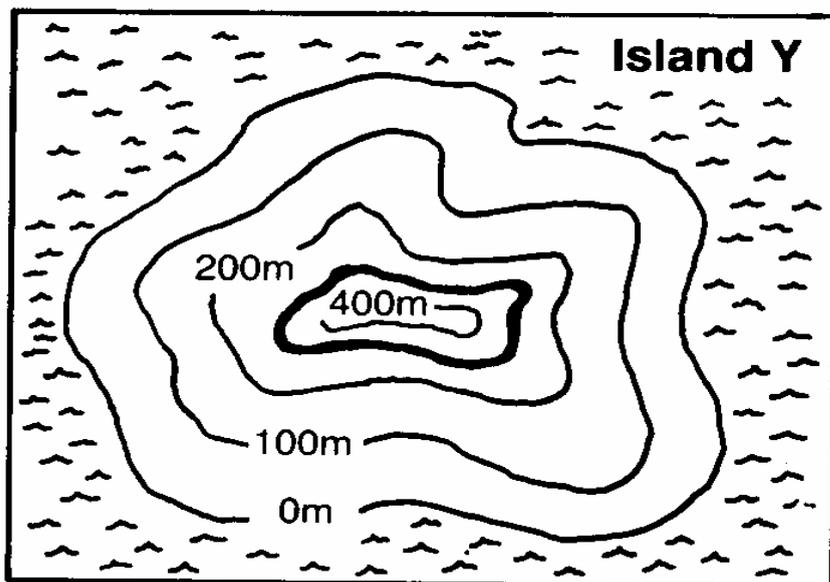


Social and Spiritual Development Strand  
Social Science

Unit 1: Natural and Cultural Environments

## Module 1.1 Geography Skills



**Student Support Material**

## Acknowledgements

Materials written and compiled by Sue Lauer.

*In consultation with*

Helen Walangu	PNGEI
Cornelius Gumbira	Madang TC
Lena Rifi	St Benedict's TC
Teng Waninga	Holy Trinity TC
Aloisia Maradangoi	Balob TC
Carol Cottingham	Balob TC
Pilari Hiraya	OLSH Kabaleo

Layout and diagrams supported by Nick Lauer.



*Primary and Secondary Teacher Education Project*

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## Unit outline

Unit	#	Modules
<b>Unit 1</b>  <b>Natural and Cultural Environments</b>	1.1	<b>Geography Skills (Core)</b>
	1.2	<b>Land Use and Settlement (Core)</b>
	1.3	<b>Environmental Issues (Core)</b>
	1.4	<b>Culture (Core)</b>
	1.5	<b>Resource Management (Optional)</b>

## Icons



Read or research



Write or summarise



Activity or discussion

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# Module 1: Geography Skills

## Rationale

This module is designed to introduce you to the range of skills appropriate to the study of the natural environment. You will be given opportunities not only to learn about the skills but also to apply them in a variety of situations.

## Objectives

By the completion of this module you will be able to:

- create, interpret and use maps, diagrams, graphs, and charts
- apply a range of essential geographical skills such as observing, gathering, measuring and recording data, using data to explain, draw conclusions, and make predictions
- recognise and discuss cause, effect and consequences
- solve problems
- think logically and develop informed opinions about geographical problems
- identify and discuss geographical issues from a range of perspectives.

## Topic 1 – Introduction to Geography

Geography is the branch of Social Science that studies how people relate to where they are – the environment around them. Geography is the study of people and places. We study geography to learn about our world and to understand what is happening around us.

There are three main branches of Geography – physical, human and regional. There are also several specialist areas such as cartography. (see Figure 1). These branches often overlap with other Social Science or Science subjects.

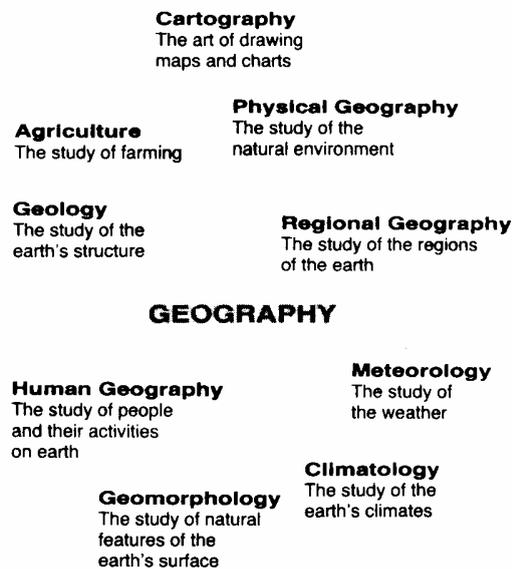


Figure 1: Branches of Geography Source: Bonner and Ralph – *Key Skills in Geography*, Longman

Geographers are always asking questions such as:

- Where is it?
- What is it?
- Why is it there?
- What are the effects or benefits of it being there?
- How is it changing?

All these questions have one thing in common. They relate to where things are or how they are distributed on the earth. To answer these questions geographers must be able to:

- INQUIRE - Ask questions and search out information
- OBSERVE - Look carefully at the world around them
- CLASSIFY - Sort out the information
- RECORD - Write down or draw the information they have seen
- INTERPRET - Explain how or why
- COMMUNICATE - Tell others of their findings

Geography is a practical subject. It involves a lot of fieldwork and the best place to start is the local area. The most important tools which geographers use are observing and recording skills. Here are some of the tools which geographers use.

#### **FIELDWORK TOOLS**

- Surveys
- Questionnaires
- Sketches
- Notes
- Observations

#### **VISUAL TOOLS**

- Photographs
- Sketches
- Diagrams
- Flow charts
- Line drawings
- Profiles
- Cross sections

#### **MAPPING TOOLS**

- Scale
- Distance
- Direction
- Symbols
- Heights
- Reference points
- Latitude and longitude
- Contours
- Features

#### **STATISTICAL TOOLS**

- Graph
- Tables
- Averages

#### **WRITING TOOLS**

- Report writing
- Notes
- Library research
- Descriptions

Geographers collect **data** i.e. information that is known or available to people. Data is used to support points of view and to make generalisations. It can be used to show changes over time and to make comparisons between places. Data consists of a variety of facts, figures and statistics.

Sources of data include:

- Lists
- Tables
- Graphs
- Diagrams
- Pamphlets
- Brochures
- Government publications
- Textbooks, reference books
- Encyclopaedias
- Maps, atlases, magazines
- Newspaper articles
- Television programs
- Video
- Film
- Computer
- Audio and visual software
- People

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## 1.1 Activity 1

*Select five sources of data listed above and provide an example of how it could be useful for a geographer, for example, a newspaper article that describes a natural disaster*

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## Topic 2 – Fieldwork

One of the best ways to learn about things is through fieldwork, getting outside. Your fieldwork may involve anything from a walk around the college to an excursion lasting several days. Fieldwork gives you the advantage of seeing things as they really are. When you are conducting fieldwork there are certain skills which are needed. Fieldwork involves the use of observation skills, an ability to describe the things you see, and skills in collecting data through methods such as conducting interviews, questionnaires and surveys.

### Observation Skills

There are a number of ways you can improve your powers of observation.

- Keep a sharp lookout for interesting places, people, things, and events.
- Ask yourself what is happening, what is it about, what makes it interesting?
- Concentrate on what stands out most – a person, a group of people, an activity, a place.
- Think of ways you could describe what is happening.
- Ask questions and investigate further.
- Sort or classify what you can see into different groups. Is it natural (made by nature), or cultural (made by people)?
- Divide observations classified as either natural or cultural even further under different sub-headings such as landforms, land use, customs.

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### 1.1 Activity 2

*Work with a small group of your peers. For this activity you will need a pencil and a notebook. Choose a site where there are people gathered, for example a market, school playground, or sports field.*

- *Decide on a category, for example, males/females/children/people wearing shoes and record the number of people of that category who pass you in a given time.*
- *Select one person and sketch what they are wearing.*
- *Describe the colour of their shirt/jacket/blouse.*

*Compare your statistics or sketches with others in your group. Can you see any similarities in the classification you made?*

## Describing skills

An important skill in Geography is to be able to describe the places or things you see in the field or find out about in your studies. You must be able to use the right words to get your message across. The description may be in the form of a report, answers to questions, lecturettes or essays. You can use headings suggested in Figure 2 to help with your descriptions.

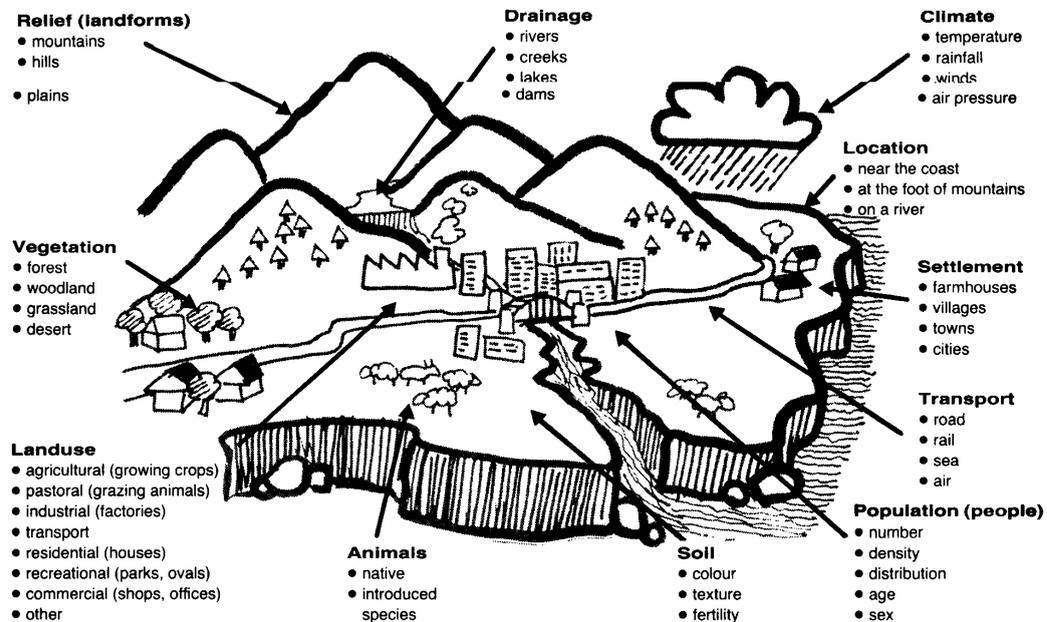


Figure 2: A checklist for describing places - Source: Bonner and Ralph – *Key Skills in Geography*, Longman Cheshire

## Interviews

An interview involves asking someone questions in order to find out more information about a subject. Through an interview you can learn about things and peoples' opinions first hand. There are usually many people with special knowledge about a topic. You can invite them to your classroom or meet them during fieldwork.

To conduct an interview successfully you need to:

- prepare your questions beforehand
- make sure the questions are simple and to the point and that they require more than a single word answer.
- make sure you tell the interviewee your purpose and thank them at the end.
- listen carefully to answers
- take notes during the interview if possible.

## Questionnaires

A questionnaire is a set of questions aimed at getting the opinions of a number of people on a particular topic or issue. It can be left for people to fill out, or the questions may be asked directly in an interview situation. A questionnaire is really only useful if a large number of people take part.

Developing a questionnaire requires careful thought and some testing. The aim should always be to get clear answers from those participating in the survey. The views of those being questioned should not be influenced by confusing questions or the views of the interviewer.

## Surveys

Surveys usually involve either counting or measuring. A lot of information can be gathered from just counting things you see everyday e.g. the number of students using the library. Once you have counted and recorded, the next step is to describe the results to see what answers they may provide to the problem under investigation

Measuring is often done using special instruments or maps, but it can also be done with simple items such as a tape measure. You can measure such things as length, height, size, speed and volume.

When conducting a survey you need to:

- decide the purpose of your survey
- decide on the categories you will observe - categories could include times, locations, subjects, types of object or action
- draw up a grid for recording your data.
- collect data
- present your data graphically, pictorially or as a written report
- summarise the information or draw conclusions

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### 1.1 Activity 3 -

*Work together with your peers to design a set of interview questions or a written questionnaire to find out how many different provinces each of your classmates has visited. Describe your findings using percentages and appropriate diagrams.*

*Use the questions formulated above to conduct a survey of about twenty students. Present your findings as a pie or column graph.*

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## Topic 3 – Drawings, diagrams and charts

### Line drawings (field sketches)

Line drawings can be done from a photograph or when you are out in the field. When you look at a photograph or scene, imagine it in three sections:

- the *foreground*- the area closest to you
- the *middle distance* –the area further away but the details are still clear
- the *background*- the area furthest away; the details may not be clear.

Each of these areas will take up about a third of your sketch. (See Figure 3)

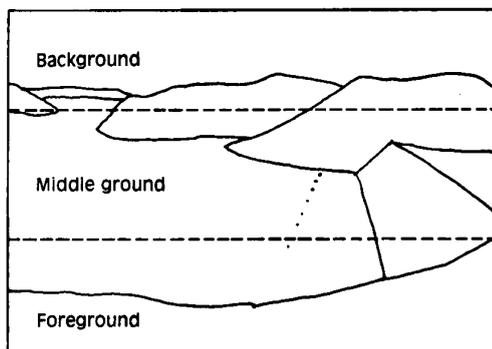


Figure 3: Beginning of a field sketch

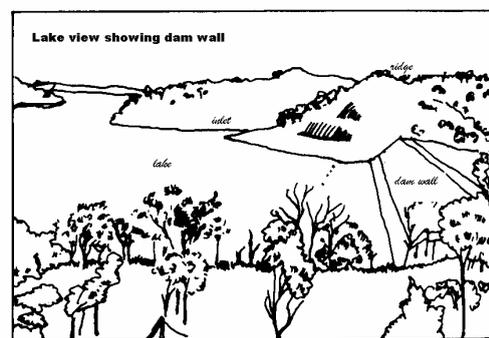


Figure 4: Completed sketch with labels

Source: Cramma and Dodd – **Discover Your World 1**, Jacaranda Press

When planning to complete a field sketch:

- select a suitable observation point
- consider why you are doing the sketch and decide what features you intend to highlight
- determine the boundaries of your sketch and what to draw in the foreground, middle and background
- use a firm surface as a backing sheet and pencil in the main features. Use shading where appropriate
- name important features
- give your sketch a title and date.

Figure 4 is an example of a completed sketch, with a title and labels.

## Diagrams and flow charts

Diagrams are employed by geographers in a variety of situations. They may be used to illustrate outlines and features of an object. They can show how something complex like a power station operates. They can show the stages in the creation of a particular landform. The best diagrams are clear, with all the necessary details, and labels to identify features and explain processes. An example of a diagram can be seen in Figure 5

A flow chart is a diagram showing a series of step-by-step operations which make up a particular process. The main elements of the process are shown in picture form and are linked by arrows to indicate how one operation leads to the next. A flow chart can also be used to show stages in the development of a consumer product. Figure 6 is an example of a flow chart.

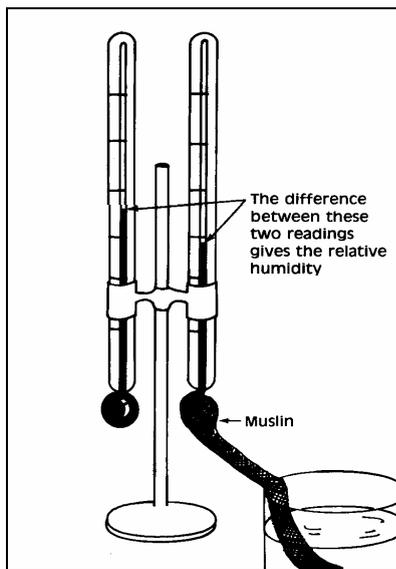


Figure 5: Diagram

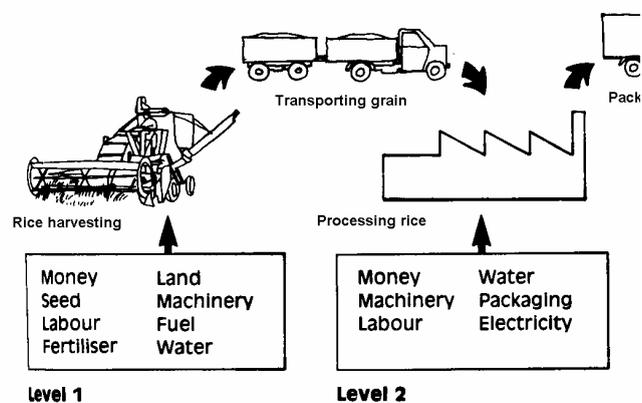


Figure 6: Flow Chart

Source: Cramma and Dodd – **Discover Your World 1**, Jacaranda Press

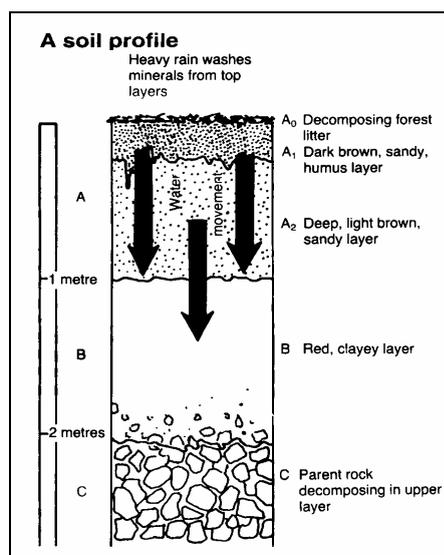


Figure 7: Profile or cross-section. Bonner and Ralph – **Key Skills in Geography**, Longman Cheshire

Cross-sections or profiles provide a side view. They are used to determine the slope or height of something or the layers within it. Figure 7 shows a cross section or profile of soil, illustrating what can be found at the various layers.

## Contour diagrams

Contour maps can be used to provide landform cross-sections. A **contour line** on a map joins points at the same height above sea level. These lines are the most accurate way of showing **relief** on maps, because they describe shape, size and steepness of all landform features. Examples of a contour cross section and a contour map can be seen in Figures 8 and 9.

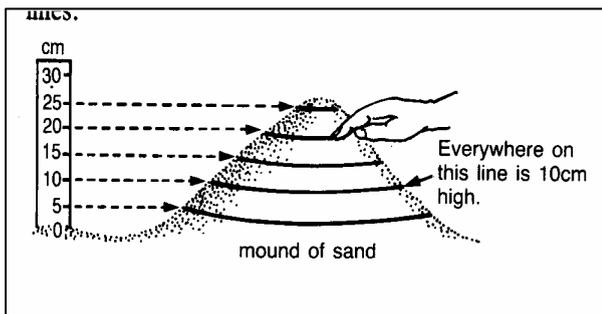


Figure 8: Contour cross-section

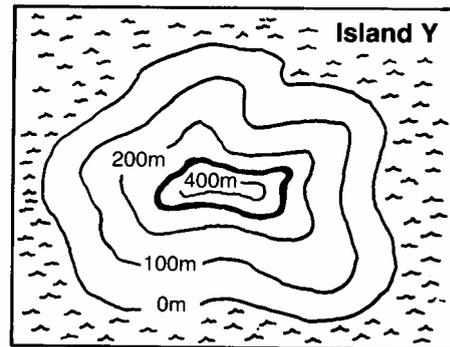


Figure 9: Contour map

Source: Codrington and Chittenden – *The Geography Skills Book*, Heinemann

## Topic 4 – Maps and mapping

A map is a picture or plan of a place, with its various features shown as symbols. These symbols can provide detailed information about a particular part of the Earth's surface.

Depending on the purpose of the map, it could show things like:

- physical features – hills, rivers, forests, deserts
- human features – towns, roads, land use
- specific features – weather patterns, holiday resorts, electoral boundaries

There are many types of maps. Some of the more common types of maps are listed below.

- Topographic maps – very accurate and detailed, showing the major natural and cultural (made by humans) features of an area. These are used by groups such as the army and emergency services.
- Road maps – roads, streets and buildings of a town or area. Street directories are a small scale version of a road map. Figure 10 is an example of a road map.
- Cadastral maps – show information such as property boundaries, allotment areas.
- Tourist maps – show the layout of an area, accommodation, local attractions.
- Political maps – boundaries of countries, transport routes.
- Orthophoto maps – aerial photographs with information such as names of rivers overlaid on them.
- Charts – which aid in navigation by sea or air.
- Plans – maps of buildings.

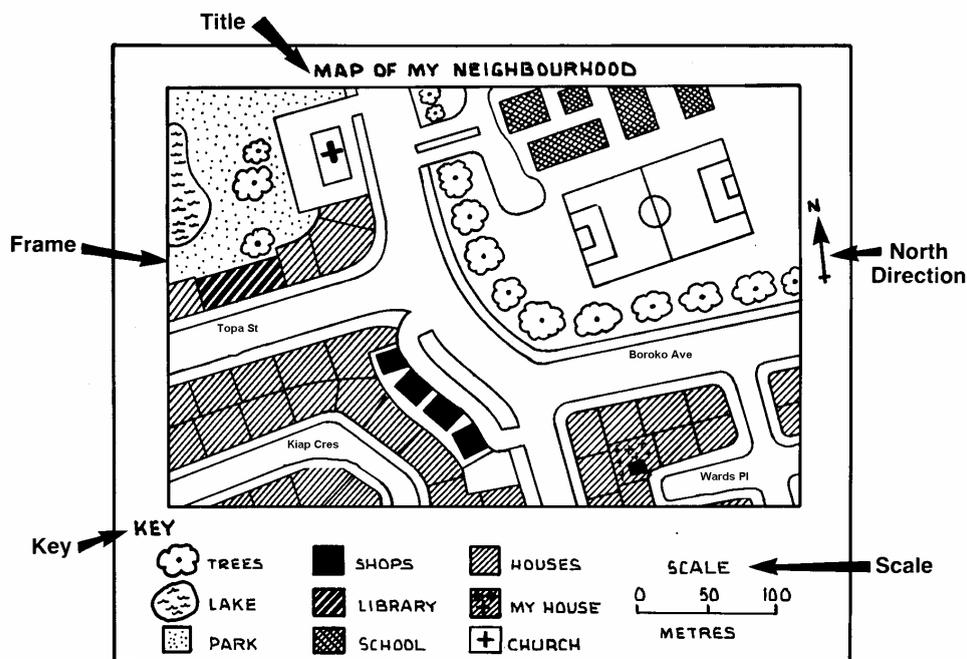


Figure 10: Completed map with essential elements Source: Bonner and Ralph – *Key Skills in Geography*, Longman Cheshire

To enable people to read it accurately a map should have a number of features.

- A title – tells the place, country, and main data shown.
- A key/legend - explains the meaning of symbols, colours, and print sizes.
- A scale – indicates distances and sizes (shown as ratio, line or description).
- A north arrow – to determine direction.
- Latitude and longitude
- Relief – height, contours.

## Latitude, longitude and map references

Geographers often refer to a global network of lines that enable them to locate the position of any point on the Earth's surface. They are measured in degrees because they are based on angles out from the centre of the earth eg Wabag is  $30^{\circ}$  S and  $40^{\circ}$  E

**Parallels of latitude** encircle the Earth from east to west. They run parallel to the Equator which divides the Earth in two, the northern and southern hemispheres. Each parallel has a value between  $0^{\circ}$  and  $90^{\circ}$ . Lines of latitude are associated with changes in climate.

**Meridians of longitude** are lines that run vertically on the globe and pass through the North and South Poles. Longitude is measured in degrees east or west of the line running through Greenwich Observatory (near London). Meridians of longitude are used to calculate world time. Time is measured as so many hours ahead or behind Greenwich Mean Time (GMT). Port Moresby is 10 hours ahead of GMT. Figure 11 shows lines of latitude and longitude marked on a map of the world.

Most maps have a set of numbers or letters around the borders. The number or letter that gives us the location of a particular place is called a **map reference**. Sometimes a four or six number scale is used. These are called **grid references**. When using a four number scale the first two numbers are called an **easting** which is found by looking along the bottom of the map. The next two numbers are the **northing** which is found by looking up the side of the map. This is illustrated in Figure 12.

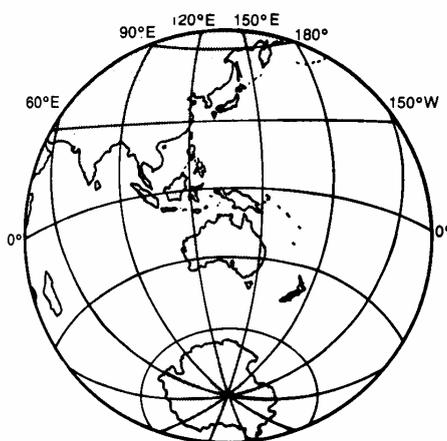
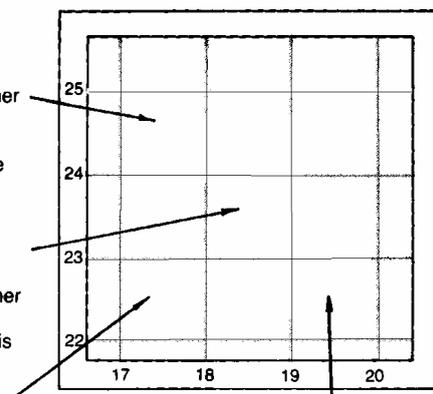


Figure 11: Latitude and longitude

Source: Cramma and Dodd

Easting 17 and northing 24 form the bottom left hand corner of this square. Its four-figure grid reference is therefore 1724

Easting 18 and northing 23 form the bottom left hand corner of this square. The area reference (AR) is therefore 1823



This square has an area reference of 1722

This square has an area reference of 1922

Figure 12: Grid references

Source: Bonner and Ralph

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 **1.1 Activity 4 - Interpreting a map**

*Work with a small group to complete this task. Choose an appropriate map from an atlas, street directory or another source. The map will need to be fairly detailed. Complete the following activities that incorporate all the basic mapping skills.*

- *Identify four landform features e.g. creeks (natural).*
  - *Identify three signs of human habitation e.g. bridge (cultural).*
  - *Work out the distance between three locations (distance/scale).*
  - *Identify aspects of the landscape represented by three different symbols (key).*
  - *Select a feature and describe what you would find to the southeast of it (direction).*
- 
-

## Topic 5 – Tables and graphs

A graph is a drawing of statistics. It can show important facts at a glance. Graphs are used to show how an item or items of information change over a given time. Most graphs will have some or all of the following features:

- a title – heading or name
- a source – where the information came from
- horizontal axis – line running across graph with numbers or words on it
- vertical axis – line running up the side of the graph with numbers or words on it
- a scale – a number line on either axis.

**Line graphs** may take the form of a smooth curve or may consist of line segments that join places plotted on the graph. Figure 13 is an example of a line graph.

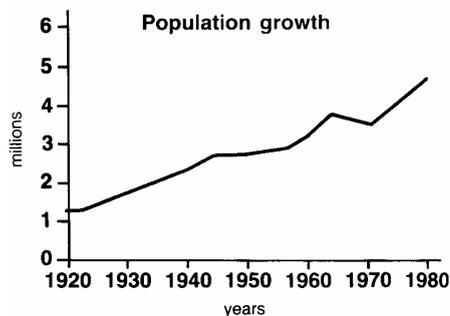


Figure 13: Line graph

Source: Codrington and Chittenden – *The Geography Skills Book*, Heinemann

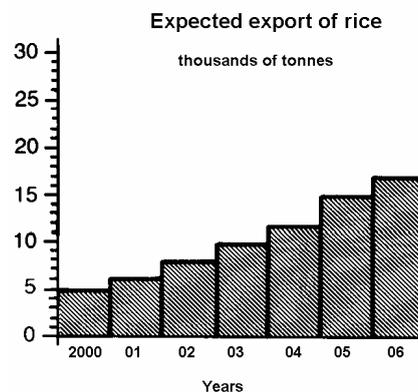


Figure 14: Bar/column graph

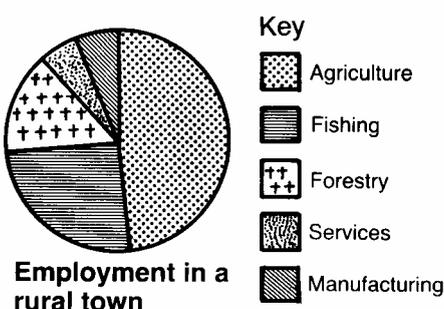


Figure 15: Pie Graph

Source: Codrington and Chittenden

A circle or **pie graph** is an accurate way of showing how each item of data contributes to the complete picture. The 'slices' of the 'pie' are drawn proportionally in a clear, colourful way to show the percentages they represent. Figure 15 is an example of a pie graph.

Climatic statistics can be more easily read and compared when presented in a **climate graph**. Figure 16 is an example of a climate graph. Rainfall is drawn at the bottom of the graph using bars to represent precipitation each month. Temperatures are represented by a line graph. Rainfall and temperature can be shown on separate graphs or they can be combined in one climograph. A climograph lists the temperature on the left axis and the rainfall measurements on the right axis.

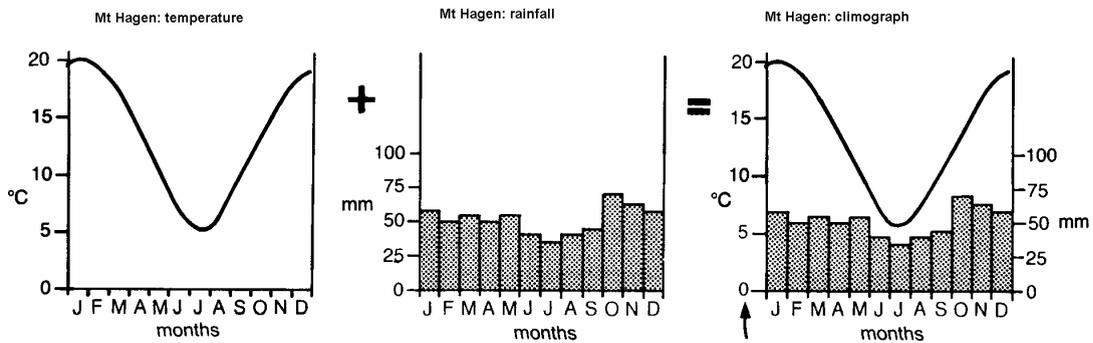


Figure 16: Climate Graph

Source: Codrington and Chittenden – *The Geography Skills Book*, Heinemann

Graphs can provide valuable information, but sometimes only a certain amount of information is required. This is where a **table** becomes a useful method for presenting data. A table is also useful for organising information. Figure 17 is an example of a table.

**Vegetable production in PNG  
(’000 tonnes)**

Vegetables	1997	1998	1999
Potato	370	380	390
Cabbage	340	300	320
Broccoli	110	120	150
Beans	120	120	120

Figure 17: Vegetable production table

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 **1.1 Activity 5****Constructing a diagram**

*For this activity you are required to draw a diagram which records the height of the tallest mountain in each continent. To construct your diagram:*

- *draw an axis with each of the seven continents as column headings (horizontal)*
- *decide on a vertical height scale for your diagram*
- *use an atlas to find the height of the highest mountain in each continent and mark the height on your diagram*
- *record the name of each mountain and its actual height on the diagram*
- *name your diagram*

**Constructing a pie graph**

*Conduct a survey of the members of your class to gather the following information:*

- *the province in which each student was born*
  - *calculate the percentage of students born in each province*
  - *construct a pie graph to show this information.*
-

## Topic 6 – Research and recording

### Research

One of the best ways to learn about any subject is to think of the questions you want answered or what you want to know, and inquire about the things which interest you. This means doing your own research to find the answers. Completing your own research involves using many of the skills outlined above. There are a number of steps involved in doing research and the best results are achieved through a systematic approach. One approach to conducting research is outlined below.

- You need to **clarify** the task i.e. work out exactly what you want to know.
- **Review** any available information related to your research topic e.g. find relevant material from the library
- **Plan** how you will go about the research e.g. what equipment might you need.
- **Collect** your data by observation, interview, surveying or other appropriate methods.
- **Analyse** your data, that is, decide what the results of your research tells you.
- **Present** your findings in an appropriate format such as a report, chart, diagram.

Information you have gathered from the field or during research needs to be presented appropriately. It could take the form of a report, answers to questions, lecturettes or essays. You must be able to choose the right words to get the message across. It is often easier to describe something if you have been given hints about what to look for.

A big problem after collecting data through surveys, interviews or other methods, is to know whether the results are interesting, important, alarming or unusual in any way. You can get a better idea by comparing your data with other information you have collected or contrasting it with what others have found out.

### Writing a report

Reports usually follow the same sort of pattern.

- **Introduction:** State the topic and perhaps why you chose it. Then state clearly your research question and what you intended to find by your research. Explain where the problem exists. Define any special words that are important in your project.
- **Method:** Explain the methods you have used in your research, for example, observation, counting, measuring, interviews, questionnaires. Why did you choose some methods and not others? Show the steps and the methods you took in your data collection. Explain how you processed your data so that it told you something. Explain any limits you faced in time or resources.

- **Body of the report:** This is where you present all your information. You might use written information, photographs, maps, graphs, statistical tables, diagrams, models, and so on. It is more interesting to present information in a variety of ways. In this part of your report you will analyse your data to indicate what it tells you.
- **Conclusion:** This is where you present the conclusions of your research. What did you discover as a result of your efforts? Don't be concerned if the results were different to what you expected, it is far more important to be accurate in your conclusion. Think about the importance of your findings: what are the implications of your research?

---

## Activity 1.7 – Research and presentation

*People's clothing usually reflects the weather in their home region.*

*Consult your library and other resources to find out about the traditional clothing of one of these groups of people:*

- *Eskimos*
- *Sherpas*
- *Pygmies*
- *Bedouin.*

*Present your findings as a resource which could be used in the primary classroom. e.g. chart, diagrams, text, sketches, models.*

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## Writing an explanation

An explanation is used to explain how or why something occurs. An explanation usually contains

- A general statement about the feature or process being described
- A series of paragraphs that tell how or why. These should be in sequence so that the reader or listener builds up their understanding of the feature or process.
- A concluding paragraph

## Discussions and expositions

A discussion is used to present the different opinions on a particular issue or topic, that is, the arguments for and against. A discussion can be written or oral. A written discussion should contain

- An introductory paragraph that introduces the issue or topic. It can contain a question or it can state the view of the writer.
- A series of paragraphs that outline the arguments for or against the issue or topic. It should use words that show a comparison or contrast and words that link arguments.
- A conclusion that sums up the issue and outlines the writer's own point of view or recommendation.

An exposition only presents one side of an issue. It is used to persuade the reader by presenting a particular point of view. A new paragraph should be used for each new argument.

<b>WRITERS' WORD BANK</b>			
<p><b>Words that compare</b></p> <p>Also As As do Like Similar to The same as</p> <p><b>Words that contrast</b></p> <p>Alternatively Although But By contrast Differs from However Instead Nevertheless On the contrary On the other hand Rather Whereas Yet</p>	<p><b>Words that show cause and effect</b></p> <p>An effect of An outcome of As a consequence As a result Because Brings about Brought about Caused by Consequently Contributed to Creates Culminated in Despite this Due to Even though Gives rise to Hence Leads to Otherwise Produced by Results in So Stems from Therefore</p>	<p><b>Words that show time and sequence</b></p> <p>After a while Afterwards At this point Before Finally First (second etc) Here In the end Lastly Meanwhile Next Next time Now Previously Shortly Soon Then When</p>	<p><b>Words for presenting another argument</b></p> <p>Also As well as Furthermore In addition to Likewise Moreover Not only</p> <p><b>Words for introducing examples</b></p> <p>As shown by For example For instance Including Such as These include</p>

## **References**

Bonner and Ralph (1994) *Key Skills in Geography*, Longman Cheshire

Codrington and Chittenden (1990) *The Geography Skills Book*, Heinemann

Cranna and Dodd (1989) *Discover Your World*, Jacaranda

Kleeman et al (1998) *A Geography of Global Environments and Communities*,  
Heinemann