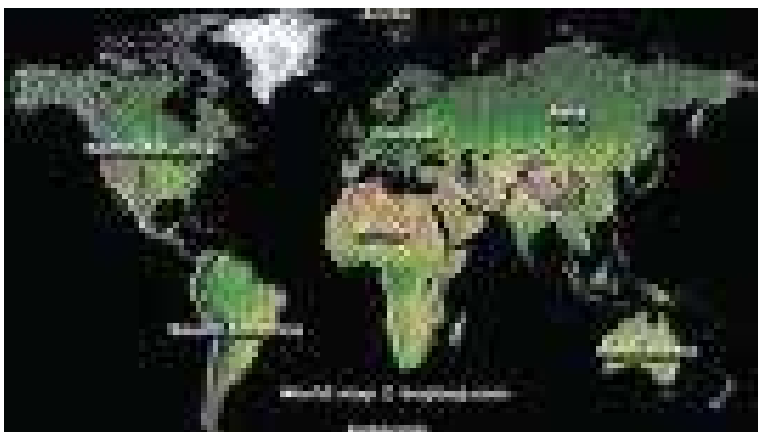


UNIT 1

MAPS AND TYPES OF MAPS



[Source:<http://www.map-world.net/wp-content/uploads/2011/03/Fiji-world-map.jpg>&imgrefurl]

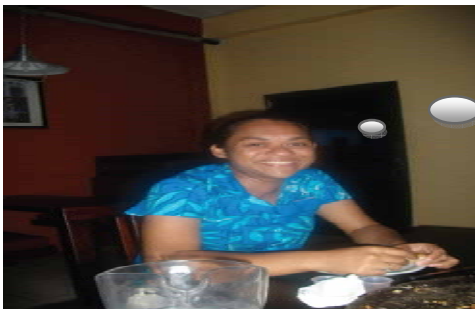
TOPIC

- WHAT IS A MAP
- TYPES OF MAPS
- ESSENTIALS OF A MAP
- USES OF MAPS
- DIRECTIONS
- SCALES AND CONVERSION
- USAGE OF KEYS

VOCABULARY

Maps	Pattern	Relief
Atlas	Relationship	Symbol
Legend	Cross Section	Sketch Map

THINKING SKILLS



What is a map?

Maps are representation of an area of the earth and they come in varieties of forms. Maps have different features which help us to gather important information.

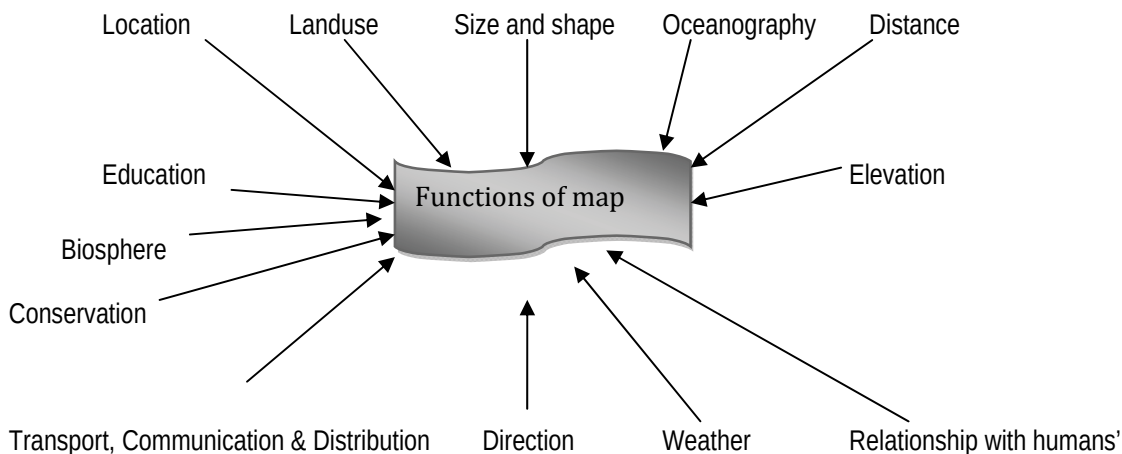
A map should have a legend (a guide explaining the map's symbols), a notation of which way is north, and an indicator of scale. We must keep in mind that no map is perfect and every map is unique. Maps are useful in Geography, History, Sociology (about societies), Law, Science, Weather, Environment and many other subjects.

Why study maps?

- For direction purposes
- To identify features of the topography (rivers, mountains, deserts)
- To identify human impact/land use (farms, roads, dams)
- To identify location (where I live, where a city is)
- Maps are basic tools in helping us to understand about places and people

Uses and functions of maps

- Maps may be used as an aid to detailed conservation or planning and development of an area of land.



Forms of Maps

- GIS (Global Information System – electronic map)
- Wall maps
- Atlases
- Globes

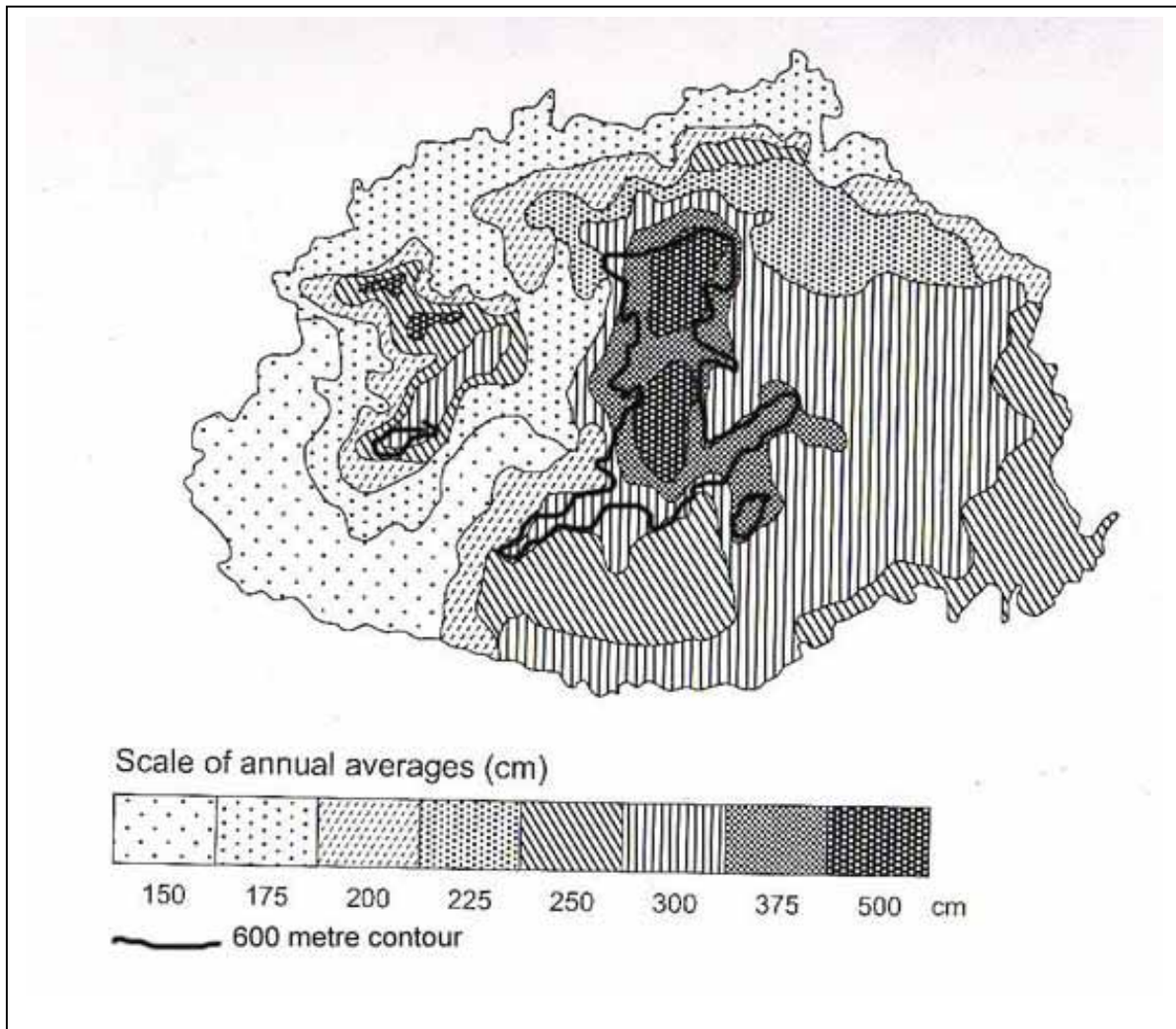
An atlas is a collection of maps bound in a book; it may include additional information, such as illustrations, statistical tables, topography, and other important information about a place or places.

TYPES OF MAPS

- Maps can be classified in a different ways according to scale. Large scale map and Small scale map. For example, 1 cm on a map equals 100km or 1000km or just 1km
 - Large Scale Maps shows features of a small area in great detail
 - Small Scale Maps show features of a large area in less detail.
-
- There are several types of maps. Each map shows different information. Most maps include a compass rose, which indicates which way is north, south, east and west. They also include a scale so you can estimate distances. Here's a look at some different types of maps.

Varieties of Maps

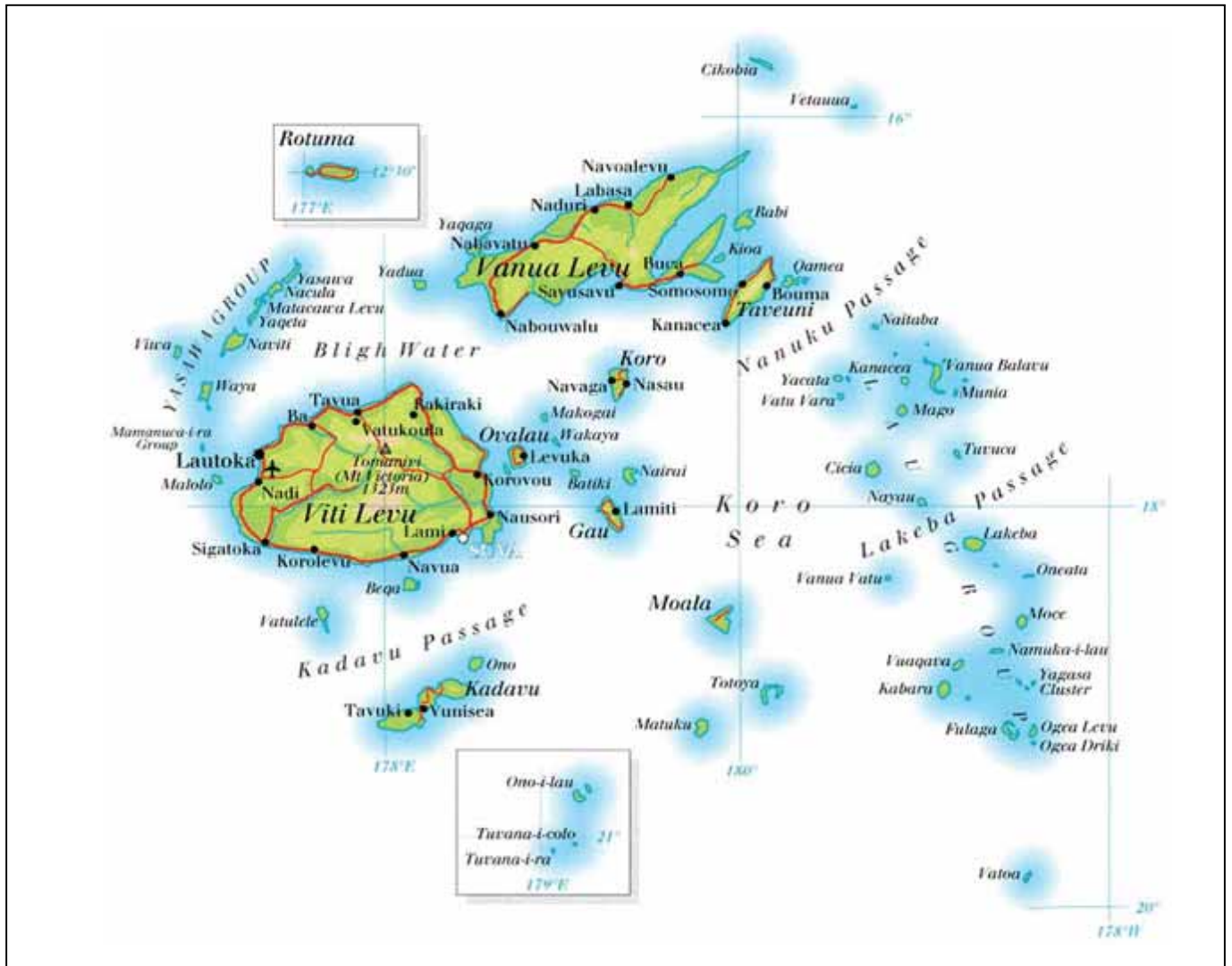
1. Climate Maps



<http://www.fao.org/ag/AGP/AGP/doc/counproof/southpacific/Fiji.htm>

Give general information about the climate and precipitation (rain and snow) of a region. Cartographers, or mapmakers, use colours to show different climate or precipitation zones

2. Physical Maps

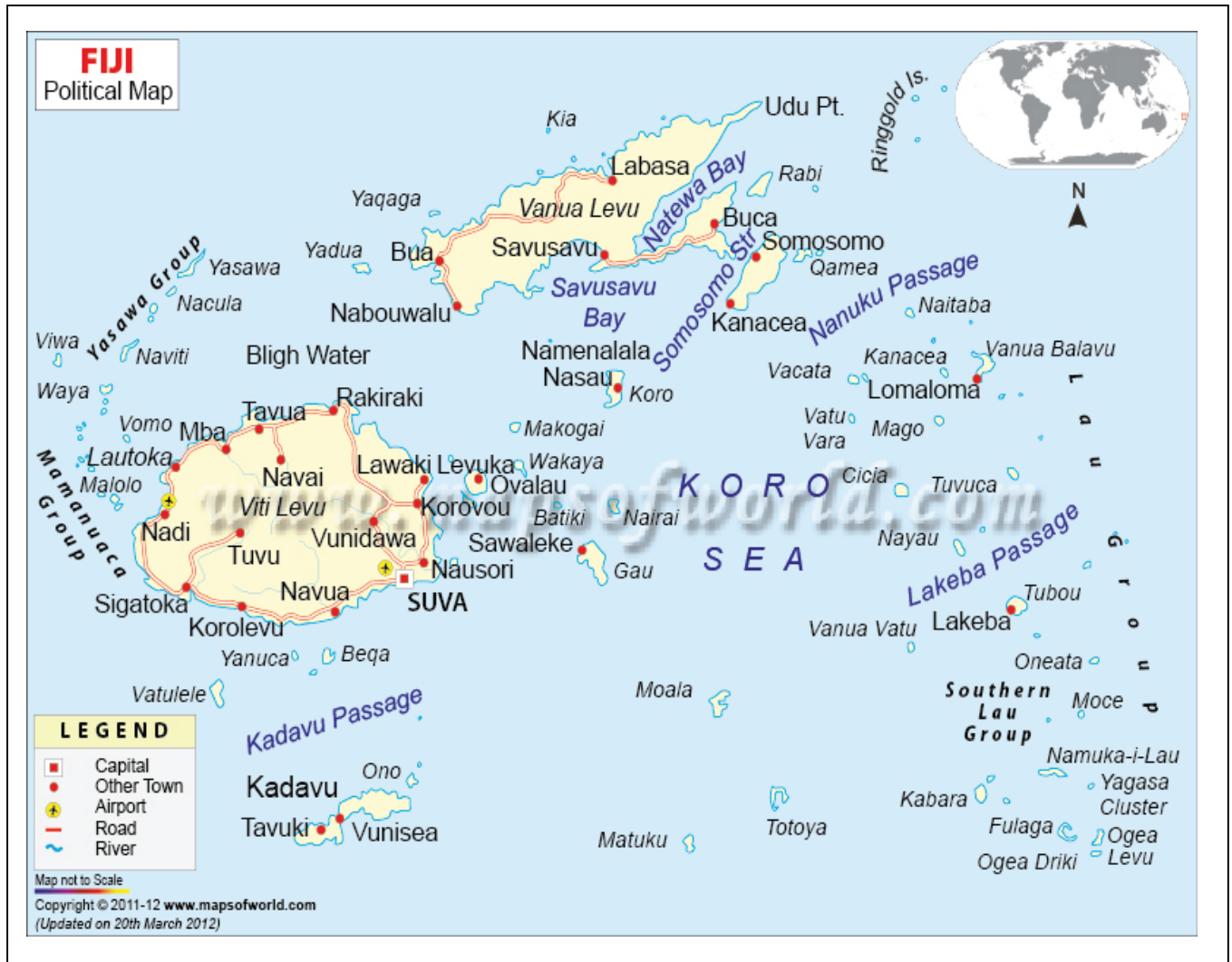


http://www.vidiani.com/maps_of_fiji/detailed_physical

A physical map shows natural features of the land such as mountains, rivers, lakes, streams, and deserts.

3. Political Maps

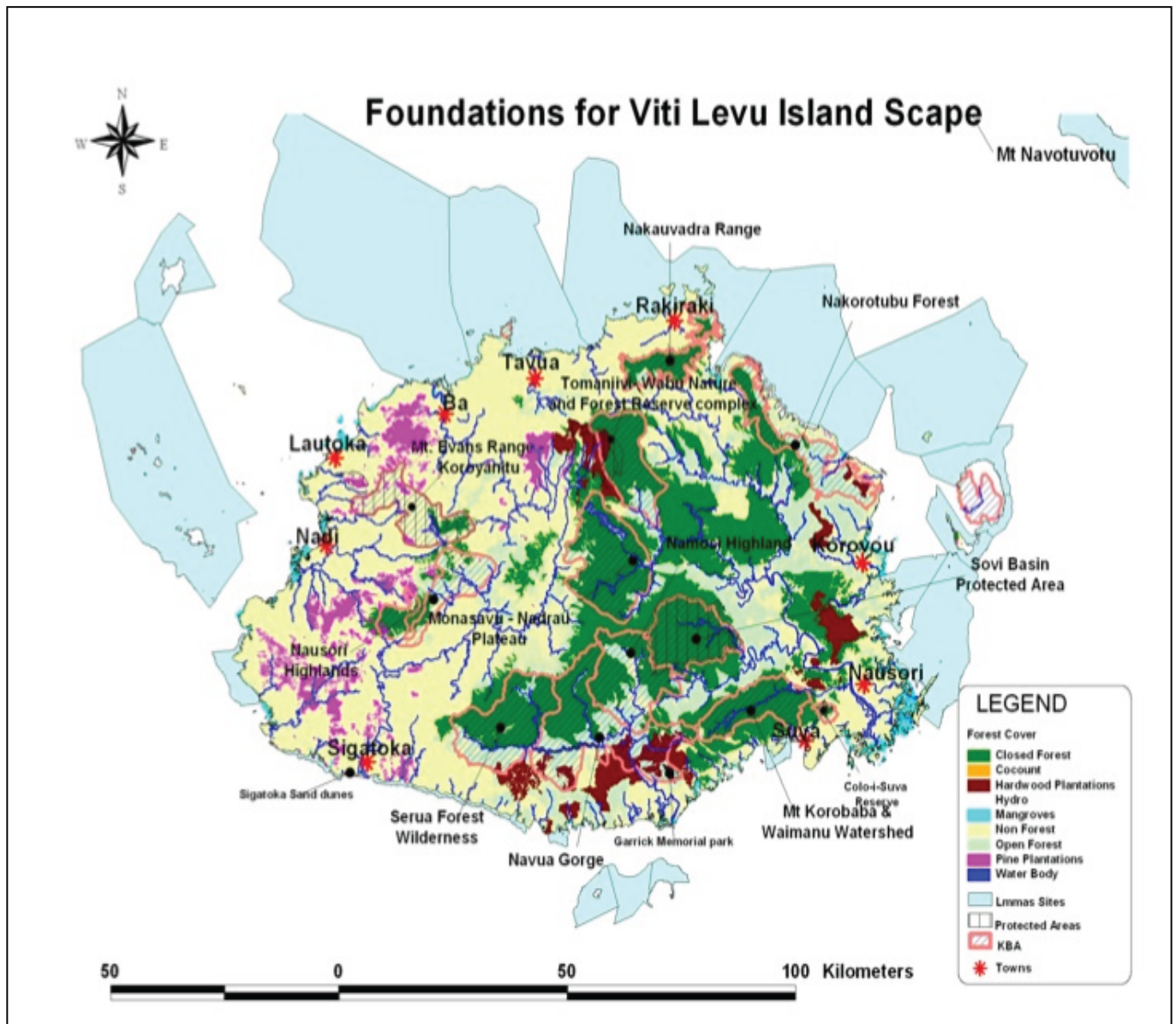
A political map shows human-made features and boundaries such as cities, highways, and countries.



[Source: <http://www.mapsofworld.com>]

4. Economic/Resource Map

Feature the type of natural resources or economic activity that dominates an area. Cartographers use symbols to show the locations of natural resources or economic activities.

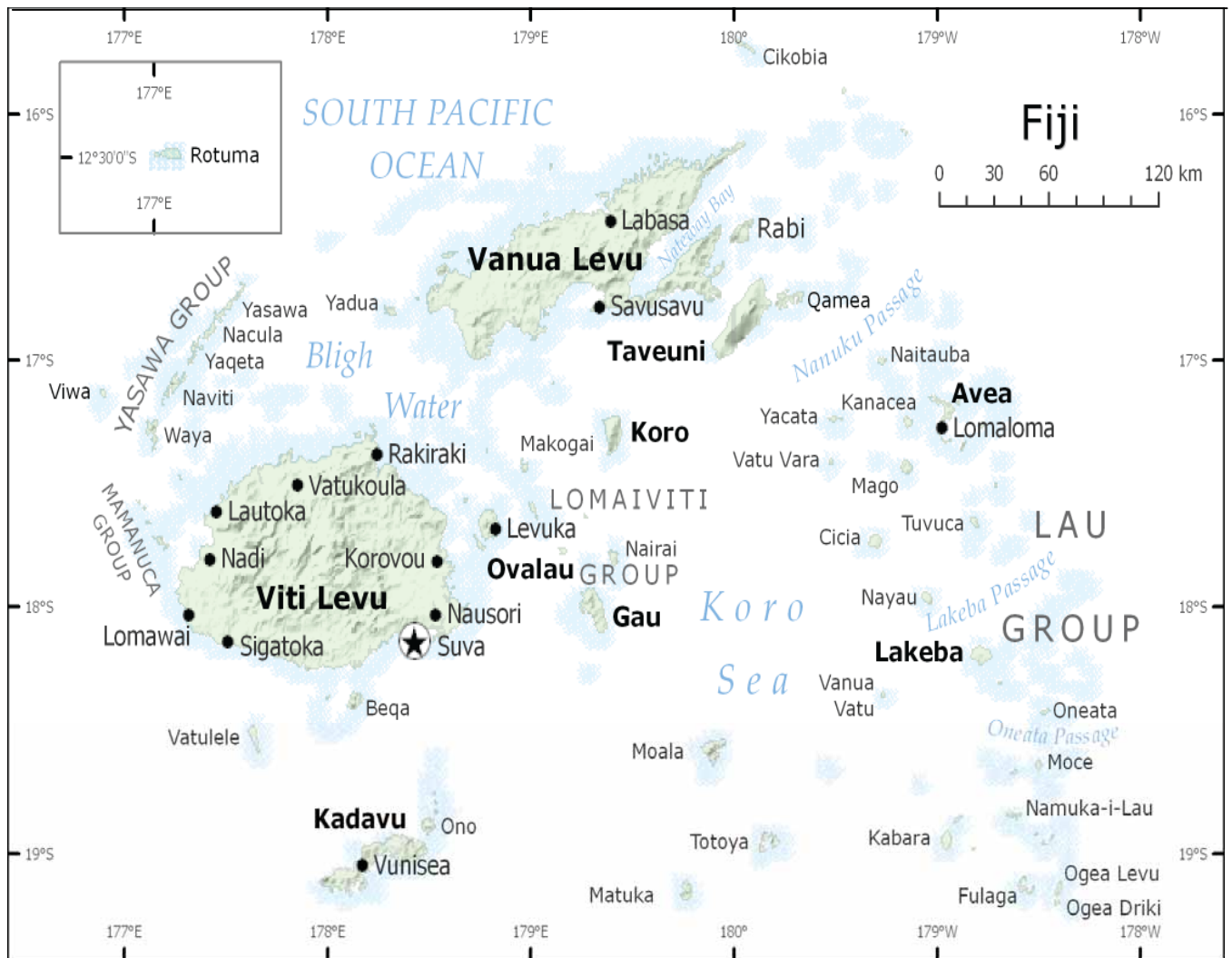


http://www.conseruation.org/FMG/Articles/Pages/fiji-fresh_water-to-ref.

(Economic and resource map for Viti Levu Island)

5. Relief Map

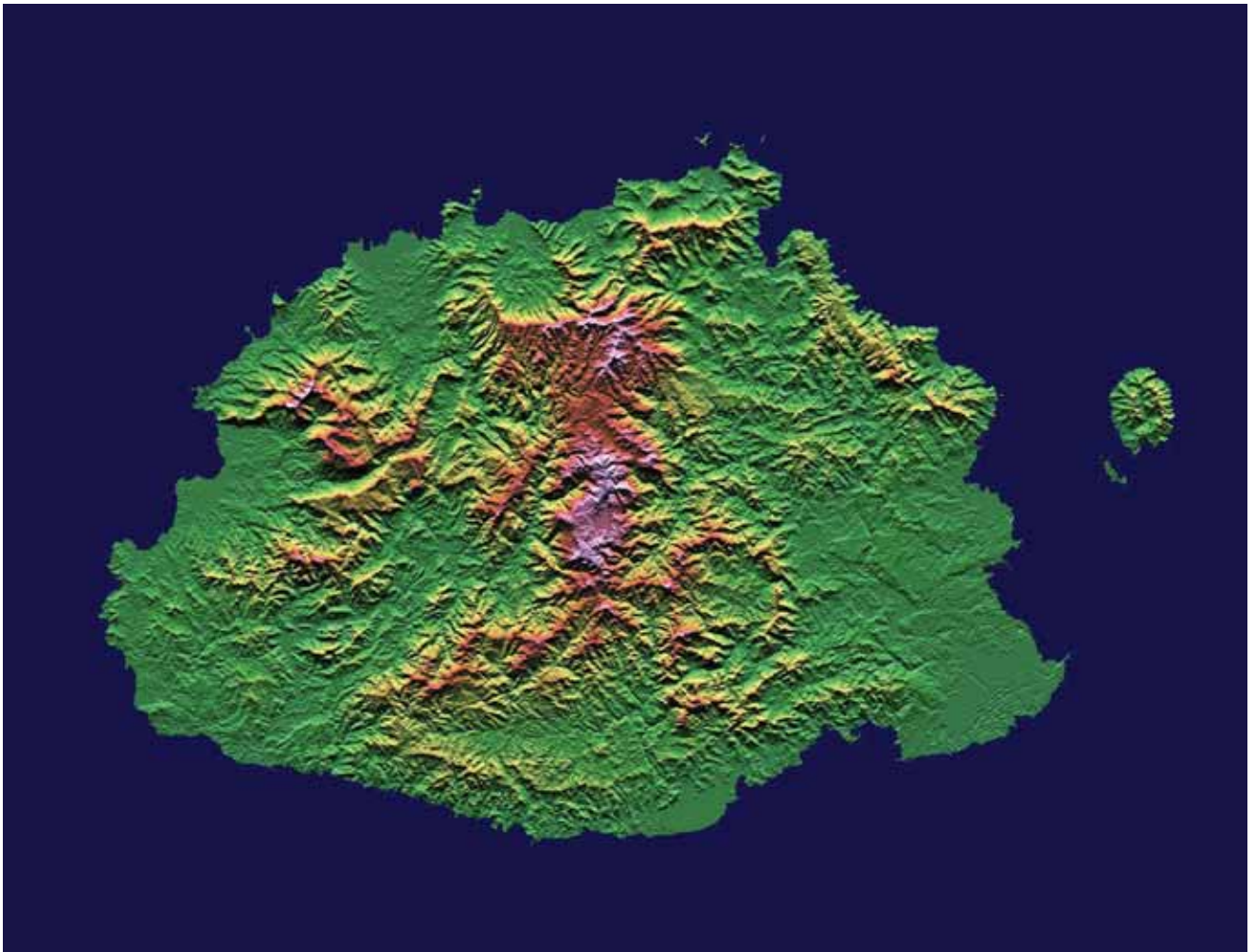
- It portrays various elevations in different colors.
- On these maps, mountains are displayed as red or brown while lowlands are shown in shades of green.



[Source: <http://onlinemaps.blogspot.com/2009/04/Fiji-relif-map>]

6. TOPOGRAPHIC MAP

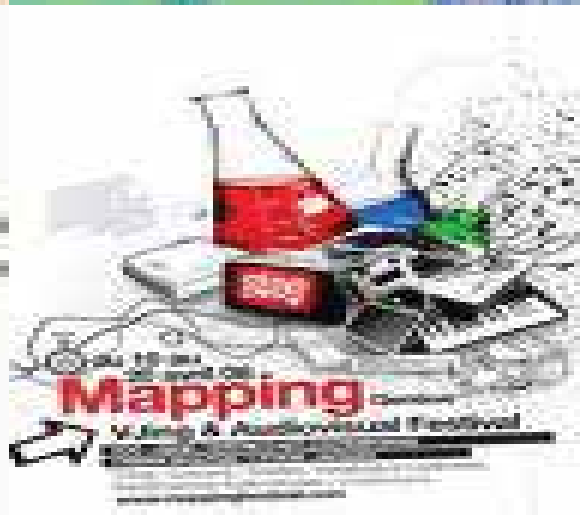
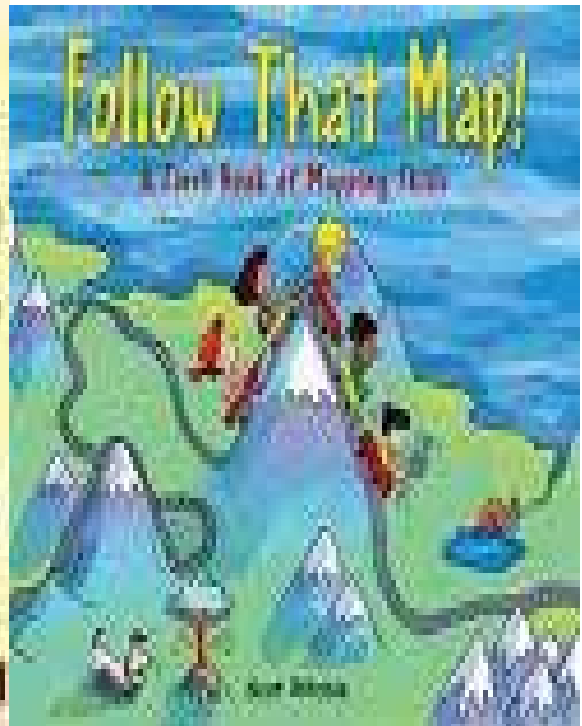
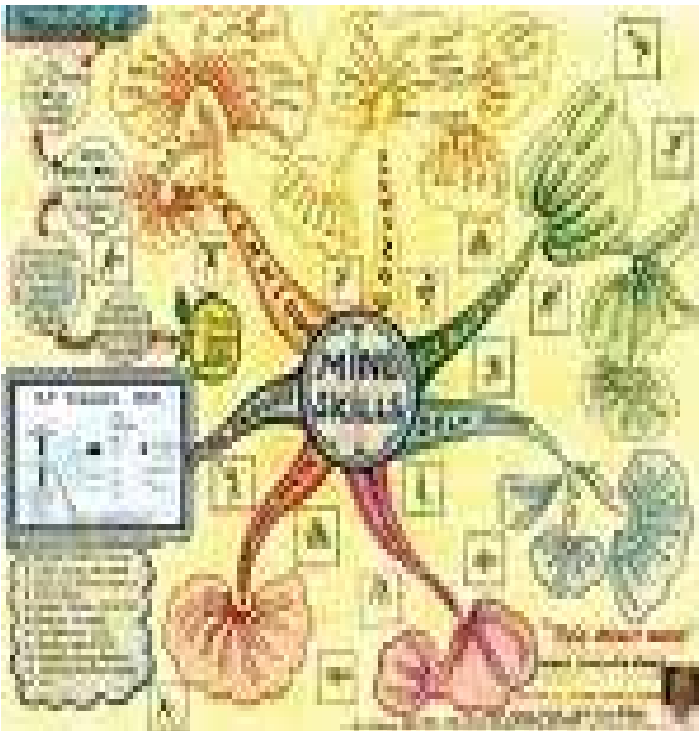
- Include contour lines to show the shape and elevation of an area. Lines that are close together indicate steep terrain, and lines that are far apart indicate flat terrain.



[Source: <http://mappery.com/maps/fiji-topographic-map.thumb.jpg&imgrefurl>]

UNIT 2

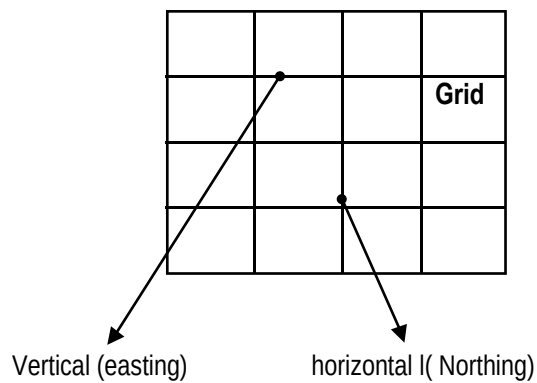
BASIC MAPPING SKILLS



[Source: <http://blog.richmond.edu/openwidelookinside/files/2009/10/follow-that-map.jpg&imgrefurl>]

THE GRID SYSTEM

- The Grid System is used to locate places on the map.
- When the grid is drawn on a map, the horizontal lines are called northing and the vertical lines are called easting. For example:

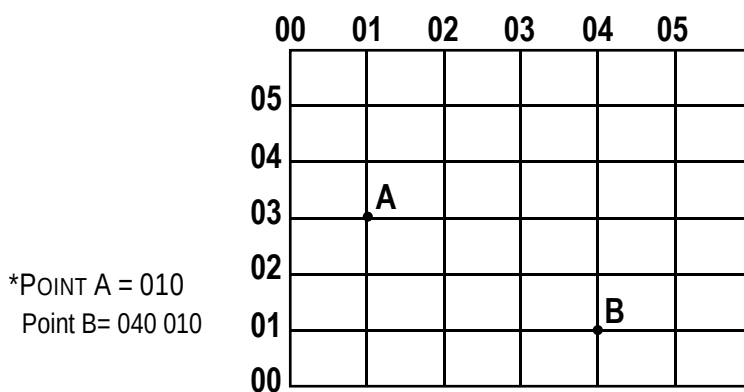


❖ Vertical + Horizontal = Grid

❖ A grid reference usually consists of six digits such as 020030.

020- Easting AND 030- northing

For example:

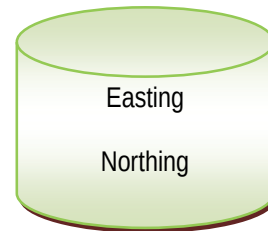


030- NOTE THAT EASTING COMES BEFORE NORTHING.

WORK TO DO

ACTIVITY 3: 1

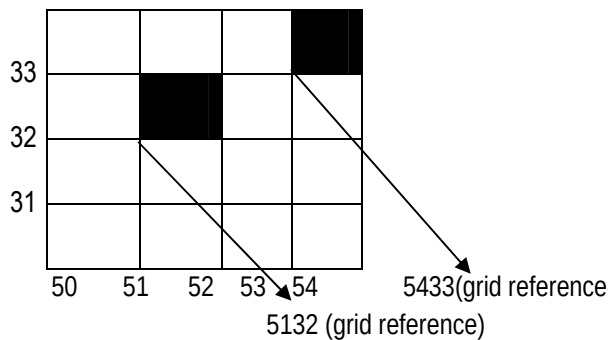
- i. Locate on the following points on the grid.
 - a. 110 225
 - b. 135 234
 - c. 120 215
- ii. Write down the grid reference of point B, C, D and E



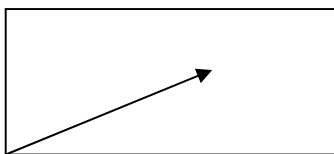
FOUR FIGURE GRID REFERENCE

- Sometimes it is difficult to give the exact location of certain places or features.
- For example, cattle grazing, large area of forest, a village or lake.
- In these cases we use a four figure grid reference, unlike a six figure grid reference which represents a particular point; a four grid reference represents a complete square.

For example:



- The reference is taken from the bottom left hand corner.

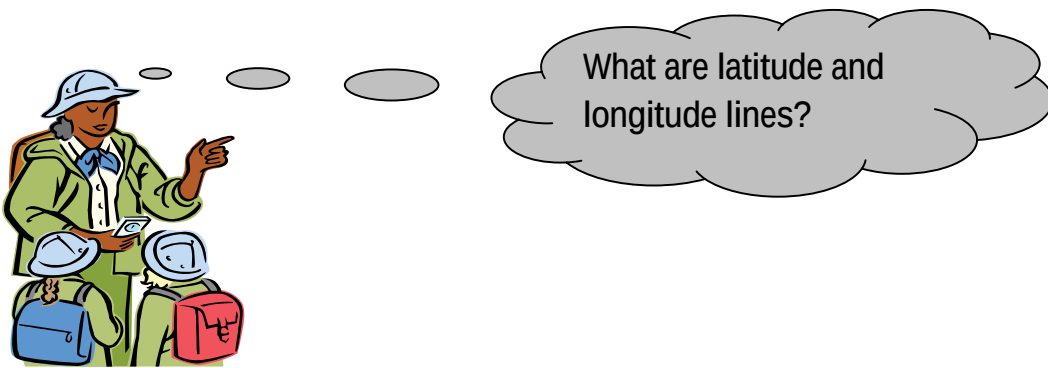


ACTIVITY

I Shade in different colors the square which have the following grid reference (use the grid from Activity 3.1)

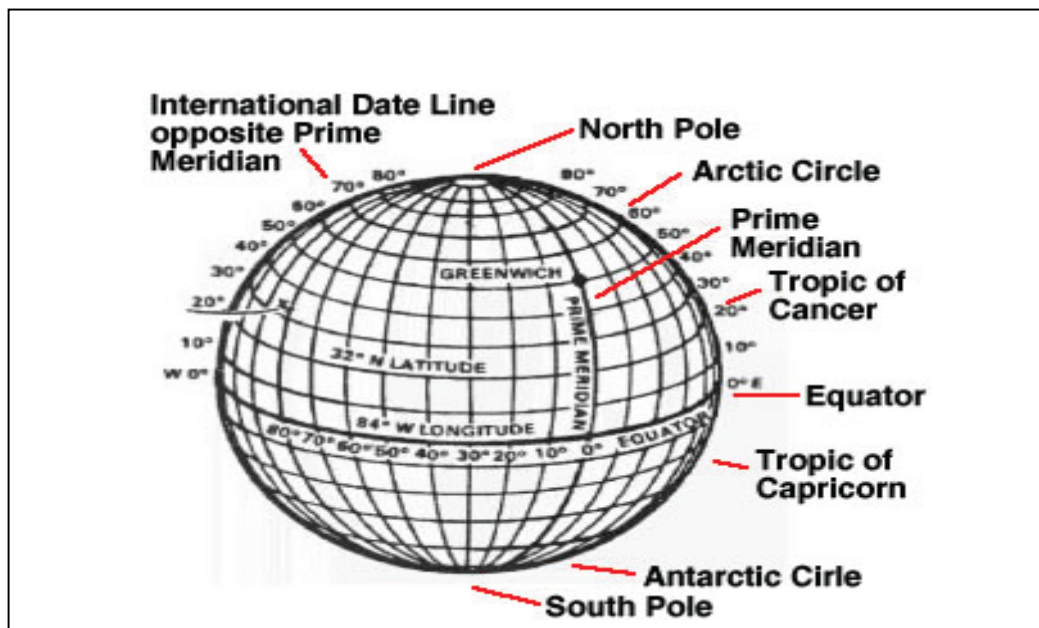
- a. 1221
- b. 1323
- c. 1422
- d. 1520

LATITUDES AND LONGITUDE

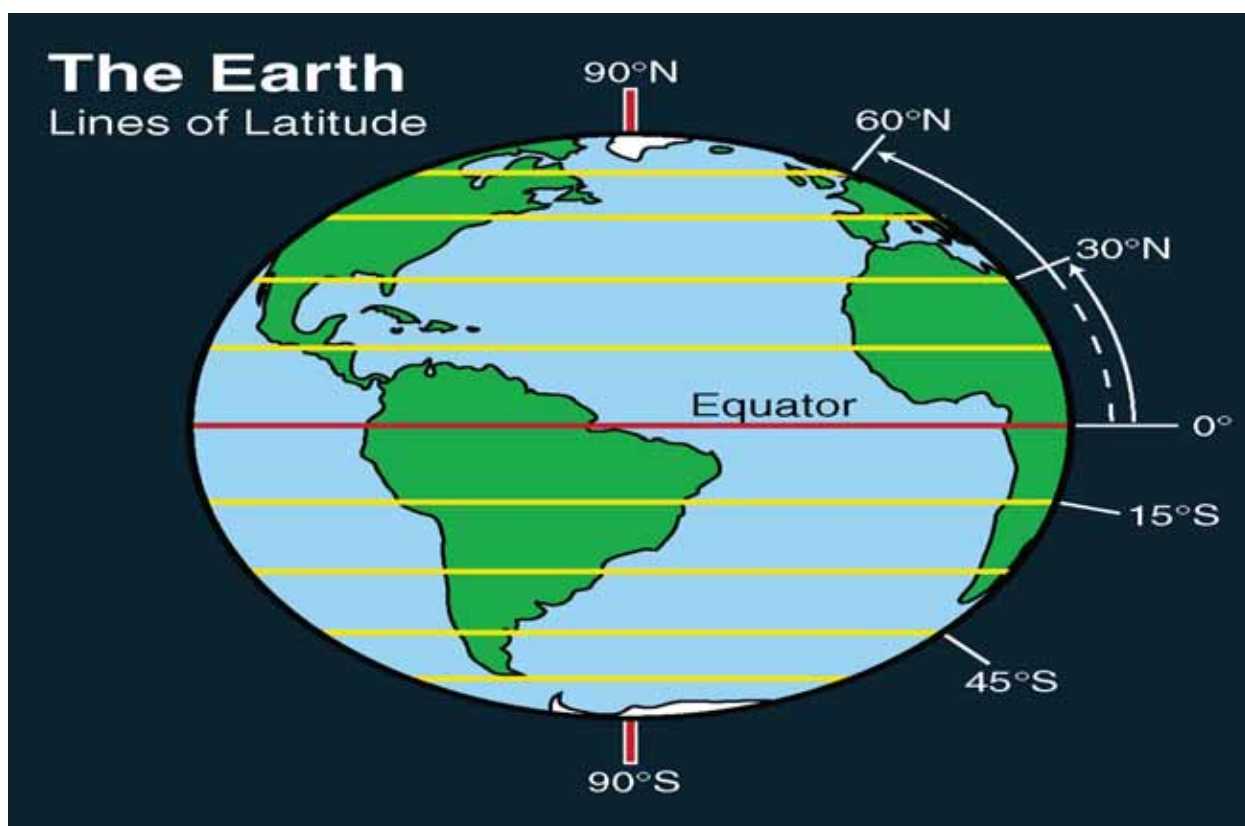


- Lines of latitude and longitude make up a grid system that was developed to help determine the location of points on the Earth.
- These lines run both north and south and east and west across the planet.

- Lines of latitude (those that run east and west) begin at the equator, which is zero degrees.



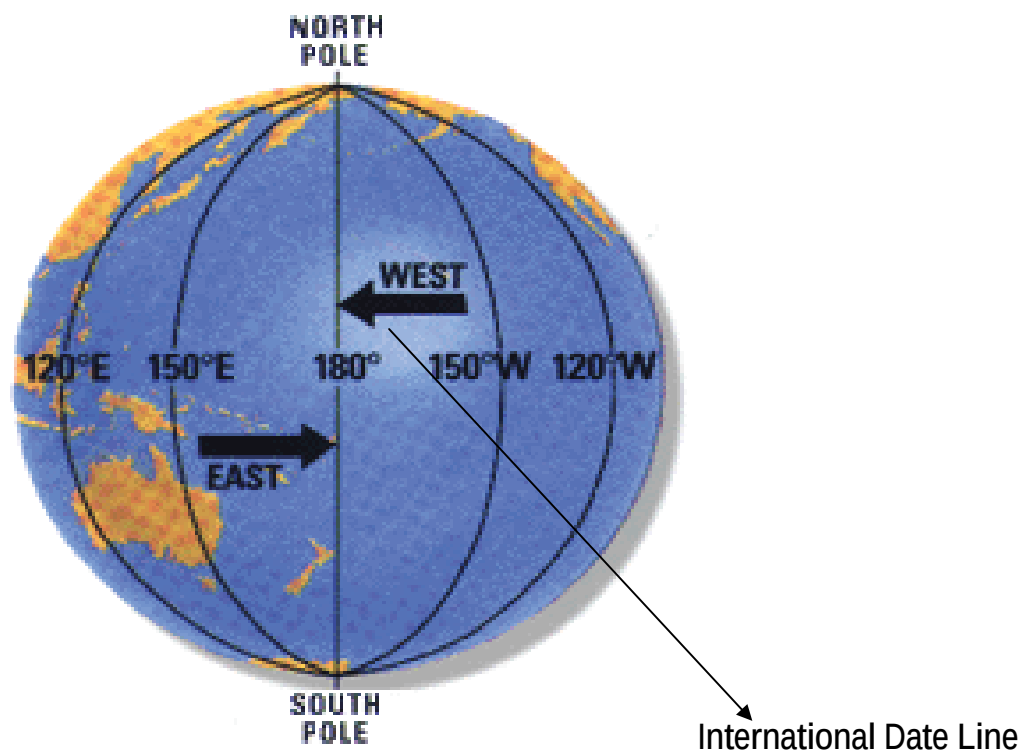
[Source: <http://www.academicung.edu/geology/leveson/core/graphics/mapgraphics/gif&imgrefurl>]



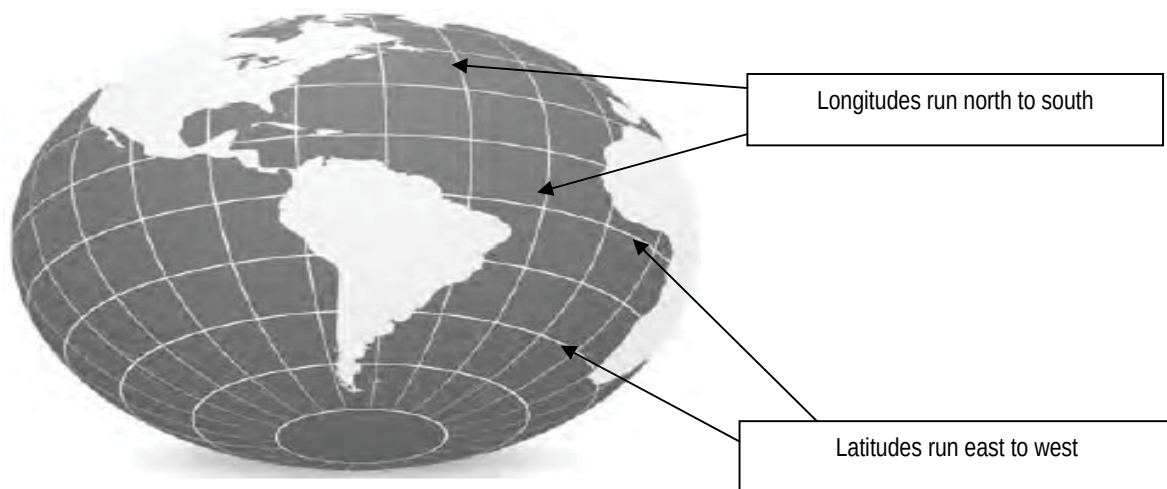
Lines of Longitude

They begin at the town of Greenwich from 0-180° East, and from the middle of the Pacific 180°-0° West. They extend to the North Pole and the South Pole, which are 90 degrees north and 90 degrees south, respectively.

Lines of longitude (those that run north and south) begin at the Prime Meridian, which is the imaginary line that runs through the Royal Observatory in Greenwich, England.



The lines of longitude extend both east and west from the Prime Meridian (also GMT, Greenwich Mean Time), which is zero degrees, and converge on the opposite side of the Earth at 180 degrees (also called the International Date Line).



Latitude lines run horizontally around the globe, while longitude lines run from north to south.

ACTIVITY

- (i) Use an atlas – identify which latitude and longitude run through Fiji.
- (ii) Longitude is used for measuring time. 1° of longitude represents 4 minutes.
 1. Work out the time different between a place on longitude 30° and another place on longitude 60° .
- (iii) Why is a day 'lost' when crossing the International Date Line from West to East?
- (iv) Use your atlas - on which latitudes and longitudes are the following cities located?

a. Suva	d. Wellington
b. London	e. Sydney
c. Los Angeles	f. Bombay
- (iv) Copy and complete.

Name 3 countries in each of the following heading:

	Northern Hemisphere	Southern Hemisphere	Eastern Hemisphere	Western Hemisphere
1				
2				
3				

ESSENTIAL FEATURES OF MAPS

Each map should have the following :

- **TITLE** – A description of the location, be must be written outside the frame and in BLOCK LETTERS.
- **FRAME** – ruled in black
- **DIRECTION/ NORTH POINT**
- **SCALES** – must be inside the frame
- **KEYS/ LEGENDS**- A standard set of symbols which show the special features which apply to the map. The key should be clear, complete and self- explanatory.

A. SCALES AND DISTANCES

Maps are drawn from actual objects seen on the land. Since the objects are always larger, there must be a reduction in their sizes when reproducing it on paper. This relationship between the sizes of the drawing and that of the object on the ground is known as **scale**.

The scale of a map can be expressed in many ways.

- Statement** – the scale is expressed or written in words or sentences. For example: One centimeter on the map represent one kilometer on the ground.
- Representative Fraction** – scales may be represented as a fraction .For example: $\frac{1}{100\ 000}$ (The numerator is always one- represents the distance on the map and the denominator represents ground distance).
- Ratio** – scales may also be expressed as a ratio. For example: 1: 100 000. (This means that one unit on the map represents 100 000 units on the ground).

ACTIVITY

- I. Use the scale 1: 50 000, calculate the actual distance in kilometers if the following measurements are given:

- | | |
|--------------------|------------------|
| (a) 2.5 cm _____ | (b) 7cm _____ |
| (c) 10cm _____ | (d) 20cm _____ |

- ii. The scale of a map is 1:100,000

- a. What is the actual distance represented by 1 centimeter on the map in:

- | | | |
|-----------------|---------------|-------------------|
| (i) centimeters | (ii) meters | (iii) kilometers |
|-----------------|---------------|-------------------|

iii. Write the following scales as a:

- a) Statement
- b) Ratio
- c) Representative fraction

(i) 1cm – 200m

(ii) 1cm – 10km

(iii) 1cm – 500m

B. DIRECTION

- Directions must be indicated on a map or plan by means of an arrow pointing to the north. The north point is found by using an instrument known as the compass.
- A compass has four main points known as the cardinal points. They are North, South, East and West. Besides these cardinal points other directions may be added in.



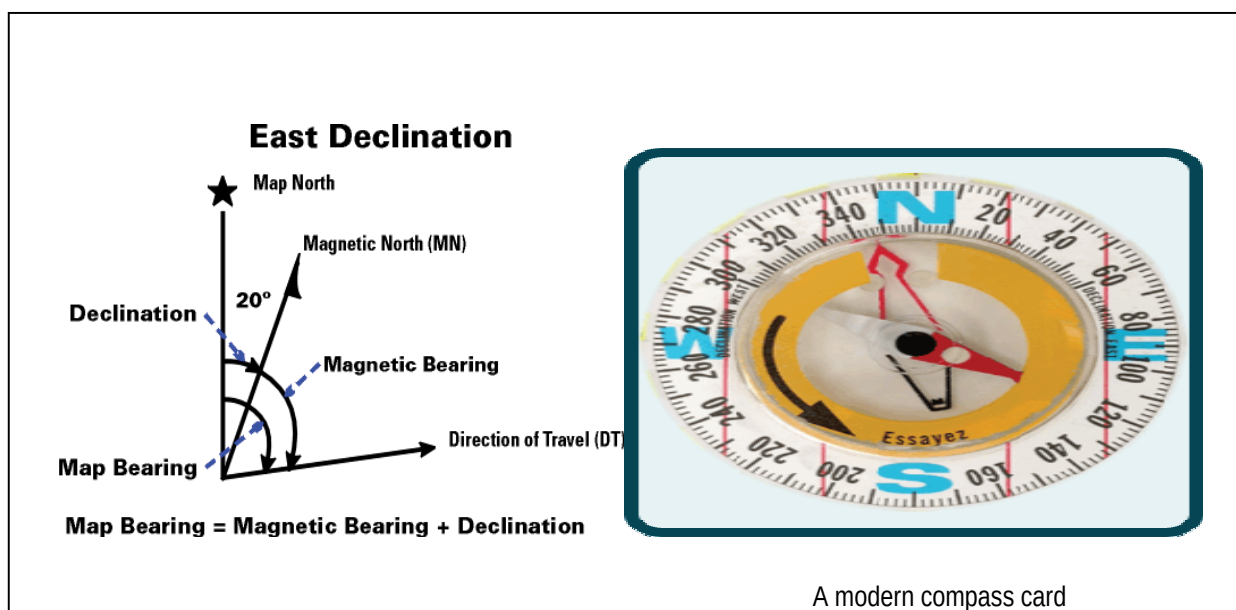
In the eight- point compass, the north-east, south- east, north- west and south –west directions are shown. This can be subdivided to produce a sixteen- point compass as shown above

C. BEARINGS

A bearing is a compass direction given in degrees.

- Bearings are calculated by measuring the angle from the North in a clockwise direction.
- It is always written in three digits. For example: A bearing of 45° will be written as 045° East.

In a compass there are 360 degrees. If a compass is pointing North, North is 0°, East is 90°, South is 180° and West is 270°



ACTIVITY 3.4

Study the diagram of a modern compass card, and then convert the following compass points into bearings.

NE -	ESE -
SE -	WNW -
NNW -	SW -
SSE -	WSW -
NNE -	ENE -
NW -	SSW -

D. MAP SYMBOLS

- Symbols are used on maps to represent features which exist on the ground. In many cases these features are easily recognized- building, streams, trees and roads for example.
- Other symbols represent features that may not be seen. Contour lines, for example, will not be seen lying on the ground although they are one of the most important and useful symbols on the map.

- In the opinion of the cartographer, symbols are used to show information and are designed so that they can easily be identified with the feature they represent on the map.
- The use of color is an additional aid to identification. For example: blue for water, green for vegetation, black for man-made culture, yellow for deserts
- Below is an example of some common symbols used on topographical maps.

TOPOGRAPHIC MAP SYMBOLS

VARIATIONS WILL BE FOUND ON OLDER MAPS

Primary highway, hard surface		Boundaries: National	
Secondary highway, hard surface		State	
Light-duty road, hard or improved surface		County, parish, municipio	
Unimproved road		Civil township, precinct, town, barrio	
Road under construction, alignment known		Incorporated city, village, town, hamlet	
Proposed road		Reservation, National or State	
Dual highway, dividing strip 25 feet or less		Small park, cemetery, airport, etc.	
Dual highway, dividing strip exceeding 25 feet		Land grant	
Trail		Township or range line, United States land survey	
Railroad: single track and multiple track		Township or range line, approximate location	
Railroads in juxtaposition		Section line, United States land survey	
Narrow gage: single track and multiple track		Section line, approximate location	
Railroad in street and carline		Township line, not United States land survey	
Bridge: road and railroad		Section line, not United States land survey	
Drawbridge: road and railroad		Found corner: section and closing	
Footbridge		Boundary monument: land grant and other	
Tunnel: road and railroad		Fence or field line	
Overpass and underpass			
Small masonry or concrete dam		Index contour	
Dam with lock		Intermediate contour	
Dam with road		Supplementary contour	
Canal with lock		Depression contours	
Buildings (dwelling, place of employment, etc.)		Fill	
School, church, and cemetery		Cut	
Buildings (barn, warehouse, etc.)		Levee	
Power transmission line with located metal tower		Levee with road	
Telephone line, pipeline, etc. (labeled as to type)		Mine dump	
Wells other than water (labeled as to type)		Wash	
Tanks: oil, water, etc. (labeled only if water)		Tailings	
Located or landmark object; windmill		Tailings pond	
Open pit, mine, or quarry; prospect		Shifting sand or dunes	
Shaft and tunnel entrance		Intricate surface	
Horizontal and vertical control station:		Sand area	
Tablet, spirit level elevation	BM Δ 5653	Perennial streams	
Other recoverable mark, spirit level elevation	Δ 5455	Intermittent streams	
Horizontal control station: tablet, vertical angle elevation	VABM Δ 9519	Elevated aqueduct	
Any recoverable mark, vertical angle or checked elevation	Δ 3775	Aqueduct tunnel	
Vertical control station: tablet, spirit level elevation	BM X 957	Water well and spring	
Other recoverable mark, spirit level elevation	X 954	Glacier	
Spot elevation	X 7369 X 7369	Small rapids	
Water elevation	670 670	Large rapids	
		Small falls	
		Large falls	
		Intermittent lake	
		Dry lake bed	
		Foreshore flat	
		Rock or coral reef	
		Sounding, depth curve	
		Piling or dolphin	
		Sunken wreck	
		Rock, bare or awash; dangerous to navigation	
		Marsh (swamp)	
		Submerged marsh	
		Wooded marsh	
		Mangrove	
		Woods or brushwood	
		Orchard	
		Vineyard	
		Scrub	
		Land subject to controlled inundation	
		Urban area	

(Source: <http://www.Csuchico.edu/bib/maps/MAP 3.GIF>)

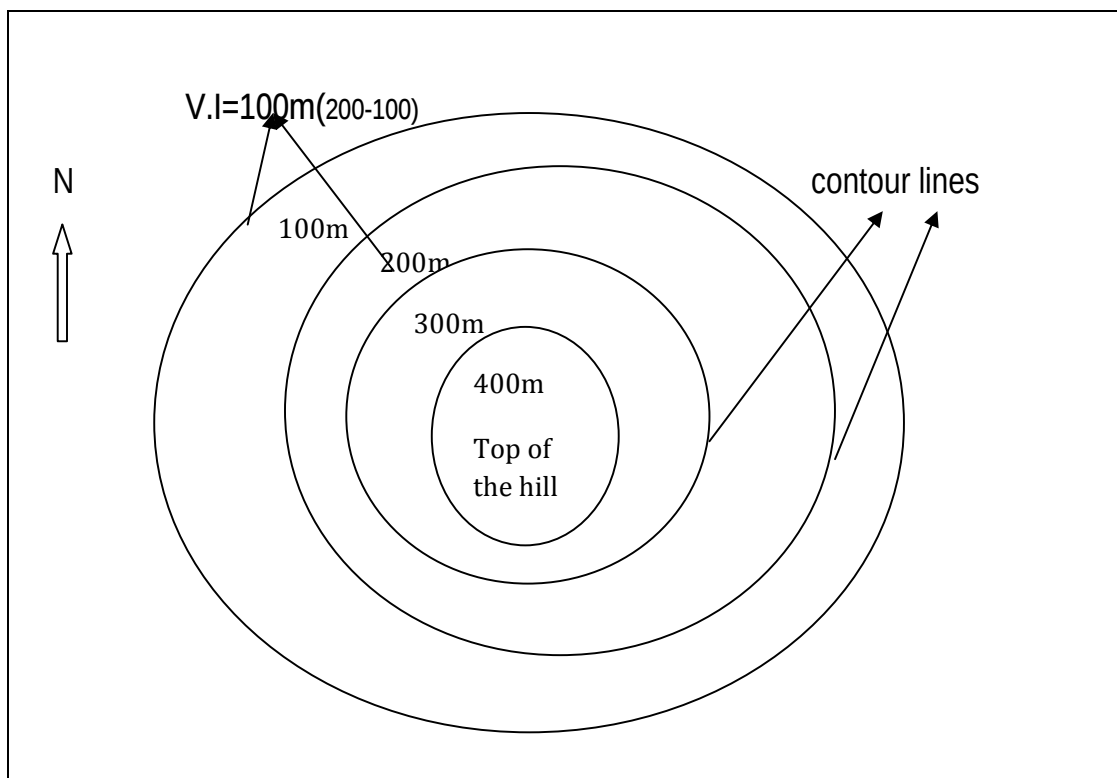
HEIGHTS AND LANDFORMS ON MAPS

Maps use different methods of illustrating relief, the most common is to use contour lines.

CONTOUR LINES

- So far this is the best way of representing relief. (height below and above sea level).
- A contour line is an imaginary line joining all places (height above and below sea-level).
- It is drawn at intervals and their values are usually in meters.
- The difference between successive contour lines is known as the vertical interval (V.I.).

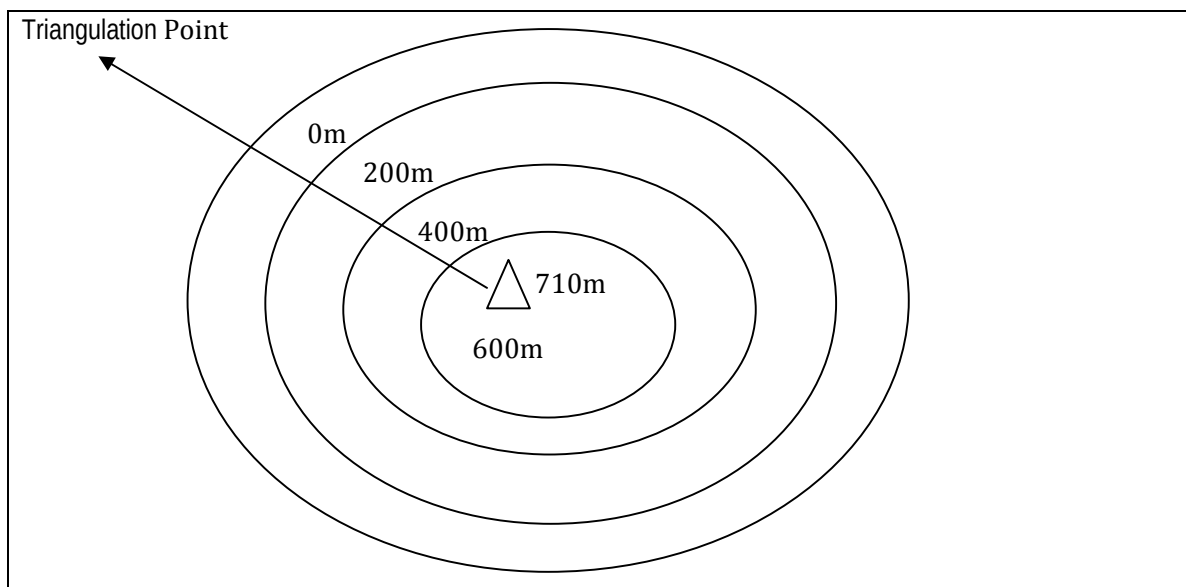
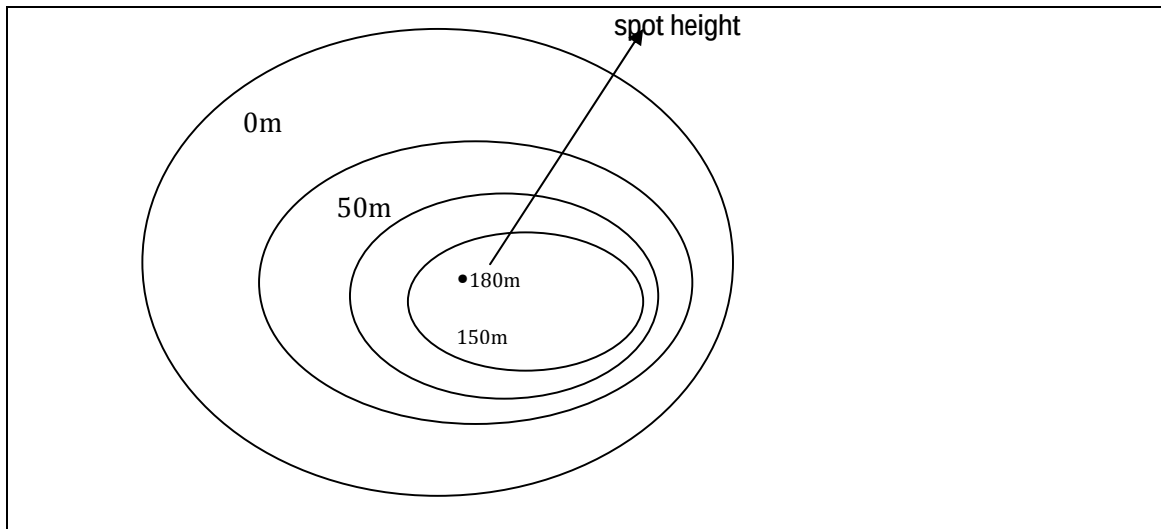
A CONTOUR MAP



Heights above sea level are shown in three ways:

- Contour lines
- Spot heights – these are points on a map with the exact heights above sea level (are usually marked by a dot with the height written next to it, usually in meters).

- Triangulation points (stations) – these are sites which overlook the country side and is used for surveying the land. (It is shown by a small triangle with a dot inside it) Triangulation points are also referred to as Trigonometric Points (stations).



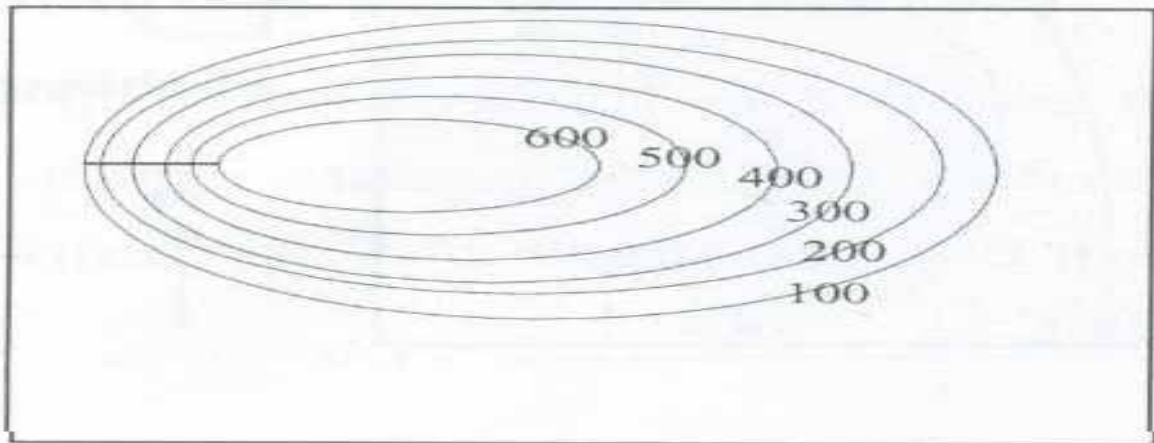
BASIC CONTOUR PATTERNS

- Notice that when contours are closer together, they represent a steep slope, while those that are widely spaced, represent the gentle slope.
- Where contours have crossed a valley, the lines will bend upstream direction. If there is a ridge they would bend in a downhill direction.

- First, we will examine all the contour patterns in isolation, once we have practiced drawing them then we can assemble them together forming a complete landscape.

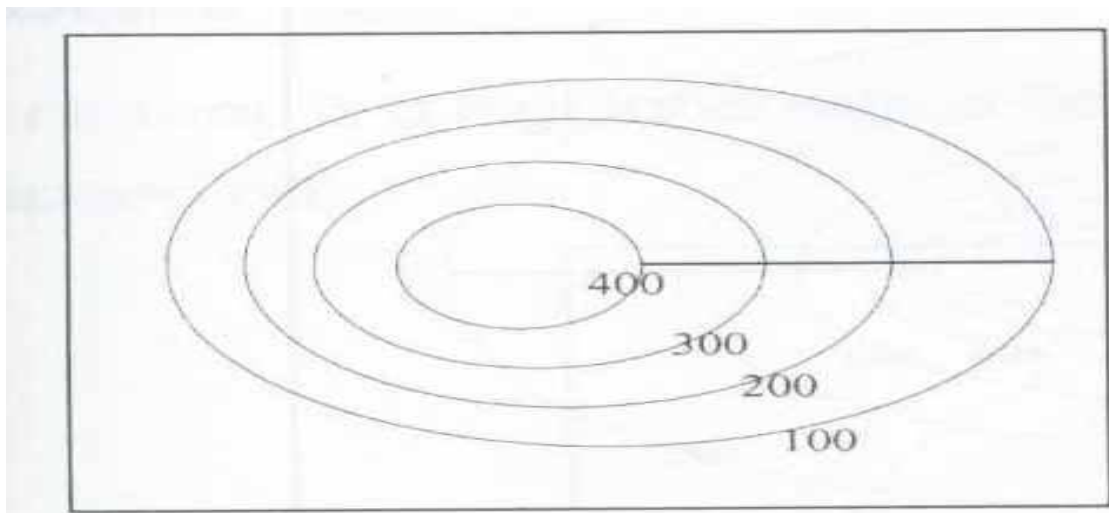
1. Steep/ Scarp Slopes

The contour lines are drawn closer together.



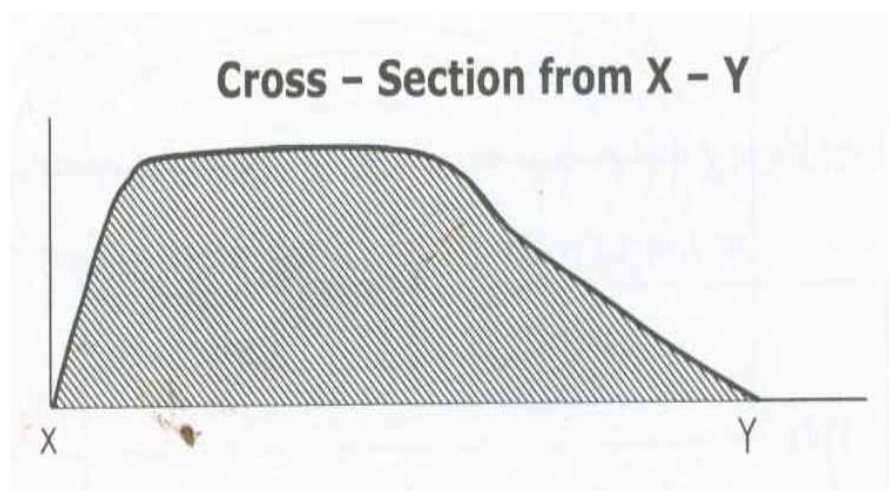
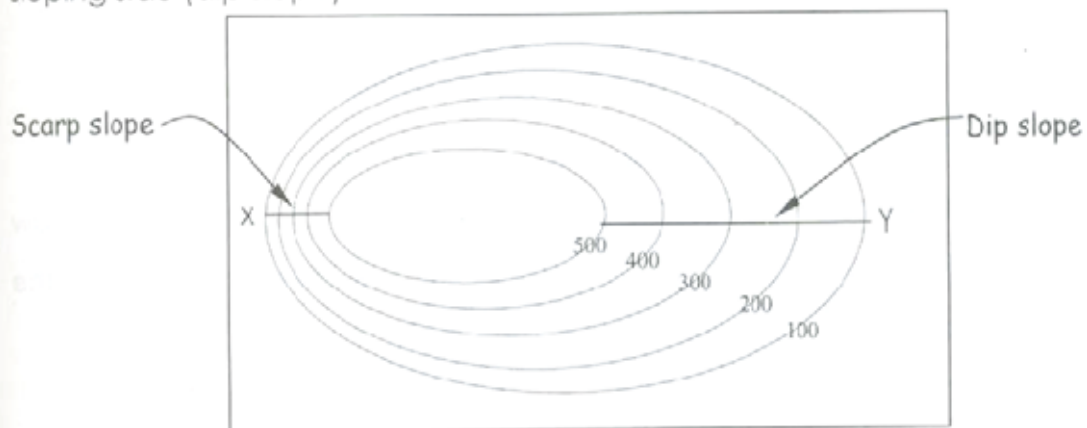
2. Gentle/ Dip Slope

The contour lines are widely spaced.

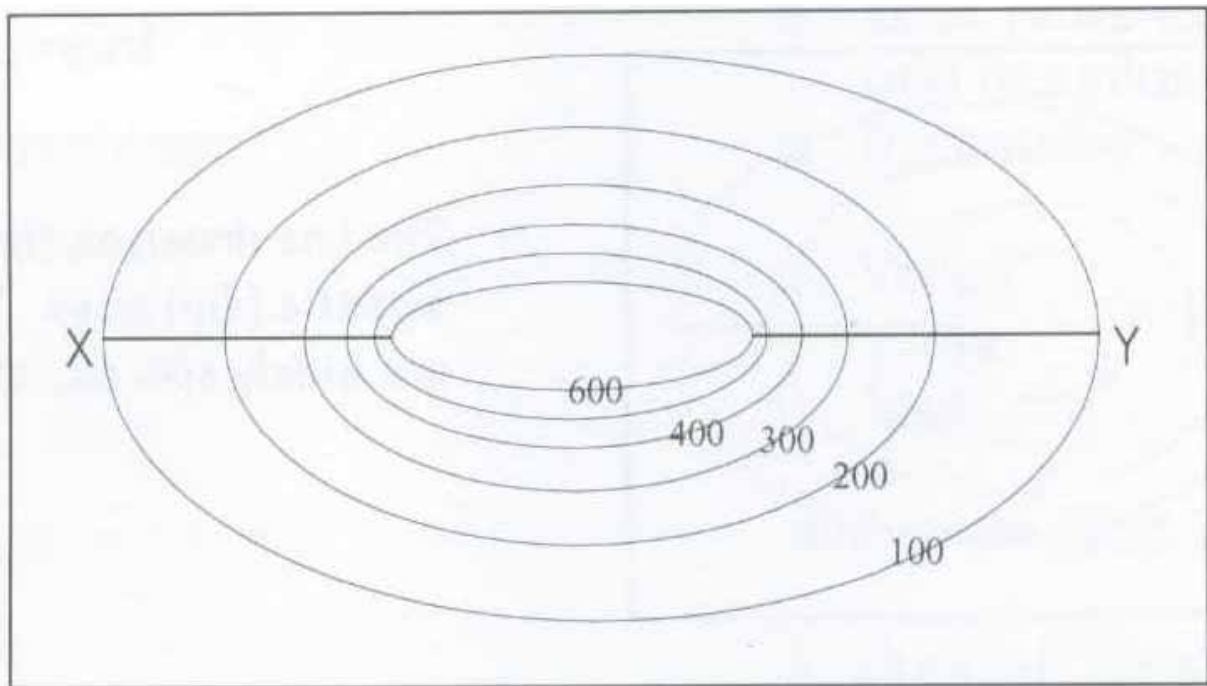


3. Escarpment

An escarpment is a hill with one steep side (scarp slope) and one gently sloping side (dip slope).



4. Concave Slope

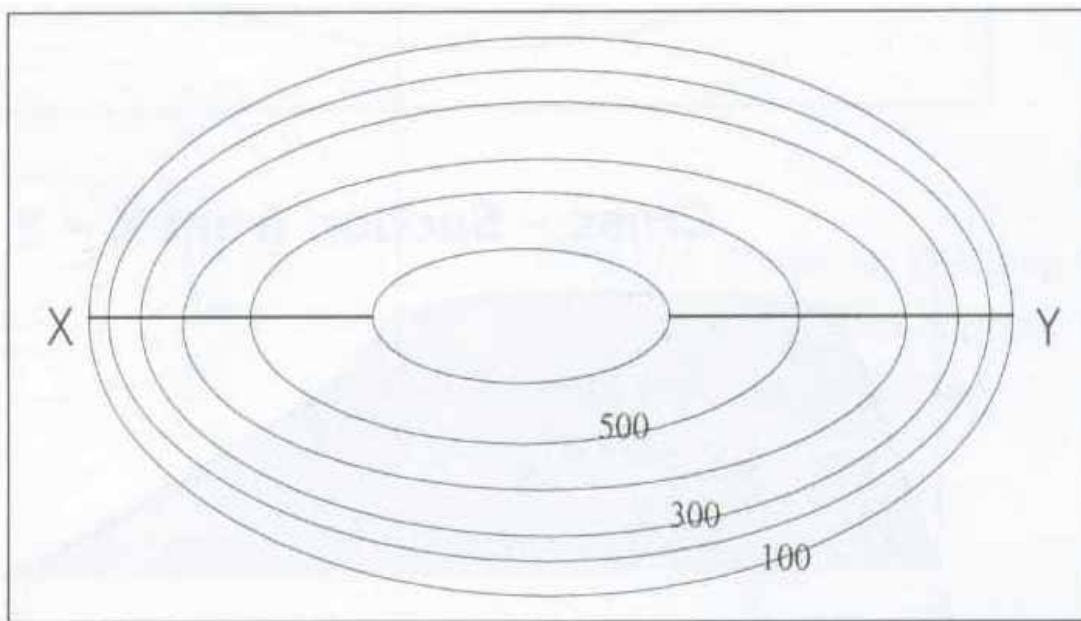


Cross – Section from X – Y

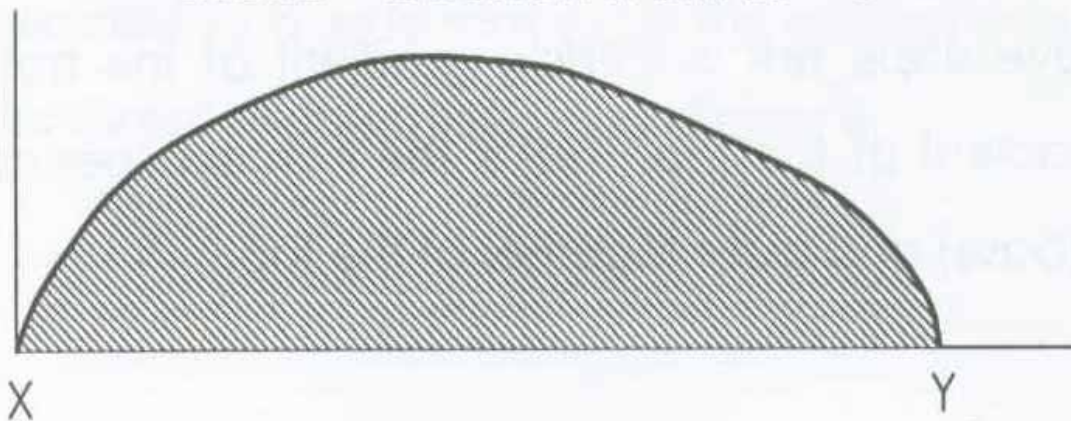


A concave slope has a shallow gradient at the base and a steep gradient at the top.

5. Convex Slope

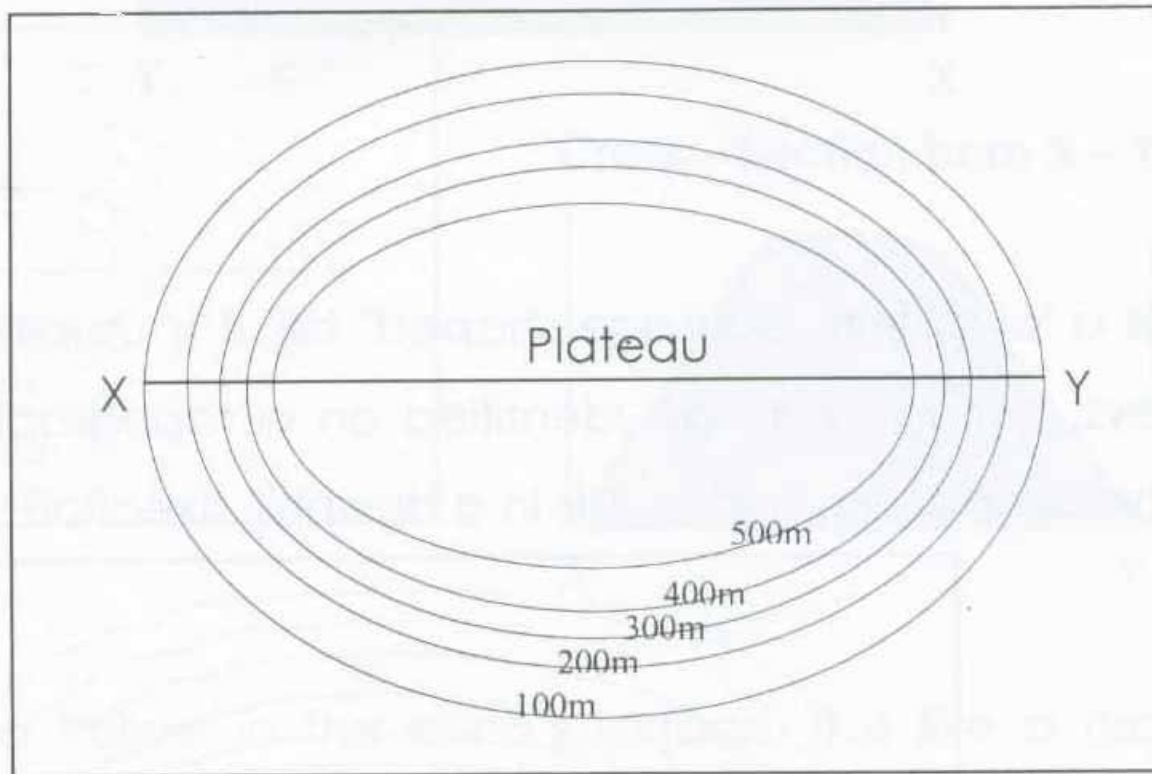


Cross – Section from X – Y

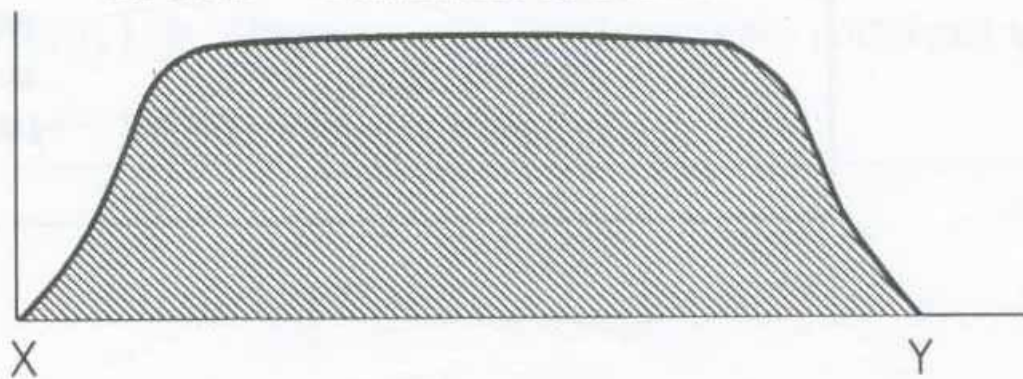


A convex slope has a steep gradient at the base and a shallow gradient at the top.

6. Plateau

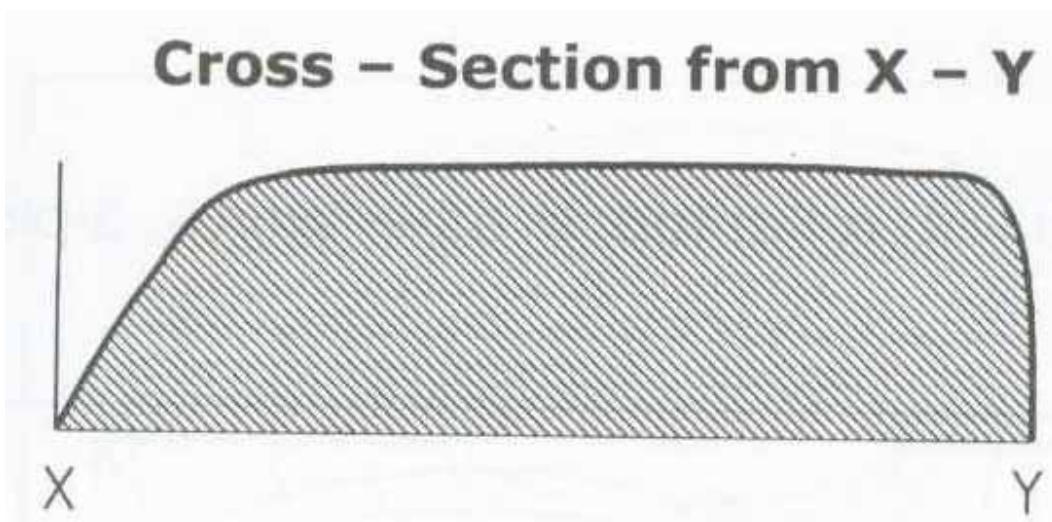
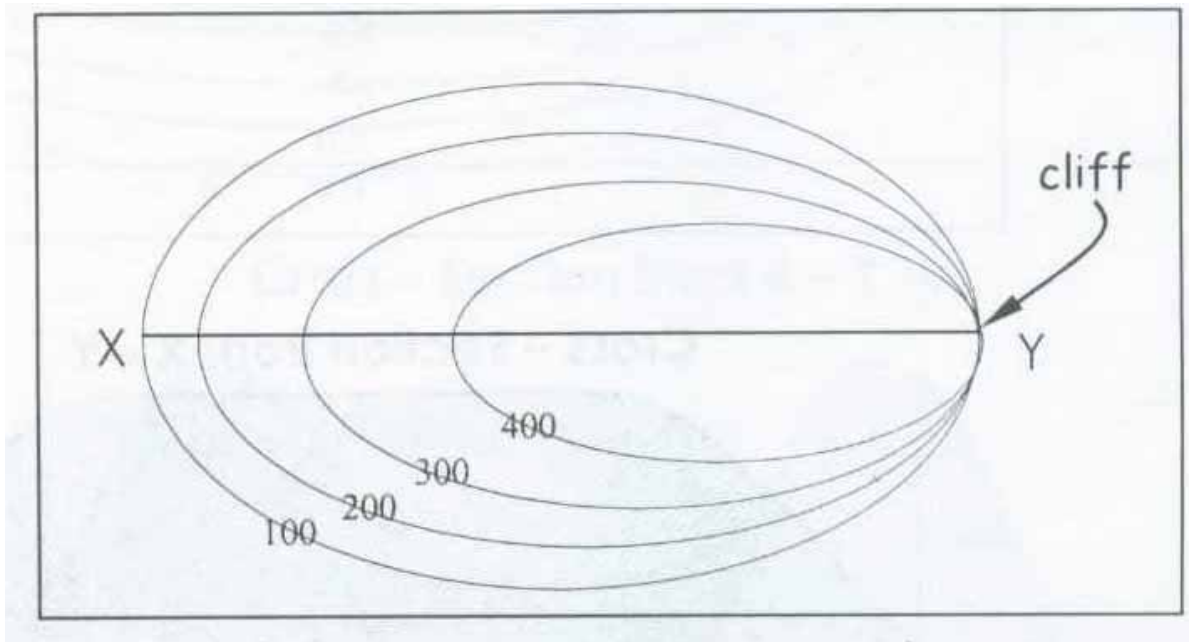


Cross – Section from X – Y



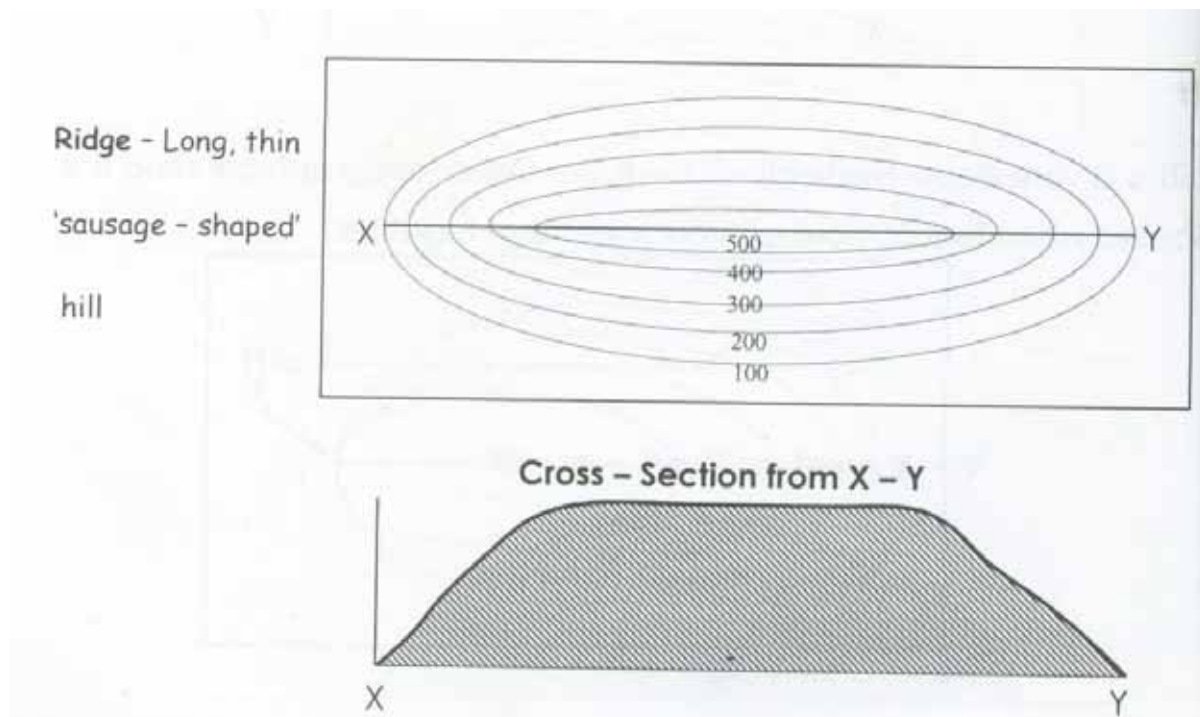
A plateau is a landform with a flat top

7. Cliff



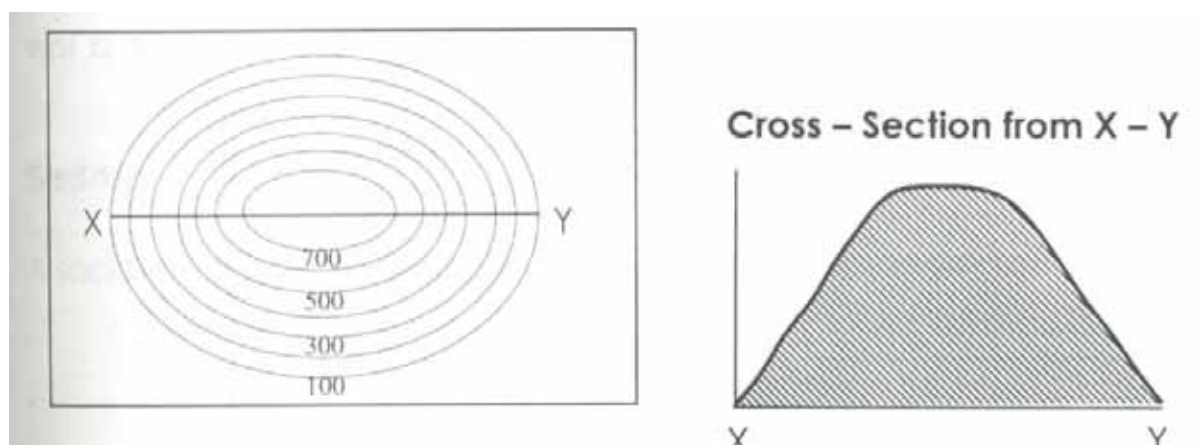
A cliff is a very steep slope, even vertical

8. Ridge



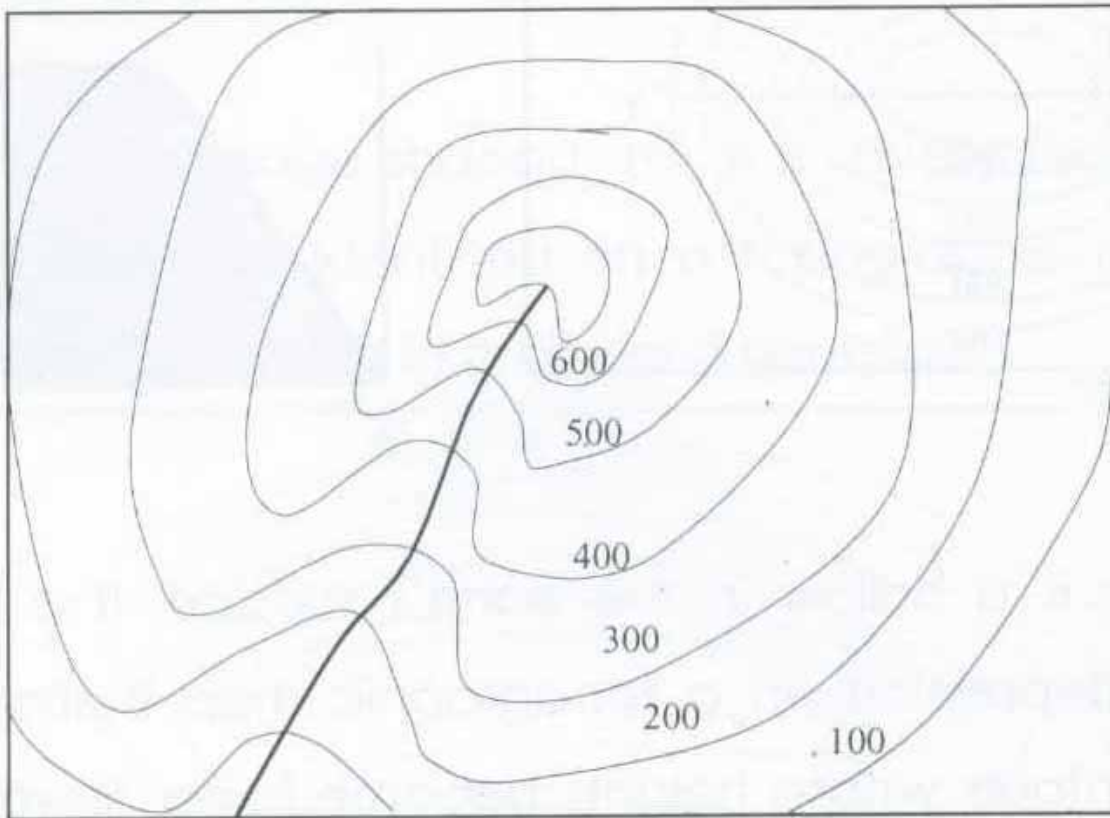
A ridge is usually found between two valleys.

9. Knoll

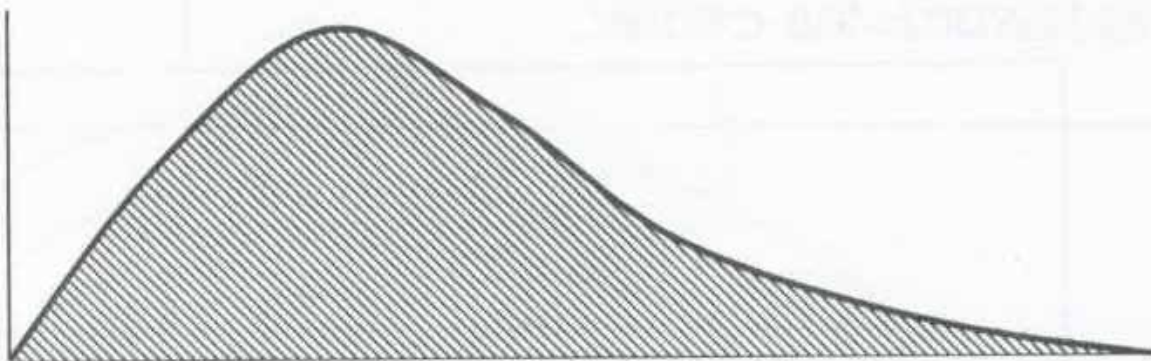


A knoll is an isolated hill. It is indicated by almost circular contour lines.

10. Valley

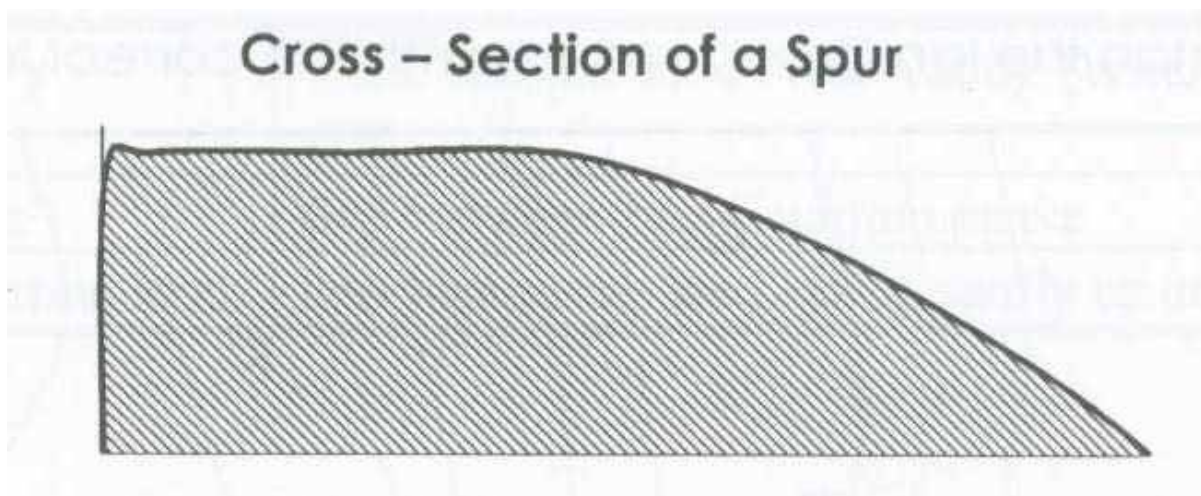
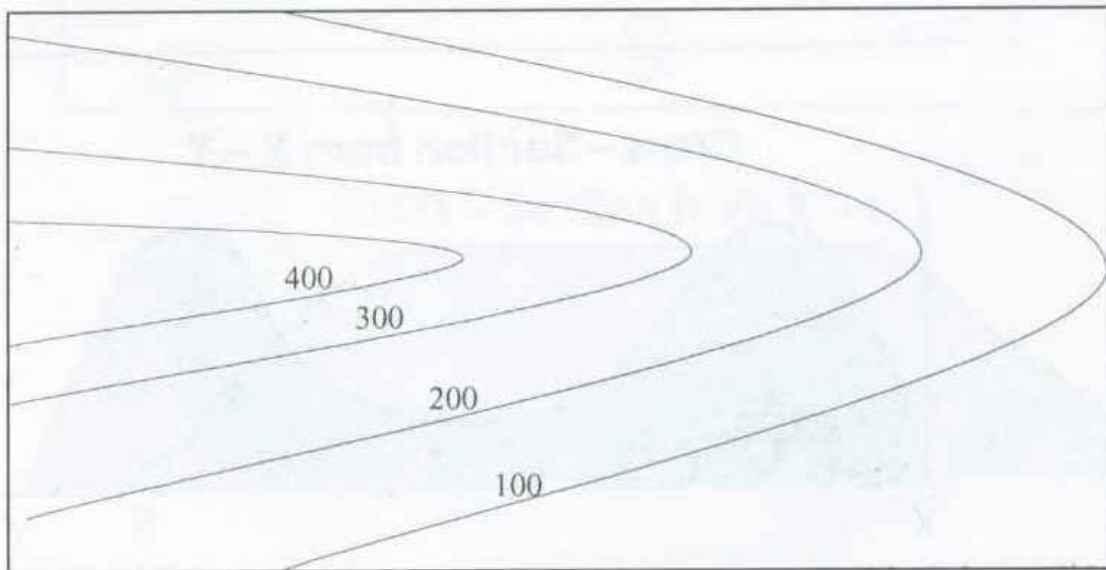


Cross – Section of a River Valley



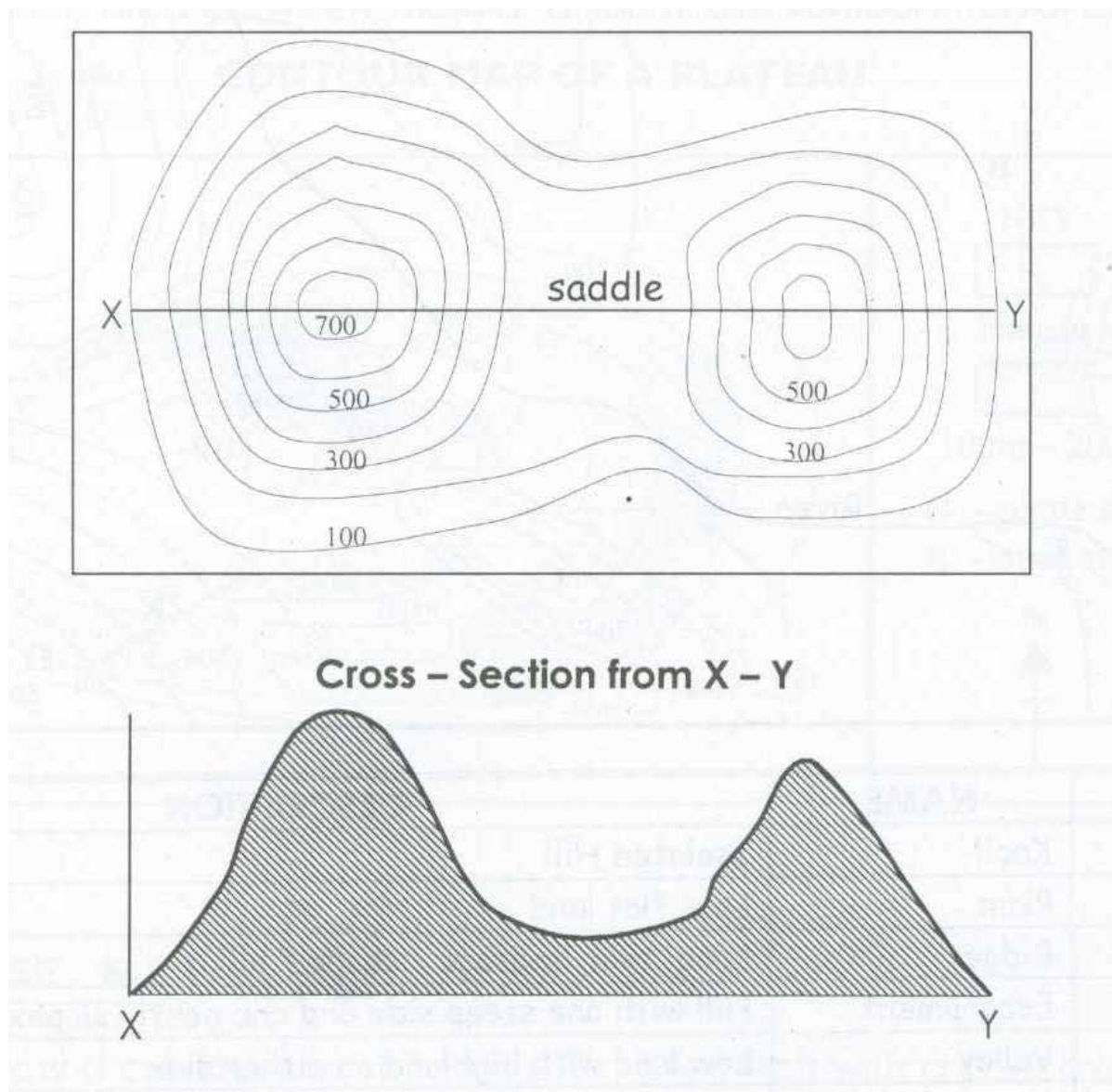
On a topographic map valleys can be recognized by a V shaped contour pattern.

11. Spur



A spur is a figure of high land pointing in to low land or it is a high land jutting out towards the lower ground.

12. Saddle



A saddle is a gap between two mountain peaks.

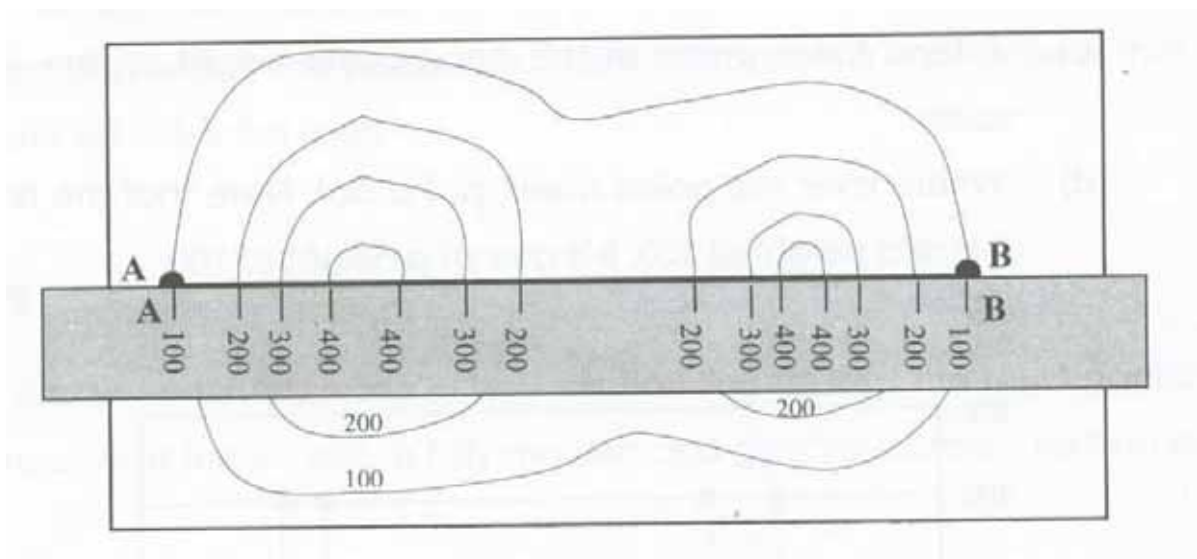
CROSS-SECTIONS

A cross-section shows the side view of a landform. From the cross-sections the shapes of hills, mountains, valleys and other features of the landscape can be learnt. It is useful to know how to draw cross sections.

How to draw a cross section from a given contour map

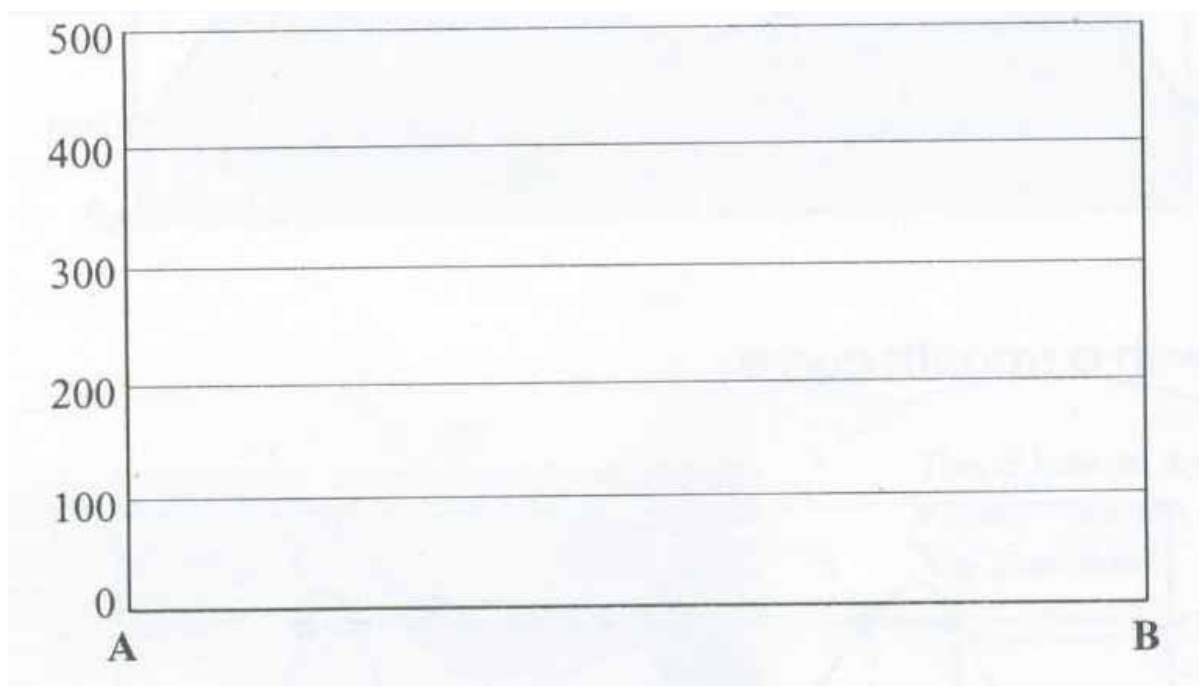
Step i

1. Work out the vertical scale
2. Join points A and B with a straight line.
3. Place a straight edged paper along line AB.
4. Mark on the paper every point where it cuts across a contour line.
5. Write the heights of each contour line below each mark.



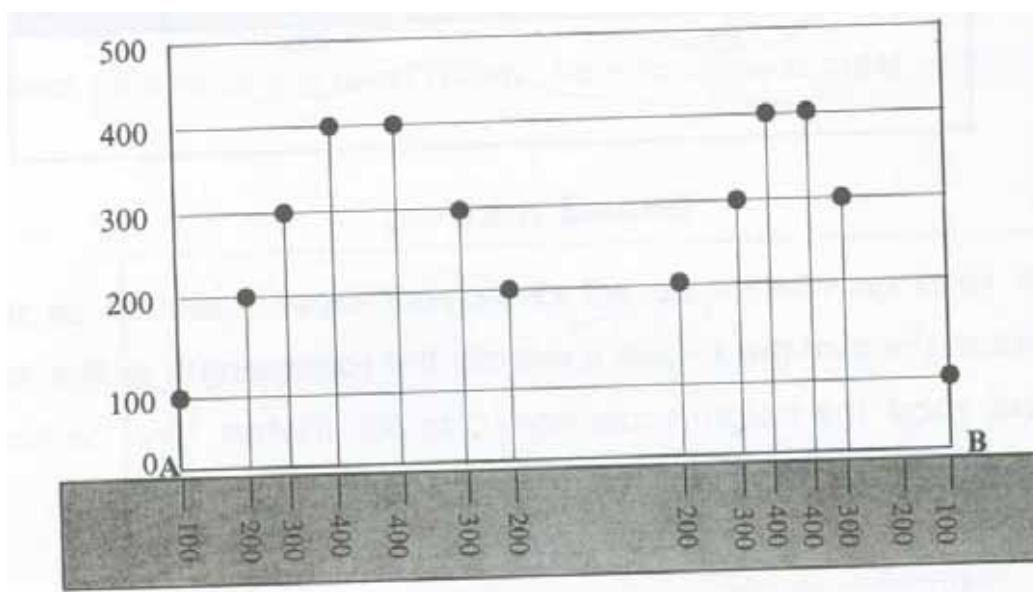
Step ii

1. Draw the axes on which you will draw your cross section.
2. Make sure that the x-axis is exactly the same length as line AB.
3. On the y-axis, mark the height scale from 0-500m. (One centimeter on the y-axis should represent 100 meters.)



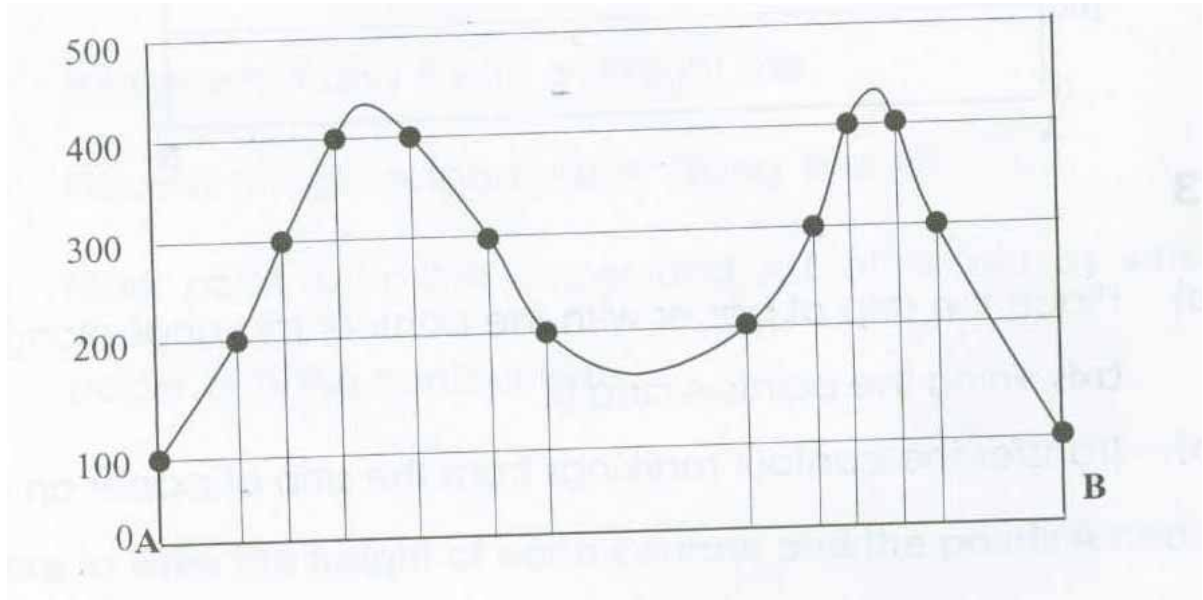
Step iii

1. Place the strip of paper with the contour markings along the x-axis, lining the points A and B.
2. Draw a vertical line from each of the marks until it touches the correct height on the vertical scale.



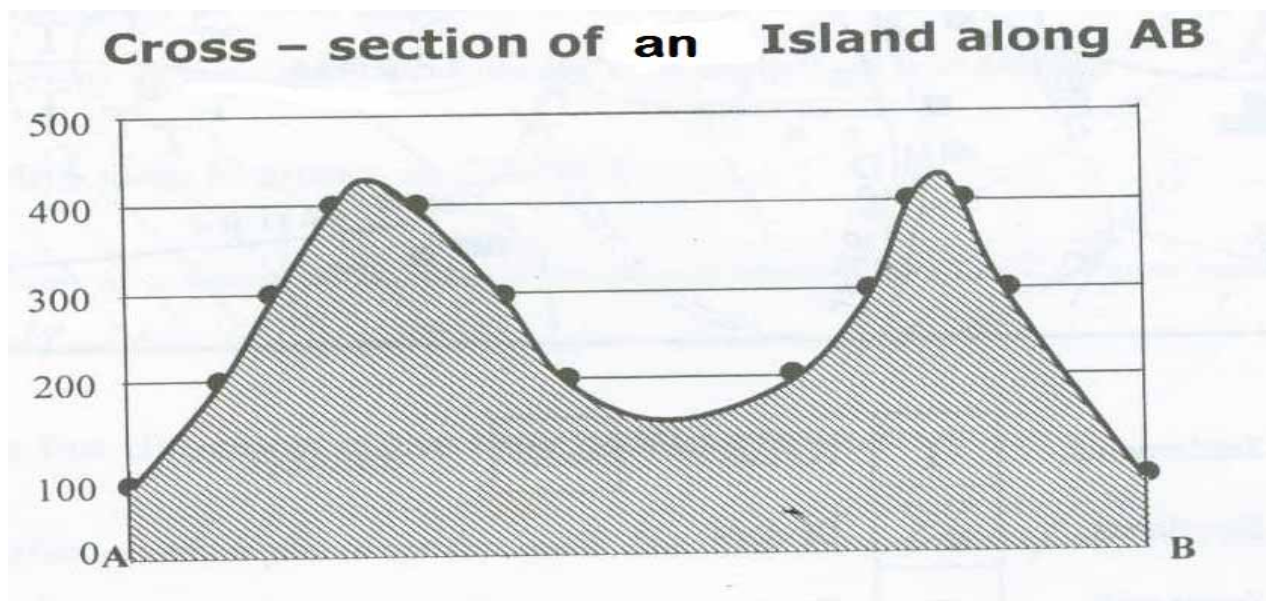
Step iv

1. Join the dots with a smooth curve.



Step v

1. Finally shade the landform and do not forget to check that the y-axis is fully marked and your cross-section has a title.



(Source: Look at Map and Shah:2003)

ACTIVITY

A. Study the Sovi Area and answer questions (i) – (xi).

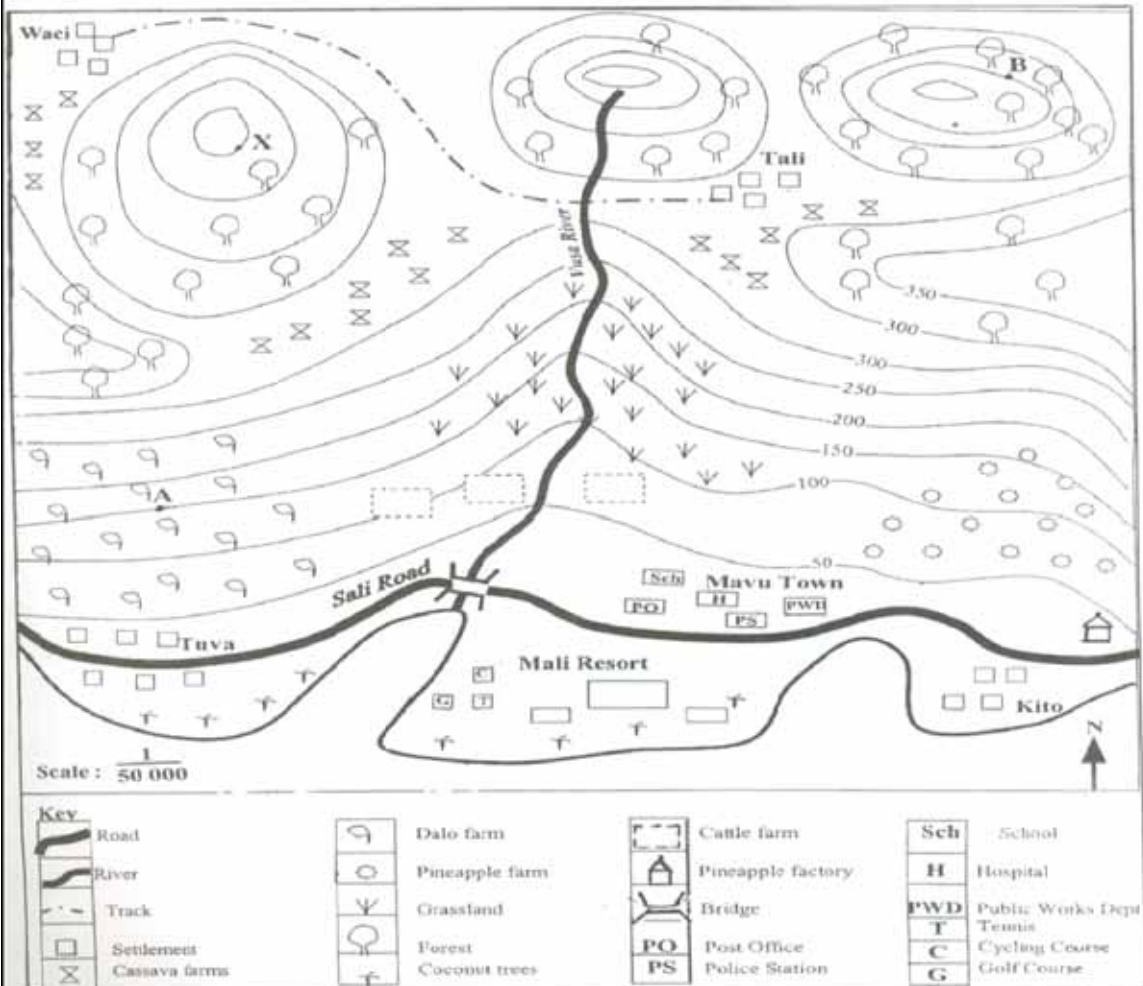
- i. Express the scale as a representative fraction.
- ii. In which direction is Vusa River flowing?
- iii. What is the height of point X?
- iv. Calculate the distance covered by Sali road.
- v. Name two exports from Sovi area.
- vi. Identify two uses of Vusa River.
- vii. State two outdoor activities that tourists could enjoy at Mali Resort.
- viii. State a problem faced by the people of Waci Village.
- ix. State a source of income for the people of Kito and Tuva Villages.
- x. State two social services provided at Mavu Town.
- xi. (a) Draw a cross- section from Point A to Point B.
(b) Locate and label the following features on the cross-section.

1. Dalo farm
2. Forest area

3. Tai Village
4. Vusa River

3.

SOVI AREA



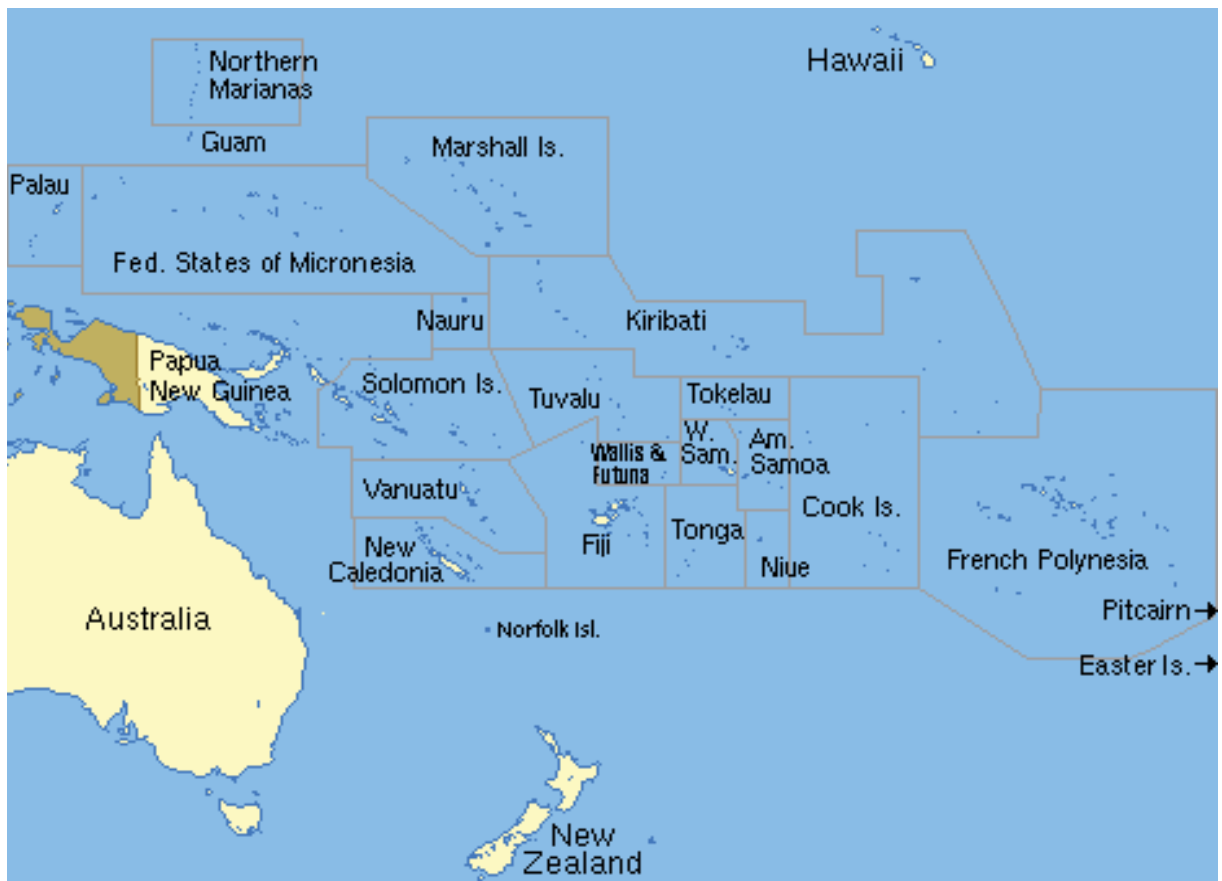
Turn Over

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THE FIJI ISLAND MAP

LOCATION AND NAME

The Fiji archipelago lays central position among the island groups of the South- west Pacific Ocean mid-way between the Kingdom of Tonga and Vanuatu.



(source: [http:// www.asiapac.org.fj/cafepacific/images/pacmap.gif](http://www.asiapac.org.fj/cafepacific/images/pacmap.gif))

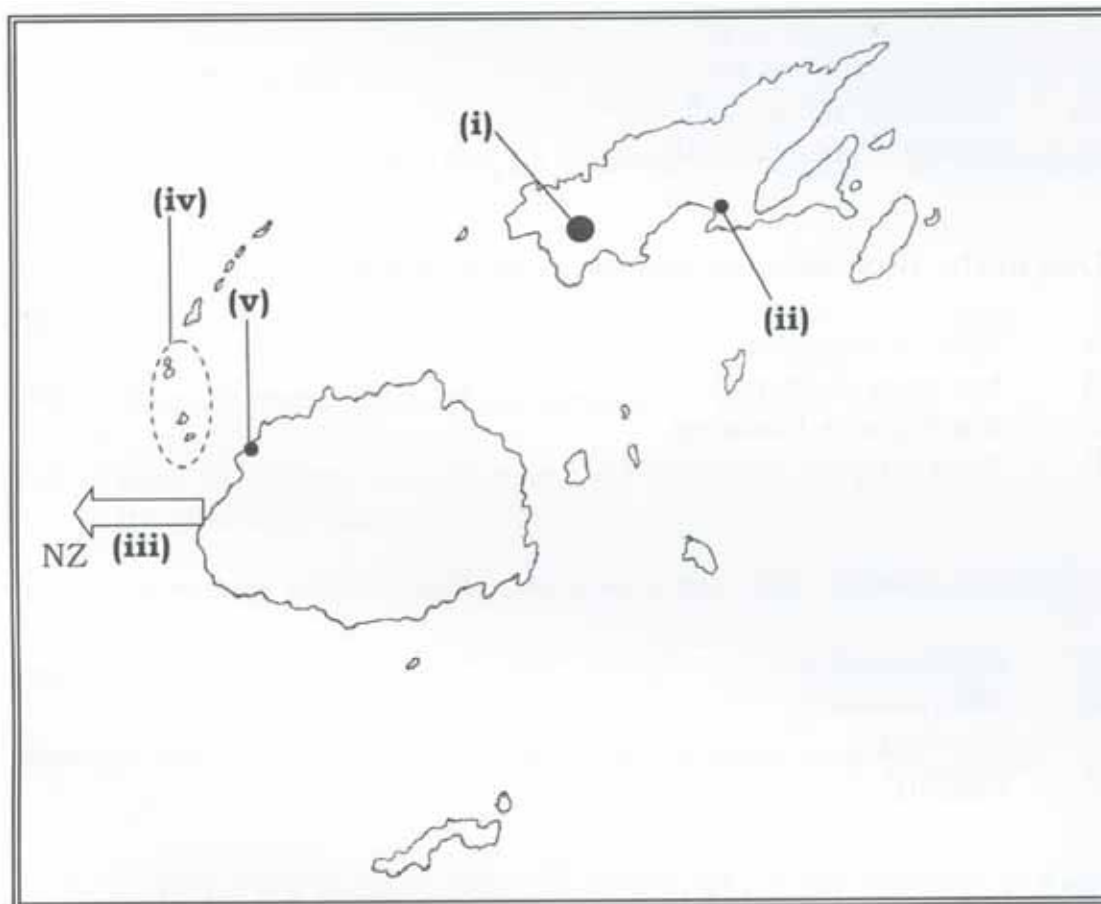
The islands lie between longitude 176° 53' east and 178° 12' west and the 180° meridian runs through Taveuni although the International Date Line is bent conveniently to form Fiji time.



(Source: http://www.gfiner_search/countries/image)

ACTIVITY

MAPPING



Identify and name the features marked **(i)** to **(v)** on the map. These features are described as follows :

- (i) a sparsely populated province
- (ii) a town
- (iii) this type of external migration
- (iv) this group of islands
- (v) a major port of entry

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ACTIVITY 2

- I Sketch the outline map of Fiji and locate and name the following:
 - a. The Garden Island of Fiji
 - b. The old capital of Fiji
 - c. The island in the Lomaiviti group that produces Bio-Coconut fuel
 - d. The salad bowl of Fiji
 - e. The capital of Suva

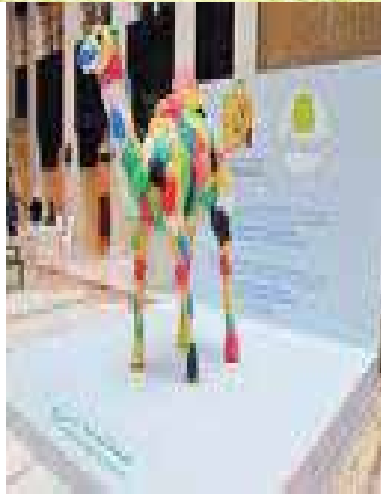
- ii. Sketch the outline map of Fiji. Locate and name the following:
 - a. The Kings road
 - b. The Queens road
 - c. The Hibiscus Highway
 - d. The province that is influenced by the Polynesian group.
 - e. The South- East trade wind

- iii. Sketch the outline map of Fiji. Locate and name the following:
 - a. An International port of entry in Nadi
 - b. Lautoka Wharf
 - c. Nabouwalu port
 - d. Bouma Historical site
 - e. Bligh water

- iv. Sketch the outline map of Fiji. Locate and name the following:
 - a. An island on the north-west of Viti Levu
 - b. Bureta airstrip
 - c. Matei airstrip
 - d. The Lomaiviti group
 - e. Udu point.

UNIT 3

ENVIRONMENT AND ITS USES



CONCEPTS

SETTLEMENT
COMMUNICATION
ENVIRONMENT
CONSERVATION
NATIONAL HERITAGE

3.0 Environment



Environment is our surrounding. It includes living and non- living things. It also provides for our survival and therefore it is important that we take good care of it.

June 5th is World Environment Day. If we take care of our earth, it will take care of us

❖ *As a class, brainstorm on the usefulness of protecting our environment and why we must take good care of it. Also discuss ways you can take good care of the earth.*

People have made good use of the environment to suit their needs and wants. Different people have different opinions on the use of environment. It is important that precautionary measures are taken if our environment is to be sustained. In this way, there is a chance for future generations to enjoy the same environment that we are enjoying today

3.1 Types of Environment

Environment can be classified into two groups

- (i) The physical environment
- (ii) The cultural environment

Physical Environment

This includes our environment and everything that exists around naturally, such as rivers, vegetation, mountains, animals, plants and insects that live in this environment

Cultural Environment

This environment includes people and their activities, for example, roads, settlements, infrastructure and many more. Today we often use the word Biosphere – it means the natural and physical environment (and atmosphere) as well as humans.

3.12 THE USE OF ENVIRONMENT

Everyone on earth has the right to use the resources provided by the environment. However, there are certain ways in which different groups of people use the environment. As a result, we are starting to experience environmental problems like pollution and global warming. Some groups are also concerned about the use of the environment (Greenpeace) and have decided to design policies and take actions in order for everyone to take care of the environment and its resources.

DISCUSSION

Apart from the list below, identify some other ways humans use their environment

Some of the ways in which humans use their environments are:

- | | |
|-----------------------------|--|
| a. Farming | g. Sight-seeing, building parks and tourist attraction |
| b. Constructing roads | h. Strip mining |
| c. Fishing and water sports | i. Deforestation |
| d. Extracting raw materials | j. Developing settlements, towns and cities |
| e. Waste dumping | |
| f. Nuclear testing | |



ACTIVITY

- (i) Conduct a survey on how people are using their environment in your area. State whether they are managing or destroying their surroundings.
- (ii) In a paragraph, explain why and how people try to manage their environment in different ways



a. Snowfields

b. Reef

c. Forest

- (iii) Study the three pictures above and describe how they can be used by humans without causing destruction.

3.13 WAYS OF CONSERVING THE ENVIRONMENT

Continuous use of environment without proper care can cause serious damage to the environment. Fortunately, there are also ways in which we can make sure that our environment is not affected by our action. Taking proper care of the environment means using proper conservation method.

- | | |
|-------------------------|---|
| a. Shifting Cultivation | e. Soil Conservation Methods |
| b. Agro forestry | f. Contour Planting |
| c. Rotational Grazing | g. Use of Appropriate Fishing Methods |
| d. National campaigning | h. Sustainable Development (Ecotourism) |

- (i) Select one of the conservation methods above and discuss how it is carried out and explain its effectiveness.
- (ii) Discuss the impact of population on the environment.
- (iii) .What is the role of the government in trying to conserve the environment?
- (iv) Students to work in groups and demonstrate their conservation skills within the school compound.
- (v) Discuss the message sent by the two pictures below. [Teacher to facilitate discussion]



Source: Internet

- (v) Apart from the government, name two other organizations who are involved in the conserving of our environment.

3.14 MARINE ENVIRONMENT

Our ocean is part of our environment so it is also important that we look after it and conserve it just like our land and forest. The ocean is a habitat for marine life and also a source of food for people.