

GRADE 8

SOCIAL SCIENCE

STRAND 4 SKILLS

TOPIC 1:	POPULATION, RESEARCH AND SURVEY • Population Density • Calculating Population Density • Research Skills • How to conduct a Survey
TOPIC 2:	POPULATION PYRAMID AND CLIMOGRAPH • Reading Population Pyramid • Drawing Population Pyramid • Reading Climograph • Drawing Climograph
TOPIC 3:	CONTOUR MAPS AND TIMELINE • Contour lines • Contours and Landforms • Reading and interpreting timelines • Drawing Timelines
TOPIC 4:	ANALYSING • Grid Reference (6 figure) • Identifying key issues in newspaper articles • Photographs • Multiple Line Graphs

Acknowledgements

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MR. DEMAS TONGOGO
Principal-FODE

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SECRETARY'S MESSAGE

Achieving a better future by individual students and their families, communities or the nation as a whole, depends on the kind of curriculum and the way it is delivered.

This course is part and parcel of the new reformed curriculum. The learning outcomes are student-centred with demonstrations and activities that can be assessed.

It maintains the rationale, goals, aims and principles of the national curriculum and identifies the knowledge, skills, attitudes and values that students should achieve.

This is a provision by Flexible, Open and Distance Education as an alternative pathway of formal education.

The course promotes Papua New Guinea values and beliefs which are found in our Constitution and Government Policies. It is developed in line with the National Education Plans and addresses an increase in the number of school leavers as a result of lack of access to secondary and higher educational institutions.

Flexible, Open and Distance Education curriculum is guided by the Department of Education's Mission which is fivefold:

- To facilitate and promote the integral development of every individual
- To develop and encourage an education system that satisfies the requirements of Papua New Guinea and its people
- To establish, preserve and improve standards of education throughout Papua New Guinea
- To make the benefits of such education available as widely as possible to all of the people
- To make the education accessible to the poor and physically, mentally and socially handicapped as well as to those who are educationally disadvantaged.

The college is enhanced through this course to provide alternative and comparable pathways for students and adults to complete their education through a one system, two pathways and same outcomes.

It is our vision that Papua New Guineans' harness all appropriate and affordable technologies to pursue this program.

I commend all the teachers, curriculum writers and instructional designers who have contributed towards the development of this course.



DR. UKE KOMBRA, PhD
Secretary

STRAND 4: SKILLS



Dear Student,

Welcome to Strand 4 of the Grade 8 Social Science Skills course. This Strand looks at the different skills in Social Science.

In this strand you will:

- ❖ identify and describe the main features and elements of the different skills in social science
- ❖ identify factors that influence populations
- ❖ identify the forces and conditions that contribute to changes in world populations
- ❖ look at ways to carry out research and conduct a survey
- ❖ analyse photographs, newspaper articles, multiple line graphs, and grid reference

In sub-strand 1, you will learn about population, research and survey.

In sub-strand 2, you will learn about the factors that influence population that results in the different population pyramids. You will also read and draw a climograph.

In sub-strand 3, you will learn about contour lines and landforms. You will also read and draw a timeline.

In sub-strand 4, you will learn about the six-figure grid referencing, identify key issues in newspaper articles; analyse the different types of photographs, and lastly, read multiple line graphs.

Each Sub-strand has **lessons** with **Practice Exercises** and **Answers**. You must read each lesson and work through the Practice Exercises. You will have to correct your own answers. The answers to the Practice Exercises are given at the end of each sub-strand. When you complete a sub-strand, you will then complete the **Sub-strand Test** in the Assignment Booklet. You will repeat the same process until you complete the Strand.

We hope you enjoy this Strand!

STUDY GUIDE

Follow the steps given below and work through the lessons.

- Step 1** Start with Sub-strand 1 and work through it in order.
- Step 2** When you complete Lesson 1, you must do Practice Exercise 1.
- Step 3** After you have completed the exercise, you must correct your work. The answers are given at the end of each Sub-strand.
- Step 4** Then, revise well and correct your mistakes, if any.
- Step 5** When you have completed all these steps, tick the check-box for Lesson 1, on the content page, like this:



Lesson 1: What is Population Density?

Then go on to the next lesson. You are to repeat the same procedure until you complete all the lessons in a Sub-strand.

As you complete each lesson, tick the box for that lesson on the content page, like this. This will help you check your progress.



Assignment: Sub- strand Test

When you have completed all the lessons in a Sub-strand, do the Sub-strand Test for that Sub-strand, in your Assignment Booklet. The Strand book tells you when to do this.

Marking:

The Sub-strand Tests in each **Assignment** will be marked by your **Distance Teacher**. The marks you score in each Assignment will count towards the final result. If you score less than 50%, you will have to repeat that Assignment.

Remember, if you score less than 50% in three (3) Assignments, your enrolment will be cancelled. So, you are encouraged to do your work carefully and make sure that you pass all Assignments.

Here is a sample Study Timetable to use as a guide. Refer to it as a reminder of your study times. A timetable will help you to remember when you should be doing some of your FODE work each day.

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:00-10:00	FODE STUDY TIME				
10:00-11:00					
1:00-2:00					
2:00-4:00					
6:00-7:00					
7:00-9:00	Listen to or watch current affairs programmes. Write your diary, read a book.				

Course Materials

Here is a list of materials that you will need for this course.

- Grade 8 Social Science Skills Course Book
- Assignment 4 Booklet
- Marker's Guide

Other Learning Materials

- World Atlas
- Papua New Guinea Atlas

SUB-STRAND 1: POPULATION, RESEARCH AND SURVEY

In This Sub-Strand, You Will Learn About:

- **Population Density**
- **Calculating Population Density**
- **Research Skills**
- **How to Conduct a Survey**

SUB-STRAND 1: POPULATION, RESEARCH AND SURVEY

In this Sub-strand, you will study about Population, and how to calculate population density.

You will study examples of populations in some of Papua New Guinea's towns and cities, the population density of these areas and also other regions in the world.

In the later part of this sub-strand, you will study the basic research skills and how to conduct a survey using an example.

Lesson 1: Population Density



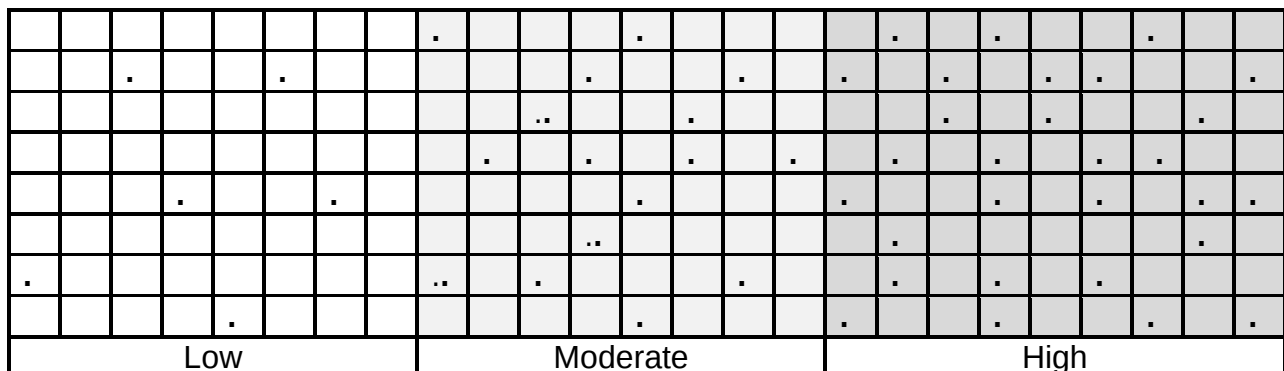
- define and discuss population density
- identify and list examples of areas with high population densities in Papua New Guinea, the South-western Pacific, and the world in general

What is Population density?

Population refers to all the people who live in a particular area, region or country. This means all of the people who live in an area, region, or country. Population is about all the people of a particular nationality, ethnic group, religion, or class who live in an area.

Now, let us define population. Population is the total number of people living in an area at a particular time. Secondly, 'What is population density?' Population density is a measurement of population per square kilometre (km^2) or every one square kilometre. Population density may be calculated for a state or province, city, country, other, or the entire world.

See diagrams below showing the idea of population density.



Low = Less number of people every one square kilometre. Population is spread out over an area.

Moderate = not low, or high; just enough people living in a km².

High population density = More number of people every one square kilometre.
There are many people living in an area.

People choose to live in places that are favourable to them. This means that some places have many people living in them while other places have no people or a very small number of people.

Factors influencing the Distribution of Population

Let us briefly discuss why there are high population densities in some areas and while other areas are low. There are many different reasons.

The following table shows factors that influence a high and low population growth in different areas.

Factor	Low Population Density	High Population Density
Landform	High, steep, mountainous areas	Fertile highland valleys and river basins and along the coasts
Climate	Cold and hot desert areas	Temperate areas or tropical areas that are not too humid
Resources	Areas with few resources such as food or basic services	Areas with enough resources to support life such as food or basic services
Water	Areas with little water	Areas with plentiful water supplies

Where people live in PNG

Some remote areas in Papua New Guinea have only one person per square kilometre while in some small islands there is a high population density. However, the most recent survey shows a density of 15 people per square kilometre (km²) in Papua New Guinea.

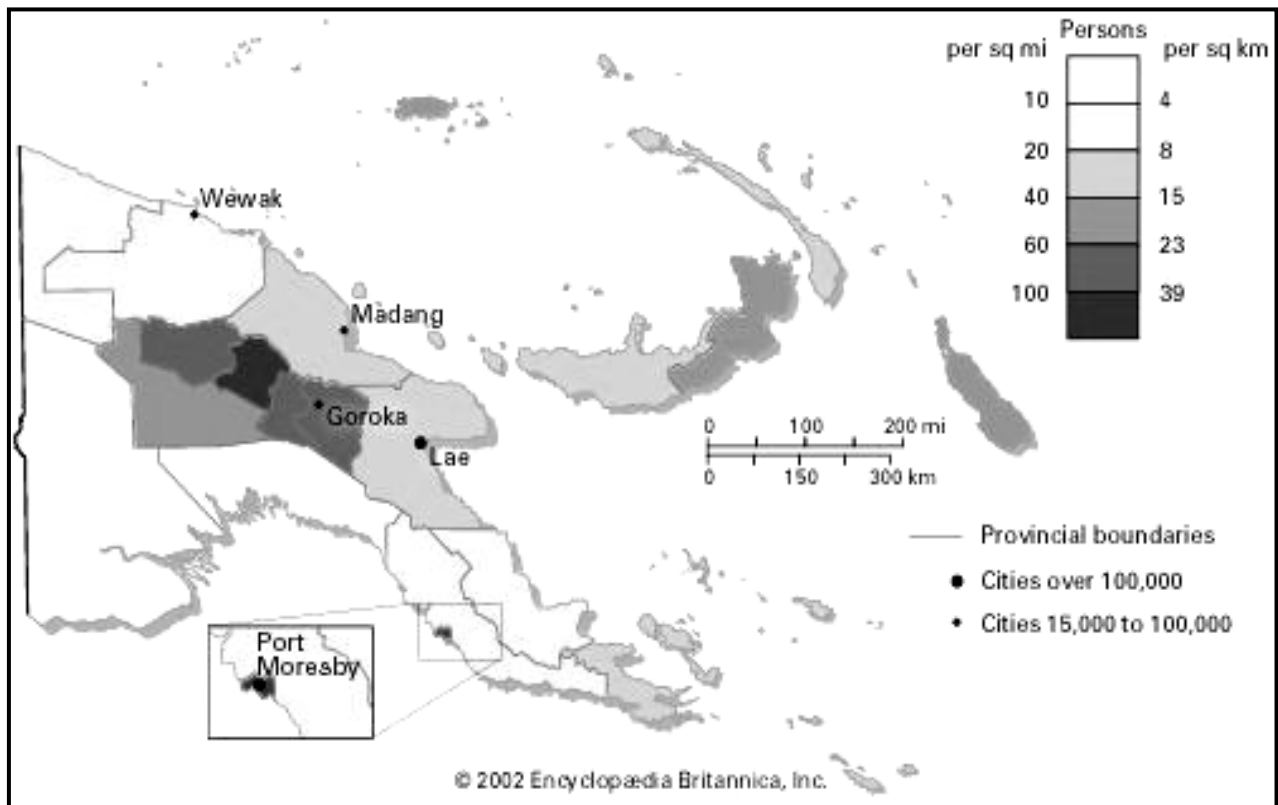
This indicates that there is a lot of land in PNG. Regardless of land being available in PNG, some parts have few resources, while others have more resources and rich environments. For example, there is high population densities in the Highlands because of suitable cool climate and soil. In Western and Gulf Provinces, for example, the lowlands are swampy and wet and the mountains have a very high rainfall and poor soils. This means that it is not a place where people will want to settle. Life would be difficult in terms of access to food and basic services such as health and education, so the population density will be quite low.

Thus, many people from these areas move to Port Moresby. Some of these people are educated, living and working in the city, but many have left their homes to live with relatives in the city and look for job opportunities.

You will also find many highlanders living and working, and settling permanently in Port Moresby. This is because of high population density in the highlands areas that has forced people to migrate to the city in search of land, job opportunities and knowledge.

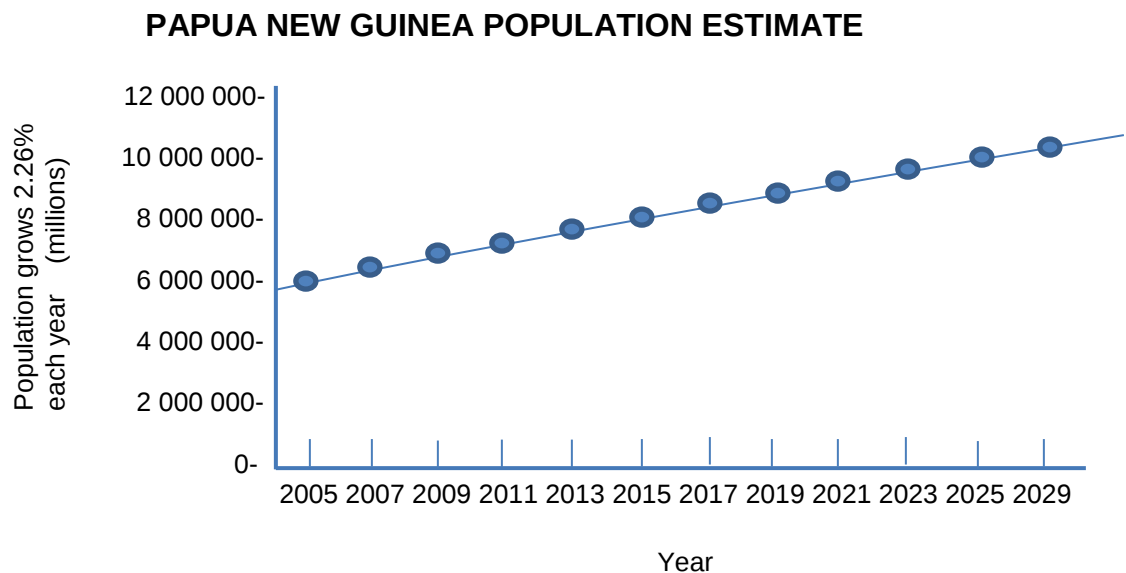
Other factors such as tribal fights have pushed people away from their homes. Whilst in other parts of Papua New Guinea such as in East New Britain and Madang, the volcanic activities in these populated islands have pushed people into resettling elsewhere other than their own provinces. But for those who are educated they tend to live in the capital city or move to settle permanently in their own urban town areas.

The map below shows the population density of Papua New Guinea.



Map Illustration 8.4.1a: Population distribution in PNG

The population of Papua New Guinea is growing rapidly. The line graph below shows Papua New Guinea's estimated total population since 2005. In 2005, the population was growing at about 2.26 per cent every year. This means that for every 100 people in PNG in 2005 there would have been 102.6 in 2006 and for every one thousand people in 2005, there would have been 1026 in 2006.



The graph shows how the population of Papua New Guinea will grow if the rate stays at 2.26 per cent each year. This is an estimate. It is using the knowledge we have to make a good guess. From 1980 to 1990 it was 2.4 per cent. If the rate becomes higher, this means that we will have more people sooner than is expected. There are many factors that contribute to the rate of population growth.

Some important factors that contribute to the changes in the rate of population growth are:

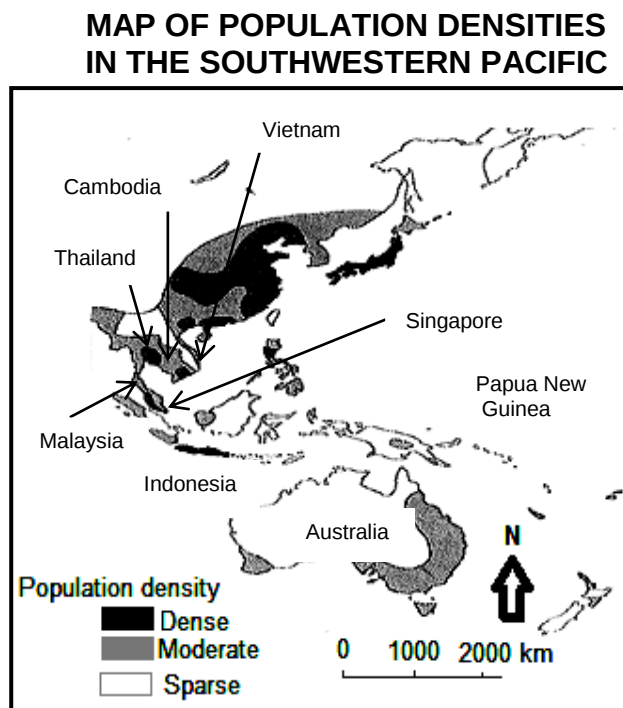
- family planning
- traditional obligations
- religious beliefs
- family life and upbringing; peer pressure

You have read about some factors that contribute to population change in Papua New Guinea.

Now, you will read about some of the most populated regions in the south-western Pacific.

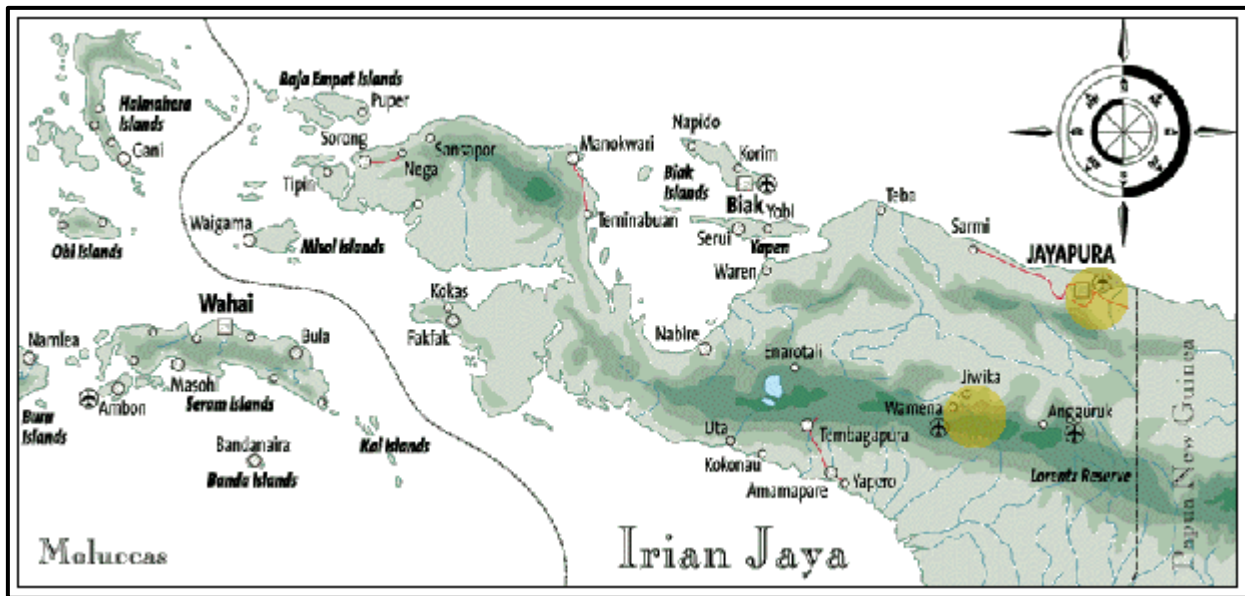
Papua New Guinea and Indonesia are part of the south-western Pacific region though Indonesia is also part of the southeast Asian region. Indonesia has hundreds of millions of people compared to Papua New Guinea with 7 million according to the 2012 National census.

Study the map below that shows the population density of the southwestern Pacific.



Indonesia is situated in the southwest Pacific. It is a country that shares a border with Papua New Guinea. Indonesia is geographically located on the western side. PNG is the second largest island in the world after Greenland.

Study the map of Indonesia below.



The island of Java in Indonesia is one of the most populated places in the world. Indonesia has an average population density of 85 people per square kilometre. However, this average hides the fact that parts of Indonesia have more people living in them than others. Java had a population density of about 700 people per square kilometre. West Irian, on the other hand, has only about two people per square kilometres. This is because the land is densely forested and has a rugged terrain. West Irian (Irian Jaya) is now known as West Papua.

In the early 1950s through to 1990s the Indonesian Government came up with the Transmigration policy to move people from Java to the other less populated islands of Indonesia. Study the flow map below. It shows the number of people and families from Java who were relocated to the sparsely populated islands of Sumatra, Kalimantan, Sulawesi and Irian Jaya on mainland New Guinea. Study the Transmigration map of Indonesia below.

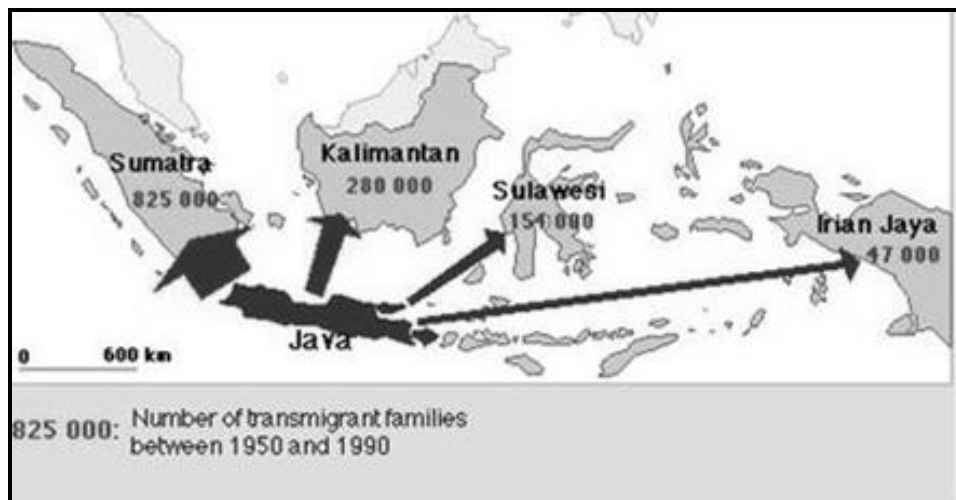


Illustration 8.4.1e: Transmigration in Indonesia from 1950s-1990s

Java island is small but rich in volcanic soils. Its population was over 140 million people. Though Java is only a small island its rich soil was able to support a large population over the years.

The transmigration policy was an exercise the Indonesian government had to carry out to distribute population density across the country. However good the intentions of the government in its exercise there were also setbacks the migratory people had to be faced with. The two major setbacks were:

- the actual movement of people and their belongings from one place to another, and secondly;
- the adaptation by the migrants. These people after moving in were 'newcomers' in a new land and many found it difficult to adapt.

The Javanese who came to Irian Jaya had had many problems settling. The environment and resources were very different in New Guinea and many had gone back to Java whilst some had died of malaria. However, people from other parts of the Indonesian archipelago have also come to settle in Irian Jaya. Many of those who had come on their own free will found it easier to adapt to a new way of life in Irian Jaya than those who were required to move.

You will read next the world population densities. Study the map below that shows high and low world population densities.



Adapt means to become used to something or a place

The population density of the earth (including all land area) is about 105 people km². If Antarctica is eliminated (since it has zero population density), the world population density will rise only to 115 people km².

The world map shows the distribution of world population. This means the number of people in 1 km² of land area. The medium population density countries are USA, Central America, South America, countries of eastern and southern Africa, north Europe and Saudi Arabia. The other parts of the world including Western Europe and Asia are the regions having the highest population densities in the world.

The population density of the continents are as follows.

- North America - 32 people per square mile
- South America - 73 people per square mile
- Europe - 134 people per square mile
- Asia - 203 people per square mile
- Africa - 65 people per square mile
- Australia - 6.4 people per square mile
- Antarctica- 0 people per square mile

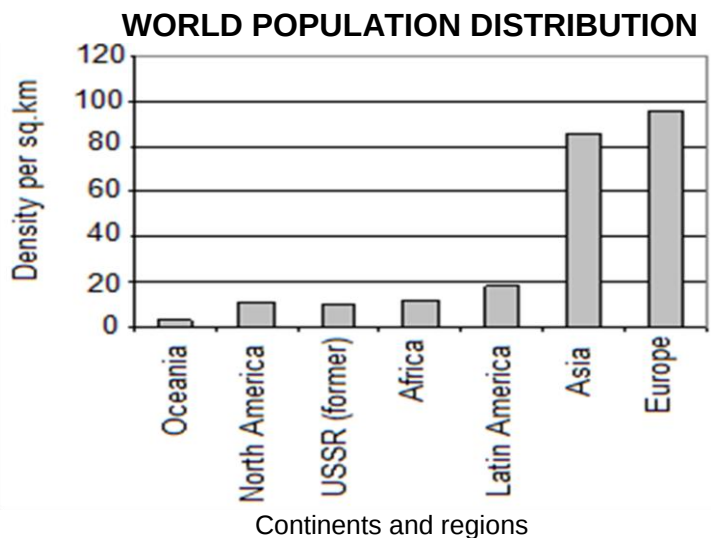
Mile is a unit for measuring distance equal to 1, 609 metres, or 1.6 kilometres.

A mile is longer than 1 kilometre. One kilometre is equal to 1, 000 metres.

Study the graph below and analyse the population distribution in the different regions and continents in the world. Europe has the highest population density of all the continents as you can see from the column graph below. The total population is not the largest but because Europe's land area is relatively small; many people live in every square kilometre.



Europe has some of the most populated areas in the world! Although it has a big landmass it is also densely populated!



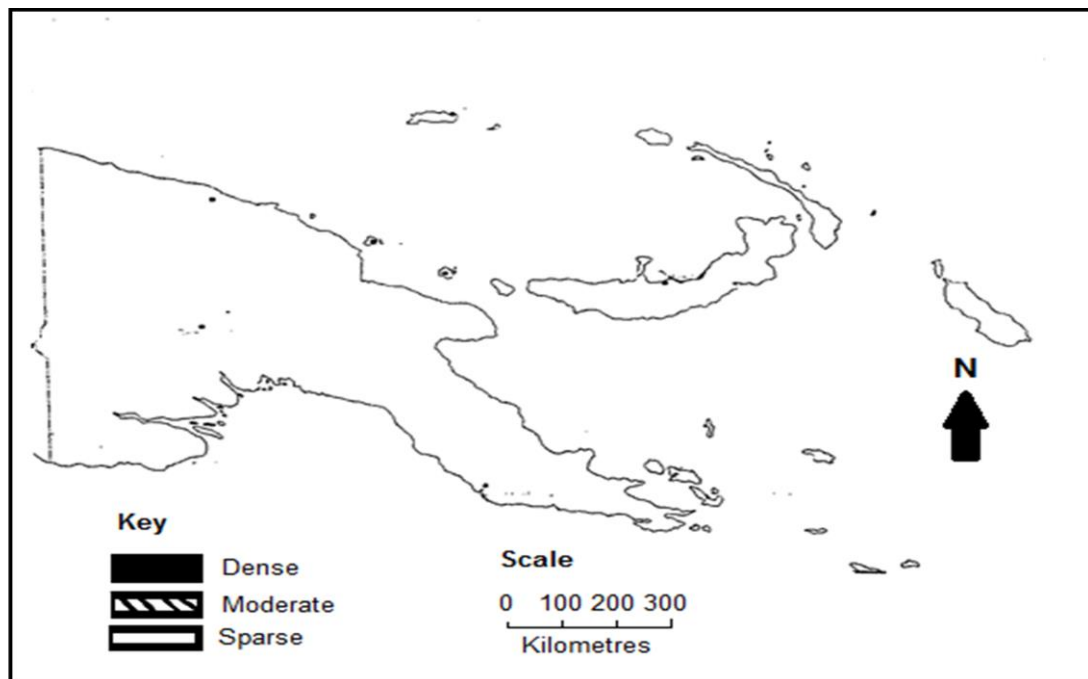
Now do Activity.



Activity

Refer to map 8.4.1a to complete the blank map below. Shade and label the distribution of population density in each region. The key represents each regions' approximate population density.

MAP OF PAPUA NEW GUINEA



Check your answers after the summary.

Now read the summary.



Summary

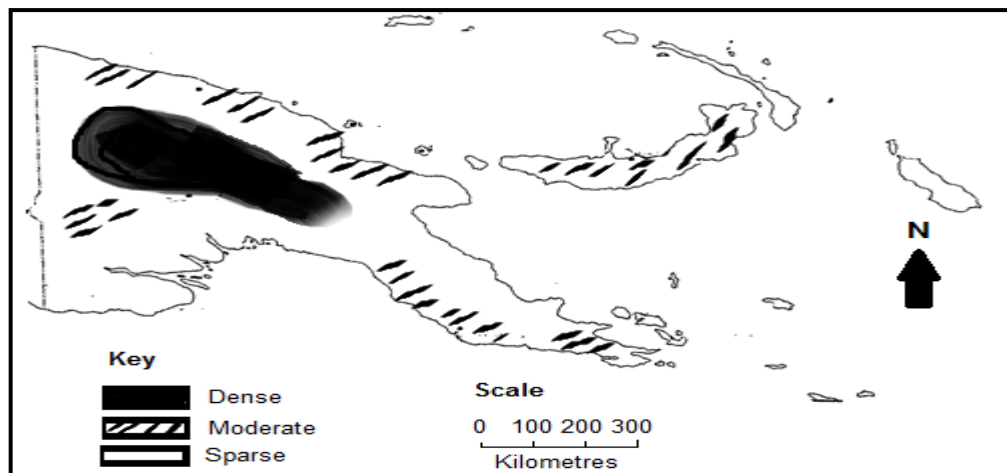
You have come to the end of Lesson 1. In this lesson, you have learnt that:

- population density is a measure of the number of people living in one square kilometre (km²) of land at a given time.
- mile is a unit for measuring distance equal to 1, 609 metres.
- a mile is longer than 1 kilometre. One kilometre is equal to 1, 000 metres.

- Europe has the highest population density of all the continents.
- Java is the most densely populated place in the world having an average population density of 200 people per km².
- the average population for all of Papua New Guinea is about eight people per Km².
- there is a lot of land in Papua New Guinea and also few resources and poor environment are contributing factors.
- transmigration is the process of moving people from an overpopulated area to a sparsely populated area. This process helps maintain population distribution and over crowdedness in very densely populated areas such as in Indonesia.

Answers to Activity

POPULATION DENSITY OF PAPUA NEW GUINEA



NOW DO PRACTICE EXERCISE 1 ON THE NEXT PAGE



Practice Exercise 1

1. What is population density?

2. List four factors that causes a low population density in Papua New Guinea.

a) _____

b) _____

(c) _____

(d) _____

3. The island of Java has one of the highest population densities in the world. What effects does it have on the people?

4. _____ is the process of moving people from one place to another.

5. Write one advantage and disadvantage of transmigration in the table given below.

Advantage	Disadvantage

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 1
--

Lesson 2: Calculating Population Density



In Lesson 1 you learnt about population density. In this lesson you will learn how to calculate the population density of certain areas and countries in the world.



Your Aims:

- calculate population density
- calculate and show population density of an area

The word population is not new, you have learnt about population in grade 7.

So, what is population density?



Population density is the same as defined in the last lesson, Lesson 1 of this Sub-strand.

Population density is the measure of how many people there are in one square kilometre (km²) of land.

Calculating population density

So, how is population density calculated?



Let us study an example of how population density of an area is calculated. Say, for example, the first settlers to Easter Island, in the Pacific, were a group of 20 people. The island is about 170 square kilometres, so the settlers' population density would be 20 people divided by 170 which would give about 0.1 people per square kilometre.

The formula to calculate population density:

$$\frac{\text{Total Area Population}}{\text{Total Land Area in Km}^2} = \text{Population Density}$$

The Total Population of people was 20, so you divide 20 by the Total Land Area which is 170 square kilometre (Km²). Your answer should be 0.1 people living in one square kilometre.

This means in a square kilometre of land or area there may have been no people living at all!

When the population grew to 200 people, the density would be $200/170$ or about 1.2 people per square kilometre.

The formula is: $200/170 = 1.17$, which is rounded off to the nearest whole number that is 1.

The density of an area can be calculated for any place, country, city, and so forth as long as you know the size of the land area and the population within that area. The population density of cities, states, entire continents, and even the world can be calculated.

Now, you will look at an example. You will discuss Canada's population and be able to calculate its population density.

Canada has a population of about 33 million. This population is divided by the land area of 3,559,294 square kilometres which would give a density of 9.27 people per square kilometre. This means there would be about 9 people living in a square kilometre. Now, can you calculate Canada's population density?

Sovereign states and dependent territories by population density

The world's population is 7 billion, and Earth's total area (including land and water) is 510 million square kilometres.

Therefore the worldwide human population density is $6.8 \text{ billion} \div 510 \text{ million} = 13.3$ people per km². If only the Earth's land area of 150 million km² is taken into account then human population density increases to 45.3 people per km². This calculation includes all continental and island land area, including Antarctica. If Antarctica is also excluded, then population density rises to 50 people per km².

Over half of the Earth's land mass is made up of areas that are not suitable for human beings to live in, such as deserts and high mountains. Population therefore is more around seaports and fresh water sources.

Several of the most densely populated territories in the world are city-states, or dependencies (areas that depend on other areas). These territories share a small area and a high population growth level. City-states are cities with a very large population, while microstates are very small states with very large populations, for example, Monaco.

Cities with high population densities are thought to be overpopulated. This depends on factors like quality of housing and infrastructure and access to resources. Most densely populated cities are in southern and eastern Asia, though Cairo and Lagos in Africa also fall into this category.

Monaco and other small states in Europe have some very high population densities due to their extremely small size. Bangladesh also is often thought to be the most densely populated country, with more than 2,200 people per square kilometre.

Mongolia is the world's least densely populated country with only 4.3 people per square kilometre. Australia is a close second with 6.4 people per square kilometre.

About 90% of the earth's people live on 10% of the land. Additionally, about 90% of the people live north of the equator.

The table below shows the nine most densely populated countries in the world.

NINE MOST DENSELY POPULATED COUNTRIES

Rank	Country/Region	Population	Area (km ²)	Density (Pop. per km ²)
1	 Singapore	5,183,700	710	7301
—	 Hong Kong	7,061,200	1,104	6396
2	 Bahrain	1,234,596	750	1646
3	 Bangladesh	152,518,015	147,570	1034
4	 Taiwan (R.O.C)	22,955,395	36,190	634
5	 Mauritius	1,288,000	2,040	631
6	 South Korea	48,456,369	99,538	487
7	 Rwanda	10,718,379	26,338	407
8	 Netherlands	16,760,000	41,526	404
9	 Lebanon	4,224,000	10,452	404

Some of the densely populated areas in the world are shown in the photographs below.



Illustration 8.4.2a: SaiYeung Choi Street South in Hong Kong.



Monaco in South Europe currently is the most densely populated country in the world.



Mongolia is the least densely populated country in the world.

Now do Activity.



Activity

Calculate the population density of each of these countries below using the formula given. Write your answers on the space provided. Country E has been done for you.

Country	Total Population (thousands)	Total Land Area (per sq. km)	Population Density
Country A	110, 000	10, 000	
Country B	30, 000	56, 000	
Country C	5, 000	50, 000	
Country D	70, 000	230	
Country E	43, 000	90, 000	0.47 round off to 1

Check your answers after the summary.

Now read the summary.



Summary

You have come to the end of Lesson 2. In this lesson, you have learnt that:

- population density is a measure of the number of people in one square kilometre (km^2) of land.
- the density of an area can be calculated for any place, country, or city, as long as the size of the land area and the population within that area is known.
- population density is calculated by dividing the Total Population of a place by the Total Land Area.
- the world's population is distributed unevenly between countries.
- Europe has the highest population density of all the continents because its land area is relatively small, and many people living in each square kilometre.

Answers to Activity

Country	Total Population	Total Land Area (per sq. km)	Population Density
Country A	110, 000	10, 000	11
Country B	30, 000	5, 000	6
Country C	50, 000	5, 000	10
Country D	70, 000	230	304
Country E	43000	9, 000	0.478 round off to 5

NOW DO PRACTICE EXERCISE 2 ON THE NEXT PAGE



Practice Exercise 2

1. Why is Monaco a high population density area?

2. Write the formula for calculating population density.

3. Complete the table below. Calculate the population density for each country and write your answer in the space provided.

Country	Total Population	Total Land Area	Population Density
Rwanda	10, 718, 379	26, 338	
Netherlands	16, 760, 000	41, 526	
Lebanon	4, 224, 000	10, 452	
Singapore	5, 183, 700	710	
Bahrain	1,234, 596	750	
Bangladesh	152, 518, 015	1034	
Taiwan (R.O.C)	22, 955, 395	36, 190	
Mauritius	1, 288, 000	2, 040	

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 1
--

Lesson 3: Research Skills



In Lesson 2 you learnt about how to calculate population density. You used examples of different places and countries and calculated the population densities. In this lesson you will learn how to apply research skills using examples. You will apply these skills to carry out a small research on your own or in a group.



Your Aims:

- define research
- uses of research as a skill
- carry out research on a selected topic
- apply the steps involved in carrying out a research

What is a Research?

A research is an organised study. This type of study uses different methods of investigation into a subject to discover facts, form or revise a theory, or to develop a plan of action based on the facts discovered.

One of the best ways to learn in any subject is to think of the questions you want answered and to find the answers yourself. You ask about the things which interest you and complete your own research to find the answers. You must have certain skills to be able to carry out your research effectively and efficiently.

A research is a skill and the ability to do a careful study into a subject, especially to discover new facts or information about it.



A research can be carried out in two ways: through questionnaires or interviews. In the questionnaire, questions are written and given to a certain number of people or population to answer. An interview takes place face to face whereby the interviewer asks questions and the person being interviewed answers accordingly.

Conducting researches are important because the world is continually changing and we need to keep up with the trend.

What are the uses of a research?

The world is changing every day and people and societies also change in their attitudes, behaviours, lifestyles, and cultures. You will now read about some of these changes in the modern society.

Information and technology are areas of change that are evident in our society today. Changes are sometimes good and sometimes bad depending on the type of change. Individuals, groups and organisations try to find out more information about a subject or a problem which leads to carrying out their own independent research or investigation into these issues. The purpose of research is to investigate further about a subject that has become a concern to the individual, community or nation.

The Social Science Process represents a series of steps that students can undertake in their own research.

This is a time for you to learn more about something you have studied during the term. You will have extra time to work on a project of your choice. Usually you have two weeks to complete a project.

Here are the Steps involved in carrying out a small school based research. An example has been used to show you the Steps.

To do the project well we follow the Social Science Process. There are five steps or processes:

Step 1: Choose a project

When you have done this you will complete the Social Science Project Proposal sheet. An example of a proposal sheet is given below. On the proposal sheet the main points of the project will be outlined.

Social Science Project Proposal Sheet

1. How many students are working on the project? 7
2. Names of the students: *Owen, Gale, Wayne, Nick, Tom, Mary, Miriam*
3. Type of project: *People and environment of Papua New Guinea and the region.*
4. Name of the project: *Save our animals*
5. What are we doing the project for (purpose): *To make our people understand that some animals are in danger of disappearing from the world.*
6. Who are the target readers of our project: *Our parents, the LLG members, young men who go hunting and fishing?*
7. Description of the project: *You will find out about the animals in our area that are in danger, and make a small book for everyone to read. We will also make posters to put up on the church and school notice boards.*
8. Social Science skills: *Finding a problem, gathering information, taking action.*
9. Social Science Contract:

We agree to carry out the Social Science project

Signed:

10. Approval for the project: Ms Jayne Vuvu

Teacher's signature: _____

Date:

Step 2: Gather information about the project

For this step you will have to find out where to collect information. You need to get ready to gather information. This may mean you need to prepare a survey form or make a questionnaire, or make a plan of what you are going to do.

The following example will help you to come up with a plan to gather information.

- (a) First we need to gather information about what endangerment means.
- (b) Then we need to find out which animals are protected by special laws in Papua New Guinea.
- (c) Next we need to gather information about which of these animals is found in which province.
- (d) We need to find out information about where the animals live and what they eat.
- (e) We need to find out what is causing these animals to be endangered.
- (f) We need to talk to the old people about what animals they hunted in the past.
Prepare a survey.
- (g) We need to find out if any of those animals are now hard to find. Prepare a survey.
- (h) We need to know if the old people have noticed if other kinds of animals are disappearing.
- (i) We need to think of ways to help to keep these animals safe.
- (j) We need to think about how we can let other people know about the endangered animals

Step 3: Thinking about the information (Evaluating)

In this step you put the information together. You decide what action to take.
For example:

We found that there are many endangered PNG animals that are protected by special laws. We found that some of these animals are found in our own province. However, there is no place in the province where these animals are kept so that they can be seen by people and there is no way of making sure that these animals will survive. We found that where the animals live is the forest and that many people want to cut the forest down. We could not find much information about the animals as there are no books in the library, so we decided to talk more to the old people.

When we talked to the old people they told us about hunting these animals in the past. There were many of them to be found in the bush. Now they are hard to find. They also told us about frogs disappearing. This made us think of building a frog pond. They gave us a lot of good information that we can use in our book. Some of the stories they told us were legends. We decided to make these stories into a special book for the elementary school, but not now.

Most people do not speak English well in our community. We decided to make a small book written in *Tok Ples*, with pictures and maps that we could show to people who hunt animals and cut down forests. We also want to make a poster to put on the noticeboard at the market, at school, at church and at the local level Government (LLG) Office.

We have decided to build a frog pond near the school gardens and put frogs into the pond.

Step 4: Completing Activity

In this activity you take the action you have planned.

For example:

(a) Making the books and posters.

We divided up the jobs. Some students wrote about the animals. Some drew maps. Some drew pictures. Some made the posters.

We had to find paper for the books, big paper for the posters, and coloured pencils.

(b) Making the frog pond

We all worked together to make the frog pond. We made a list of materials we needed, and where we would get the materials from.

Materials	Location
Black plastic sheet to line the pool	Store
Sand to line the hole	River bank
Rocks to put around the edge of the pool and in the pool	River bank
Plants for the pool	Other ponds and the swamp and drains
Frogs	We will collect these over the holidays.

We make a list of tools we would need and where we could get them from.

Tools	Where to get them
Wheelbarrow to carry sand and rocks	Local church, homes
Spades	Our parents, homes
Collecting jars	Our mothers, homes

Step 5: How successful was the project?

In this step you need to copy the Project Evaluation sheet. Fill out the form and give it to your teacher for his or her comments. Look at the example given on the next page.

Social Science Project Evaluation Sheet

1. Name of project

2. Name of students who worked on the project.

3. Do you think your project was successful? Explain why it was successful or explain why it was not successful.

4. What was the best thing about your project?

5. What could have been better about the project?

6. Did you enjoy the project?

7. What Social Science Skills did you practise? Put a circle round those you practised:

- Making a survey
- doing a questionnaire
- interviewing people
- preparing a report
- making the community aware of something
- taking action for the community.

8. Teachers' comments

Here are some sample activities that you can do in your research on the Social Science Process and some sample activities.

Social Science Process	Examples of activities
SEE Gather information	• Active participation in community activities • Interview resource people • Excursions • Small group discussions • Conduct surveys • Invite guest speakers • Write to organisations, groups and individuals for information • Library search • Interpret maps, graphs (line, bar, pie, climate), tables, timelines, diagrams and flow charts • Obtain information from photographers and cartoons • Summarise main points from a variety of texts • Read a variety of written sources

	• Gather information from newspapers, other news reports • Brainstorm
JUDGE Analyse/evaluate information and make judgements	• Compare the accuracy of information from different sources • Create, interpret and use maps using mapping conventions (for example, key/legend, scale, cardinal points, grid references) • Interpret and construct timelines • Create tables of information • Transform information into graphs, diagrams and flow charts • Role play • Interpret and/or draw cross-sections • Compare different points of view and check for supporting evidence • Debate opposing viewpoints • Propose alternatives to the way things are • Note patterns and predict possible trends • Analyse evidence • Make predictions • Draw conclusions from data •
ACT Present or take action	• Develop posters • Build models • Present information to other classes • Dramatizations (for example, about building cultural appreciation and acceptance) • Reports (written or oral) • Assignments • Maintain a diary of change

	• Implement alternatives and predictions • Awareness campaigns • Demonstrations within the community • Actively change an aspect of community life (for example, sustainable environmental practices, changes to community building practices) •
--	--

Now read the summary.



Summary

You have come to the end of Lesson 3. In this lesson, you have learnt that:

- Research is a more organised form of study. It is a precise and careful study into a subject in order to discover facts, to establish or improve a theory, or to develop a plan of action based on the facts discovered.
- there are numerous topics and or problems to research or find out about.
- a research can be carried out in two ways: through questionnaires or interviews.
- in the questionnaire, questions are written and given to a certain number of people or population to answer.
- an interview takes place face to face whereby the interviewer asks questions and the person being interviewed answers the questions.
- conducting researches are important because the world is continually changing and we need to keep up with the current trend of modernisation in our societies.
- it is through research that problems and theories about certain parts of our native and modernised cultures can be improved.
- the social science way of carrying out a research is as follows:
 - (a) Choose a topic or project. You write a proposal or an outline of the main points of your project/topic.
 - (b) Gather information about the project/topic. You decide whether to use questionnaire or interview format or carry out awareness, role plays in the community.

- (c) Evaluate the information collected yourself or in your group. Decide what action to take to improve the problem or if the results are good discuss how you can make it better?
 - (d) Give your evaluation report with the recommendations you have made to your teacher or a higher authority to view and analyse.
-

NOW DO PRACTICE EXERCISE 3 ON THE NEXT PAGE



Practice Exercise 3

1. Define Research in your own words.

2. Who is a researcher?

3. What is the purpose of doing Research?

4. Write down the steps involved in doing a Research and explain each one of them.

(a)

(b)

(c)

(d) _____

5. Carry out a small research in your community. Give yourself two weeks to complete it.

[illegible]

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 1

Lesson 4: How to conduct a Survey



In Lesson 3, you learnt about how to do a small school based research. In this lesson, you will learn about how to conduct a survey. A survey is also a skill used to collect information about issues or problems in the community.



Your Aims:

- explain what a survey is
 - state examples of different types of surveys
 - identify the main elements of a survey
 - discuss the steps involved in conducting a survey
-

A survey is a data collection tool used to gather information about individuals from a sample. This 'sample' is usually just a fraction of the population being studied. A survey may focus on factual information about individuals or it might aim to collect the opinions of the people carrying out the survey. Surveys are used to assess thoughts, opinions, and feelings.

It also uses questionnaires and interviews to find out about a subject, people's opinions about something or someone, or problem generally.

Survey, in statistics, is a method of collecting data in which people are asked to answer a number of questions using questionnaires. An opinion poll is an example of a survey. How reliable a survey's results are depends on whether the sample of people from which the information has been collected is free from bias and sufficiently large.

There are different types of surveys. A survey can be carried out in a few different ways. In the interview, the person carrying out the survey asks each participant the questions. An interview is oral. In the other method known as the questionnaire, the participant fills out the survey on his or her own.

Not only do surveys have a variety of uses, they also can be conducted in many ways including over the telephone, by mail, e-mail or in person. Yet, all surveys have certain features in common. For example, a sample of voters is questioned in advance of an election to decide how the public sees the candidates and the issues. A manufacturer does a survey of the potential market before introducing a new product. A government carries out a survey to gather the factual information it needs to assess existing laws in order to write up a new legislation.

Legislation is the process of writing and passing laws.
--

Now, here is a questionnaire on 'Shopping Habits'. Study it.

QUESTIONNAIRE: SHOPPING HABITS

Thank you for agreeing to participate in this survey.

Instructions: For Questions 1 and 2 please tick the box that is the best answer for **you**. For Question 3 write in your own answer.

1. What age group are you in?

☐ 10-20 years
☐ 21-30 years
☐ 31-40 years
☐ 41-50 years
☐ Over 50 years

2. Have you ever gone shopping in Marstown?

☐ Yes
☐ No

3. If you answered 'no' for Question 2, give reasons for your answer.

Thank you for your assistance. Please place your questionnaire in the envelope provided. It will be collected from you

Clear Instructions

This question aims to find something out about the person

This question aims to find out facts about the person's shopping habits

A very important courtesy

Clear instructions on what to do with the completed questionnaire

Question 1 is a 'multiple choice' question

Question 2 is a 'closed' question – a simple choice between 'yes' and 'no'

Question 3 is an 'open-ended' question. It gives people a chance to write their own answer

Let us take a closer look at some of the most common types of survey.

(a) Interview

In interviews people are asked questions so that more information can be found out about a subject. In this way you can learn about things (and people's opinions) first hand. There are usually many people with special knowledge about a topic who can help you in your studies. Occasionally these people can be invited to your classroom or you may meet them while doing your field work. There are many different people, from all walks of life, who can be invited to be guest speakers at your school. For example, an LLG member, church pastor, a Volunteer Serving Overseas (VSO) personnel or teacher, and many others that you can think of.

Now, read a cartoon about an interview.



Illustration 8.4.4a: Interviewing someone by asking questions

In the interview, there may be two types of questions: structured and open-ended. A structured interview is a 'controlled' interview. The questions have been put into words and the interviewer knows exactly the type of questions to ask. The interviewer may also have some ideas about the end-results of the interview. An open-ended interview is about the interviewer asking questions that may require more than one answer. In such an interview the person being interviewed may sometimes be put in an awkward situation by the nature or sensitivity of the issue and may not give his or her best.

Therefore, when planning a survey interview you must think about the type of interview and type of results to expect. An interview can be conducted correctly or incorrectly. Here are some interview hints that may be useful.

- (a) Always introduce yourself and say where you are from.
- (b) Explain why you want to interview the person.
- (c) Always speak clearly.
- (d) Make sure your questions are simple and to the point.
- (e) Plan your questions carefully to get the information you need.
- (f) Ask questions that let people give more than just a 'yes' or a 'no' for the answer.
- (g) Listen carefully to the answers.
- (h) Skip over any questions on your list that has already been answered.
- (i) Take notes if you can. If you are going to use a tape recorder, ask permission first.
- (j) Try not to give your own opinion – the interview is their chance to give an opinion.
- (k) Never interrupt a person during an answer – allow time for answers to be given.
- (l) Always thank the person being interviewed when you have finished.

(b) Questionnaire

A questionnaire is a written set of questions aimed at getting the opinions of a number of people on a particular topic or issue. A questionnaire is often left for people to fill out or the questions may be asked directly in an interview situation. The results of questionnaire are usually very interesting because they can often show how people feel about important matters.

A questionnaire is really only useful if a fairly large number of people take part in it. Below is a sample of a questionnaire which can be used whenever you want to carry out a survey which requires a questionnaire. You may change some information depending on the type of survey you are engaged in or carrying out.

Here are some hints about a survey questionnaire.

(a) Be honest about length of time

Tell respondents exactly how much time they should allow for the survey. If the survey is going to take longer tell them that.

(b) Show the progress.

For surveys that are more than one or two pages, provide a progress indicator that shows how much of the survey is remaining.

(c) Send reminders

Telephone or e-mail reminders can help to increase the response rate.

(d) Test, Test, Test!

Test the survey and underlying database or file prior to opening the survey to ensure everything is working correctly.

Main elements of a survey

A survey should have an aim, method, results, conclusion and recommendation. Let us now look at each of them more closely.

Aim: it states the purpose or reason for carrying out the survey.

Method: it states how the survey will be carried out. Whether a questionnaire is prepared and people are asked to answer questions or have a face to face interview.

Results: the information collected

Conclusion: the conclusion is about your findings. Do you have a favourable result and the resources available for your project?

Recommendations: these are your suggestions about the best action to take or that something is good and useful and will produce the best results.

Here are some simple steps in conducting a survey.

1. Determine the purpose of the survey – what information do we need to obtain?
2. Consider the form of survey most appropriate to gather information needed on a topic/issue/problem.
3. Be aware that if questions are used, they should be carefully formed to get the required information. Students should frame precise questions, perhaps discovering that responses to broad questions often confuse rather than clarify the purpose of the investigation.
4. The need to trial a questionnaire could be looked at as well as bias in sampling methods. *Bias means to be one-sided or unfair in your opinion to someone or something.*
5. Supervision, safety student protection issues, needs to be considered and discussed, for example, when conducting traffic survey or surveying adults. Students should not survey adults other than their immediate family without teacher or parental supervision.

Now read the summary.

**Summary**

You have come to the end of Lesson 4. In this lesson, you have learnt that:

- a survey is a data collection tool used to gather information about individuals from a sample. This 'sample' is usually just a fraction of the population being studied.
- a survey may focus on factual information about individuals or it might aim to collect the opinions of the people carrying out the survey.
- surveys are used to assess thoughts, opinions, and feelings.
- it uses questionnaires and interviews to find out about a subject, people's opinions about something or someone, or problem generally.
- survey, in statistics, is a method of collecting data in which people are asked to answer a number of questions using questionnaires. An opinion poll and Census are examples of a survey.
- a survey's results depend on whether the sample of people from which the information has been collected is free from bias and sufficiently large.
- surveys can be administered or conducted through:
 - Interview
 - Questionnaires

- Telephones
 - Mail
 - Internet
- the main elements of a survey include:
 - Aim
 - Method
 - Results
 - Conclusion
 - Recommendation

NOW DO PRACTICE EXERCISE 4 ON THE NEXT PAGE
--



Practice Exercise 4

1. What is a survey?

2. List five ways a survey can be administered.

- (i)

- (ii)

- (iii)

- (iv)

3. List the five elements of a survey.

- (i)

- (ii)

- (iii)

- (iv)

- (v)

4. What are the steps in conducting a survey? Write them down.

- (i)

- (ii)

- (iii)

- (iv)

(v)

5. Carry out a small survey in your community. Give yourself two weeks to complete it.

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 1

ANSWERS TO PRACTICE EXERCISES 1-4

Answers to Practice Exercise 1

1. Population density is the measure the number of people there are in one square kilometre (km²) of land.
2.
 - (a) Some areas may have only a few resources
 - (b) Poor environment
 - (c) High or steep mountainous landform
 - (d) the type of climate
3. Java will face shortages of land. Land disputes may occur that will cause fights and deaths amongst the people.
4. Transmigration
5. Advantage and disadvantage of Transmigration

Advantage	Disadvantage
1. Avoid land dispute	1. People move to unfamiliar environments being exposed to various diseases (e.g. Malaria)

(Any other answers that are correct)

Answers to Practice Exercise 2

1. This is because Monaco has a very small land area and a large population.
2. The formula to calculate population density is the Total Population divide by the Total Land Area (in km²).
- 3.

Country	Total Population	Total Land Area	Population Density
Rwanda	10, 718, 379	26, 338	407
Netherlands	16, 760, 000	41, 526	404
Lebanon	4, 224, 000	10, 452	404
Singapore	5, 183, 700	710	7301
Bahrain	1,234, 596	750	1646
Bangladesh	152, 518, 015	1034	147,502.91
Taiwan (R.O.C)	22, 955, 395	36, 190	634
Mauritius	1, 288, 000	2, 040	631

Answers to Practice Exercise 3

1. Research means to study and discover a particular topic in a methodical way. You use methods of questionnaire or interview to get information from a numbered population. The information gathered is analysed and recommendations made to improve the situation and if the outcome is good then suggestions are outlined for further improvement.
2. A researcher is the person doing the research. It can refer to a group of people who are doing the research together.
3. Conducting researches are important because the world is continually changing and we need to keep up with the current trend of modernisation in our societies.
4.
 - (a) Choosing a topic/project name.
As a group or individual you find a problem or situation that exists in the community that needs to be improved and you give it a name and outline the main points of the research.
 - (b) Gather information about the topic. You use either questionnaires or interview on a numbered population to get the information you want.
 - (c) Think about the information you have gathered and evaluate it. You organise and rewrite this information including your recommendations or solutions to improving the problem or solving it.
 - (d) Teacher Evaluation. After organising and writing up your research give it in to your local teacher or a person of higher status in the community to evaluate and make further recommendations and suggestions.
5. For the Research project, your answers will vary. You can find a social science teacher nearby to help check your progress, and your project once completed.

Answers to Practice Exercise 4

1. A survey is a data collection tool used to gather information about individuals from a sample population. This 'sample' is usually just a fraction of the population being studied. A survey may focus on factual information about individuals or it might aim to collect the opinions of the people carrying out the survey. Surveys are used to assess thoughts, opinions, and feelings.
2.
 - (i) Interview
 - (ii) Questionnaire
 - (iii) Telephone
 - (iv) Mail
 - (v) Internet
3.
 - (i) Aim
 - (ii) Method
 - (iii) Results
 - (iv) Conclusion
 - (v) Recommendation

4. (i) Determine the purpose of the survey – what information do we need to obtain?
- (ii) Consider the form of survey most appropriate to gather information needed on a topic/issue/problem.
- (iii) Be aware that if questions are used, they should be carefully formed to get the required information. Students should frame precise questions, perhaps discovering that responses to broad questions often confuse rather than clarify the purpose of the investigation.
- (iv) The need to trial a questionnaire could be looked at as well as bias in sampling methods. Bias means to be one-sided or unfair in your opinion to someone or something.
- (v) Supervision, safety student protection issues, needs to be considered and discussed, for example, when conducting traffic survey or surveying adults.
- (vi) Students should not survey adults other than their immediate family without teacher or parental supervision.
5. Your answers will vary.
-

END OF ANSWERS TO PRACTICE EXERCISES 1-4

SUB-STRAND 2: POPULATION PYRAMID AND CLIMOGRAPH

In This Sub-strand, You Will Learn About:

- **Reading Population Pyramid**
- **Drawing Population Pyramid**
- **Reading Climate graph**
- **Drawing Climate graph**

SUB-STRAND 2: INTRODUCTION

In the first part of this Sub-strand you will study population pyramids. You will define and look at the different types of population pyramids of some developing and developed countries. You will also draw a population pyramid.

Towards the end of this sub-strand, you will study climographs also called climatic graphs. You will draw climatic graphs to help you develop this skill.

Lesson 5: Reading Population Pyramid



In the last lesson, you learnt about how to conduct a survey in your community. In this lesson, you will learn about population pyramid, its use, and how to interpret.



Your Aims:

- define population pyramid
- identify features of population pyramid
- read and interpret information on a pyramid

What is a Population Pyramid?

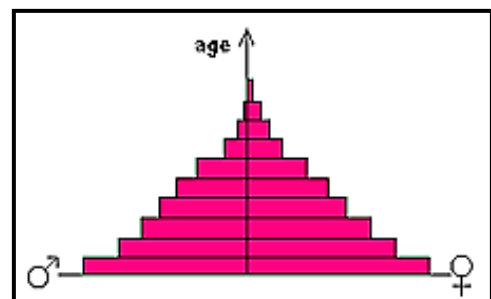
First of all, let us look at the word population in general. You can refer back to Lesson 1 for the definition of the word population. The study of population is about people: how many people there are? Where they are? What sorts of places they live in? How old they are? Are they moving about from one place to another? How fast are they increasing in numbers? These are some questions about the population of people.

The number of people who live in a country and the skills and abilities they have are an important resource for any country.

To get this information, every so often most governments count the number of people in the country through a census. Census is the counting of all the people in a country. The information collected from the Census can then be put on a population pyramid.

A population pyramid is a set of two histograms set on a vertical axis and back to back which show the numbers of two sexes in different age groups. Males are usually on the left with females on the right. The youngest group is at the base; the oldest group at the top. The actual figures, or percentages of the age groups, may be used.

A histogram is a graph that shows the age and sex of a population at a given time. This particular histogram is called a population pyramid. A population pyramid is also called a Age-Sex Pyramid. See *right* a sketch of a population pyramid.

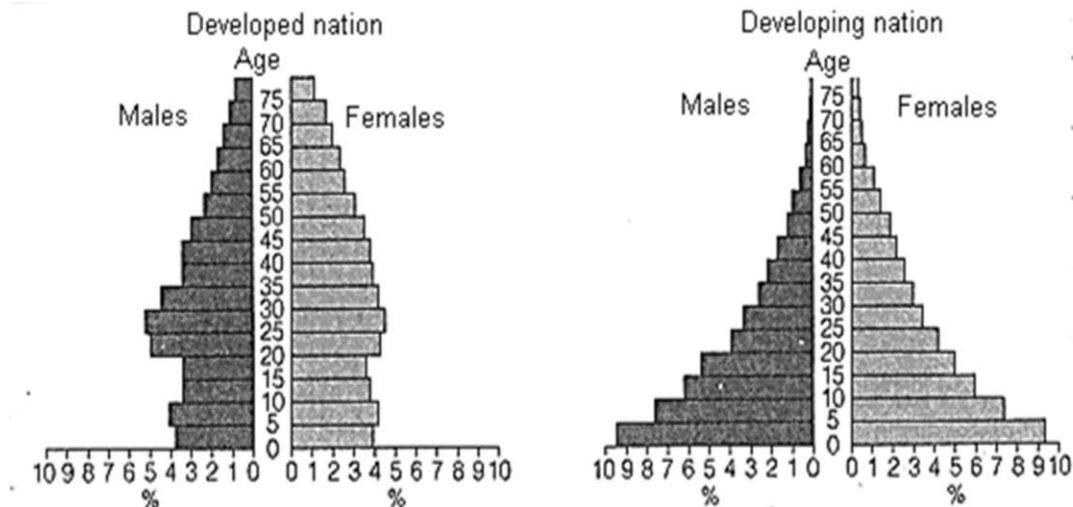


Types

There are different types of population pyramids. The two basic types represent:

- (i) populations of a developed and rich country
- (ii) populations of a developing or under developed and poor country

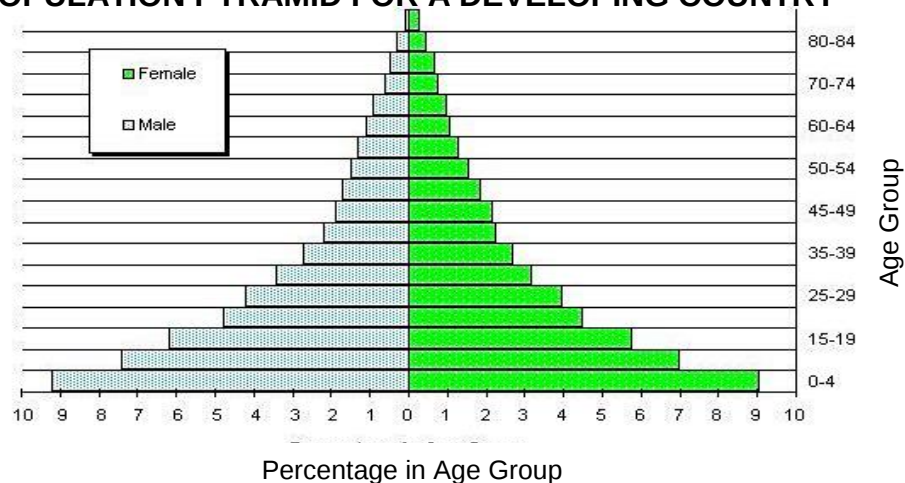
You can see below two population pyramids. The first one shows the age and sex of a developed country. The second one shows the age and sex of a developing country.



Typical population pyramids of a developed and developing nation

Papua New Guinea is a developing country therefore its age and sex measurement of the population will be similar to the population pyramid below. Study it.

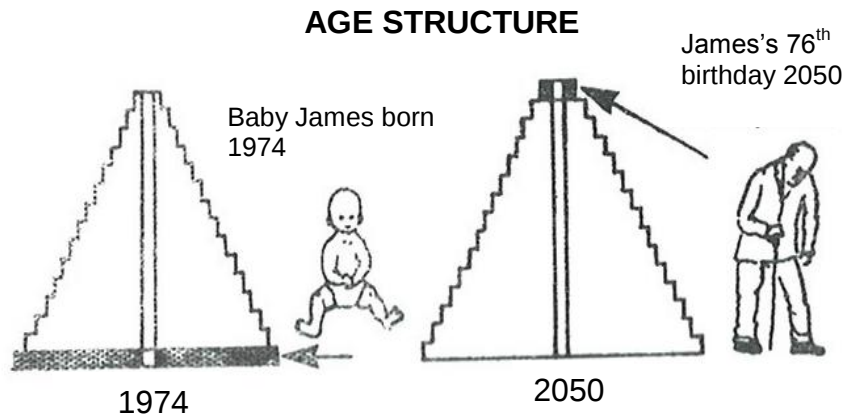
POPULATION PYRAMID FOR A DEVELOPING COUNTRY



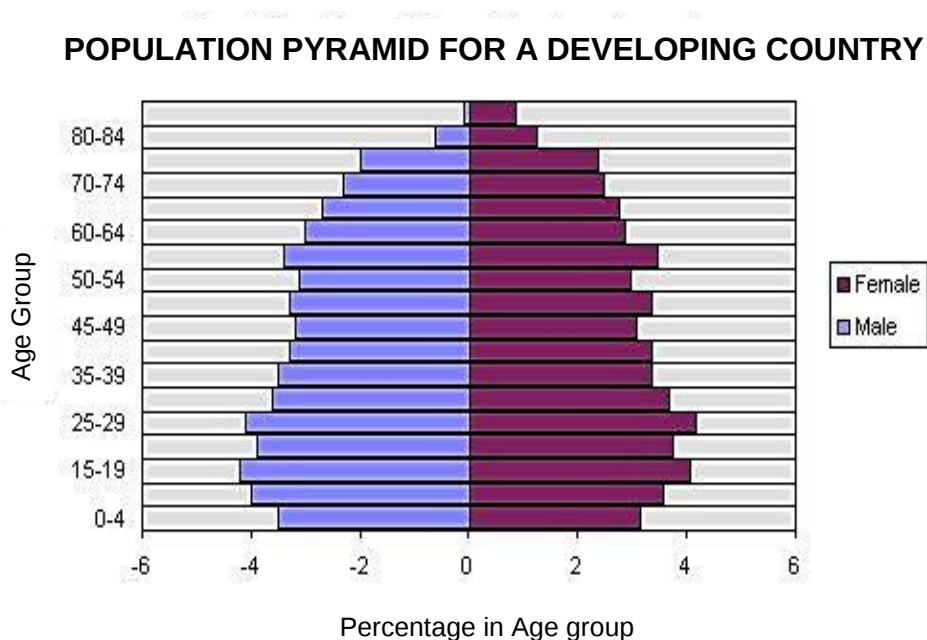
This population pyramid is wide at the base, which means there are a large proportion of young people in the country. It narrows very quickly as you go up into the older age groups, and is narrow at the top. This shows that a very small proportion of people are elderly.

This shape of pyramid is typical of a developing country, such as Kenya or Vietnam, or even Papua New Guinea and West African countries. Below is an example to explain the shape of a developing country's population pyramid.

Every year some people from each age group will die. You were one of many babies when you were born. Not all of these babies will have reached the age of five, though most of them will. A few more will have died before you were ten and so on. By the time you have reached the 75 and older age group there will not be many of you left. Each age group, therefore, gets smaller as years pass by, giving the age structure graph its pyramid shape. See diagram below.



Now, below is a population pyramid of a developed country, for example, Australia. Study it.



This shape is typical of a developed country. It is narrow at the base, wider in the middle, and stays quite wide until the very top, as there is a large percentage of older people. Note that there are more old women than men. Italy and Japan have population structures that are of this shape.

Importance of different types

Population pyramids provide an interesting record of the events over the past 80 years. It looks at the rate at which people are born and die, or arrive in or leave the country.

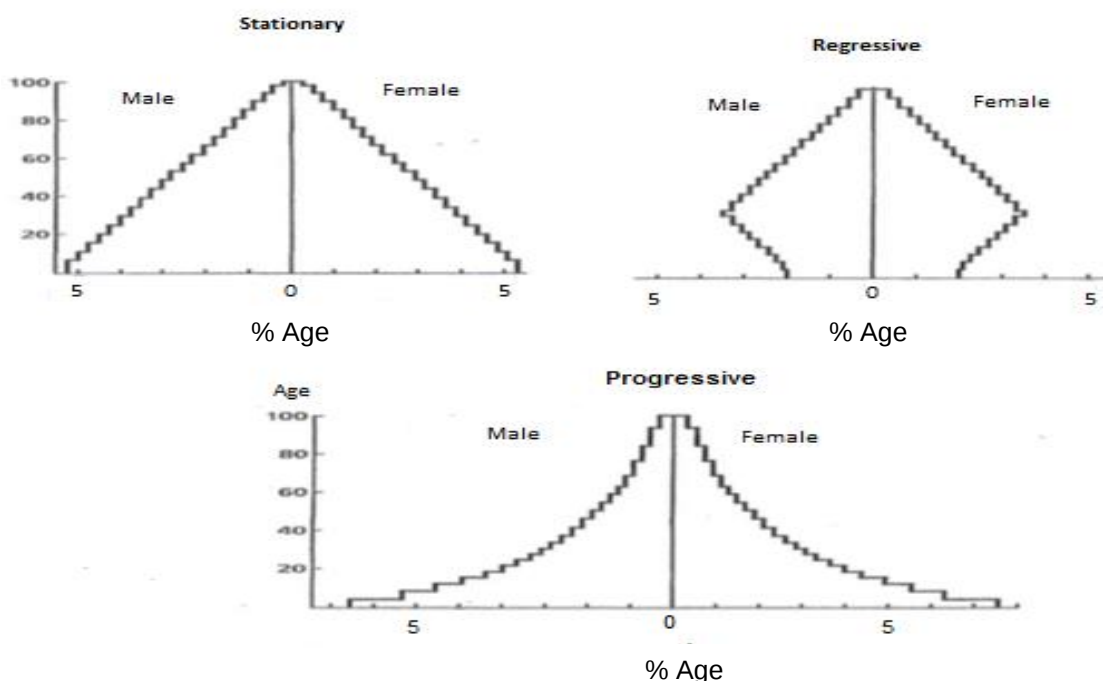
Examples of such events would be the immigration policies of countries like Australia on wars, economic depression and birth control programmes. Economic depression refers to hard times in the financial system in a country. Cost of goods and services may be high and the value of the currency may drop to a very low level. One of the reasons for Japan taking part in the Second World War was to expand her territory and provide more room for her rapidly growing population. However, after Japan's defeat in 1945 she had to find another solution to the problem of overcrowding.

The importance of population pyramids is that they can show, in pictorial form, the changing population structures of different types of society.

For example, in many less developed countries the pyramid will have a very large base. In contrast the pyramids for Western nations are more cylindrical because they have less children and more old people. In between the two are stationary pyramids which show a balance between old and young and no population growth.

Regressive pyramids show population of developed countries where there is less children and more old people. The population growth is likely to decrease in the future. The word regressive means to 'go back' or 'returning'. Japan, is a country that has more old people and less children.

The **progressive** pyramids show population in developing countries where is a large number of children and less old people. The word progressive means to 'advance' or 'go forward'; it is the opposite of regressive. Papua New Guinea is one developing country with more small children and less old people.

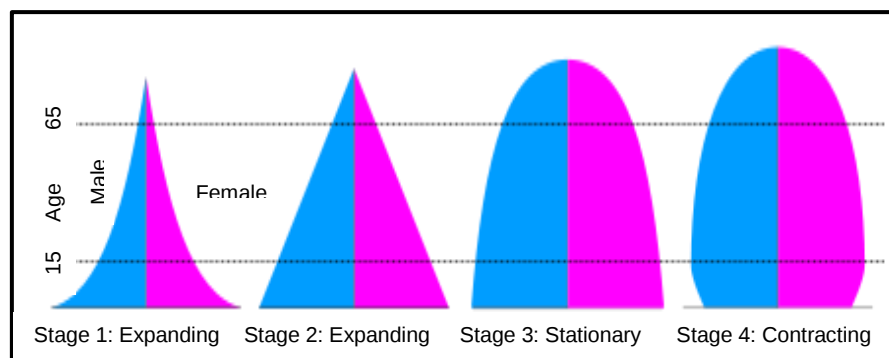


Features

Here are key features of a population pyramid.

- Up the centre is an axis showing the age of the people.
- On the left is a bar graph showing the number of males in each age group.
- On the right is a bar graph showing the number of female in each age group.
- Along the bottom is a scale that measures the number of male and female. (Sometimes a percentage rather than a number scale is used).
- It is easy to use the number scale than percentage.

It is important to know the age and sex of people in a country. The government must know how many schools to build. Only people of a certain age go to school, so it must know the number of young people living in different parts of the country. Very young children and their mothers may need special medical care and advice. In order to provide these services, it is very useful to know the age and sex of the population. This makes it easy for the government to plan and develop these services to cater for the particular population. Below is model showing the four stages of population change over time of a country. While all countries' population pyramids differ, four general types have been identified by the fertility and mortality rates of a country.



Stable pyramid: A population pyramid showing an unchanging pattern of fertility and mortality.

Expansive pyramid: A population pyramid showing a broad base, indicating a high proportion of children, a rapid rate of population growth, and a low proportion of older people. This wide base shows a large number of children. Steady upwards narrowing shows that more people die at each higher age band.

This type of pyramid shows a population in which there is a high birth rate, a high death rate and a short life expectancy. This is the typical pattern for less economically developed countries, due to little access to and incentive to use birth control, negative environmental factors, for example, lack of clean water, and poor access to health care.

Incentive means encouraging effect.

Stationary pyramid: A population pyramid typical of countries with low fertility and low mortality, very similar to a constrictive pyramid.

Constrictive pyramid: A population pyramid showing lower numbers or percentages of younger people. The country will have a graying population which means that people are generally older, as the country has long life expectancy, a low death rate, but also a low birth rate. This pyramid has been occurring more frequently, especially when immigrants are removed, and is often a typical pattern for a very developed country, a high over-all education and easy access and incentive to use birth control, good health care and a low number to no negative environmental factors.

Life Expectancy is the number of years a person lives.

- **Fertility refers to birth rate of infants.**
- **Infant Mortality is the death rate of infants out of every 1000 babies born.**

Uses of population pyramid

Population pyramids can be used to find the number of economic dependents being supported in a particular population. Economic dependents are those children under 15 who are in full time education and therefore unable to work; and those over 65 who have the option of being retired.

In some less developed countries children start work well before the age of 15, and in some developed countries it is common to not start work until 30 (like in the North European countries), and people may work beyond the age of 65, or retire early.

In many countries, the government plans the economy in such a way that the working population can support these dependents. This number can be further used to calculate the **dependency ratio** in that population. Population pyramids can be used to observe the **natural increase, birth, and death rate**.

Dependency ratio is the number of young and old people who depend on others to take care of them.

Natural Increase is the time it takes for a population to double.

Birth Rate is the number of infants alive out of every 1000 born.

Death Rate is the number of infant deaths out of every 1000 born.

Now read the summary.



Summary

You have come to the end of Lesson 5. In this lesson, you have learnt that:

- population is the number of people in a particular place or community. It can also refer to the population of other living things such as plants and animals.
- the population pyramid for Papua New Guinea has a very wide base with decreasing steps upwards.
- developed countries have small bases and nearly vertical sides.
- the number of people who live in a country and the skills and abilities they have are an important resource for any country.
- governments conduct census to count the number of people in a country.
- a population or age – sex pyramid is a set of two histograms set on a vertical axis back to back which shows the numbers of two sexes in different age groups.
- a country's dependency load refers to the number of people who are not part of the workforce and are supported by other people.
- natural Increase is the time it takes for a population to double.
- birth Rate is the number of infants alive out of every 1000 born.
- death Rate is the number of infant deaths out of every 1000 born.

NOW DO PRACTICE EXERCISE 5 ON THE NEXT PAGE



Practice Exercise 5

1. What is population?

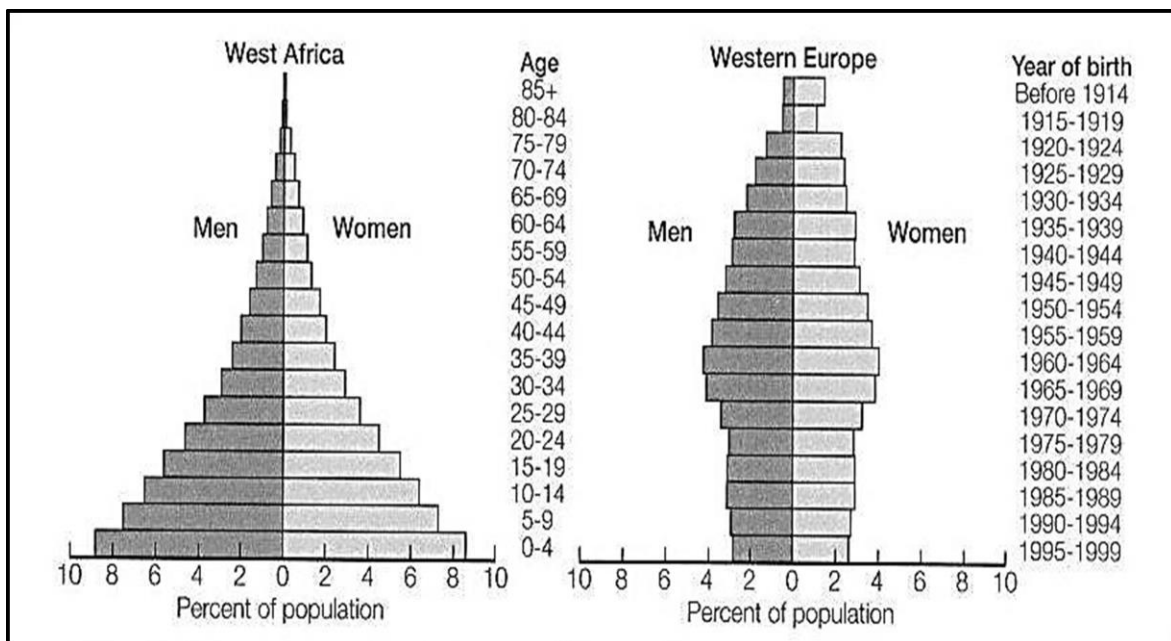
2. What is another word for population pyramid?

3. Define population pyramid.

4. List the three elements of population pyramid.
(i) _____
(ii) _____
(iii) _____

Refer to the information below to answer questions.

West Africa is a region that includes a number of countries that are mostly developing or underdeveloped and poor. Western Europe is another region in Europe that includes a number of countries that are usually highly developed and rich.



5. Which population pyramid fits each of the following descriptions?

(i) 'Many children are born but many die before reaching old age'. Why?

(ii) 'A significant number of people live to reach the age of 50 or 60.' Why?

6. Which of the population pyramids show a high birth rate and a relatively high death rate?

7. Compare the dependency load of West African countries with that of a developed country. Explain the difference in their dependency load.

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 2
--

Lesson 6: Drawing Population Pyramid



In the last lesson you learnt about population pyramid, its uses and features, and the most basic population pyramids. In this lesson you will draw a population pyramid.



Your Aims:

- draw a population pyramid accurately using a set of information given in a table
- draw a population pyramid accurately using a set of guidelines

A population pyramid is a special type of bar graph, drawn to show the age structure or age distribution of a population. A population pyramid is made up of many horizontal bar graphs laid on top of the other. Each horizontal bar is divided into males and females, and represents the number of the total population in a particular age group.

The age groups are marked at regular interval or distance on the vertical axis, either between the male and female sections of the pyramid, or to one side of the pyramid. Number scales are marked along the horizontal axis, for both the males and the females so that the proportion of each sex in any age group can be calculated.

The features of a population pyramid are shown below.



Raw data must be collected from population census and put on a table form to construct a population pyramid.

How to read a population pyramid

1. Use a ruler to mark off the end of each bar. Read off the number scale where the bar ends on the horizontal axis.
2. A number scale is easy to read and calculate than percentage. Almost all the population pyramids shown have number scales, or percentage.
3. The axis between the two histograms show the age of people. Each bar represent an age group. Therefore, when reading the bar for an age group, read off at the end of a bar, mark off.
4. In a number scale, you add up the marked off figures for male and female the total is in thousand.

Here is an example using the population pyramid given on page 51.

What is the male and female populations for infants and babies between 0 and 4 years old?

- Male = 8.4
- Female = 7.7

The total population for 0-4 years old is 16.1 thousand.

Now read the summary.

**Summary**

You have come to the end of Lesson 6. In this lesson, you have learnt that:

- population pyramids are special types of bar graphs, drawn to show the age and sex distribution of a population.
- a population pyramid is made up of horizontal bar graphs laid on top of the other and drawn back to back.
- each horizontal bar is divided into males and females and represents the proportion of the total population in a particular age.
- population pyramid looks at the rate at which people are born and die, or arrive in, or leave the country.
- the age groups are marked at regular interval or distance on the vertical axis, either between the male and female sections of the pyramid, or to one side of the pyramid.
- number scales are marked along the horizontal axis, for both the males and the females so that the proportion of each sex in any age group can be calculated (in thousands).

NOW DO PRACTICE EXERCISE 6 ON THE NEXT PAGE



Practice Exercise 6

1. What type of graph is a population pyramid?

2. (a) How many axis are given on the population pyramid? _____

- (b) Name these axes and the type of information shown on them.

(i) _____

(ii) _____

3. Use the figures given in the table below to construct a population pyramid for Papua New Guinea.

Age group	Males	Females
0 – 4	8.2	7.5
5 – 9	7.5	6.9
10 – 14	6.8	6.1
15 – 19	5.6	4.5
20 – 24	4.5	4.1
25 – 29	3.7	3.5
30 – 34	3.5	3.5
35 – 39	2.5	2.4
40 – 44	2.5	2.4
45 – 49	2.0	1.9
50 – 54	2.0	1.9
55 – 59	1.5	1.4
60 – 64	1.1	1.0
65 +	0.8	0.7
Total	52.2	47.8

Source: Population of Papua New Guinea, 1980 National Census

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 2

Lesson 7: Reading Climograph



In the last lesson you drew a population pyramid. In this lesson you will learn about climographs. A climograph is also known as a climatic graph.



Your Aims:

- define climograph
 - identify the features of a climograph
 - read and interpret information on a climograph
-



I learnt about line and column graphs in grade 7. A climograph has both a line and column graph.

Climograph

A climograph is a graph that shows monthly temperatures and precipitation of a particular place. Precipitation is any form of moisture. A climograph fulfils two basic functions: it shows precise, detailed information about the climate of a particular place, and, is also used to classify the climate of that place.

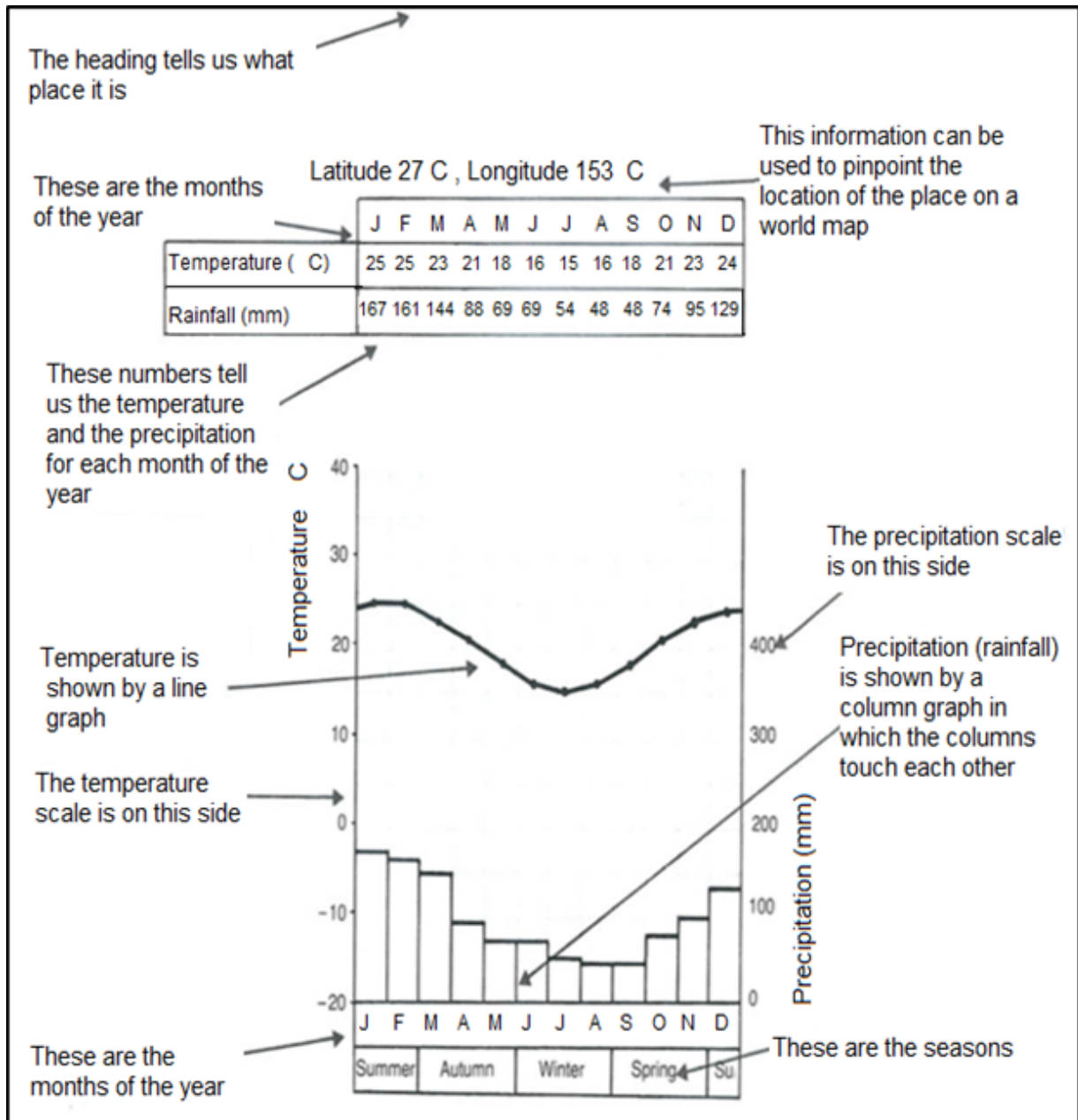
Here are the basic features of climatic graphs,

- title or heading
- the temperature scale is on the left vertical axis
- the rainfall scale is on the right vertical axis
- there are 12 columns for each month of the year horizontally from left to right at the base of the graph
- each axis must show the unit of measurement



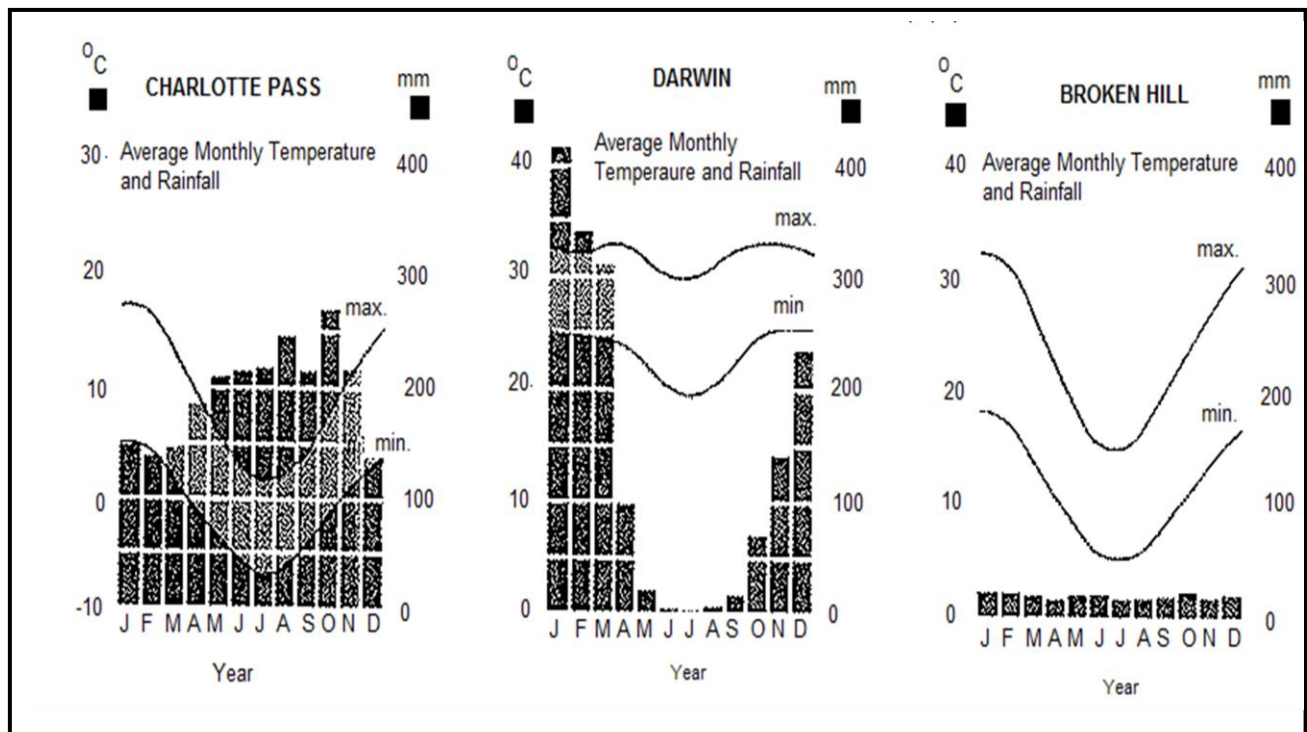
Study the climatic graph below.

CLIMATIC TABLE AND GRAPH FOR BRISBANE



The graph above is for Brisbane, Australia. Australia experiences four seasons. These seasons are: summer, autumn, winter and spring. Although Brisbane is in the northern part of Australia, which is tropical, it experiences four seasons.

Study these climatic graphs and complete the table in the Activity.



Now do Activity 1.



Activity 1

Complete the table below by writing the basic features of each of the graphs above.

Charlotte Pass	Darwin	Broken Hill

Interpreting

A climatic graph is a combination of two graphs line and column. This sort of graph gives lots of information about temperature, precipitation, the seasons and location of the place shown. The rainfall and temperature figures are drawn on the same graph. The temperature is drawn in a line (graph) and rainfall (columns).

According to the graph of Charlotte Pass mountainous places tend to have low temperatures and high rainfall. The graph for the city of Darwin shows places that are close to the equator that tend to have warm temperatures. And if you study the graph representing the temperatures and rainfall of Broken Hill, you will see that it describes inland places that have temperature variations and low rainfall.

Given below are some interpretations of the temperature and rainfall readings of the three climate graphs.

Temperature

- The maximum (highest) temperature will be shown by the highest point on the line graph or the highest temperature shown in the table.
- The minimum (lowest) temperature will be shown by the lowest point on the line graph or the lowest temperature in the table
- The temperature range will be found by taking the minimum away from the maximum.

Temperature Range is the difference between the highest and lowest temperatures.

Formula: Highest Temperature – Lowest Temperature = Temperature

What is
precipitation



Precipitation is any form of moisture that falls to the ground.

Precipitation

- The highest precipitation will be shown by the highest column in the graph or the smallest precipitation figure in the table.
- The lowest precipitation will be shown by the lowest column in the graph or the smallest precipitation figure in the table.
- A grouping together of a number of higher columns will show a distinct wet season.
- A grouping together of a number of low columns will show a distinct dry season.
- If all columns are quite high it is probably wet all year round.
- If all columns are quite low it is probably very dry all year round.
- To find out the total precipitation for the year, add up all twelve precipitation figures from the table.

Now do Activity 2.



Activity 2

Complete the following table by writing the highest and lowest temperatures and rainfall figures for each of the graphs in the spaces provided.

Charlotte Pass		Darwin		Broken Hill	
<i>Temperature (°C)</i>		<i>Temperature</i>		<i>Temperature</i>	
Highest	Lowest	Highest	Lowest	Highest	Lowest
<i>Rainfall in mm</i>		<i>Rainfall in mm</i>		<i>Rainfall in mm</i>	
Highest	Lowest	Highest	Lowest	Highest	Lowest

Check your answers after the summary.

Now read the summary.



Summary

You have come to the end of Lesson 7. In this lesson, you have learnt that:

- a climate graph is also referred to as a climograph.
- it shows the average temperature and precipitation (rainfall) of a place over a year.
- a climatic table shows the average temperatures and rainfall reading for each month of a year.
- climatic graphs are a combination of line and bar graphs that show the distribution and patterns of average monthly temperatures and precipitation in a period of a year.

Answers to Activity 1

Charlotte Pass	Darwin	Broken Hill
1. The title of the graph is Charlotte Pass.	1. The title of the graph is Darwin	1. The title of the graph is Broken Hill
2. The temperature scale is 1cm:10°C	2. The temperature scale is 1cm:10°C	2. The temperature scale is 1cm:10°C
3. The monthly rainfall scale is 1cm:100mm of rainfall.	3. The monthly rainfall scale is 1cm:100mm of rainfall	3. The monthly rainfall scale is 1cm:100mm of rainfall
4. The unit of measurement for temperature is °C, and rainfall is millimetres (mm).	4. The unit of measurement for temperature is °C, and rainfall is millimetres (mm).	4. The unit of measurement for temperature is °C, and rainfall is millimetres (mm).
5. There are twelve columns for each month of the year horizontally at the base of the graph.	5. There are twelve columns for each month of the year horizontally at the base of the graph.	5. There are twelve columns for each month of the year horizontally at the base of the graph.

Answers to Activity 2

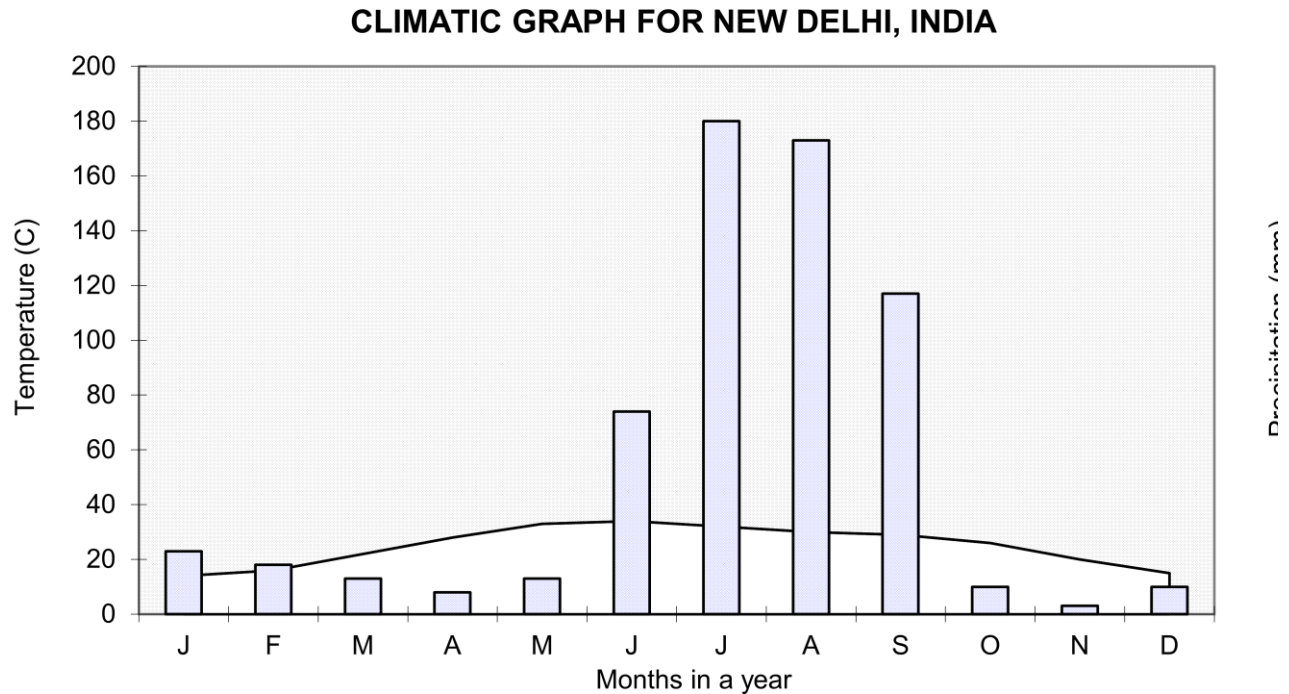
Charlotte Pass		Darwin		Broken Hill	
<i>Temperature (°C)</i>		<i>Temperature</i>		<i>Temperature</i>	
Highest	Lowest	Highest	Lowest	Highest	Lowest
18°C	-7°C	33°C	20°C	32°C	5°C
<i>Rainfall in mm</i>		<i>Rainfall in mm</i>		<i>Rainfall in mm</i>	
Highest	Lowest	Highest	Lowest	Highest	Lowest
In October with 270mm	In February with 145mm	In January with 400 mm	In July almost 0mm	In October with 25mm	In June with 10mm

NOW DO PRACTICE EXERCISE 7 ON THE NEXT PAGE



Practice Exercise 7

Study the climate graph below and answer the following questions. Some of the questions have clues to help you work out your answer from the graph.



1. In what month was the maximum rainfall recorded? _____

Clue: What should you look for? You look for the highest column as it shows the month with the highest rainfall.

2. (a) What was the highest temperature for the year? _____

Clue: What should you look for? You look for the highest dot on the line graph, then place a ruler from the dot and read off the vertical axis for temperature.

- (b) What was the lowest temperature for the year? _____

3. What is the annual Temperature range for New Delhi? _____

Clue: To work out the annual temperature range, subtract the lowest Temperature that is 14°C from the highest temperature of 34°C .

4.

(a) Which month was the driest? _____

(b) How much rain fell during this month? _____

Clue: What should you look for? You look for the column that has no rainfall at all.

5.

(a) Which months show the wet season? _____

(b) How do these months indicate the wet season in the year? Explain.

Clue: *What should you look for? You look for the months that have the tallest columns with more than 80 mm of rain.*

CHECK YOUR ANSWERS AT THE END OF SUB STRAND 2
--

Lesson 8: Drawing Climographs



In the last lesson, you have learnt about reading climographs. In this lesson, you will draw a climograph using the information for rainfall and temperature given in a table.



Your Aims:

- briefly discuss the steps involved in drawing climate graphs
- draw a climate graph accurately using a set of information given

Given below are the steps you must follow to draw a climatic graph of Sydney.

Step 1: Study the climatic table carefully. Think about how you will draw the graph using the information given. You can ask yourself these questions.

- *How will I set out the graph?*
- *What size must the horizontal axis and vertical axes be?*
- *How much space do I have in my book?*
- *What will be the scale for the horizontal and vertical axis?*
- *Do I have graph paper?*
- *Do I already imagine what my graph will look like?*

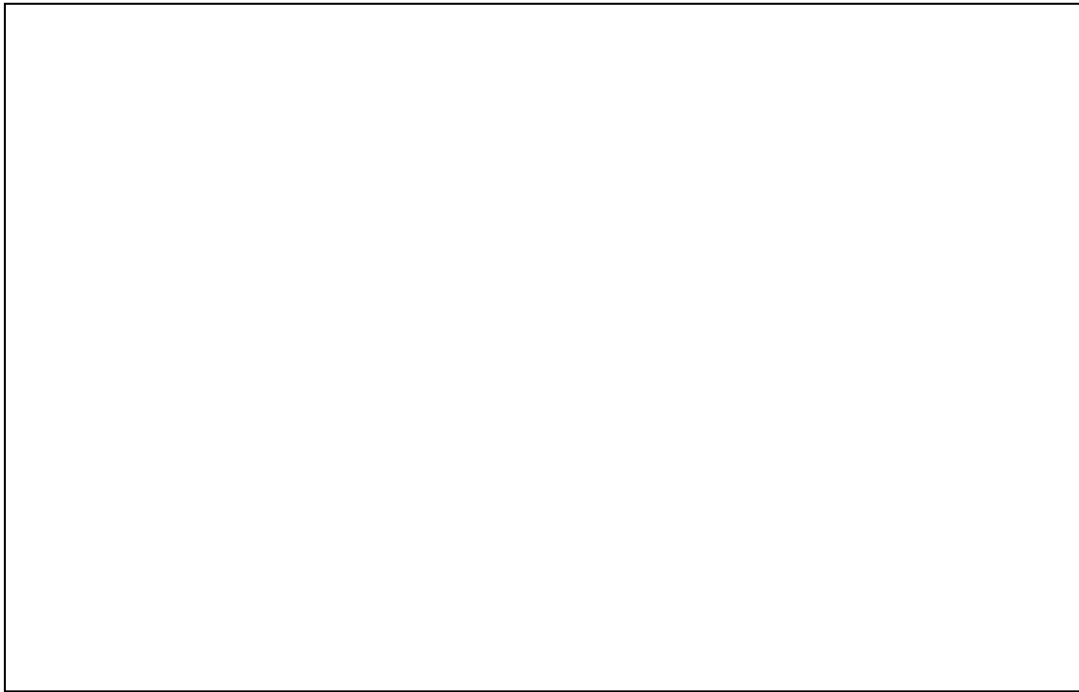
Climatic figures for Sydney

Months in a Year	J	F	M	A	M	J	J	A	S	O	N	D
Temperature (°C)	22	22	21	18	15	13	12	13	15	18	19	21
Precipitation (mm)	100	115	131	126	123	133	104	81	69	76	78	79



It would be fun drawing a climograph. Let us follow the steps and draw a neat and accurate graph!

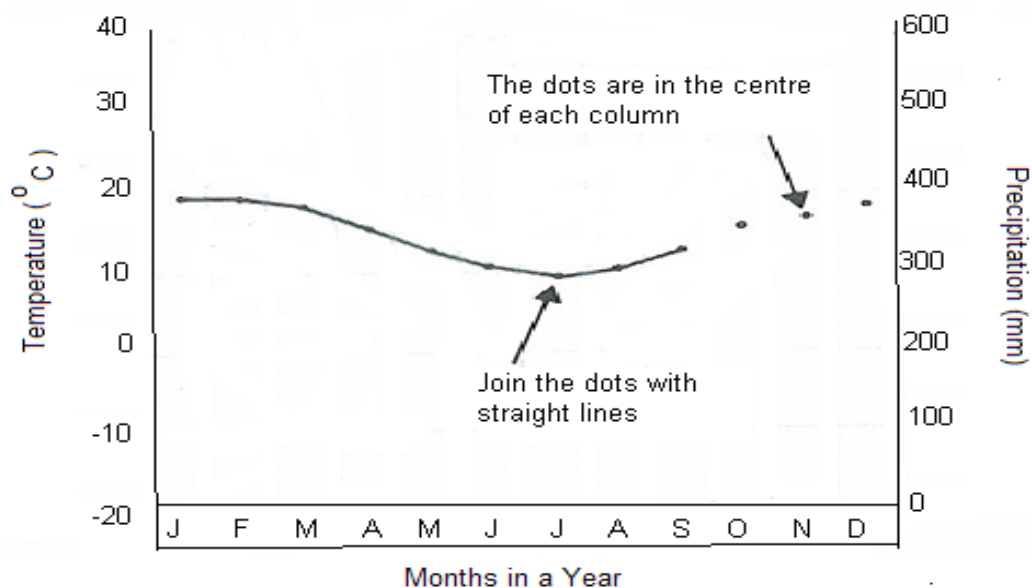
Step 2: Draw the horizontal axis so that there are twelve spaces across it. Write in the letter for each month. Draw the temperature scale and the precipitation scale. Write in the temperature and precipitation figures. Label each axis.



The temperature scale should be **10°C is to 1 cm**. The precipitation scale should be **100 mm is to 1 cm**.

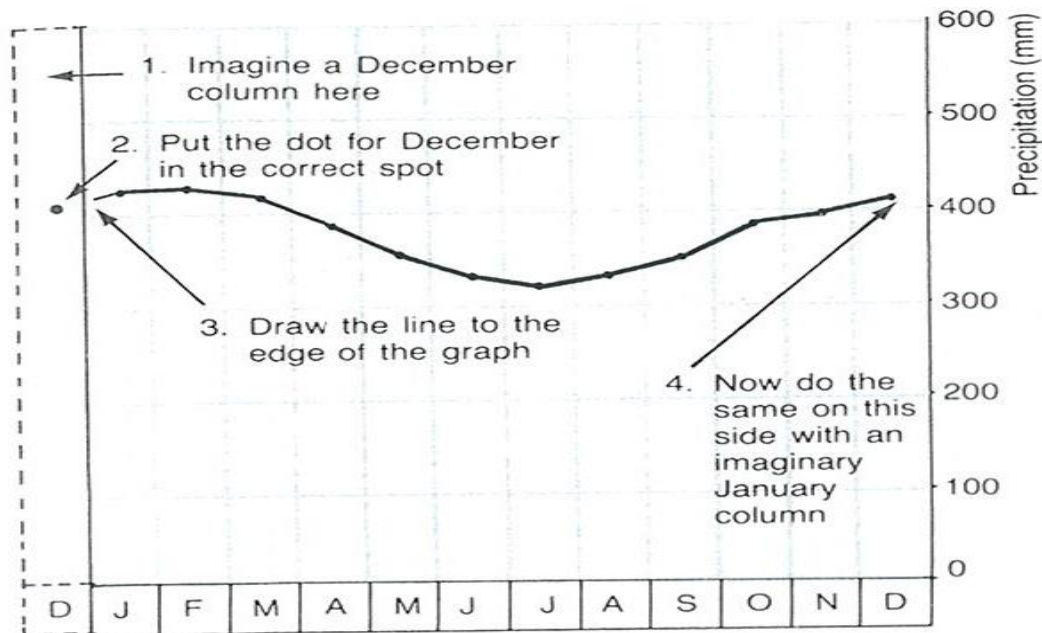
Step 3: Begin 'plotting' the temperature information from the table. Join up the dots with a straight line.

Note: Unlike other line graphs you have drawn, temperatures on a climatic graph are plotted in the middle of the column for each month.



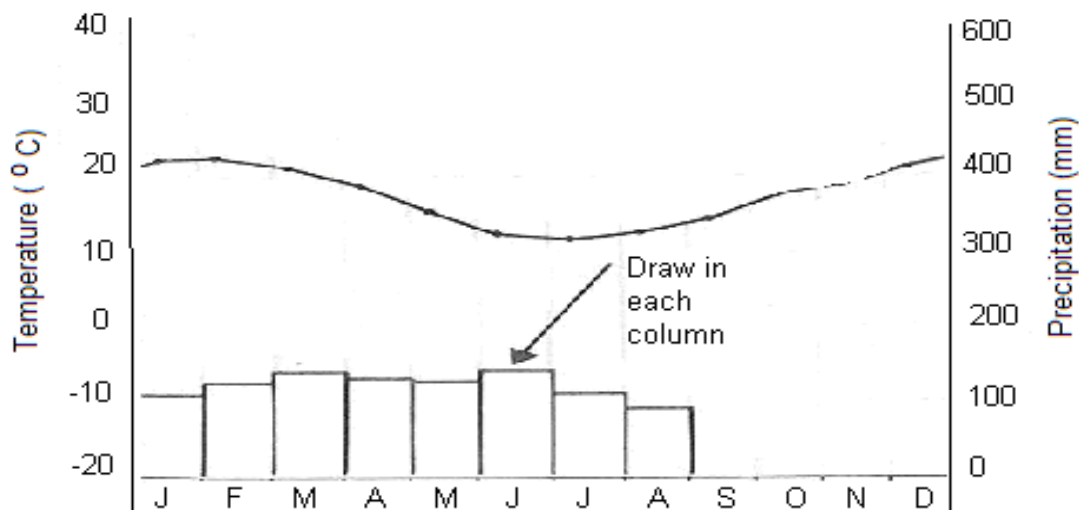
Step 4: You must now complete the temperature line so that it reaches the edge of the graph on both sides.

- Imagine a December column to the left of the January column. Plot the temperature for December in this imaginary column. Rule a line from the January dot towards this December dot. Stop at the edge of the graph.
- Now imagine a January column on the right of the graph. Plot the temperature and rule the line

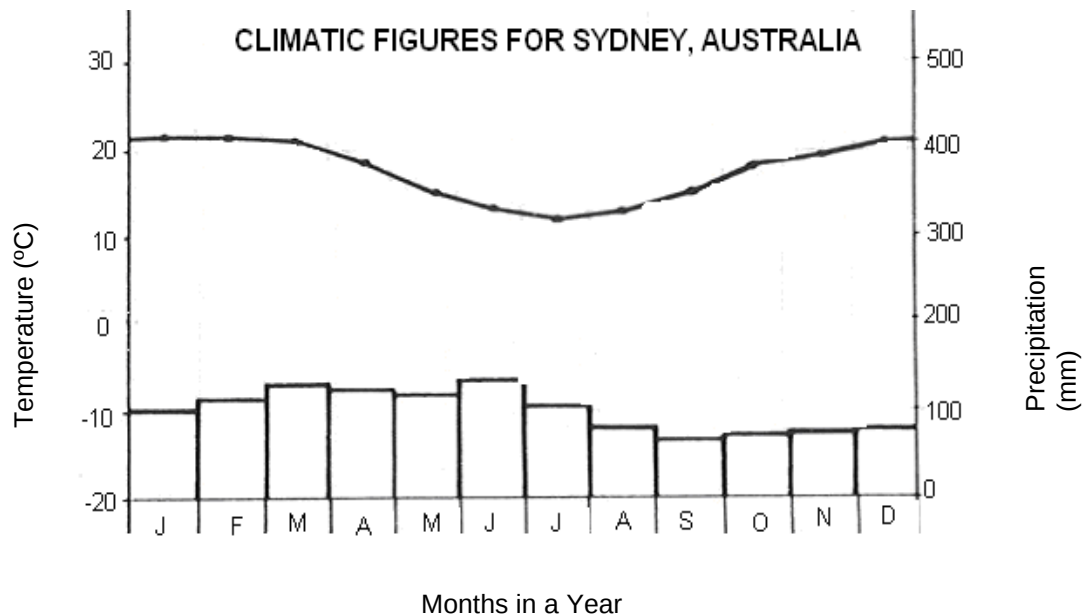


Step 5: Now begin drawing in the columns to show precipitation. Use a ruler at all times. Shade in the columns if necessary.

Note: Precipitation is shown on a climatic graph by columns joined side by side.



Step 6: Complete the graph by putting a title at the top.



Now read the summary.



Summary

You have come to the end of Lesson 8. In this lesson, you have learnt that:

- a climograph is referred to as climatic graph.
- climatic graph shows the average temperature and precipitation (rainfall) for a place over the 12 months period.
- a climatic graph is usually drawn from a climatic table.
- climatic table basically has the average temperature and rainfall readings for each month of the year.
- climate graphs are a combination of a line graph that shows the distribution and pattern of the average monthly temperature and a column graph represents average monthly precipitation.

NOW DO PRACTICE EXERCISE 8 ON THE NEXT PAGE



Practice Exercise 8

1. Use the climatic table below to draw a climatic graph for Brisbane. Refer to the steps above to guide you. Use a graph paper or a paper with ruled grid lines.

Climatic figures for Brisbane

Months in a Year	J	F	M	A	M	J	J	A	S	O	N	D
Temperature (°C)	22	22	21	18	15	13	12	13	15	18	19	21
Precipitation (mm)	100	115	131	126	123	133	104	81	69	76	78	79

2. Which month has the highest precipitation? _____
3. How much rain falls during this month? _____
4. Which month has the lowest precipitation?
- (i) _____ (ii) _____
5. Which months had the highest temperature?
- (i) _____ (ii) _____
6. When is the dry season? _____
7. What is the temperature range for that year? _____
8. According to the information, do you think Brisbane has enough rainfall in a year? Explain.

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 2

ANSWERS TO PRACTICE EXERCISES 5-8

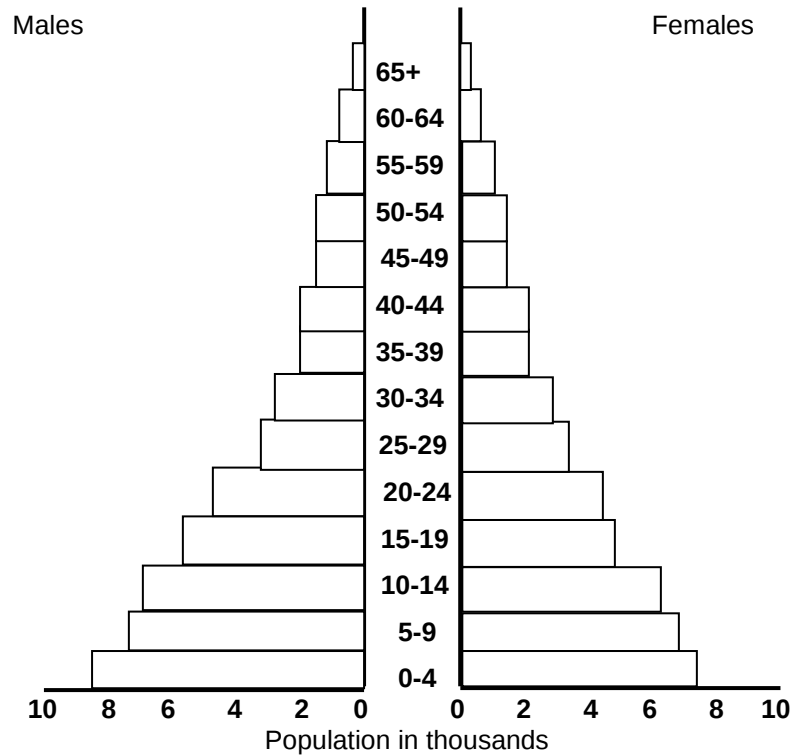
Practice Exercise 5

1. Population is the total number of people living in a particular place at a given time.
2. Age-Sex pyramid
3. A population pyramid is a set of two histograms set on a vertical axis back to back which shows the numbers of two sexes in different age groups.
4.
 - (i) Population is divided into five age groups
 - (ii) Population is divided into males and females
 - (iii) A population pyramid also tells how many people of each age range live in the area.
5.
 - (i) West Africa. This is because the population pyramid is wide at the base, which means there is a large group of young people in the country. It narrows very quickly as you go up into the older age groups, and is narrow at the top. This shows that a very small group of people are elderly. This shape of pyramid is typical of a developing country, such as Kenya or Vietnam, or even Papua New Guinea and West African countries.
 - (ii) Western Europe. This is because the shape is typical of a developed country or region. It is narrow at the base, wider in the middle, and stays quite wide until the very top, as there is a large percentage of older people. Note that there are more old women than men. Italy and Japan have population structures that are of this shape.
6. The population pyramid of West Africa.
7. The dependency load of West African region is very large due to children and young adults still dependent on parents, whilst in Western Europe there is hardly any dependency load.

Practice Exercise 6

1. They are special types of bar graphs drawn to show the age and sex distribution of a population.
2.
 - (a) Two
 - (b)
 - (i) Vertical axis shows the age and sex groups which are marked at regular intervals.
 - (ii) Horizontal axis shows the percentage scales.

3. Population Pyramid of Papua New Guinea

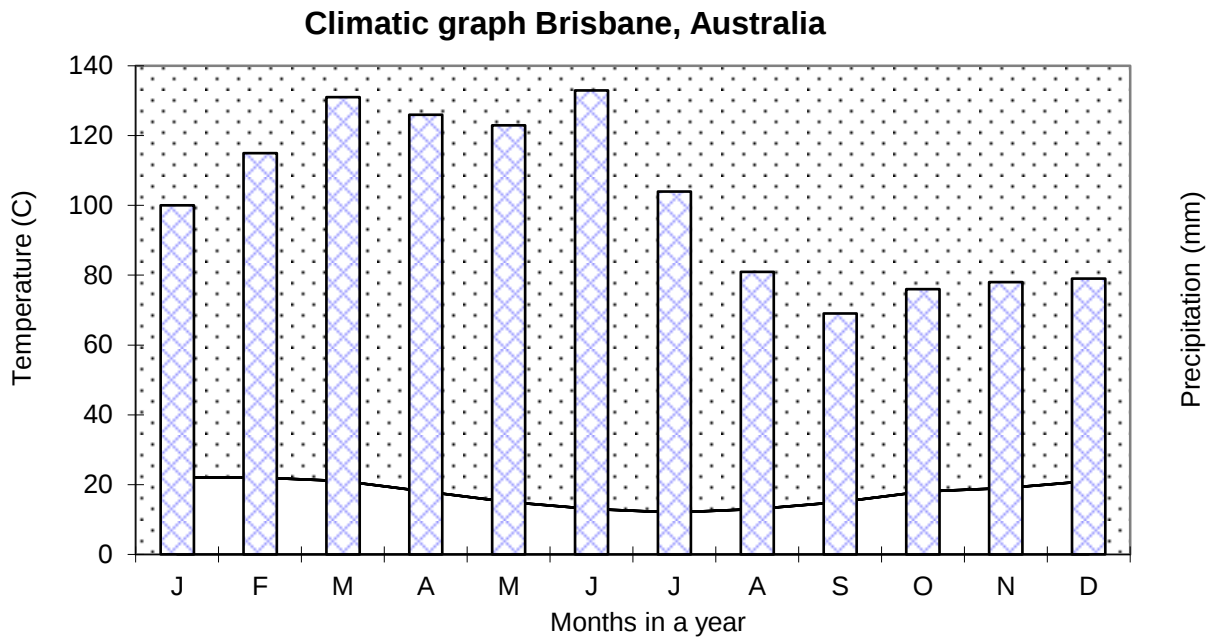


Practice Exercise 7

1. The highest rainfall was recorded in July.
2.
 - (a) The highest temperature was 34°C in June.
 - (b) The lowest temperature was 13°C in January.
3. The annual temperature was 20°C.
4.
 - (a) The month that had no rain at all was November.
 - (b) None at all.
5.
 - (a) June to September
 - (b) These months indicate the wet season because they have high rainfall starting from 80mm and higher

Practice Exercise 8

1.



2. June

3. 133mm

4. September

5. January and February

6. The dry season is at the end of the year. The dry season starts in August and ends around December.

7. The temperature range is 10 degrees Celcius.

8. Yes. Brisbane has enough rainfall throughout the year. There is more than 100mm of rainfall starting January through to July. Even during the dry season starting August through to December the amount of rainfall was above 50 mm and no less.

SUB-STRAND 3: CONTOUR MAPS AND TIMELINES

In This Sub-Strand, You Will Learn About:

- **Contour Lines**
- **Contours and Landforms**
- **Reading and Interpreting Timelines**
- **Drawing Timelines**

SUB-STRAND 3: INTRODUCTION

In the first part of the sub-strand, you will learn about the basics in contour lines and landforms. You will study the definitions of contour lines, intervals and mapping. You will also study more contours and do activities on contour mapping and landform.

In the second part of the sub-strand, you will study the basic timeline skills. You will define, read and interpret timeline in student activities. You will eventually draw a timeline to demonstrate your understanding.

Lesson 9: Contour Lines



In the last lesson, you learnt about climatic graphs. In this lesson you will learn about contour lines and how to calculate the height between each contour line called contour interval.



Your Aims:

- define contour lines and contour intervals
 - calculate contour intervals between different heights
-

Contour line

Let us look at the meaning of contour and contour lines. The word contour means, the outer edge of a shape or the outline of a shape. Contour line is a line on the map that joins places that are the same height above sea level.

Contour lines are the main feature of a topographic map. Contour lines are lines drawn on a map joining points of equal elevation or height. If you physically followed a contour line, elevation would remain constant or the same. Elevation is height above sea level. Contour lines show elevation and the shape of the terrain or landscape. They are useful because they show the shape of the land surface on the map.

Here is one way to interpret contour lines: Take an object like a ball or a pile of laundry, and shine a red laser pointer along the object's side. The line you see will look like a contour line on a topographic map. You can do this little activity at home at your own time to help you understand contour lines.

On most maps, the contour lines are drawn in brown. Starting at zero elevation, every fifth contour line is drawn with a heavier line. These are known as index contour. Some place along each index contour, the line is broken and its elevation is given. The contour lines between the index contours are called **intermediate** contours. These lines are thinly drawn and usually do not have their elevations given. Contour lines are lines drawn on a map connecting points of equal elevation. If you walk along a contour line you neither gain nor lose elevation.

Can you picture yourself walking along the beach exactly where the water meets the sand? Good. Now as you are walking you ignore the small waves that rush to meet your feet. The water surface marks an elevation we call sea level, or zero. As you walk along the shore your elevation will remain the same, you will be following a contour line. If you stray from the shoreline and start walking into the ocean, the elevation of the ground (in this case the seafloor) is below sea level. If you stray in the other direction and walk up the beach your elevation will be above sea level. The cartoon below shows the contour lines at certain

point and the elevation above or below sea level when you walk away from zero point of elevation.

Topography is the shape of the Earth's surface and landforms.

The contour line represented by the shoreline separates areas that have elevations above sea level from those that have elevations below sea level. We refer to contour lines in terms of their elevation above or below sea level. In this example the shoreline would be the zero contour line (it could be 0 ft., 0 m, or something else depending on the units we were using for elevation).

Now, study this diagram carefully.

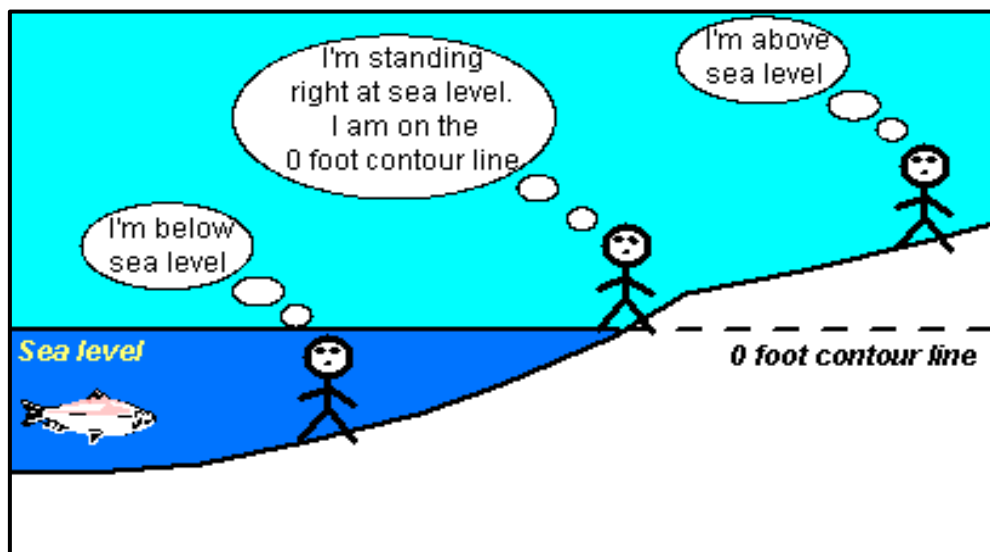


Illustration 8.4.9b: Above and below sea level

Contour intervals

With that understanding, let us discuss the meaning of contour intervals. A **contour interval** is the difference in height between one contour line and the next.

Diagram 1 show the same island. The *left* show the side (cross profile view) such as you would see from a ship offshore. The *right* show a view from above, map or aerial view such as you would see from an aeroplane flying over the island.

The shape of the island is shown by location of shoreline on the map. Remember this shoreline is a contour line. It separates areas that are above sea level from those that are below sea level. The shoreline itself is right at zero so we will call it the 0 ft. contour line (we could use metre, centimetre, inches or any other measurement for elevation).

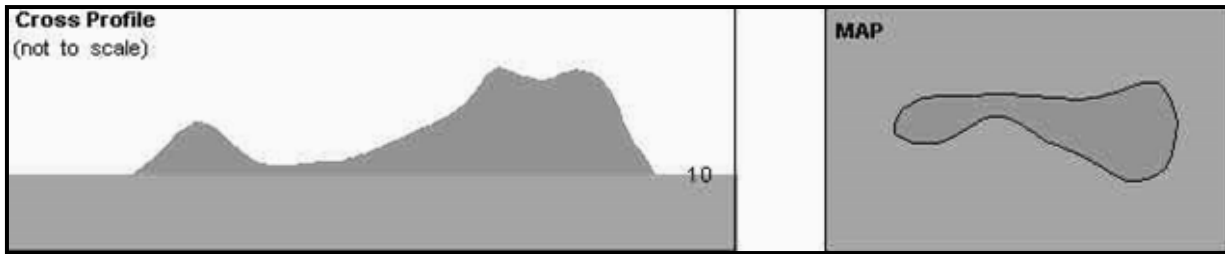


Diagram 1

The shape of the island is more complicated than the outline of the shoreline shown on the map above. From the profile it is clear that the island's topography varies (that is some parts are higher than others). This is not obvious on maps with only one contour line. But contour lines can have **elevations** other than sea levels. We can picture this by pretending that we can change the depth of the ocean. The diagram below shows an island that is getting flooded as we raise the water level 10 ft. above the original sea level.

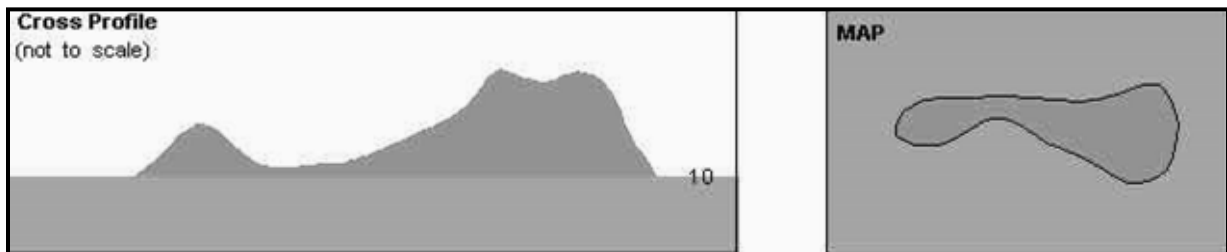


Diagram 2

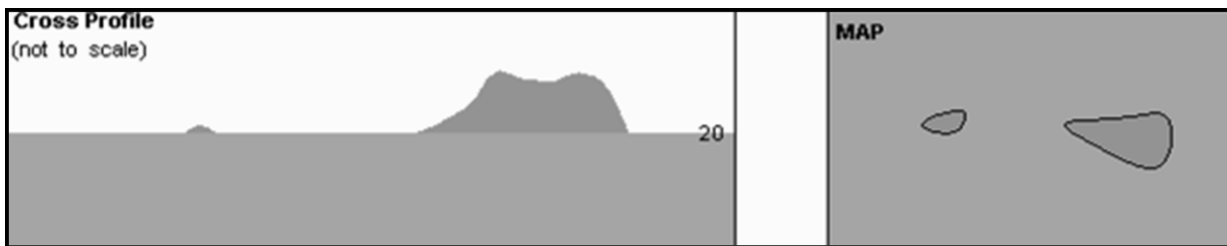


Diagram 3

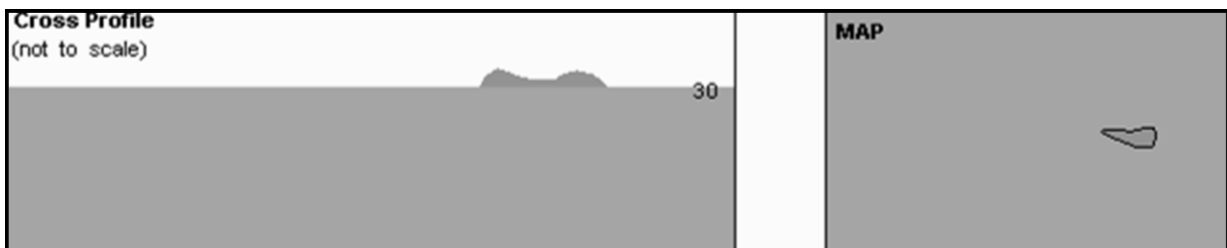


Diagram 4

Shorelines are real but contour lines are imaginary. If we take each of the shorelines from the maps above and draw them on the same map we will get a topographic map as you see in Diagram 5. Contour lines give much information on the surface area of the islands. From the map and cross profile we can see that the island has two "high" points. The highest point is above 30 ft. elevation (inside the 30 ft. contour line). The second "high" point is above 20 ft. in elevation but does not reach 30 ft. These high points are at the ends

of a ridge (small hill) that occupies the whole island. Lower elevations between 0 and 10 ft. contours surround the entire ridge.

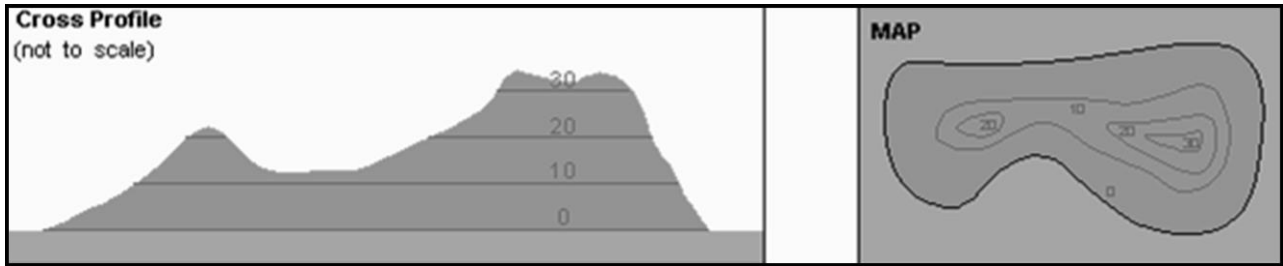


Diagram 5

With practice you can picture the surface area by looking at the map even without the cross profile.

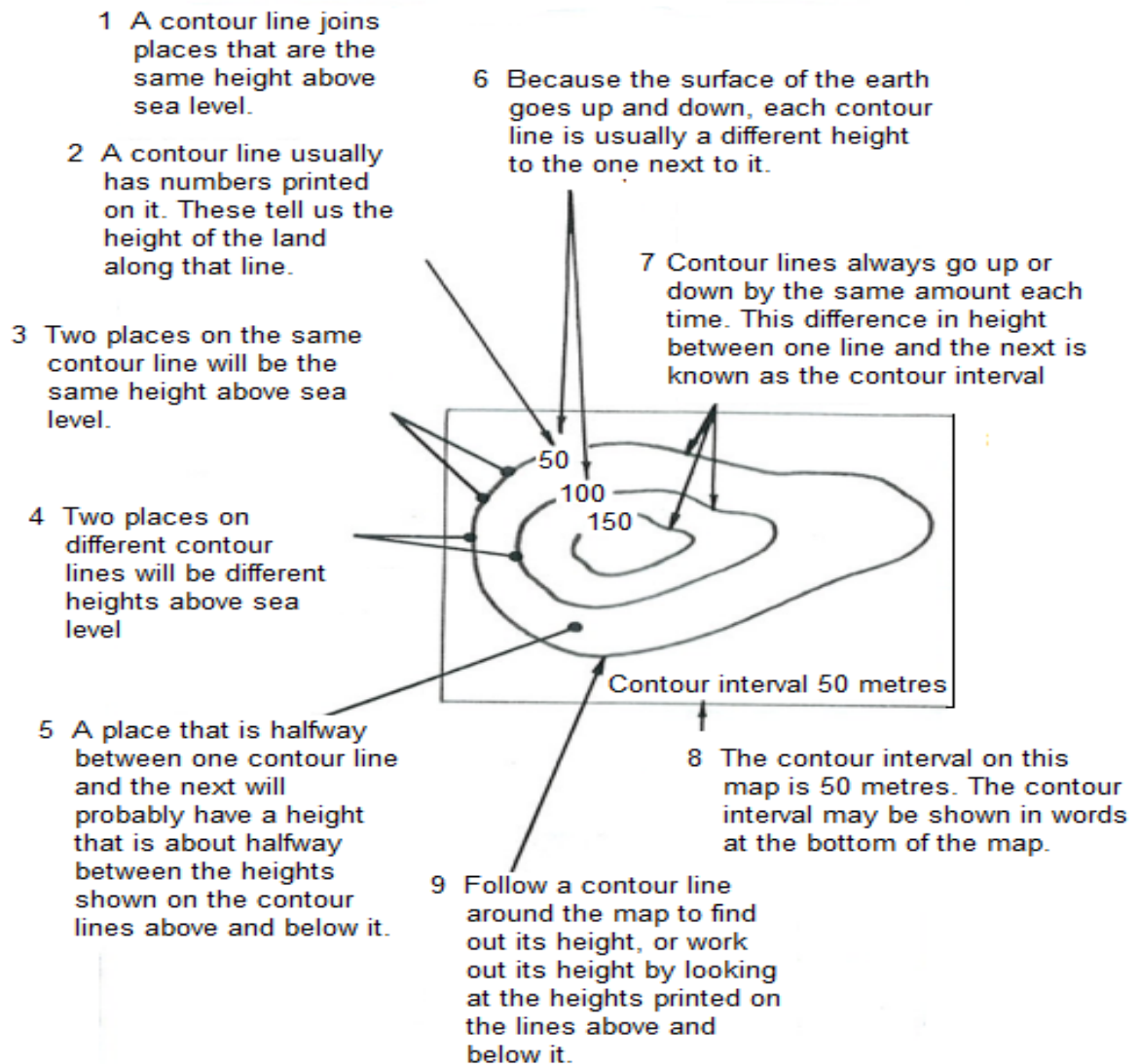
Contour lines can be drawn from any elevation or point. These elevations are chosen to be evenly spaced vertically as you can see diagram 5. This vertical spacing is referred to as the contour interval. The maps above have used a 10 ft. contour interval. Each of the contour lines was a multiple of 10 ft., which is 0, 10, 20, and 30.

REMEMBER:

- **Contour Intervals are not the same. Different maps have different contour intervals.**
- **Elevation means height or altitude**
- **A foot is a unit of length. 1 foot = 12 inch, or 0.3048 metres. For example: 10 feet (ft.) equals to 3 metres**
- **1 foot is further divided into 12 inches.**

Feet is plural for foot; abbreviation (ft.) or symbol (')

There are many important things that you should know about contour lines. They are shown in the illustration below. Read each point carefully.



How to read a contour map

The diagram below shows the contour intervals from 0 to 30 m. Each contour interval from points A to E is explained below.

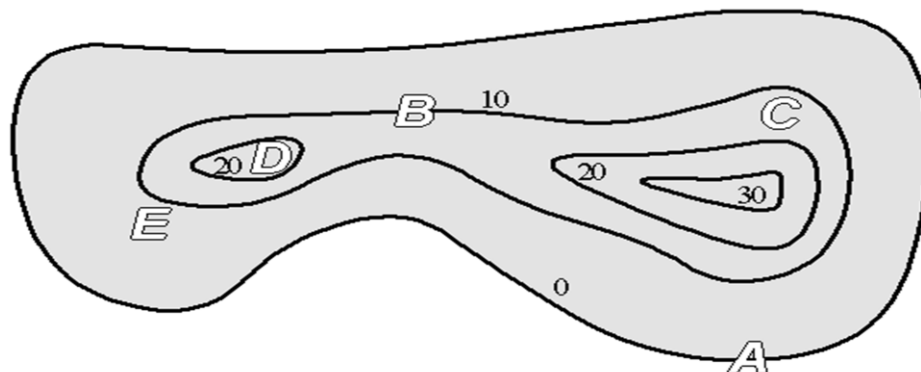


Diagram 6

- Point A = 0 m
Point A sits right on the 0 ft. contour line.
- Point B = 10 m
Point B sits right on the 10 ft. contour line.
- Point C $\approx$ 15 m
Point C does not sit directly on a contour line so we cannot work out the height exactly. We do know that point C is between the 10ft and 20 m contour lines so its height must be greater than 10 m and less than 20 m.
- Point D $\approx$ 25 m
It is harder to guess the height for Point D. Point D is inside the 20 m contour line showing its height is above 20 m. Its height has to be less than 30 m because there is no 30 m contour line shown. There is no way to tell from the map. Therefore we can make a close guess that it is about 25 m.
- Point E $\approx$ 8 m
Just as with point C, we need to estimate the height of point E somewhere below 10 m Point E elevation is between the 0 m and 10 m contour lines.

These symbols mean	(1) = equal to
	(2) $\approx$ almost equal to

Unlike the simple topographic map used in Diagram 6, real topographic maps have many contour lines. It is not likely to label the elevation (height) of each contour line. To make the map easier to read every fifth vertical contour line is an **index contour**. Index contours are shown by bolded lines on the map. These are the contour lines that are easily labelled. The thin lines are the normal contours and the bolded ones are the index contours.

You will notice in Diagram 7 that elevations are only marked on the thick lines.

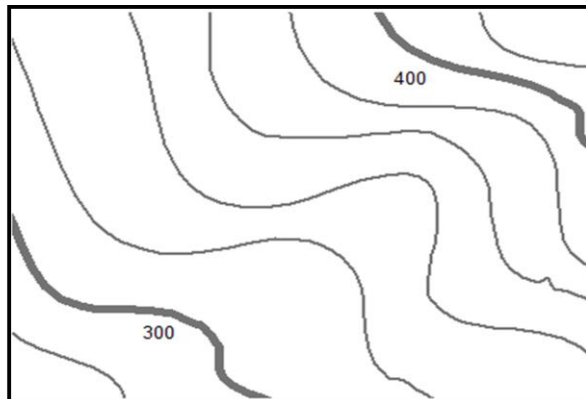


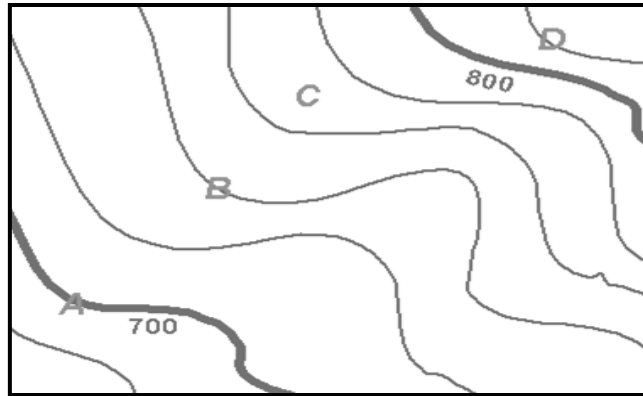
Diagram 7

Now do Activity.



Activity

Study the contour map below and answer questions.



1. What are the lines on the map called? _____
2. What do the thick bold lines represent? _____
3. What do the thin lines represent? _____
4. What does contour interval mean? _____
5. What is/are contour line(s)? _____

6. How many metres are equal to 10 m? _____
7. What is an elevation? _____

8. Calculate the contour intervals for B and C. _____

Check your answers after the summary.

Now read the summary.



Summary

You have come to the end of Lesson 9. In this lesson, you have learnt that:

- a contour line is a line that joins places that are the same height above the sea level.
- contour Interval is vertical spacing or the difference in height between contours.
- contour line consist of two lines:
 - contour line- four thin lines drawn between index contours
 - Index contour line-the fifth line that is in bold.
- contour intervals are not the same. Different maps have different contour intervals.
- the lines between the index contours are called intermediate contours.
- elevation refers to (a new) height or contour.

Answers to Activity

1. Contour lines
2. Index contour lines
3. Intermediate contour lines
4. Contour intervals are vertical spacing between contour lines.
5. Contour lines are lines that join places that are the same elevation (height) above sea level.
6. 3 metres is equal to 10 feet (ft.)
7. Elevation refers to a height of a contour above sea level.
8. **B**=740 metres; **C**=770 metres; **D**=820 metres

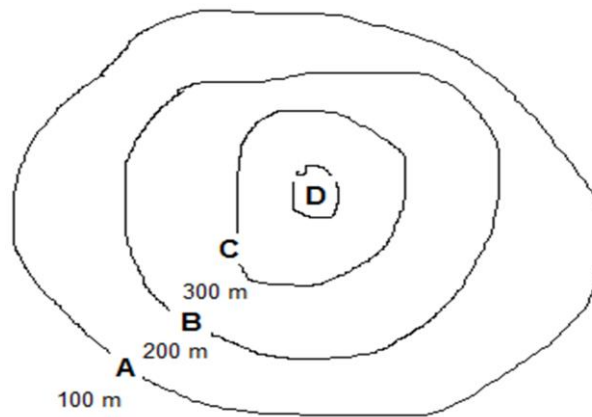
The index contour A is 700 metres, and the other index contour is 800 metres above sea level. Therefore each contour line within is about 20 m higher than the next one. If 20 m is added to each contour the height will be 800 m which is correct and so 20 m is added to make **D**=820 m

NOW DO PRACTICE EXERCISE 9 ON THE NEXT PAGE
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Practice Exercise 9

Study the contour map given below and answer questions.



1. Does the map show an aerial or cross profile view of the contours? _____
2. Differentiate between an aerial and cross profile view? _____

3. Define contour line. _____

4. Differentiate between contour interval and elevation. _____

5. What is the contour interval from point A to C? _____
6. Work out the contour for point D. _____

7. Does the map show an index contour? If no, then explain your answer.

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 3

Lesson 10: Contours and Landforms



In Lesson 9, you learnt about contour lines. In this lesson, you will study contour patterns and landforms. You will study different contour patterns and landforms to work out the slope of the land.



Your Aims:

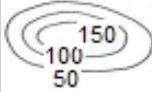
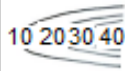
- define contour patterns
- identify the different contour patterns with their corresponding landforms
- use contour lines to tell the steepness and gentleness (flatness) of a slope

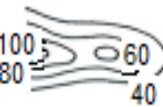
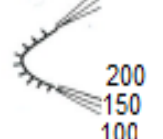
Contour Patterns

Contour patterns are contour lines that show how steep or gentle a landform feature is. The contour patterns are formed depending on the distance between each contour line. Contour lines spaced far apart mean the slope of the land is gentle, not steep. Contour lines spaced close together mean the slope of the land is steep. Other contour patterns show concave and convex landforms. Contour patterns therefore show the type of landform.

The height of the land should be quite easy to work out if contour lines have been used on a map. However, it is not easy to imagine the slope of the land and the landforms in an area unless you understand the patterns made by these lines.

Study the table below it shows more contour patterns and landforms.

Contour Pattern	Explanation of contour pattern	Name of landform	Side view	Explanation of landform	Sketch of landform
	Contours in a circle or oval shape	Round hill		A high round area of land, not as big as a mountain	
	Contours in a U or V shape that point towards high land	Spur		An area of high land that sticks out like a finger from the side of a mountain or hill	
	Contours in a U or V shape that point towards high land	Re-entrant		A dip between two spurs, a small valley	

Contour Pattern	Explanation of contour pattern	Name of landform	Side view	Explanation of landform	Sketch of landform
	Two-circled shape contours with a space between them	Two hilltops and a saddle		Two areas of high land with a shallow dip between them	
	A circled-shaped contour located out on a spur	Knoll		A low knob-like hill located out on a spur	
	Contours on top of or almost on top of each other	Cliff		An almost vertical fall in the land	

Study the patterns and features of slopes that will help work out the gentleness or steepness of slopes.

Table 1

Contour pattern	Type of slope
Lines far apart	Gentle slope
Lines close together	Steep slope
Lines closer together at top, wider apart at bottom	Concave slope (a slope that 'caves in')
Lines close together at bottom, wider apart at top	Convex slope (a slope that 'bulges out')
Lines that are the same distance from top to bottom	Uniform slope (a slope that has the same steepness from start to finish)



There are different types of contour patterns and slopes. Look at the diagrams on the next page.

The picture diagrams below show each contour pattern and type of slope.

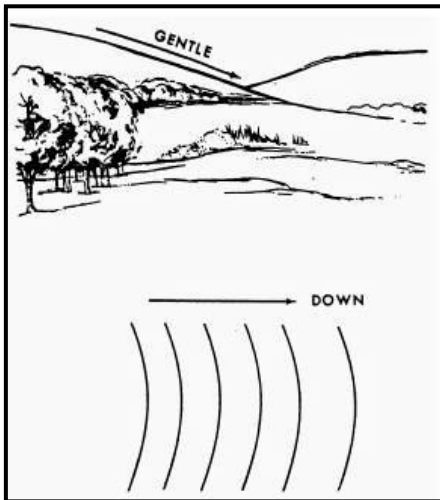


Figure 1 Gentle slope

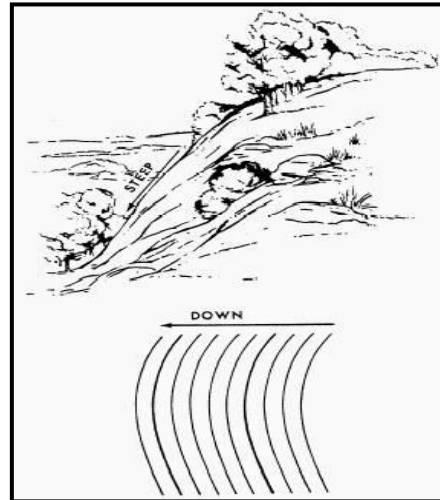


Figure 2 Steep slope

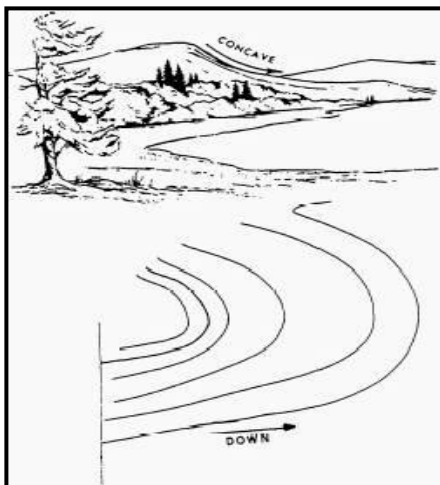


Figure 3 Concave slope

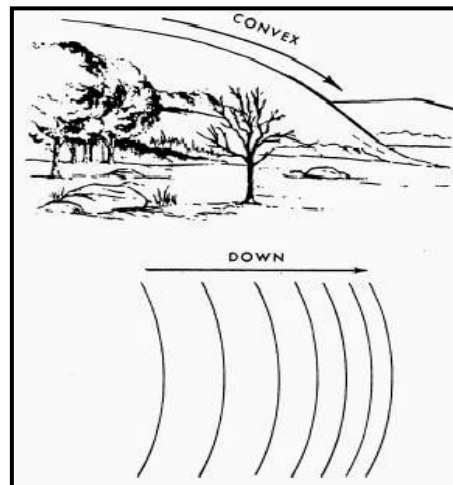


Figure 4 Convex slope

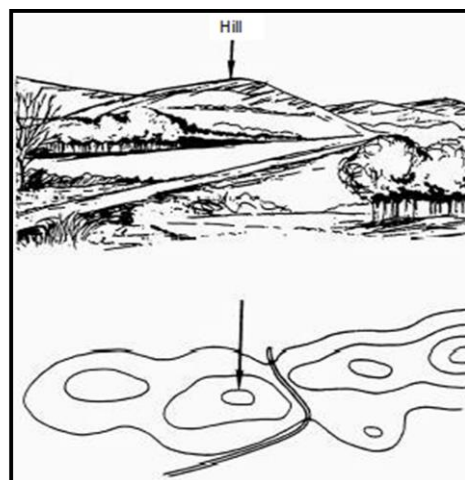


Figure 5 Hill

Now do Activity.



Activity

Use the information given in Table 1 to match the contour patterns shown below on the left with the side view of those patterns on the right. The first one has been done for you.

Contour Pattern	Side view
A 	1
B 	2
C 	3
D 	4

Example:

C = lines far apart, a gentle slope

Complete A, B and D.

A _____

B _____

D _____

Now read the summary.

**Summary**

You have come to the end of Lesson 10. In this lesson, you have learnt that:

- contour patterns show how steep, gentle, concave or convex a slope is on land.
- contour patterns show
 - Steepness: lines close together
 - Gentleness: lines far apart
 - Concave: lines close together at the top but wide apart at the bottom
 - Convex: lines close together at the bottom but wide apart at the top
 - Uniform slope: lines that are the same distance apart from top to bottom
- There are different types of contour patterns and landform.

Answers to Activity

A=gentle slope

B=concave slope

D=convex slope

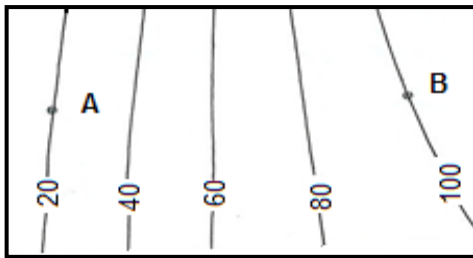
NOW DO PRACTICE EXERCISE 10 ON THE NEXT PAGE



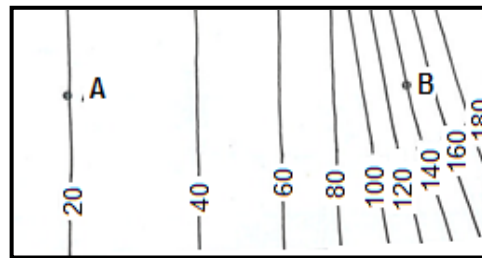
Practice Exercise 10

1. What are contour patterns? Explain in your own words. _____

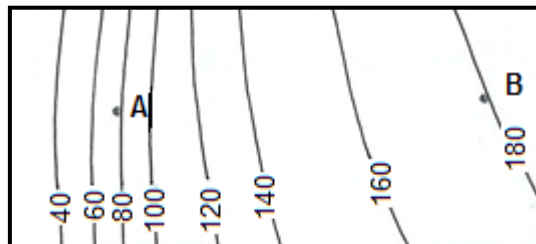
2. What type of slope is formed when the contour lines are
 - (a) far apart from each other? _____
 - (b) close together? _____
 - (c) same distance apart from top to bottom? _____
 - (d) close together at the bottom and wide apart at the top? _____
 - (e) close together at the top and wider at the bottom? _____
3. Write down the type of slope that each contour pattern shows.



Contour pattern 1



Contour pattern 2



Contour pattern 3

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 3

Lesson 11: Reading and Interpreting Timelines



In the last lesson you learnt about contour patterns and how they are used to tell the steepness and gentleness of a slope. In this lesson, you will study how to read and interpret timelines.



Your Aims:

- define timelines
 - identify the main features on a timeline
 - read and interpret information on the timeline
 - calculate and interpret the time intervals
-

Timeline

Timelines are often used in education to help students and researchers with understanding events and trends for a particular subject. They are mostly used to show periods of time between two events. They are particularly useful for studying history, as they convey a sense of change over time. Wars and social movements are often shown as timelines. They are also useful for biographies or writing people's life stories. They can cover an extremely brief period of time or a very long time. Historical study uses timelines by writing the dates and events in order of happening many years ago. Other timelines can show very long spans of time, such as the time involved in the rise and fall of dinosaurs or the length of time people have lived on land.

A timeline is a vertical, horizontal or curved line which displays a list of events in a chronological order. It is usually a graphic design showing a long bar labelled with dates alongside itself and (usually) events labelled on points where they would have happened. The word chronology means that events are placed in the order in which they happened, from the earliest time to the most recent. This is called chronological order. Accurate timelines have a definite scale where a certain length on the timeline represents a given number of hours, days or years.

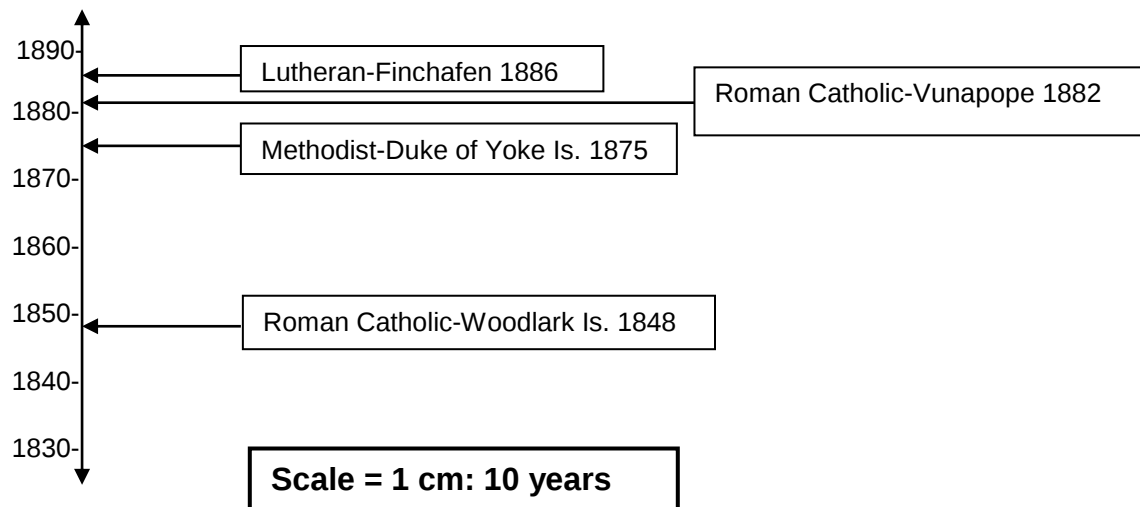
A timeline must be drawn with an accurate scale. The accuracy of the scale lessens the amount of time spent reading it. Not only are there historical timelines but in our daily activities a diary is a timeline!

A timeline of just one day might look like the one on the following page.

My Diary		25 July, 2010
Time	Events	
8.00 a.m.	Woke up	
9.00 a.m.	Ate breakfast	
10.00 a.m.	Cleaned the house	
11.00 a.m.		
12.00 a.m.	Lunch	
1.00 p.m.	Finished cleaning the house	
2.00 p.m.	Went window shopping with Dylan	
3.00 p.m.		
4.00 p.m.		
5.00 p.m.	Cooked dinner	
6.00 p.m.	Ate dinner	
7.00 p.m.	Washed up, ironed clothes	
8.00 p.m.	Watched television	
9.00 p.m.		
10.00 p.m.	Went to bed	
11.00 p.m.		

A timeline that shows a longer period of time is given below. Study carefully the information given on it.

Location of missions in Papua New Guinea



In order to interpret timeline you need to know the basic features. These features include:

- Title
- Scale
- Time interval
- Time or date
- Event

We will interpret the information given in the timeline, 'Location of Missions in Papua New Guinea'.

The title of the timeline is Location of Missions in Papua New Guinea. The title must always be on the top. It tells you what type of information the timeline is going to be about. To correctly interpret the information on the timeline the scale must be interpreted well. For instance, between 1890 and 1880, is a period of ten years; 1850 and 1860, is also a period of another ten years. It is therefore, very important to understand the scale and time interval.

Now, use the same timeline to complete the following activity.



Activity

1. What year was the Roman Catholic mission established in Vunapope? _____
2. Which mission was started in Woodlark in 1848? _____
3. (a) What is the scale of the timeline? _____
(b) How many years does an interval represent? _____
4. What mission was established on Duke of Yoke Island in 1875? _____
5. How many missions altogether are shown on the timeline? _____

Check your answers after the summary.

Now, here are some abbreviations for timelines. Read them carefully.

B.C.	= time Before Christ
A.D.	= Anno Domini (in the Year of the Lord)
Decade	= period of 10 years
Century	= period of 100 years
Millennium	= period of 1000 years

REMEMBER:

The time or dates must be in chronological order starting from the earliest to the most recent date.

Now read the summary.

**Summary**

You have come to the end of Lesson 11. In this lesson, you have learnt that:

- timeline is a vertical, horizontal or curve line which shows dates and events in chronological order.
- the phrase 'Chronological Order' means events are placed in order from the earliest to the recent or in the order the events occurred.
- the main features on a timeline are title, time and date, scale and the event.
- a timeline must always have a scale. The scale is in the form of ratio.
- accurate timelines have definite scales.
- the time or dates on timelines are arranged in chronological order from the earliest to the most recent.
- common abbreviations used are A.D., B.C., or B.P. These abbreviations mean A.D. is Anno Dominini which means in the *Year of the Lord*; B.C stands for Before Christ, and B.P means Before Present. B.C and B.P may refer to the same period of time in history.
- timelines summarises long paragraphs of dates and events.

Answers to Activity

1. 1882
2. Roman Catholic
3. (a) About 1 cm:10 years
(b) 10 years
4. Methodist
5. Five missions' altogether

NOW DO PRACTICE EXERCISE 11 ON THE NEXT PAGE



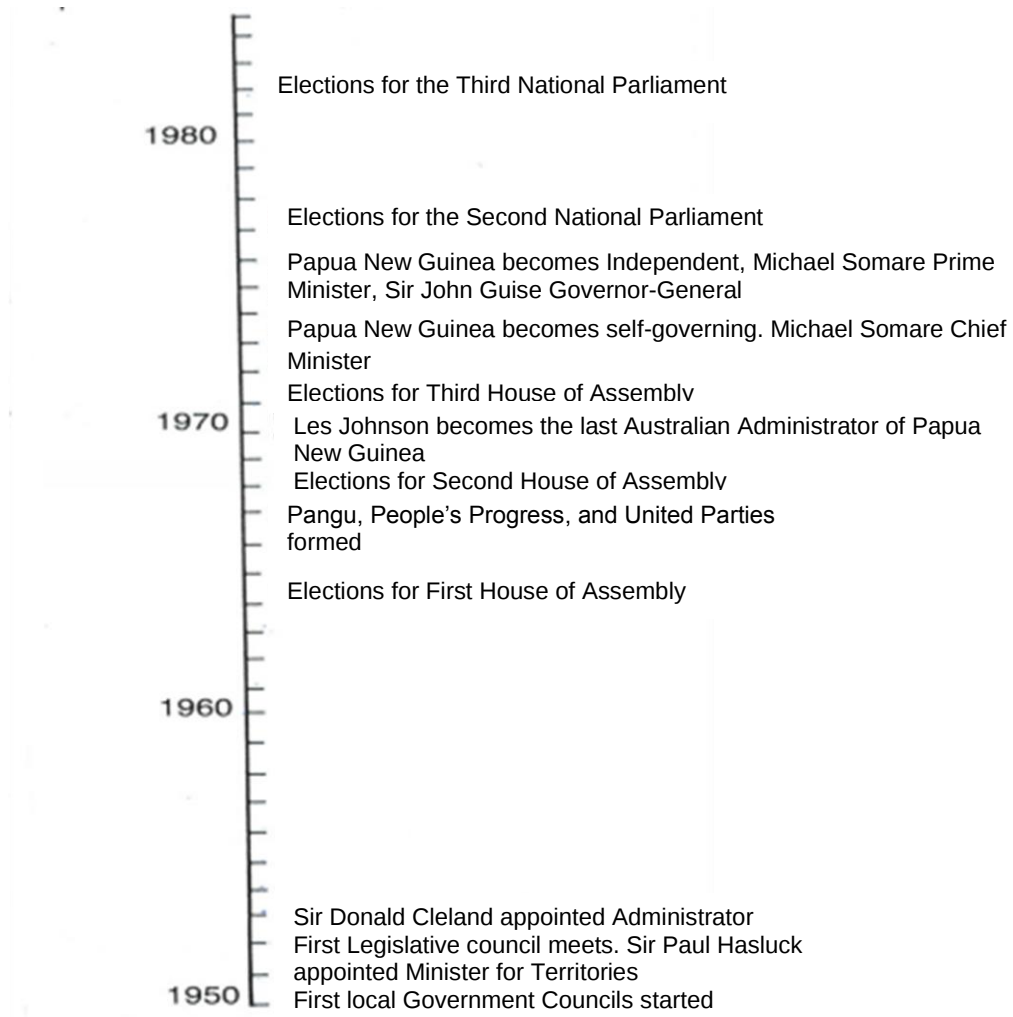
Practice Exercise 11

1. Define timeline.

2. What does the phrase 'chronological order' refer to?

For Questions 3 to 6 refer to the timeline below.

PAPUA NEW GUINEA: POLITICAL DEVELOPMENT



Timeline for Independence

Scale = 5mm: 1 year

3. What is the title? _____
 4. What is the time interval? _____
 5. When was the first election of the First House of Assembly? _____
 6. What event took place in Papua New Guinea in 1982? _____

 7. When did Papua New Guinea become self-governing? _____
 8. Who was appointed as Minister for Territories in 1952? _____
 9. Which three political parties were formed prior to the Elections of the Second House of Assembly?

 10. Which cabinet minister became the first Prime Minister for Papua New Guinea?

-

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 3
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Lesson 12: Drawing Timelines



In the last lesson, you learnt about reading and interpreting timelines. In this lesson you will draw a timeline.



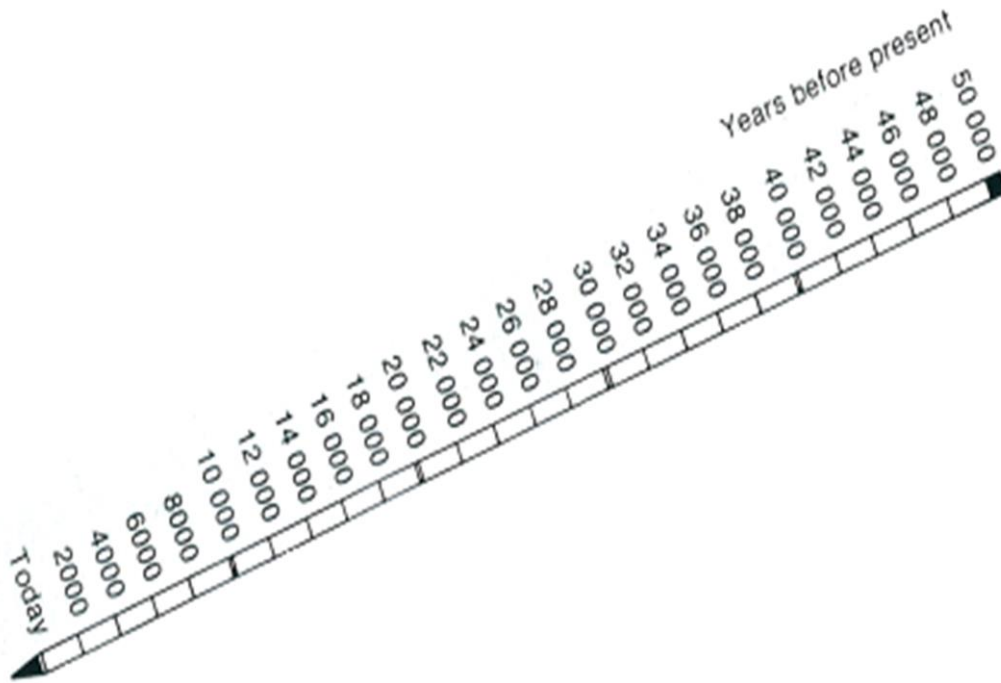
Your Aims:

- identify the steps to draw timelines
- draw a timeline based on given information

Reading and interpreting timelines is a skill. In order to be accurate, you must master the skill of drawing a timeline with an accurate scale.

Before you draw the timeline, you must be sure of the features of the timeline. As you learnt earlier the features of a timeline are the title, list of events, and scale. It is very important that the scale must have an equal or fair time interval.

Have a look at the example below; the time interval is 2000 years. This means between every date for example 50,000 and 48,000 years ago, is a time interval or period of 2,000 years.



You will now use the information given below to draw up a timeline.

Life did not develop on the Earth for a long time; life first appeared in the seas. Scientists think that the simplest of water plants developed about 1500 million years ago. About 500 million years ago many types of jellyfish, sponges and worms lived in the seas of the Earth. The first fish appeared about 400 million years ago, about 350 million years ago life moved on to the land. Man seems to have lived on the Earth for the last two million years. The earliest evidence we have of true Man comes from Olduvai in Ethiopia in Africa. Man is very new on the planet Earth compared to other living organisms.

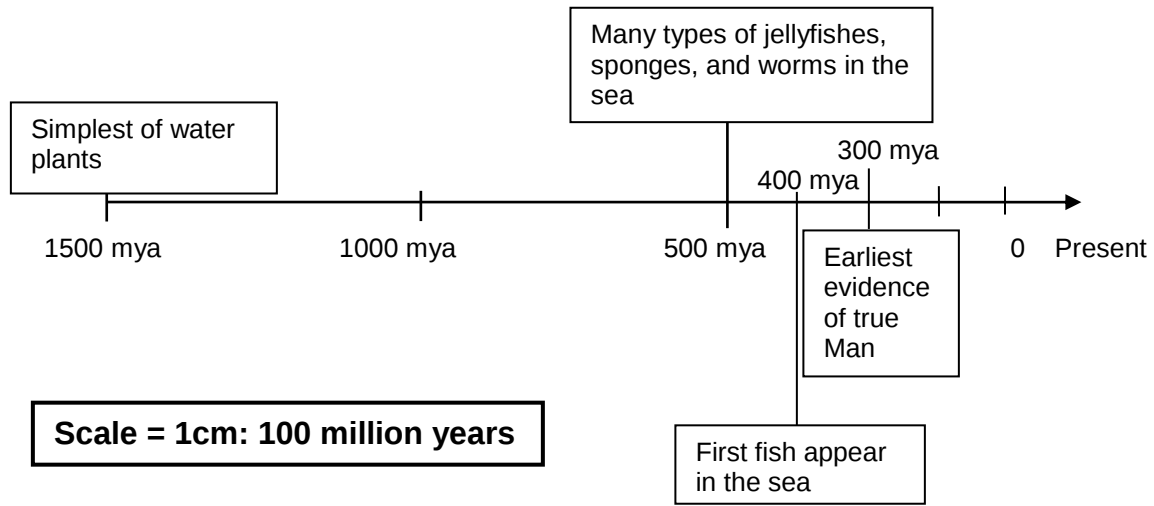
Read the steps below to help you draw a timeline with an accurate scale.

Steps in Drawing up a Timeline

- Step 1: Look at the information (dates and events) move carefully. How will you set your timeline? What type of line would you use? Vertical, horizontal, or curve, what size, space do you have in your exercise book? Do you need a bigger paper? By doing this you will see what the timeline should look like.
- Step 2: List all the dates and events. Briefly put them in chronological order.
- (i) Simplest of water plants (1500 million years)
 - (ii) Many types of sponges, jellyfish and worms in the sea (500 million years)
 - (iii) First fish appeared in the sea. (400 million years)
 - (iv) Life moved to the land (350 million years)
 - (v) Earliest evidence of true man (200 million years)
- Step 3: Begin by drawing your vertical, horizontal or curved line. Decide on a suitable scale with a fair interval. Draw the scale on the line.
- Step 4: Now, follow your order in Step 2 to place the events on the timeline. Put a dot or an arrow to show the exact date, year or time. Have your title on the top.
Development of Life on earth

Now, study the completed timeline given on the following page and compare it to your timeline.

Development of Life on Earth



When you are done go through all the steps once again to see that all the features on the timeline are present.

Now read the summary.



Summary

You have come to the end of Lesson 12. In this lesson, you have learnt that:

- drawing of a timeline is a skill.
- main features on a timeline are title, time and date, scale and the event.
- features of the line will help draw an accurate timeline.
- all dates and events must be in chronological order.
- all timelines must have a definite scale with fair time interval.

NOW DO PRACTICE EXERCISE 12 ON THE NEXT PAGE



Practice Exercise 12

1. Read the article below and answer questions.

Britain, Germany, Australia, and Papua New Guinea

There have been many types of traditional governments in Papua New Guinea for thousands of years. Traditional leaders such as big men and chiefs helped their people in the same way as leaders in the government today. The type of government which we have in Papua New Guinea now was started by Europeans and Australians.

Papua

In 1883 Queensland in Australia tried to take control of Papua. Queensland was frightened that the many Germans in New Guinea would get the German government to take control of Papua New Guinea. At that time Queensland was a colony of Britain and so did not have the power to take control of Papua. Instead, Australia asked Britain to make Papua a British Protectorate. This meant that Britain agreed to help Papua as part of Britain. Papua became a British Protectorate in 1884.

In 1906, Britain gave the newly independent country of Australia the work of governing Papua, which Australia did until 1975.

2. Draw a timeline using the information given.

- Instructions

- (i) Read the information carefully.
- (ii) List your findings (it has been done for you)
 - 1883- Queensland in Australia tried to take control of Papua
 - 1884- Papua became a British Protectorate
 - 1906- Britain gave the newly Independent country of Australia the work of governing Papua, which Australia did until 1975
 - 1975- Papua New Guinea gained political independence.
- (iii) Give a suitable title and put the information on a timeline.
- (iv) Give a scale of 1cm=10 years.

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 3

ANSWERS TO PRACTICE EXERCISES 9-12

Practice Exercise 9

1. Aerial view
2. An aerial view is observing something from above whereas a cross profile view is observing from the side.
3. A contour line is a line that joins places that are the same height above sea level.
4. Contour interval is vertical spacing between one contour and the next. An elevation refers to a height of a contour line.
5. The contour interval from point A to C is 100 metres. From point A to B to C, a 100 is added to make 200 metres in B and 300 metres in C.
6. It is harder to estimate the contour for point D because point D does not sit on a contour line but in the middle of a contour line. Therefore we can guess the contour surrounding point D to be 400 metres but point D to be around 380 metres in height.

Practice Exercise 10

1. Contour patterns are contour lines that show how steep or gentle a landform feature is. The contour patterns are formed depending on the distance between each contour line.
2.
 - a) gentle slope
 - b) Steep slope
 - c) Gentle slope
 - d) Concave slope
 - e) Convex slope
3. Contour 1= small hill
Contour 2= concave slope
Contour 3= convex slope

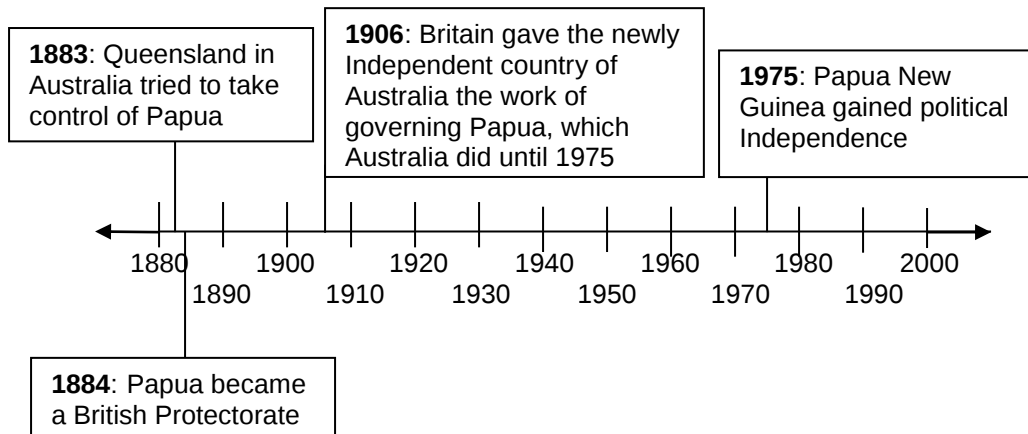
Practice Exercise 11

1. Timeline is a vertical, horizontal or curve line which shows dates and events in chronological order.
2. Chronological order refers to dates and events that are placed in order from the earliest to the most recent.
3. Papua New Guinea: Political development
4. The time interval is 10 years.
5. In 1964
6. Elections for Third National Parliament.

7. Papua New Guinea became self-governing in 1973.
8. Sir Paul Hasluck
9. Pangu, People's Progress and United Party
10. Michael Somare

Practice Exercise 12

Title: Britain, Germany, Australia, and Papua New Guinea



END OF ANSWERS TO PRACTICE EXERCISES 9-12

SUB-STRAND 4: ANALYSING PHOTOGRAPHS, NEWS ARTICLES; READING SIX- FIGURE GRID REFERENCE AND MULTIPLE LINE GRAPHS

In This Sub-Strand, You Will Learn About:

- **Grid Reference (6 Figure)**
- **Reading and Identifying Key Issues in Newspaper Articles**
- **Analysing Photographs**

SUB-STRAND 4: INTRODUCTION

In the first part of this Sub Strand you will study the six-figure grid reference. You have been taught the four-figure grid reference in grade 7. It will be helpful for you to refer back to grade 7 work to revise your notes. In this lesson you will define a six-figure grid reference, read and locate features on a map using the six-figure reference.

In social science students are required to read and gather information from news articles and periodicals other than textbooks. Therefore, you will define what a newspaper article is; discuss its uses, source and key title.

Analysing photographs will be the last topic in this sub-strand. You will explain the purpose of photography in geography; identify the different types, and sections. You will be required to use the different types of observation skills to study photographs and identify the different features natural and cultural.

We hope you enjoy this Sub-strand!

Lesson 13: Grid Reference (6 figure)

In Lesson 12, you learnt how to draw a timeline. In this lesson, you will learn how to read a six-figure grid reference.

**Your Aims:**

- define six-figure grid reference
- locate features using six-figure grid reference
- read and give six-figure references of certain features



I have learnt about the four-figure grid reference in grade 7! But what's a six-figure grid reference?



Let's find out more about the six-figure reference in this lesson!

In the Grade 7 Skills course you learnt about the four-figure grid referencing. In this lesson you will study the six figure reference.

Six-figure Grid Reference

Grid reference includes skills such as lines of longitude and latitude, map reference, and the four and six-figure grid reference. A six figure grid reference is made up of two groups of three numbers. In a six-figure reference the location of a feature is pinpointed. This means the exact location of a feature is given. The four-figure reference only gives a generalised location of a feature on a map.

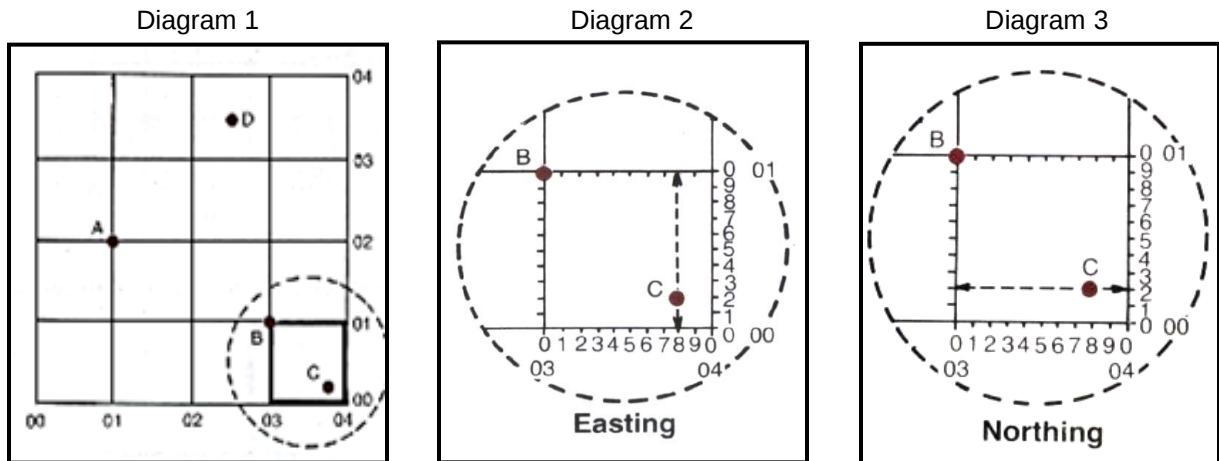
Grid references define locations on maps. The Grid lines on maps define the coordinate system, and are numbered to provide a unique reference to features in topographic maps.

Grid systems vary, but the most common is a square grid with grid lines numbered in order from the origin at the bottom left of the map. The grid numbers on the east-west (horizontal) axis are called Easting, and the grid numbers on the north-south (vertical) axis are called Northings.

Numerical grid references consist of an even number of digits. Easting are given before Northings. Thus in a 6 digit grid reference 123456, the Easting component is 123 and the Northing component is 456.

The following 4 points summarises how a six-figure reference is taken.

- The point C in the grid below is not located exactly on the grid lines as A and B is.
- The *third* number tells how many *tenths* past an easting a feature is. This means the exact location of that particular feature between 03 and 04. Between 03 and 04 are 10 intervals or points, see in diagram 2b below.

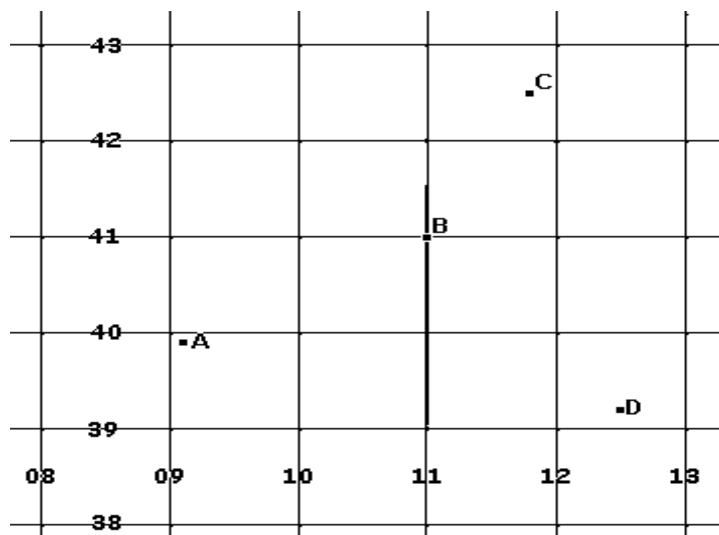


- Therefore to get the exact location for C, you are to count from west to east (from left to right). C now lies eight tenths (8/10) along easting 03, so the easting reference is given as 038.
- To locate a northing for a six-figure grid reference follows the same rule. Imagine 10 intervals or points between northing 00 and 01. You are to count from south to north (from bottom to top). C lies exactly two tenths (2/10) along from northing 00, so the northing reference is given as 002.

Now, complete this activity.

Locating Places

Below is a grid showing examples of a 6 figure grid references. Study it.



Point A is at
091399
Point B is at
110410
Point C is at
118425
Point D is at
125392

Given below are four points on how to locate a feature using the 6 figure referencing.

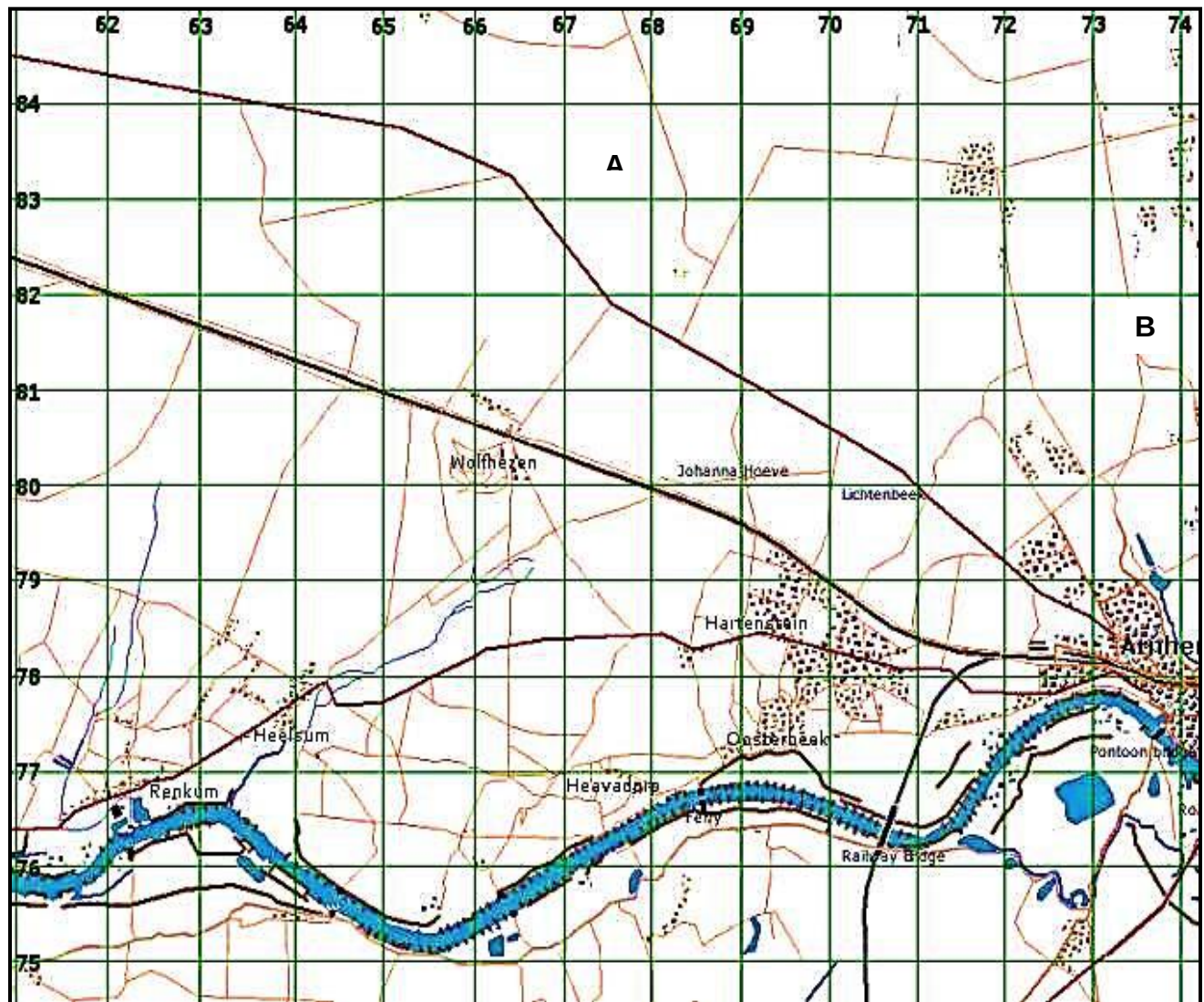
Let us find out how to do that. Point D above will be used as an example.

- 1. Always read the easting first. Easting is the line that runs from top to bottom. The easting for Point D is 12.**
- 2. Easting 12 is not exactly on the line. It is exactly between easting 12 and 13. Between 12 and 13 are intervals of 1 to 9. Point D is 5/10. The easting is 125.**
- 3. Always read the northing second. Northing is the line that runs from left to right. The northing for Point D is 39. However, Point D is not exactly on the line. It is 2/10 between 39 and 40. The northing for Point D is 392.**
- 4. The 6 figure reference for Point D is 125392.**

REMEMBER:

The third and last numbers for a six-figure grid reference is not written on the grid. These numbers or *tenths*, starting from 1 to 9, for both easting and northing must be shown by you on your map, so that you can accurately calculate the location of a feature on the

Now, do Activity.



Key:

 Lakes and rivers
Towns/Villages

 Main Highway



 Road

 Subsidiary river

(i) **Renkum** _____ (ii) **A** _____ (iii) **B** _____

Check your answers after the summary.

Now read the summary.



Summary

You have come to the end of Lesson 13. In this lesson, you have learnt that:

- a grid reference is a type of coordinating system that uses grid lines and numbers to locate features on a topographic map.
- a 6 figure grid reference is written as GR which means Grid Reference.
- the third and sixth figures for a six-figure grid reference represent one-tenth or 1 out of 10 numbers of the distance between two grid numbers.
- easting is vertical lines running from top to bottom. These lines are numbered from left to right. The northing is horizontal lines running from left to right. These lines are numbered from bottom to top.
- always start from the bottom left-hand corner of the map.
- the easting always comes before the northing when doing either a 4 or 6 figure grid references.

Answers to Activity

- (i) Renkum, 621 761
(ii) (ii) **A**, 676 836
(iii) (iii) **B**, 735 816

NOW DO PRACTICE EXERCISE 13 ON THE NEXT PAGE

(a) Give the 6 figure reference for the following features:

(i) Grove Farm _____

(ii) The junction of Templeford Lane and Grove Road _____

(iii) The church building (with a cross on it). Take the reading from the centre of the rectangle representing the church.

(iv) the junction of the town of Little Plumpton and Grove Road _____

5. How many grid squares does Gibbet Wood cover? _____

6. According to the map, how many areas of vegetation or woods can you find on the map? _____

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 3
--

Lesson 14: Identifying Key Issues in Newspaper Articles



In Lesson 13, you learnt about the 6 figure grid reference. In this lesson you will learn how to identify the issues in newspaper articles.



Your Aims:

- define newspaper article
- identify the source of the article
- identify the key title of the article
- identify the key components of the article by asking the key questions using Who? Where? What? When? and Why?
- identify the key global issue (mainly geographical issue) in the article



Let us find out more about newspaper articles. It must be important in social science.

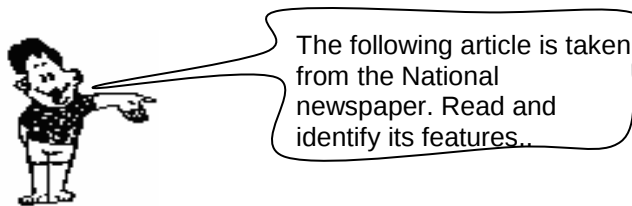
Reading and identifying key issues in the newspaper is an important skill in social science. Before we define what a newspaper article is, let us differentiate between a **newspaper** and an **article**.

A newspaper is a printed account of news. It is a publication containing news and comment on current events, together with features and advertisements that usually appears daily or weekly and is printed on large sheets of paper that are folded together. An article is a “reference piece”, which means that it is a piece of non-fiction writing about a particular subject in a newspaper, magazine, or reference book. It is about an event or situation that has happened, is happening or will be happening, and is written in the newspaper.

A newspaper article refers to an article or story published in the newspaper

A newspaper article is a piece of writing about a particular issue or subject that is regarded as news in the newspaper. For example, the newspaper article on *Search still on for missing 6*, is an article. Any story or writing, be it fiction or non-fiction is an article. An article always has a title. There are some articles that are lengthy and others short. A reading book does not contain articles as it talks about the same topic throughout, whereas reference books and journals that you consult for your research work contain

articles that are arranged alphabetically.



Source

The source of an article refers to where the story or news came or was taken from. Source also means origin. And origin refers to the place, person, or thing through which something has come into being or from which it has been obtained. In this sense of a newspaper article, the source is *The National* of Tuesday, July the 13th 2010. If you get an article from *Post Courier* then the source would be "Post Courier", or if you have cut out an article or story from a magazine, for example, the Air Niugini in-flight Paradise magazine, then the source would be "Paradise Magazine" and the year it was published. So, if you are asked to write the source of an article in a social science research about fish farming in New Ireland Province for example, you can state on your research write-up "Air Niugini Paradise magazine 2010". This means you have taken or cut out an article on *Fish Farming in New Ireland from the Air Niugini Paradise magazine published in 2010*.

Now, read the article below and identify its source.

The National, Tuesday, July 13, 2010

Search still on for missing 6

By ELIZABETH VUVU

Search is still being conducted for six men in Pomio who went missing at sea after their boat capsized in rough seas last Wednesday.

According to reports from the East New Britain disaster office, strong wind warnings was issued by the National Weather Service on the day the incident occurred around the Wide Bay coast in East Pomio.

On board was a police officer accompanying the four workers of a logging company- Golobadana Timber- which operates out of Gonaile in Central Pomio plus the boat operator.

The policeman was the only person who managed to swim to shore at Guma last Thursday after the boat capsized when it ran into high seas measuring 2-3metres.

The disaster office revealed this when it received the official report and organised a search team. The emergency search operation was launched last Thursday led by East Pomio local level government manager, Joe Ringo, using two boats to conduct search along the Guma area.

It is believed the timber company had also organised three additional boats and an air search to be conducted alongside the team from Palmalmal.

The disaster office said they would increase logistics this week to continue the search, adding they hoped the men were still alive somewhere.

The office repeated its call for people travelling to Pomio, Duke of York and Namatanai to heed the weather warnings.

You will use the same article on “Search still on for missing 6” to study other key components.

The purpose of articles in newspapers is to inform people about the daily happenings of the local area and is an excellent resource for people to gain up-to-date information on current political, economic, social and environmental issues in their country and the world.

Always remember that if you source an article from a newspaper, always state the name of the newspaper, the day, and date. This information can be found on the cover page of newspapers and magazines or periodicals.

Key Title

You may know the definitions of the words ‘key’ and ‘title’. But say if these words are put together as one word then the meaning of this word phrase changes. The **key title** of an article refers to the words given in the title of the article. This means, the title of the article itself. Just a glance at the title of the article would have already given you an idea as to what the article will be about.

Thus the key title of the article taken from the National newspaper of Tuesday the 13th of July, 2011 is *Search still on for missing 6*. These words become the key points in the article. The title of the article immediately tells you that there is a ‘*search still going on for 6 people who are currently missing*’.

Key Components: Who? What? Where? When? Why?

When you read an article you read a whole new information about something or someone or a group of people. An article always talks about something or people. In an article, you read about people or a person involved in a happening. You also read about the place that such a happening took place. You read about the time this event took place.

Now, referring to the article, let us ask some key questions using who? Where? What? When? and Why? By asking the key questions using who, what, when, where, and why, you are helping yourself to better understand the vital information reported in the newspaper article.

Discuss and find suitable answers to the following questions.

- (a) Who is involved in the story? Six men
- (b) Where did the incident take place? The incident occurred around the Wide Bay area in East Pomio.
- (c) What happened to the six men? The six men went missing after their boat capsized.
- (d) When did it happen? This incident occurred on Wednesday, the 7th of July, 2010, out in the open sea.

- (e) Why did this incident occur? This incident occurred because their boat capsized due to rough seas.

Now, that you have used the key questions to help identify the key components of the newspaper article, can you identify the key global issue (mainly geographical issue) in the article?

Key Global Issue

The key global or geographical issue in the article is the weather warnings about strong winds and rough seas. There is a need for people to take extra precautions whenever they intend to do something outdoor and far from their homes such as going out fishing during strong winds and rough seas.

Now read the summary.



Summary

You have come to the end of Lesson 14. In this lesson, you have learnt that:

- a newspaper article is a piece of writing about a particular subject in the newspaper.
- the main purpose of a newspaper article is informing people with news regarding their country and world.
- the newspaper articles are excellent sources for people to gain knowledge on current political, economical, social or environmental issues in their country and outside.
- the source of an article refers to the writer of the news article.
- the Key components of the newspaper article is who, where, what and when questions. These questions help a reader to gain more information about an issue in a newspaper article.
- a newspaper article may often have a Key global issue or geographical issue in it.

NOW DO PRACTICE EXERCISE 14 ON THE NEXT PAGE



Practice Exercise 14

Read the news article below and answer questions.

The National, 13th April, 2010

Residents brace for more rainy days

By ELLEN TIAMU

The umbrellas have been out in Lae in the past week with weather forecasters predicting that the wet season in Lae will continue for some time yet.

Assistant Director, forecasting and warning, Jimmy Gomoga, said the southeast trade winds are causing most parts of PNG to experience a dry season but because of the locality of Lae, it will experience rain.

Gomoga said the trade winds collect around the Lae area forcing the onset of rain.

For Lae residents, the umbrellas have had to come out in the past week and when it was not raining, it was overcast for most of the day.

Meanwhile, workmen working on roads in various parts of the city have had to take long breaks as the weather caused havoc for them.

Much of their water literally went down the drain as the clouds opened and the potholes continued to appear.

For drivers, there was no other way to bypass the potholes but to shift to low gear and go straight into them and for the poor commuters, it is bone-jarring.

1. What is the source of the newspaper article? _____
2. What is the Key Title of the article? _____
3. Who is/are the main character(s) in the article? _____
4. Where did the story take place in? _____
5. What is the story about? _____
6. When does the wet season end in Lae? _____
7. Can you identify the Global issue in this article? _____

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 4

Lesson 15: Analysing Photographs



In Lesson 14, you learnt about identifying key issues in news articles. In this lesson you will learn about the different angles photographs are taken from. This is called photography.



Your Aims:

- explain the uses of photography in geography
 - identify the different types of photographs
 - identify the different sections of a photograph – foreground, background and middle ground
 - use different types of observation skills to analyse a photograph by identifying its natural features of landforms, vegetation, climate, land use, and cultural features, i. e. settlement patterns
-

A photograph is a picture produced using a camera. It is an image produced on light-sensitive film or array inside a camera, especially a print or slide made from the processed image, or a reproduction in a newspaper, magazine, or book.

Photographs are one of the most useful tools of learning in geography. Geographers find photographs very useful. A geographer is someone who studies the environment. You have learnt about geography in grade 7 Skills course.

Photographs are useful for these reasons. They

- are a record of how a place looks at a certain time or season
- help a geographer study a place, to which field trips may be difficult
- allow the geographer to compare different areas of the land's surface
- allow the geographer to study changes in an area over a long period of time
- are easier to read than maps when an area is being studied for the first time
- contain information that is not included on a map, and clearly show patterns that transport routes and towns form.

Not only are you familiar with the usual day-to-day picture taking of yourselves, family or friends but think of photography as an important tool in learning. Without picture sketches, drawings and photographs your learning may be quite very different. A photograph used as a teaching aid in the classroom can motivate and improve your learning in just a few minutes. If you cannot understand a teacher's explanation a picture or photograph of the topic should help you.

You refer to a photograph of yourself or somebody else's as a 'photo'. Sometimes you see photographs of people, places and things in books, magazines and journals.

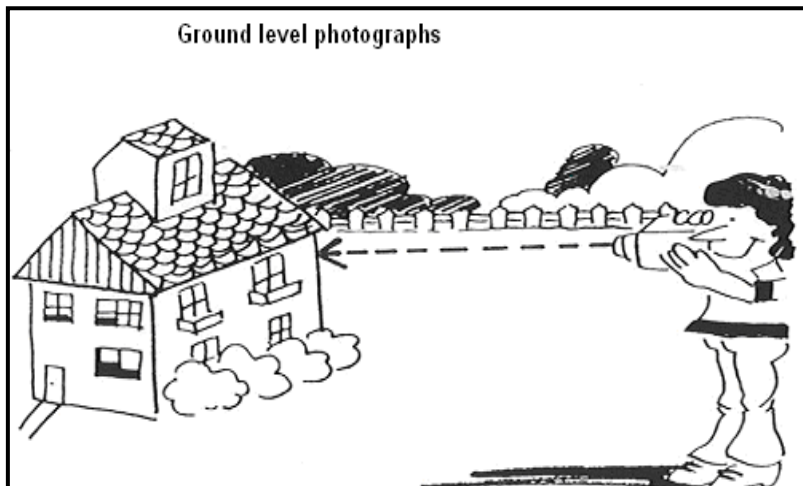
Photographs are of different types. Photographs are taken at different angles thus making them look different. There are different types of photographs.

Here are examples of photographs shown at different angles. Study each one of them.

(i) Ground level photographs

These are taken from the ground, looking across the area being photographed. Many of your own and family photographs are ground level photographs. However, there may be some photographs taken from aeroplanes and tall buildings. The angle at which these photographs were taken make them either an oblique or vertical air photographs which you will look at next.

Figure 1



(ii) Oblique air photographs

These are usually taken from an aeroplane, looking down at an angle on the area being photographed.



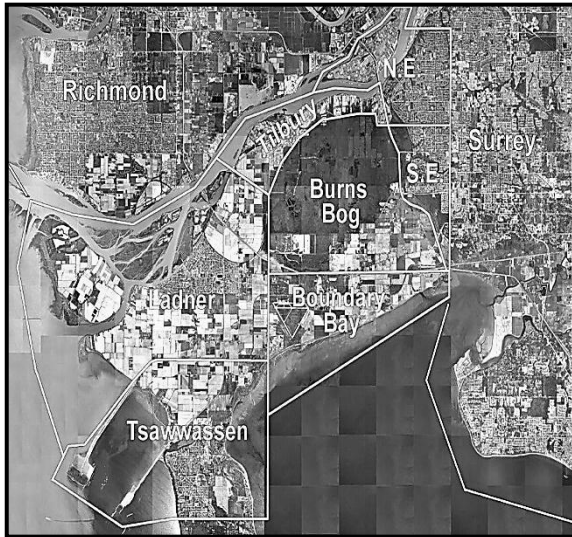
A harbour



A bay

(iii) Vertical air photographs

These are taken from an aeroplane, looking straight down at the area being photographed.



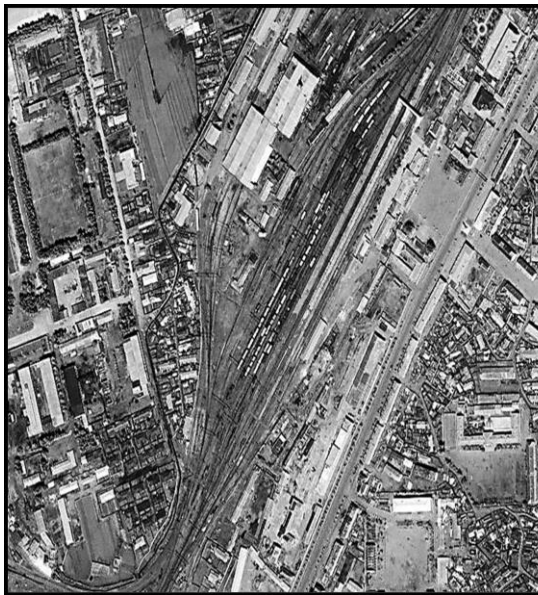
A suburb in Sydney, Australia



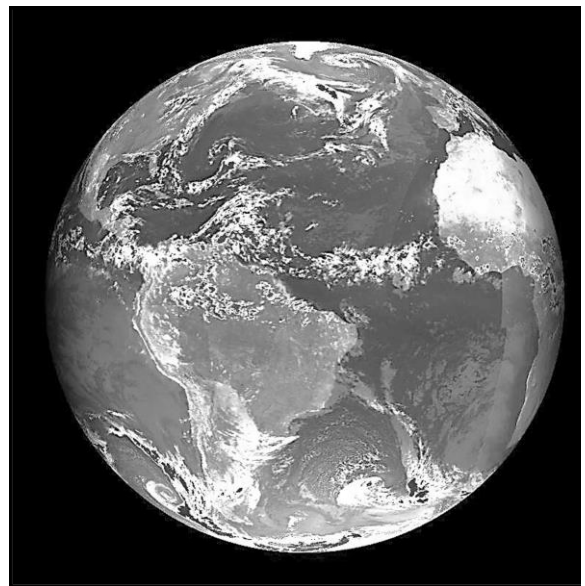
Sketch of a rural suburb, Australia

(iv) Satellite imagery

These are taken from a satellite stationed in Space.



An aerial view



A view of the earth from space

The following sketch shows that a photograph can be taken at different angles. Study it carefully and take note of the differences.

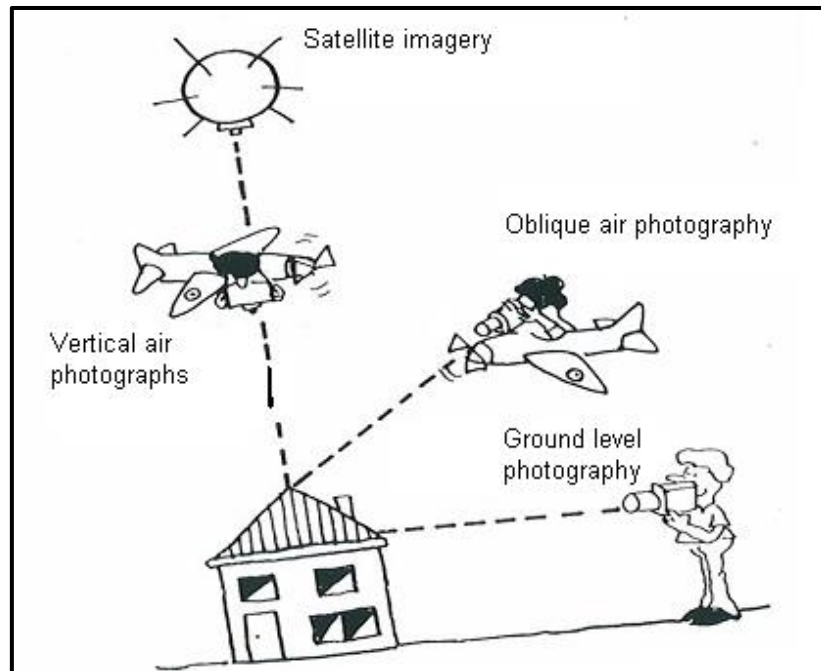
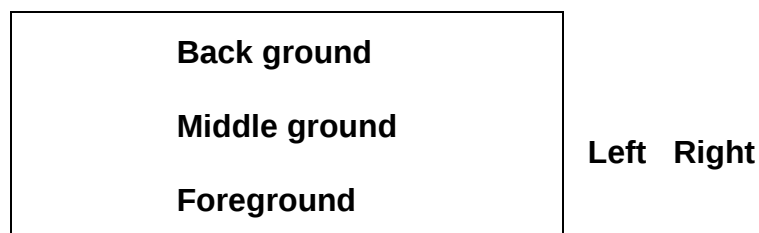


Illustration 8.4.15h: Photograph taken at different angles

The sketch above shows the different angles a photograph is taken from.

Let us now identify the different parts of a photograph.

A photograph has three different sections. These sections are the Foreground, Middle ground and the Background. See in the diagram below.



The foreground is the part of a picture or scene that appears nearest to the viewer. The foreground of the sketch map below is the part you can see clearly such as the *padi fields*, *raised footpath*, *fruit tree*, *bunds*, and the *padi fields ploughed for planting*. The features that appear in the middle are the *padi fields*, on the left, and the *coconut trees*.

The features that appear furthest in the photograph are sometimes not very visible, depending on the quality of the photograph. In the example below the background feature is the *hills, which have been cleared for timber*.

The areas or sections of the photograph are further illustrated by this sketch based on a photograph of Goa, India. Study it carefully.

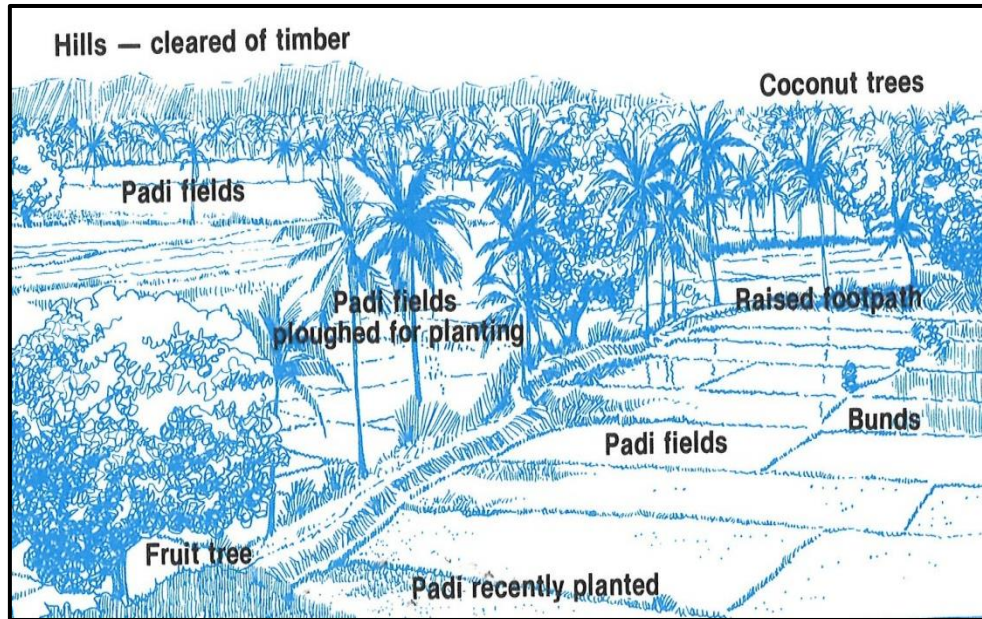


Illustration 8.4.15i: Sketch of a part of Goa, India

To get the most out of photographs in geography, we must be able to observe, record and then interpret what we see.

Observing a photograph means looking at a photograph. You want to see what it shows and where it may have been taken. A very important part of observing a photograph is the ability to recognise features from different angles and distances.

Recording means that we should be able to write down or draw what we see in the photograph. We may need to remember many of these details or explain what we saw later on.

Interpreting means

- (a) thinking about the things that you are observing and recording
- (b) sorting these features in our mind
- (c) asking questions about what has been seen and recorded
- (d) suggesting answers to some of these questions

We observe a photo to answer a geographer's questions of

- What is there?
- Where is it?

We interpret a photo to consider

- Why is it there?
- What are the consequences of it being there?

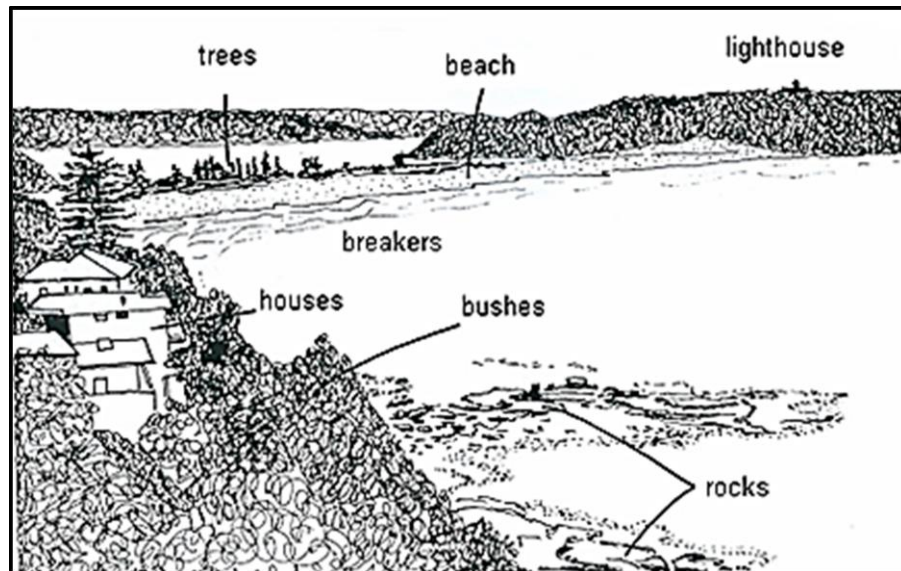
You will now discuss how the skills of observing, recording and interpreting help us to understand photographs more clearly.

You will interpret a ground level photograph of 'Palm Beach' in New South Wales, Australia.

Study the photograph and sketch of 'Palm Beach' given below and answer questions.



A ground level photograph of Palm Beach, New South Wales



A sketch of Palm Beach, New South Wales

Now do Activity.



Activity

1. Observing Photograph

- What does the photograph show?
- Does it look interesting?
- What things stand out most?
- What is happening?
- What features are in the foreground of the photograph?
- What do these features tell about the place or happenings?
- What features are in the background of the photograph?
- What do these features tell about the place or happenings?

Having looked carefully at the photograph and answered the questions about your observations, it is now time to record what you have found out. There are a number of ways in which you can record your observations and *describe* what is seen.

2. Recording

You can make a line drawing or a sketch of the photograph. Recording information in this way is very useful because:

- The information in the photograph can be seen at a glance
- drawing details on a sketch and labelling features will help you think about the information as you are recording

The sketch of Palm Beach on page 131, gives an *immediate idea* of many of the features you observed in the photograph. Another way of recording is to write down what you see in words. This is often difficult to do but a simple checklist of useful headings and words will make this task easier. You can divide what you see into two groups

- *Natural environment*
In this sub-heading you will look at landforms, climate, soil, animals and vegetation
- *Human or man-made environment*
In this sub-heading you will look at land use, settlement, transport, relief, drainage and population.

3. Interpreting

So far you have *observed, recorded and described* what you have seen in the photographs. The next step is to *think* about the information the photograph has provided and interpret what you have observed. To make this task easier there are a number of steps that you could follow. Think about how these natural and man-made features *relate* or *are linked* to each other.

- Do some natural features affect other natural features?

- Do some man-made features affect other man-made features?
- Do any man-made features affect the natural features?
- Do any natural features affect the man-made features?

Steps in Photograph interpretation	Examples from the ground level photograph of Palm Beach
List the natural and man-made features	Natural features are hills, bushes, trees, rocks, ocean, surf
<i>How do features relate to each other?</i>	
Natural- Natural	The sand on the beach has been washed up by the ocean waves
Man-made to Man-made	The ships in the area will be guided by the lighthouse
Man-made to Natural	The building of houses meant that some of the bushes have been cleared
What type of place is it?	The beach has attracted many people and there are now many buildings nearby
Who lives there?	The long broad beach would suggest that this is a popular place for holidays and weekend recreation.
What is happening?	The area looks an ideal place for people who want to escape the bustle of city life.
Suggest reasons for features or events	Perhaps the only thing at the moment is the waves breaking against the rocks and washing up onto the beach.
Suggest some end results of features or events	The high headland is an ideal spot for a lighthouse. The excellent views must have encouraged people to build houses on the hillside.
Suggest changes that have occurred or may occur	The building of houses led to natural vegetation. We might expect the area to be very crowded in summer. There will be greater demand for building blocks More tourist facilities, for example, shops, showers and toilets This may lead to more rules to protect the natural beauty of the area.

Check your answers after the summary.

Now read the summary.

**Summary**

You have come to the end of Lesson 15. In this lesson, you have learnt that:

- there are four different types of photographs: ground level, oblique air, vertical air, and satellite imagery.
- photographs are a very useful tool in learning.
- geographers find photographs to be very useful.
- geographers are social scientists who study the earth and its surface.
- photographs have three sections or parts: the foreground, middle ground and the background.
- there are three ways to analyse photographs: observe, record and interpret.
- there are two ways to record an observation: writing it down or drawing it as a sketch.
- interpreting photographs means searching through the information, sorting it out, asking questions and suggesting some answers.

Answers to Activity

1. A photograph and sketch of Palm Beach
2. It looks interesting and is a beautiful view
3. The man-made buildings or houses overlooking the sea
4. The vegetation of bushes and trees and a few houses or buildings
5. This particular place has enough rain to maintain the growth of vegetation and is inhabited by a few people
6. The lighthouse, beach and trees
7. The beach draws a lot of people during summer (hot season), and the lighthouse warns ships and small boats about dangerous rocks and reefs in near the shore.
- 8.

Natural Environment	Man-made Environment
Land forms	Hills and small coastal ridges
Climate	Temperate
Soil	Sand and clay
Animals	Domesticated such as dogs, cats
vegetation	Small trees, grass

NOW DO PRACTICE EXERCISE 15 ON THE NEXT PAGE



Practice Exercise 15

Study the photograph below to answer Questions 1 to 3.



1. What are the natural features of landform shown in the photograph?

2. Describe the type of vegetation.

3. By looking at the vegetation, can you identify the type of climate Palm Beach experiences?

4. (a) What are the three ways to analyse a photograph?

(i) _____

(ii) _____

(iii) _____

(b) Explain each one.

5.

(a) What are the different types of photographs?

(i) _____

(ii) _____

(iii) _____

(iv) _____

(b) How do the photographs vary from each other?

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 4
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Lesson 16: Reading Multiple Line Graphs



In the last lesson, you learnt and analysed the different types of photographs. In this lesson you will learn about Multiple Line graphs, its uses, and features; and how to interpret a multiple line graph using a set of information.



Your Aims:

- define multiple line graphs
- discuss the uses of multiple line graphs
- identify features on a multiple line graph
- read and interpret information on a line graph

A multiple line graph is a graph with more than one line drawn on it. Line graphs display two or more sets of data at once for easy comparison. A multiple line graph is sometimes called a group line graph. These types of graphs are mainly used to compare the rise and fall or change in one thing with changes in other things.

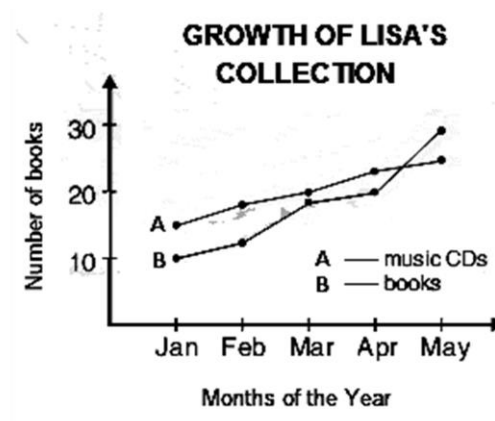
Line graphs are often used to plot changes in data over time, such as monthly temperature changes.

They can also be used to plot data recorded from scientific experiments, such as how a chemical reacts to changing temperature or atmospheric pressure.

Similar to most other graphs, line graphs have a vertical axis and a horizontal axis. If you are plotting changes in data over time, time is plotted along the horizontal or x-axis and your other data, such as rainfall amounts is plotted as individual points along the vertical or y-axis.

When the individual data points are connected by lines, they clearly show changes in your data such as how a chemical changes with changing atmospheric pressure. You can then use these changes to predict future results.

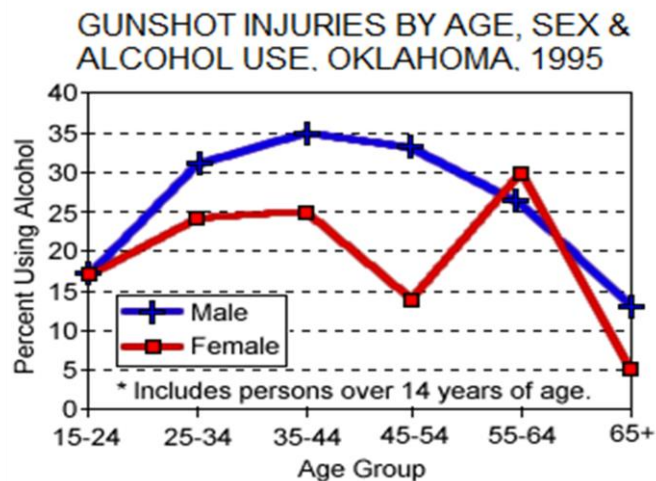
Here is an example of a multiple line graph. It shows Lisa's collection of music CDs and books from the months of January to May.



If there is the need to make a comparison or a contrast of more than one trend over the same period of time, then a multiple line graph is used.

The x axis identifies the age group (time) and the y axis identifies a quantity, in this case the percentage using alcohol.

Alcohol use between males and females is compared and differentiated at various age groups in the graph below.



Source: www.multiplelinegraphs.com/

Line graphs generally show,

- rises and falls over a period of time
- differences between a place and another over a period of time
- changes from one period of time to the next.

Multiple line graphs show,

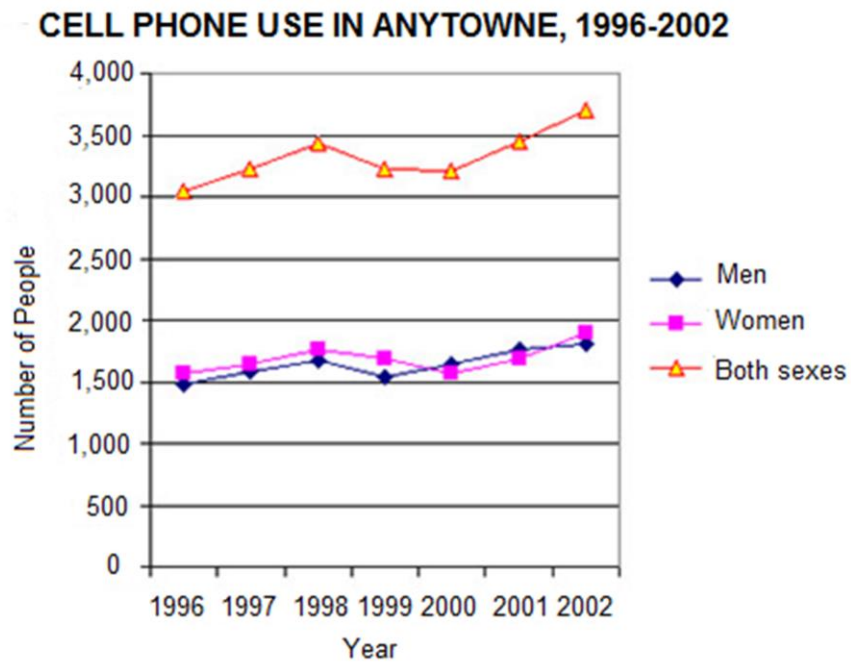
- specific values of data
- reveal trends in different groups of a variable
- compare trends in different groups of a variable

Now, study the features of line graph. Single line graphs were studied in the Social Science Grade 7 Project 3.

Multiple line graphs can sometime be referred as compound line graphs.

Multiple line graphs have the following features:

- the top line on the graph shows a total
- each line underneath this shows one of the parts that go to make up this total
- each of these lines has been placed one on top of the other to get the total
- the size of each part is shown by the gap between each line



A multiple line graph can effectively compare similar items over the same period of time.

Figure 5 is an example of a very good graph. The message is clearly stated in the title, and each of the line graphs is properly labeled. It is easy to see from this graph that the total cell phone use has been rising steadily since 1996, except for a two-year period (1999 and 2000) where the numbers dropped slightly. The pattern of use for women and men seemed to be about the same small differences between them.

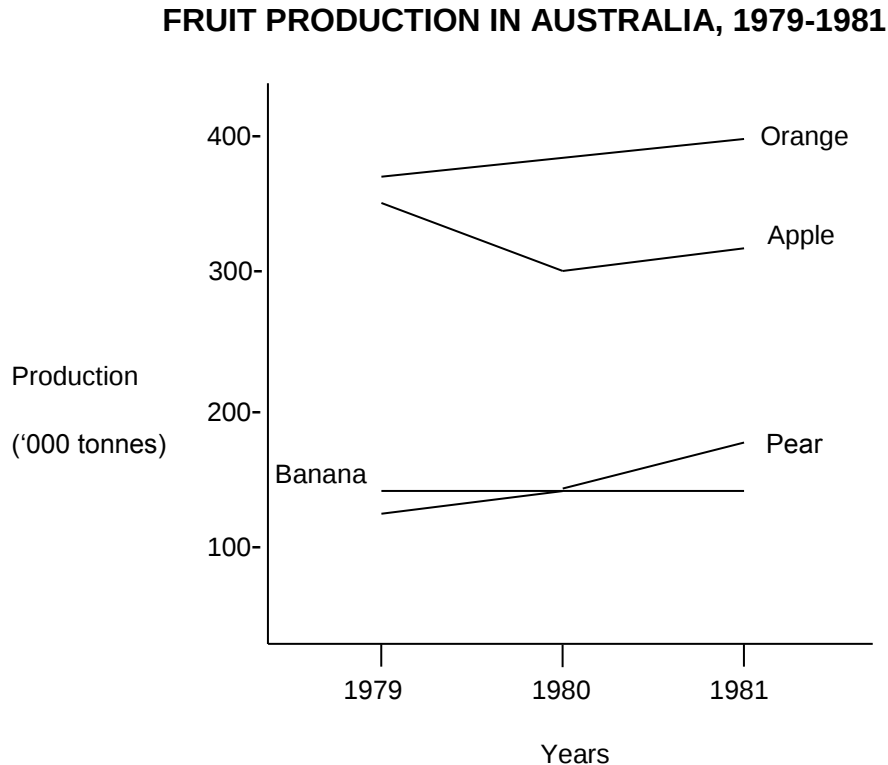
Example: Interpreting

Below is a table of information showing the different fruit production in Australia from 1979 to 1981. This information is plotted on the graph below and then is interpreted. There are three steps to a completed line graph.

Step 1: The information is recorded on a table.

Fruit production in Australia ('000 tonnes)			
Fruit	1979	1980	1981
Orange	370	380	390
Apple	340	300	320
Pear	110	120	150
Banana	120	120	120

Step 2: The information is taken from the table above and is plotted on the graph below.



Step 3: The graph has been interpreted and the information is given.

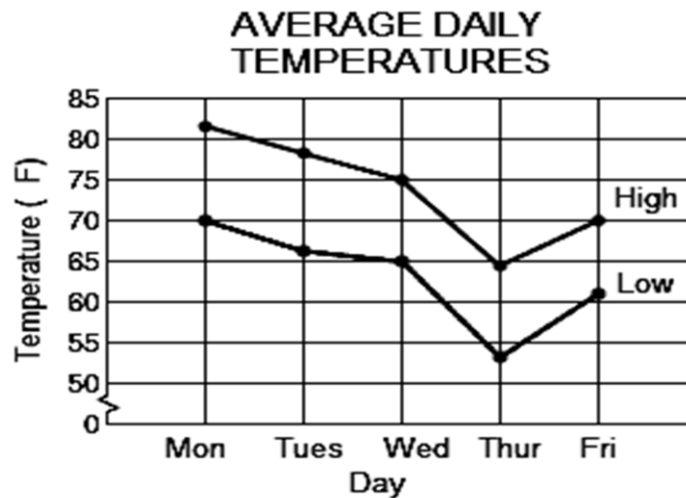
- Orange had the highest level of production in all three years.
- Orange production has slowly increased each year.
- In all three years apples had the second highest level of production.
- The level of apple production was quite close to that of oranges in 1979, but it fell in 1980. In 1981 it had risen again, but had not reached its 1979 level of production.
- The greatest difference between orange and apple production was in 1980.
- Both orange and apple production have always been much higher than pear and banana production.
- In 1979 pear production was slightly below that of banana production.
- In 1980 pear and banana production were at the same level.
- In 1981 pear production was greater than banana production.
- Pear production has gradually increased over the three years.
- The greatest increase in pear production was between 1980 and 1981.
- Banana production has remained at the same level each year.

Now do Activity.



Activity

Study the graph below and answer questions. The graph shows the average daily temperatures of a small town in Eastern Australia. The temperatures are given in degrees Fahrenheit (F).



1. What information is shown on the vertical axis? _____
2. What unit of measurement is used on the vertical and horizontal axis? _____
3. By comparing both line graphs, which day of the week had the highest temperature? What was the temperature?

4. Which day of the week had the lowest temperature? What was the temperature?

5. When was there a drop in temperature for both graphs?

6. Why do you think the temperatures dropped on that particular day?

7. What is the temperature range for both line graphs?

Check your answers after the summary.

Now read the summary.



Summary

You have come to the end of Lesson 16. In this lesson, you have learnt that:

- a multiple line graph can also be referred a compound graph. It is a graph with more than one line drawn on.
- a multiple line graph that mainly used to compare the rise, fall or changes in other things.
- a multiple line graph has the following features:
 - the top line on the graph shows a total
 - each line underneath this shows one of the parts that go to make up this total
 - the size of each part is shown by the gap between each line.
- Your ability to read information in a simple line graph can help you read and interpret a multiple line graph easily.

Answers to Activity

1. The information on temperature.
2. The unit of measurement used on the vertical axis is the temperature in Fahrenheit; and the horizontal axis is the days of the week that is Monday through to Friday.
3. Monday.

On the top line graph the temperature is about 82°F; and the bottom graph is 70°F.

4. By looking at which line is lying higher than the other. In the graphs above, already the line that has high temperatures is written 'high' and the other with low temperatures is the one with the 'low' written beside it.
5. Thursday.

The line graph with the high temperatures was 65°F; and the other line had a temperature of about 53°F.

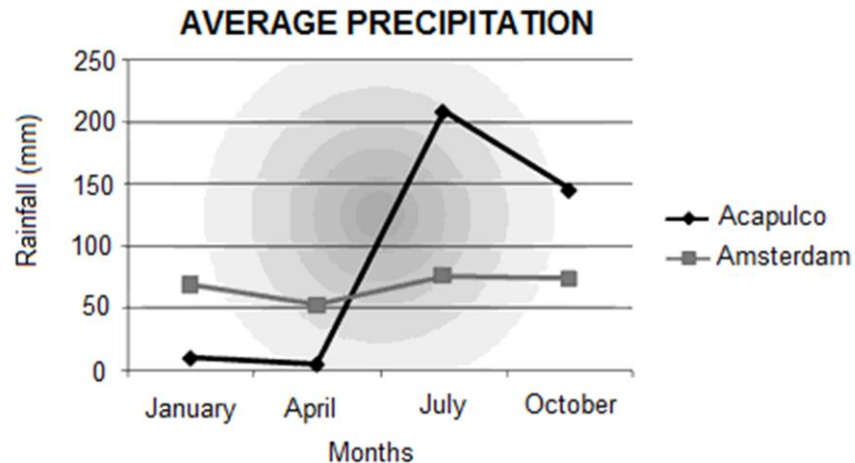
6. Thursday
7. It could have been raining; or that there was a storm causing the temperatures to drop.
8. The temperature range for the 'high' line is 17°F (between 82°-65° C); and the 'low' line had the temperature range of 17°F (between 70°-53° C).

NOW DO PRACTICE EXERCISE 16 ON THE NEXT PAGE



Practice Exercise 16

Study the graph below and answer questions.



1. What is the title or heading for the graph? _____
2. What type of a line graph is this? _____
3. What is the unit of measurement for the vertical and horizontal axis?

4. How many places did the multiple rainfall graphs represent?

5. How can you differentiate the lines representing the two places?

6. How many months of precipitation are shown on the graph?

7. What is the highest and lowest rainfall for Acapulco?

8. What is the highest and lowest rainfall for Amsterdam? _____

9. What does the word 'precipitation' mean?

10. What do line graphs generally show?

11. What do multiple line graphs show?

12. How else can 'multiple lines' graph be called?

CHECK YOUR ANSWERS AT THE END OF SUB-STRAND 4
--

ANSWERS TO PRACTICE EXERCISES 13-16

Practice Exercise 13

1. A grid reference is a type of coordinating system that uses grid lines and numbers to locate features on a topographic map 2. The 6 figure reference uses 3 numbers called easting on the horizontal axis, and 3 numbers called northings on the vertical axis to identify and locate certain features on a map.
2. A four-figure reference gives a generalised location of a feature. It has two numbers called easting on the horizontal axis, and two numbers called northings on the vertical axis to identify and locate a certain feature on a map. It has a four number coordination. A six-figure reference gives an exact location of a feature on a map. It has a six number coordination.
3. A 6 figure reference is more widely used because it gives a precise or exact location of a feature. The 4 figure reference gives the whole grid square a certain feature is located in.
4.
 - (i) 708998
 - (ii) 699994
 - (iii) 696017
 - (iv) 694018
5. six squares altogether
6. two areas showing vegetation or woods

Practice Exercise 14

1. The National newspaper of 13th April, 2010
2. "Residents brace for more rainy days"
3. The Lae residents, including the workmen, and commuters to and from work.
4. Lae town
5. The article is about when the rains will stop.
6. According to the weather forecasters it was predicted the rains will continue for some time yet.
7. The global issue relating to the article would be the continuous rain in Lae. Rain occurs everywhere on the planet and is affected by the geography of a place and elements of nature such as wind, humidity; and, the air's heating and cooling.

Answers to Practice Exercise 15

1. Natural features are hills, bushes, trees, rocks, ocean, surf Hills and small mountains surrounding the Palm Beach Bay; the beach itself is on flat, low-lying land
2. The vegetation is temperate grassland and small trees on the hills surrounding the bay
3. Palm Beach, New South Wales, is in a temperate region, therefore it has a temperate climate of four seasons: summer, autumn, winter and spring.
4.
 - (a)
 - (i) observe
 - (ii) record
 - (iii) interpret
 - (b) Observing a photograph means looking at it. Recording means to write down or draw what is seen in a photograph. Interpreting means thinking about the things you have observed and recorded. You sort these features out in your mind. You ask questions about what has been seen and recorded, and suggest answers to some of the questions.
5.
 - (a)
 - (i) ground level
 - (ii) oblique air
 - (iii) vertical air
 - (iv) satellite imagery
 - (b) Ground level photographs are taken from the ground, looking across the area being photographed. Oblique air photographs are usually taken from an aeroplane, looking down at an angle on the area being photographed. Vertical air photographs are taken from an aeroplane, looking straight down at the area being photographed. Satellite imagery photographs are taken from satellites stationed in Space or are orbiting the earth.

Practice Exercise 16

1. Average Precipitation
2. It is a multiple line graph.
3. The unit of measurement for the vertical axis is millimetres (mm); and the horizontal axis is the months of the year.
4. Two
5. You can study the key given at the bottom right-hand corner of the graph. It shows how each line represents a place by the different individual lines.
6. Four months
7. Acapulco: the highest rainfall is about 210 mm; the lowest 5 mm.

8. Amsterdam: the highest rainfall is about 75mm; the lowest 50 mm.
9. Precipitation means any form of water or moist that falls to the ground.
10. Line graph generally show:
- (a) Rises and falls over a period of time
 - (b) Differences between a place and another over a period of time.
 - (c) Changes from one period of time to the next
11. Multiple line graphs show:
- (a) specific values of data
 - (b) reveal trends in different groups of a variable
 - (c) compare trends in different groups of a variable
12. Multiple line graphs can also be called Compound line graphs.

END OF STRAND 4 SKILLS

Glossary

Archipelago	sea or stretch of water having many islands.
Census	an official count or survey, especially of a population.
Chronology	the arrangement of events or dates in the order of their occurrence
Component	a part or element of a larger whole
Compound graph	a line graph with more than one line showing different values
Constrict	to make (something) narrower, smaller, or tighter
Continent	any of the world's main areas of land (Europe, Asia, Africa, North and South America, Australia, Antarctica).
Contour	the outline or outer edge of something
Density	the average number of individuals or units per space unit
Dependency	an area that is controlled by a country but that is not formally a part of it
Depict	to describe (someone or something) using words, a story
Distribute	to give or deliver (something) to people
Elevation	the height of a place
Eliminate	to remove (something that is not wanted or needed) : to get rid of (something)
Endanger	to cause (someone or something) to be in a dangerous place or situation
Evaluate	to judge the value or condition of (someone or something) in a careful and thoughtful way
Expansive	covering or including many things; very broad or wide
Geography	an area of study that deals with the location of countries, cities, rivers, mountains, lakes
Imagery	pictures or photographs
Incentive	something that encourages a person to do something or to work harder
Intermediate	occurring in the middle of a process or series

Interpret	to understand (something) in a specified way
Interview	a meeting at which information is obtained (as by a reporter, television commentator) from a person
Microstate	a nation that is extremely small in area and population
Migrate	to move from one country or place to live or work in another
Obligation	something that you must do because it is morally right
Oblique	<i>of a line</i> : having a slanting direction or position
Population pyramid	a shape that is wide near the bottom and narrows gradually as it reaches the top, that represents the number of people who live in a place.
Predict	to say that (something) will or might happen in the future
Protectorate	a small country that is controlled and protected by a larger one
Questionnaire	a written set of questions that are given to people in order to collect facts or opinions about something
Peer pressure	a person being influenced to do something by others in the same age group or social group
Precipitation	water that falls to the ground as rain, snow, hail
React	to behave or change in a particular way when something happens, or is said
Research	careful study that is done to find and report new knowledge about something
Recommend	to say that (someone or something) is good and deserves to be chosen
Rugged terrain	land that has a rough, uneven surface
Satellite	a machine that is sent into space and that moves around the earth, moon, sun, or a planet
Sparse	present only in small amounts
Stationary	not moving; staying in one place or position
Suburb	a town or other area where people live in houses near a larger city
Survey	to ask (many people) a question or a series of questions in order to gather information about what most people do or think about something
Territory	an area of land that belongs to or is controlled by a government
Topography	the features (such as mountains and rivers) in an area of land
Vegetation	plants that cover a particular area

References

Bonnar, C & Ralph, B., (1992). *Key Skills in Geography*, second edition. South Melbourne: Longman

Scott, L & Laws, K., (1991). *Mapping and Statistical Skills For Secondary Students*, second edition. Queensland: Jacaranda Press

FODE PROVINCIAL CENTRES CONTACTS

PC NO .	FODE PROVINCIAL CENTRE	ADDRESS	PHONE/FAX	CUG PHONES	CONTACT PERSON		CUG PHONE
1	DARU	P. O. Box 68, Daru	6459033	72228146	The Coordinator	Senior Clerk	72229047
2	KEREMA	P. O. Box 86, Kerema	6481303	72228124	The Coordinator	Senior Clerk	72229049
3	CENTRAL	C/- FODE HQ	3419228	72228110	The Coordinator	Senior Clerk	72229050
4	ALOTAU	P. O. Box 822, Alotau	6411343 / 6419195	72228130	The Coordinator	Senior Clerk	72229051
5	POPONDETTA	P. O. Box 71, Popondetta	6297160 / 6297678	72228138	The Coordinator	Senior Clerk	72229052
6	MENDI	P. O. Box 237, Mendi	5491264 / 72895095	72228142	The Coordinator	Senior Clerk	72229053
7	GOROKA	P. O. Box 990, Goroka	5322085 / 5322321	72228116	The Coordinator	Senior Clerk	72229054
8	KUNDIAWA	P. O. Box 95, Kundiawa	5351612	72228144	The Coordinator	Senior Clerk	72229056
9	MT HAGEN	P. O. Box 418, Mt. Hagen	5421194 / 5423332	72228148	The Coordinator	Senior Clerk	72229057
10	VANIMO	P. O. Box 38, Vanimo	4571175 / 4571438	72228140	The Coordinator	Senior Clerk	72229060
11	WEWAK	P. O. Box 583, Wewak	4562231/ 4561114	72228122	The Coordinator	Senior Clerk	72229062
12	MADANG	P. O. Box 2071, Madang	4222418	72228126	The Coordinator	Senior Clerk	72229063
13	LAE	P. O. Box 4969, Lae	4725508 / 4721162	72228132	The Coordinator	Senior Clerk	72229064
14	KIMBE	P. O. Box 328, Kimbe	9835110	72228150	The Coordinator	Senior Clerk	72229065
15	RABAU	P. O. Box 83, Kokopo	9400314	72228118	The Coordinator	Senior Clerk	72229067
16	KAVIENG	P. O. Box 284, Kavieng	9842183	72228136	The Coordinator	Senior Clerk	72229069
17	BUKA	P. O. Box 154, Buka	9739838	72228108	The Coordinator	Senior Clerk	72229073
18	MANUS	P. O. Box 41, Lorengau	9709251	72228128	The Coordinator	Senior Clerk	72229080
19	NCD	C/- FODE HQ	3230299 Ext 26	72228134	The Coordinator	Senior Clerk	72229081
20	WABAG	P. O. Box 259, Wabag	5471114	72228120	The Coordinator	Senior Clerk	72229082
21	HELA	P. O. Box 63, Tari	73197115	72228141	The Coordinator	Senior Clerk	72229083
22	JIWAKA	c/- FODE Hagen		72228143	The Coordinator	Senior Clerk	72229085

SUBJECT AND GRADE TO STUDY

GRADE LEVELS	SUBJECTS/COURSES
Grades 7 and 8	1. English
	2. Mathematics
	3. Personal Development
	4. Social Science
	5. Science
	6. Making a Living
Grades 9 and 10	1. English
	2. Mathematics
	3. Personal Development
	4. Science
	5. Social Science
	6. Business Studies
	7. Design and Technology- Computing
Grades 11 and 12	1. English – Applied English/Language & Literature
	2. Mathematics - Mathematics A / Mathematics B
	3. Science – Biology/Chemistry/Physics
	4. Social Science – History/Geography/Economics
	5. Personal Development
	6. Business Studies
	7. Information & Communication Technology

REMEMBER:

- For Grades 7 and 8, you are required to do all six (6) courses.
- For Grades 9 and 10, you must study English, Mathematics, Science, Personal Development, Social Science and Commerce. Design and Technology-Computing is optional.
- For Grades 11 and 12, you are required to complete seven (7) out of thirteen (13) courses to be certified.

GRADES 11 & 12 COURSE PROGRAMMES

No	Science	Humanities	Business
1	Applied English	Language & Literature	Language & Literature/Applied English
2	Mathematics A/B	Mathematics A/B	Mathematics A/B
3	Personal Development	Personal Development	Personal Development
4	Biology	Biology/Physics/Chemistry	Biology/Physics/Chemistry
5	Chemistry/ Physics	Geography	Economics/Geography/History
6	Geography/History/Economics	History / Economics	Business Studies
7	ICT	ICT	ICT

Notes: You must seek advice from your Provincial Coordinator regarding the recommended courses in each stream. Options should be discussed carefully before choosing the stream when enrolling into Grade 11. FODE will certify for the successful completion of seven subjects in Grade 12.

CERTIFICATE IN MATRICULATION STUDIES		
No	Compulsory Courses	Optional Courses
1	English 1	Science Stream: Biology, Chemistry, Physics
2	English 2	Social Science Stream: Geography, Intro to Economics and Asia and the Modern World
3	Mathematics 1	
4	Mathematics 2	
5	History of Science & Technology	

REMEMBER:

You must successfully complete 8 courses: 5 compulsory and 3 optional.

