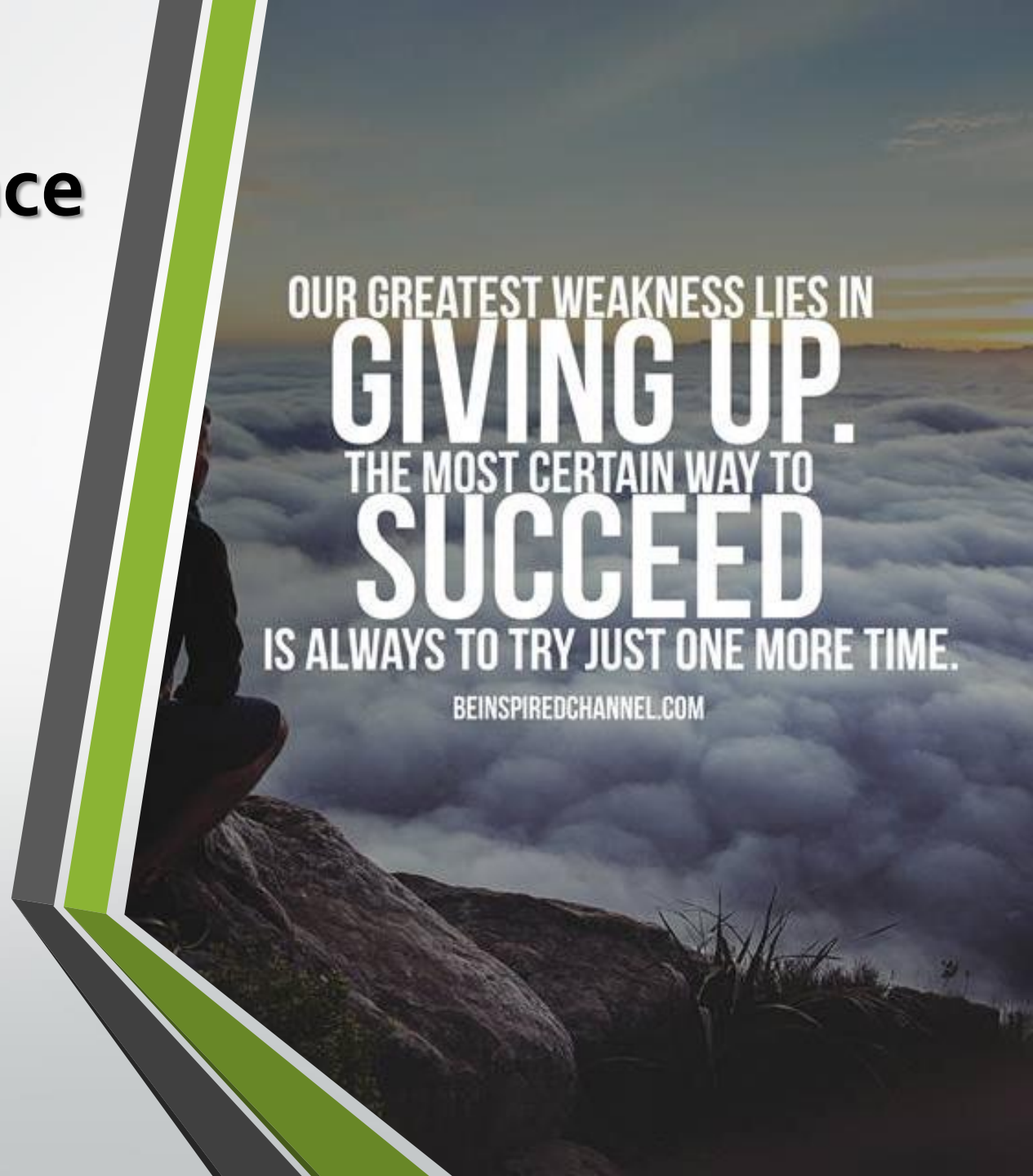
David Latimer

Head of HSIE | MLC



2002 HSC

remember 15/25/60 marks

Question	Correct Response
1	C
2	C
3	B
4	D
5	A
6	D
7	C
8	D

Question	Correct Response
9	D
10	B
11	A
12	B
13	B
14	A
15	A

2002 HSC

Question 16

Better responses:

- identified a specific challenge taken directly from the syllabus eg many of the better answers identified housing as the challenge and were able to provide strong responses
- described TWO responses related to the challenge named and were able to relate these responses to specific programs/projects operating in particular mega cities
- used specific examples and quoted detailed statistics with possible reference to the stimulus
- provided detailed descriptions with reference to specific examples
- used relevant terminology
- referred to a range of mega cities

Weaker responses:

- referred to generalised challenges
- provided too much detail about the challenge with insufficient emphasis on the responses to the challenge
- lacked detail and were very general
- failed to understand directive terms
- did not clearly differentiate between identifying and responding to the challenge
- described what could / should be done rather than actual responses
- failed to identify two responses to the challenge

2002 HSC

Question 17(a)

Question 17(c)

Better responses:

- incorporated case studies and used statistics to illustrate responses
- distinguished between health and social issues
- health issues were generally treated better than social issues

Weaker responses:

- confused social and health issues or simply listed a range of issues rather than describing them
- found it difficult to incorporate references to the future
- described general issues related to the developing world and not specifically to mega cities
- wrote emotive responses rather than factual ones
- failed to relate features to a mega city

2002 HSC

Question 18(b)

Better responses:

- referred to the ecosystem selected in part (a)
- indicated the main features of two impacts on the selected ecosystem
- made specific reference to geographic features affecting the ecosystem due to the impact
- answered the question concisely, using geographic terminology

Weaker responses:

- did not refer to the ecosystem identified in part (a)
- identified one impact only
- gave short responses such as pollution – without further features or information
- did not clearly relate the impact back to the ecosystem identified

2002 HSC

Question 19(a)

Better responses:

- demonstrated that candidates could read a pie graph accurately and draw information from this source
- provided two or more of the characteristics and features of the spatial pattern of global oil production
- provided some quantitative description to support their generalisations about the pattern of global oil production
- understood the concept of spatial pattern

Weaker responses:

- failed to read the pie graph correctly
- provided only one characteristic or feature of the spatial pattern of global oil production
- frequently failed to use quantitative information

2002 HSC

Question 19(b)

Better responses:

- clearly identified a global economic activity
- understood the difference between a global economic activity and an economic enterprise
- clearly identified two factors and explained how these influenced the future direction of the global economic activity identified

Weaker responses:

- failed to separate the factors currently affecting the economic activity and the factors that will impact on its future directions
- referred to an economic enterprise only
- identified only one factor
- did not identify a global economic activity

2002 HSC

Question 19(b)

Better responses:

- clearly identified a global economic activity
- understood the difference between a global economic activity and an economic enterprise
- clearly identified two factors and explained how these influenced the future direction of the global economic activity identified

Weaker responses:

- failed to separate the factors currently affecting the economic activity and the factors that will impact on its future directions
- referred to an economic enterprise only
- identified only one factor
- did not identify a global economic activity

2018 HSC

remember 20/40/40 marks

Question	Answer
1	D
2	D
3	C
4	A
5	C
6	B
7	B
8	C
9	C
10	A
11	C
12	B
13	B
14	C
15	A
16	A
17	D
18	A
19	A
20	D

2018 HSC

remember 20/40/40 marks

Question 21 (a)

Criteria	Marks
• Correctly completes the transect	2
• Completes some sections of the transect	1

Sample answer:

Cleared land – river – cleared land – open forest – cleared land – open forest

Question 21 (b)

Criteria
• Correctly identifies the feature

Sample answer:

Vehicular track *or* track

Question 21 (c)

Criteria	Marks
• Correctly identifies the season and provides a valid justification	2
• Provides some relevant information	1

Sample answer:

The satellite image is typical of summer because there is an obvious low pressure system over northern Australia.

Answers could include:

- Mid latitude high pressure cell over southern Australia, shown by absence of clouds, which in the winter would shift north
- High latitude cloud belt over Southern Ocean, which in the winter would shift north.