LATITUDE & LONGITUDE

PLANET EARTH

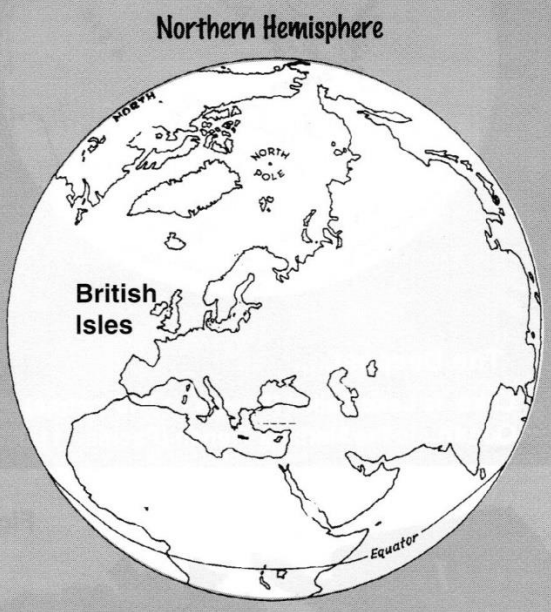


Fig.30

PLANET EARTH

Planet Earth is very large to human beings. Any journey around the Earth is over 40,000 kilometres long. The planet surface covers over 500 million square kilometres. To find the position of any place on the Earth, we need a **grid**.

LINES OF LATITUDE

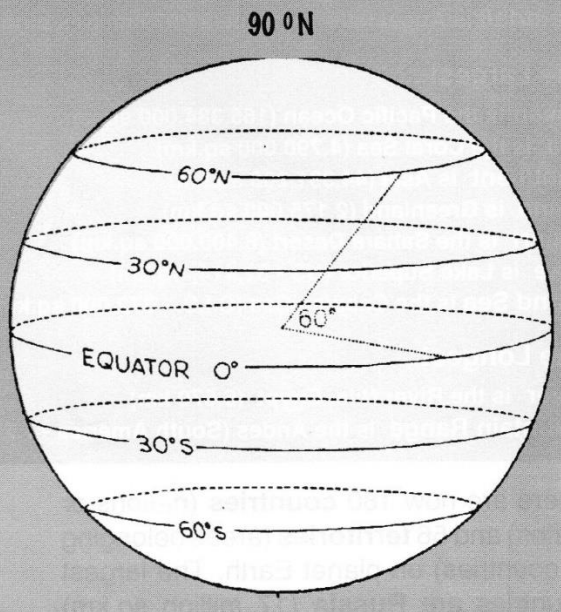


Fig.31

LATITUDE

The **Latitude** of a place is its **distance north or south of the Equator.** This distance is measured in degrees. The Equator is the O^0 line of latitude. The other lines of latitude are parallel to the Equator.

Latitude and **longitude** are used to work out the position of any place on the Earth's surface.

To help us find our way around the **Earth** we use imaginary lines of latitude and longitude. These lines, used in a **grid,** can help pin-point places on a globe.

Lines of latitude go around the Earth and show the distance north or south of the **Equator** (fig.31). The Equator is the O^0 line of latitude. The North Pole is the 90^0N line of latitude and the South Pole is the 90^0S line of latitude.

The other important lines of latitude are the Tropics of Cancer and Capricorn, and the Arctic and Antarctic circles.

Lines of latitude are imaginary lines, parallel to the Equator. They are spaced roughly 145 kilometres apart. The Equator is the longest line of latitude.

Lines of longitude meet at the North and South Poles.

The **Greenwich Meridian (fig.32)** is the 0^0 line of longitude and passes through Greenwich in London. All the other lines of longitude (or meridians) are measured east or west from this, meeting in the Pacific Ocean.

A grid showing lines of latitude and longitude (fig.33) is a useful way of fixing the position of any place on the Earth's surface. By finding where the latitude line 30^0N meets longitude 40^0E, the position of place **A** can be found.

The **index** of an atlas gives the latitude and longitude for all the places shown in the atlas pages. For example, Glasgow is **56^0N, 4^0W** to the nearest degree. Melbourne, Australia is **38^0S, 145^0E**.

...Position on the Earth

LINES OF LONGITUDE

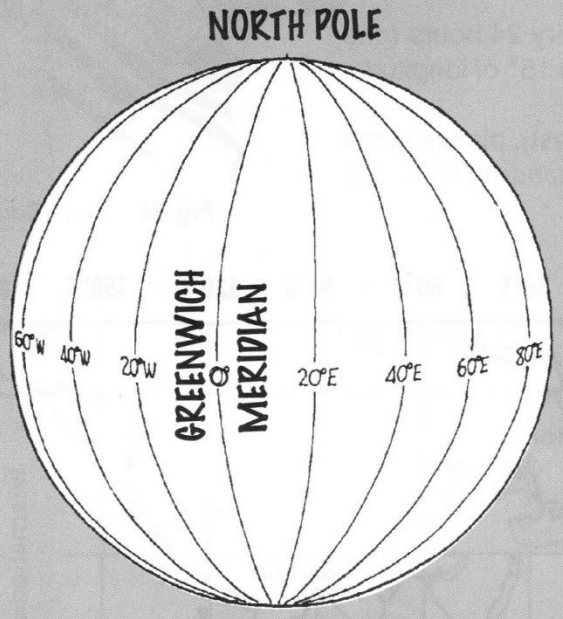


Fig.32

LONGITUDE

The **Longitude** of a place is measured **east or west of the Greenwich Meridian.**
Longitude is measured in degrees. The Greenwich Meridian is the 0° line of longitude. All lines of longitude run from pole to pole.

LATITUDE & LONGITUDE

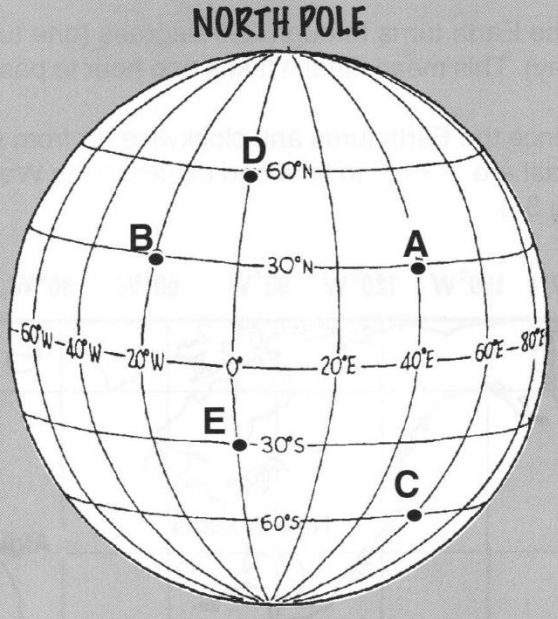


Fig.33

POSITION ON THE EARTH

When describing the position of a place on the earth's surface, the latitude is always stated first.
On the grid above place **A** is (30°N, 40° E) and **B** is (30°N, 20°W).

Latitude and Longitude Tasks

1 Copy and complete the following -

A grid is used to pinpoint the_____ of any place on the Earth. The grid is made up of lines of_____ and_____. Both are measured in_____. Lines of latitude are always_____of the Equator. Lines of longitude are always_____ of Greenwich. Latitude 0° is the _____. Longitude 0° passes through_____.

Choose from: Greenwich, position, north or south, east or west, latitude, Equator, longitude, degrees.

2 Give the latitude and longitude of places **C**, **D** and **E** on fig.**33**.

3 Use an **atlas map** of the Earth to help you answer the following questions :

i. Which **continents** lie at these latitude and longitude references -
a. 20°S, 140°E b. 0°N/S, 60°W
c. 10°N, 30°E d. 60°N, 120°W

ii. Do the following places lie in the northern or southern **hemisphere**?
Edinburgh Sydney Paris
Rio de Janeiro Beijing Lagos

iii. What is the **latitude** of the following - Tropic of Cancer, Tropic of Capricorn, Arctic Circle, Antarctic Circle ?

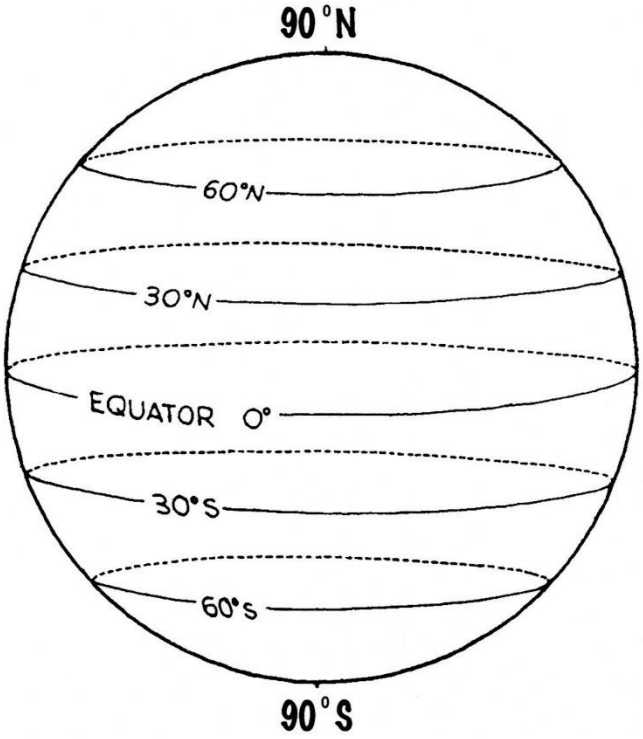
iv. Find the latitude and longitude of the following **cities** -
Bonn Los Angeles Cairo
Tokyo Bombay Darwin

v. Which of these cities lies furthest -
North ? East ? South ? West ?

Summary

Latitude and longitude are used to pinpoint the position of a place on the Earth's surface. The latitude is always given first, then the longitude.

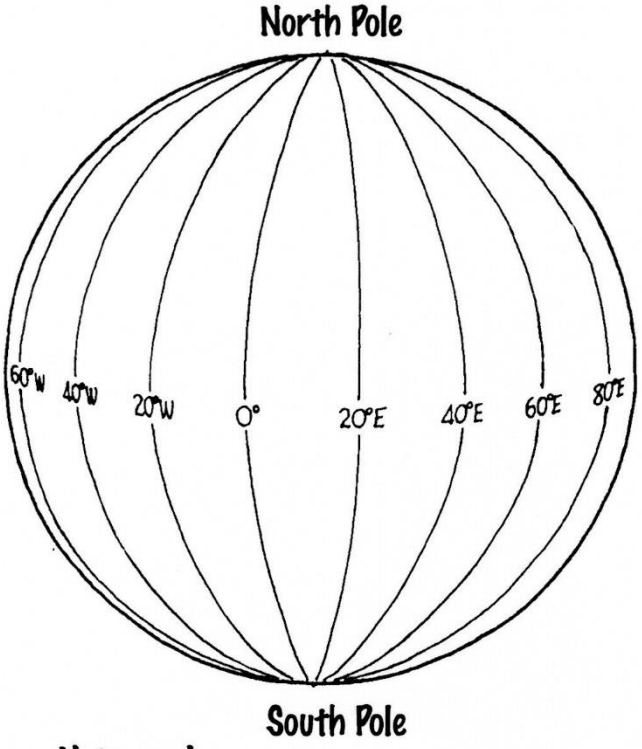
Lines of L _____



Notes on L

The **Latitude** of a place is

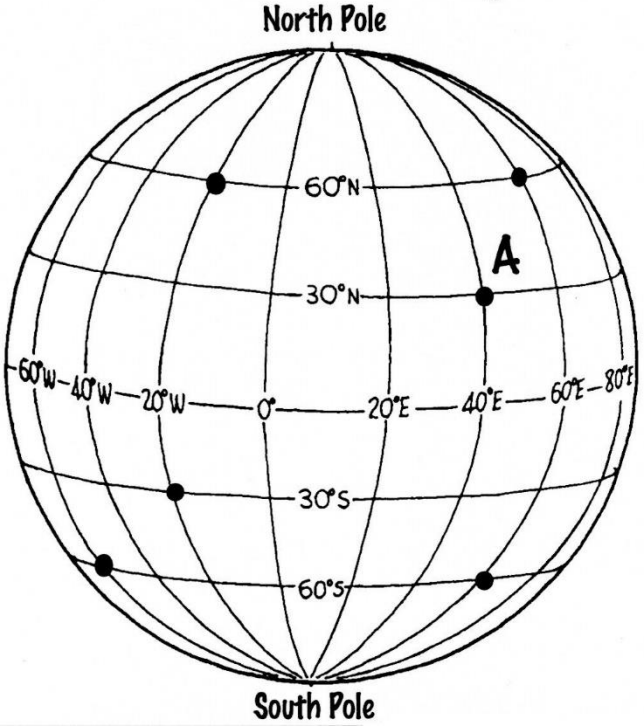
Lines of L _____



Notes on L

The **Longitude** of a place is its distance measured

Lines of Latitude & Longitude

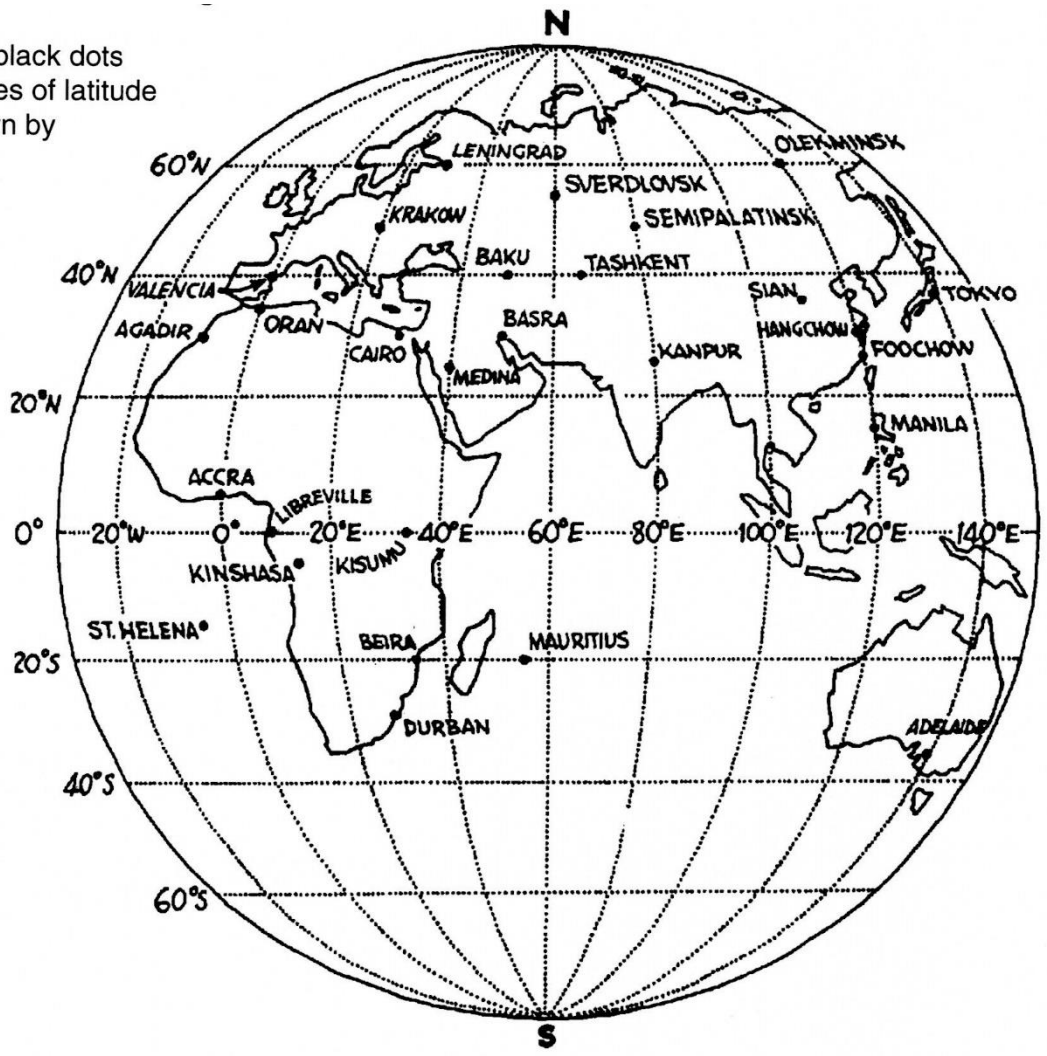


1. Copy the notes on **Latitude** and **Longitude** onto the diagram above from figures **31** and **32** on page **23**.

2. Mark onto the globe showing both Latitude and Longitude the following letters to show their position. **A** has been done for you.

A	**(30°N, 40°E)**	**B**	**(60°S, 60°E)**
C	**(60°N, 20°W)**	**D**	**(30°S, 20°W)**
E	**(60°N, 60°E)**	**F**	**(60°S, 60°W)**

On this globe map the black dots are settlements and lines of latitude and longitude are shown by dotted lines.



1. Work out the latitue and longitude of each settlement to the nearest 5° (e.g. 5°,10°,15° etc)

PLACE	LATITUDE	LONGITUDE
Valencia		
Adelaide		
Beira		
Tokyo		
Medina		
Krakow		
Tashkent		
Sian		
Kanpur		
Sverdlosk		
Cairo		
Leningrad		
Durban		
St.Helena		
Foochow		

2. Which **countries** have the latitude and longitude :-

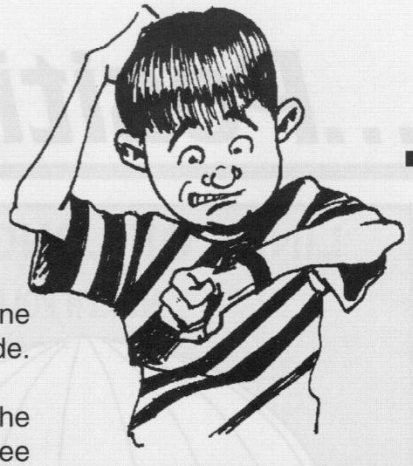
40°S, 70°W_____
50°N, 10°E_____
20°N, 80°E_____
65°N, 30°E_____
30°S, 140°E_____
40°N, 100°W_____

Answer the following questions on the back of this sheet.

3a. Find out who first used latitude and longitude.

3b. Why were latitude and longitude first invented ?

TIME ZONES

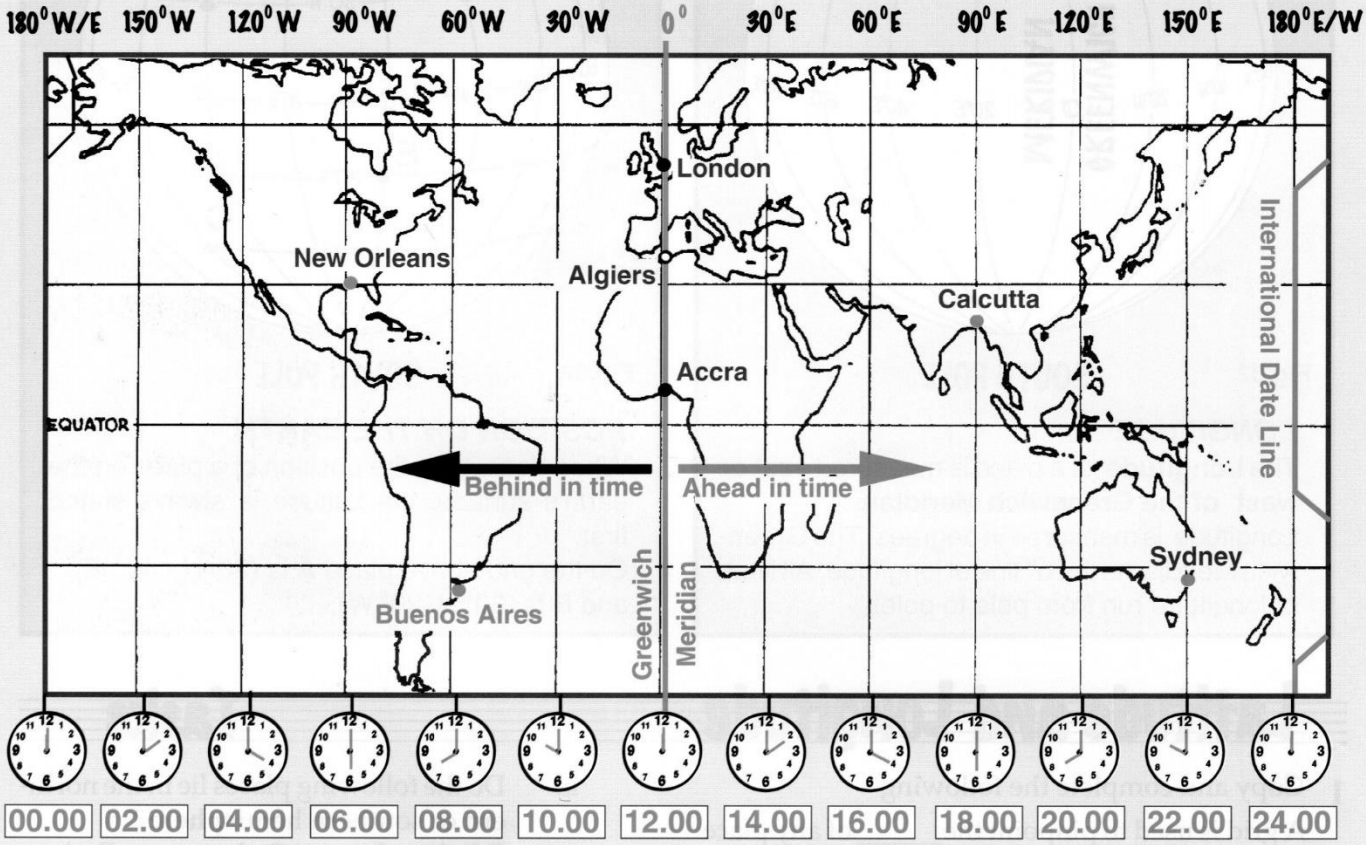


The lines of longitude are used to work out time zones across Planet Earth.

The Earth turns through 360 degrees (one turn) in every 24 hours (one day). This means that it takes one hour to pass through 15^0 of longitude.

Since the Earth turns anti-clockwise (or from west to east), places to the East are *ahead* in time and places to the West are *behind* in time (see fig.34).

Fig.34 Time Zones



Standard time is measured from the Greenwich Meridian (line of longitude 0^0E/W). This is known as **Greenwich Mean Time** or G.M.T.

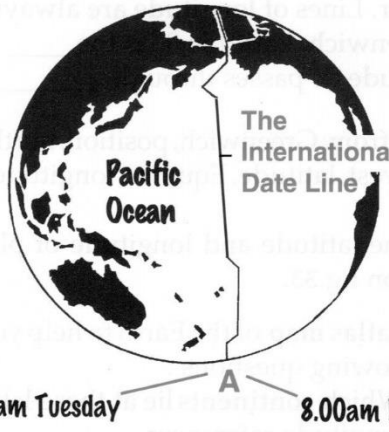
All places on the same line of longitude have the same time. In fig.34 above, London, Algiers and Accra are all on the same line of longitude and have the same time (12.00 noon).

Time Zones are generally sorted into strips of longitude, about 15 degrees wide, each of one hour time difference from the next.

The **International Date Line** is found along line of longitude 180^0 where time zones ahead of Greenwich - to the east - meet those behind Greenwich - to the west - (see fig.35).

INTERNATIONAL DATE LINE

Fig.35



The line of longitude 180^0 is known as the International Date Line. It should be a straight line but it is in fact a zig-zag line.

Time Zones — Tasks

1 Study figure **34** carefully then answer the following questions

i. Name three places with the same time.

ii. If it is 12.00 noon in **London** what time is it in

a. **Calcutta**
b. **Buenos Aires**
c. **Sydney**
d. **New Orleans**
e. **Edinburgh ?**

iii. If it is 12.00 noon in Calcutta what time is it in

a. **London**
b. **Sydney ?**

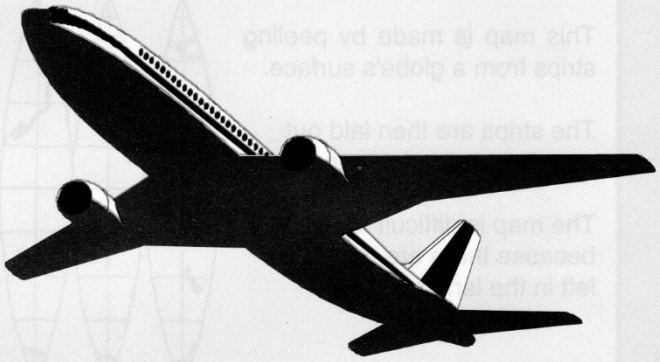
iv. If the time in **London** is 12.00 noon what will the time be in

a. **Prague (15 ^{0}E)**
b. **New York (75 ^{0}W)**
c. **Tokyo (135 ^{0}E) ?**

2 Copy and complete the following :-

Lines of _____ are used to work out time zones. It takes one _____ to pass through _____ of longitude.
Standard time is measured from the _____ _____. This is known as _____. Places to the East of Greenwich are _____ in time. Places to the West are _____ in time. The _____ _____ _____ lies at longitude 180 degrees.

Choose from : **G.M.T., 15 degrees, hour, ahead, International Date Line, longitude, behind, Greenwich Meridian.**



3 The table below shows flights from different cities in Europe, North America and Oceania.

Copy out the table and fill in the last column.

Date 08.09 Flight No.	From	To	Take-off Time	Flying Time *Hours Mins*	Landing Time & Date
SA 398	London	Algiers	12.00 noon	07 30	
SA 675	London	Sydney	09.00	16 00	
BA 216	London	New York	10.00	04 30	
CA 015	Sydney	London	10.00	16 00	
AL 205	New Orleans	London	20.00	08 00	

Hint : One way of working out the correct landing time and date is to work out what time it is in the city to which the plane is flying at take-off. Then add on the flying time using the 24 hour clock.

4a Find the **International Date Line** on an atlas map of the Pacific Ocean. Try to explain why the I.D.L. **zig-zags**.

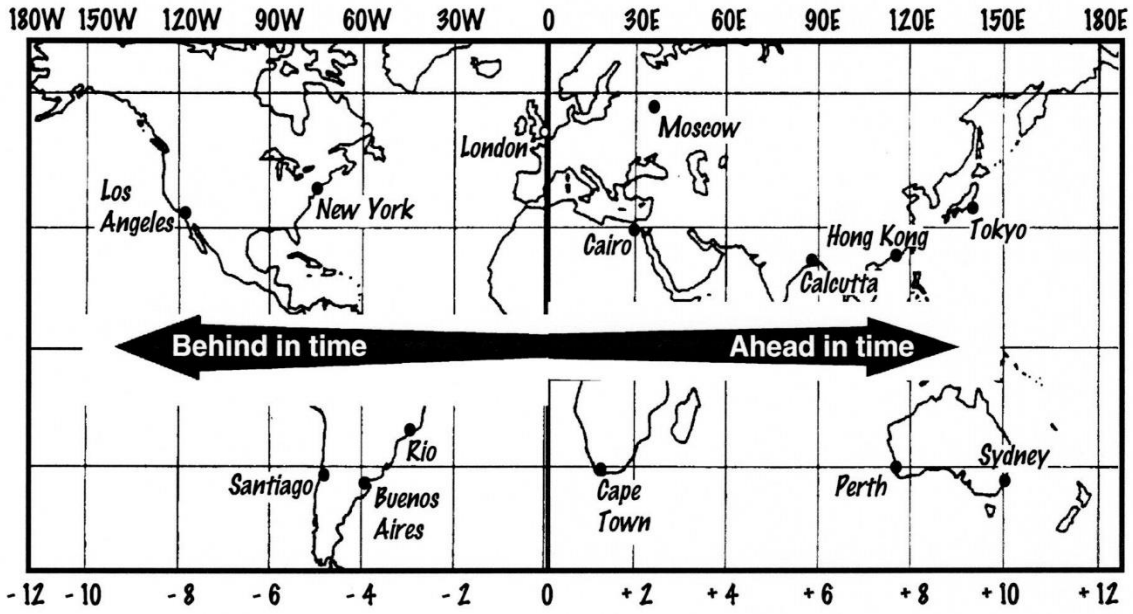
4b Study fig.**35** then copy and fill in the missing words using those in this list :-

8.00am Monday lost Tuesday gained

If a ship crosses the International Date Line from **west to east**, it reaches place A at _____ on _____. Once it has passed A, the day changes to _____. The crew aboard have _____ a day, because the following day will be _____ again.

Summary

Lines of longitude are used to measure time. It takes one hour to pass through 15 degrees of longitude. Places to the east of Greenwich are ahead in time; places to the west are behind in time. The International Date Line is found along the line of Longitude 180°.



answer the following questions.

1. Which lines are used to work out time across the planet ?

   _____

2. How many degrees does it take the planet to travel in an hour ?

   _____

3. On the ***Time Map*** above label the **Greenwich Meridian**.

4. **Standard Time** is measured to the *East* or *West* of Greenwich (London). What is this time known as ?

   _____

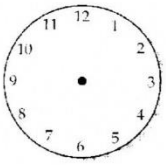
5. For each of the cities shown on the clock-faces opposite, show the correct time if it is **12.00 noon** in London.

6. What is another name for **Longitude 180^{0}E or W** ?

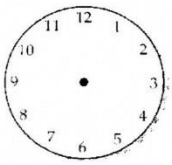
   _____

7. What is unusual about Longitude **180** ? _____

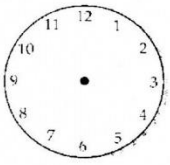
London



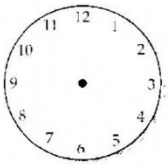
Cape Town



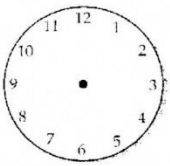
Sydney



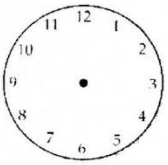
New York



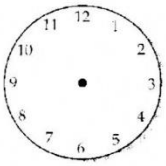
Cairo



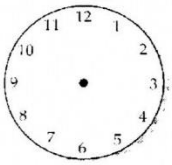
Tokyo



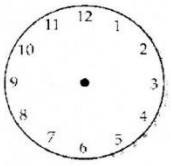
Rio de Janeiro



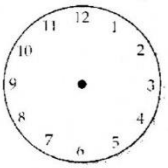
Los Angeles



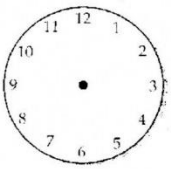
Moscow



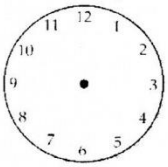
Hong Kong



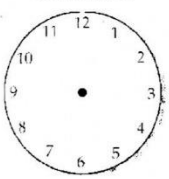
Edinburgh



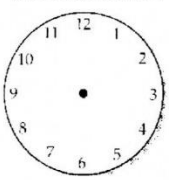
Santiago



Calcutta



Buenos Aires



Perth