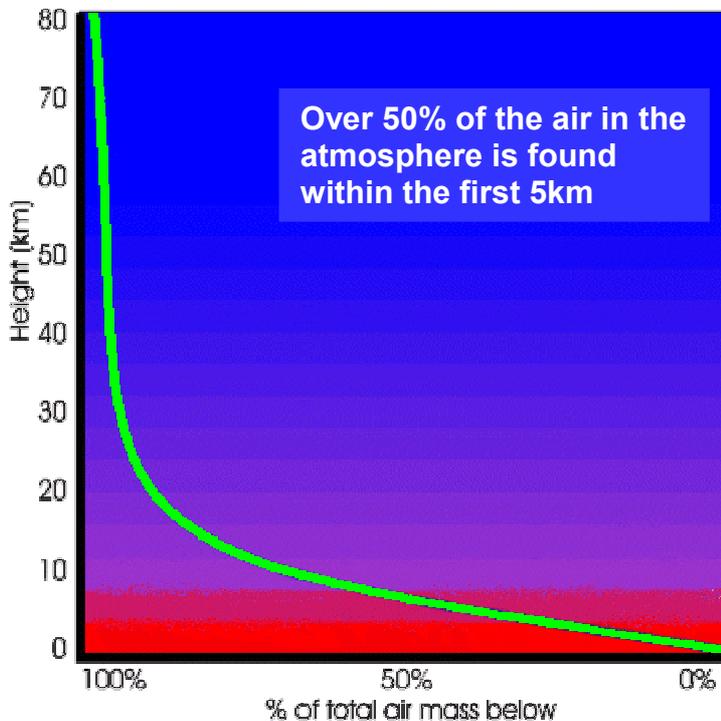


ATMOSPHERIC PRESSURE – AN EXPERIMENT

Atmospheric pressure (or air pressure) is the weight of air resting on the earth's surface. In a pile of books the weight means that pressure is greatest at the bottom of the pile. Gravity pulls the atmosphere towards the ground, so just as in a pile of books, the pressure is greater nearer the surface.

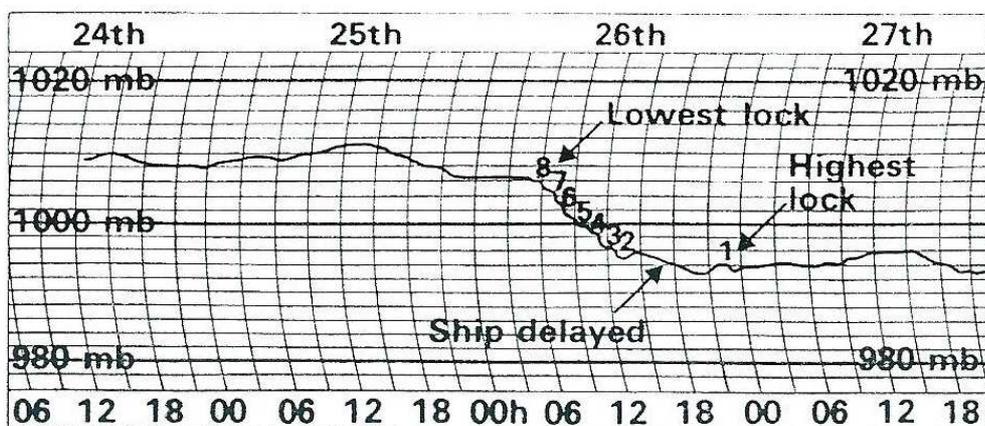


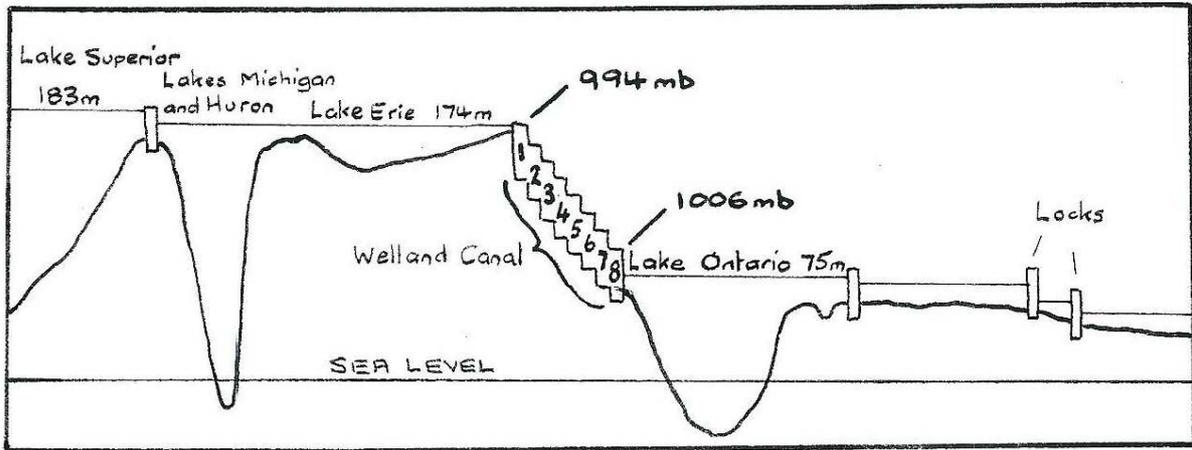
It follows that there is a pressure gradient in the atmosphere. The graph shows the higher we go the pressure falls.

Atmospheric pressure is measured by an instrument called a **barometer** in units called **millibars**.

About 90% of the atmosphere is below 16 kilometres. The fall in pressure in the lower atmosphere is about 1 mb for every 10 metres.

The famous Niagara Falls is between Lake Ontario and Lake Erie. Ships get round the falls by using the Welland Canal (see photo below). The difference in height is overcome by a series of eight locks. Ships have passed through the locks carrying a barometer. This graph shows the read out from such a barometer, you should be able to see how the pressure changed as the ship passed through the canal.





This diagram is a cross section through the Great Lakes showing the location of the Welland Canal, the locks and the pressure change recorded by the barometer.

A	Height of Lake Ontario	=
B	Height of Lake Erie	=
C	Difference in height between Lake Ontario and Lake Erie (A minus B)	=
D	Pressure at lowest lock (i.e. at Lake Ontario)	=
E	Pressure at highest lock (i.e. at Lake Erie)	=
F	Drop in pressure as ship rose (D minus E)	=
G	Number of metres over which pressure dropped by 1mb (C divided by F)	=

ACTIVITIES FOR YOU TO DO

1. Fill in the table above using the graph above and calculate the change in pressure as the ship rose through the locks.

You should find the fall in pressure came very close to the drop we would expect of about 1 mb for every 10 metres.

2. Explain why people who climb Mt Everest often need special breathing equipment.
3. Suggest why airliners deliberately climb to high altitudes when flying long distances - for example, from New York to London.