Atmospheric pressure

1. Explain how rubber suckers could be used to help lift panes of glass safely.

2. If you wanted to hang from the ceiling using a rubber sucker how big would it have to be? (Assume a perfect vacuum in the sucker. Take atmospheric pressure to be 100 000 Pa and use your own weight in Newtons Take g for the Earth as 10 N/kg).

3. On of the windows in a plane flying at high altitude breaks. Explain what happens.

4. Water has a lower density than mercury. Is the column of liquid in a mercury barometer taller or shorter than one in a barometer using water?

5. If the density of water is 1000 kg/m^3 and atmospheric pressure is 100 000 Pa how high will the column of water in a perfect water barometer be. (Take g for the Earth as 10 N/kg)

6. Explain what would happen to an astronaut doing a space walk if their space suit was punctured by a tiny meteorite.

7. What would happen to the mercury level in a mercury barometer if:
(a) the atmospheric pressure went down
(b) the atmospheric pressure went up
(c) a little air leaked into the tube above the mercury
(d) the barometer was taken up a high mountain
(e) the temperature of the room where the barometer was got higher

[Remember that mercury is a dangerous substance. It should not be used by pupils and you should certainly not heat it]

8. A high altitude weather balloon is partly inflated on the ground. What would happen to it as it rose up through the air? Explain your answer using a diagram as well if you wish.

9. Find out what is meant by:
(a) a millibar (b) an isobar (c) a cyclone (d) an anticyclone

10 (a). What is the atmospheric pressure shown by the mercury barometer in diagram 1?

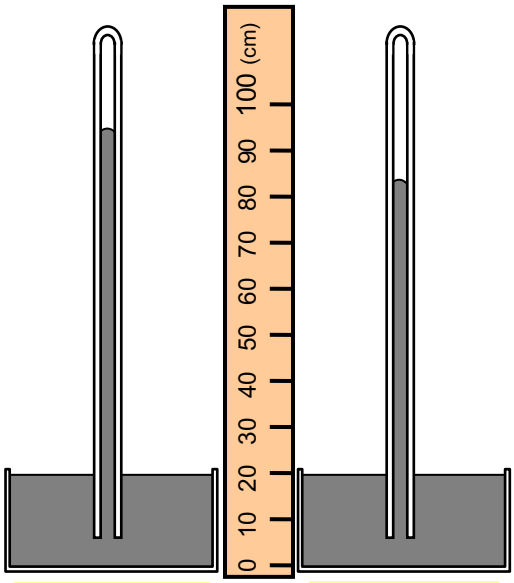

Diagram 1 Diagram 2

(b) Some air now leaks into the barometer mentioned in question 10(a). The result is shown in diagram 2.
What is the pressure of the air in the top of the barometer tube?