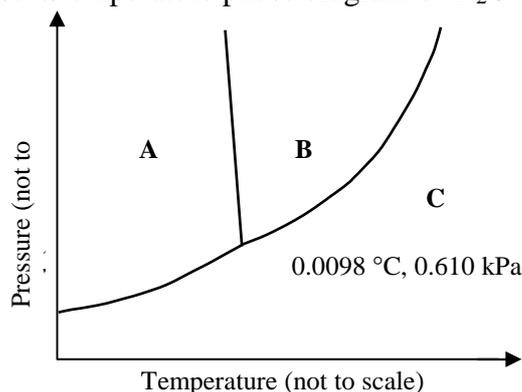


- Consider the pressure/temperature phase diagram of H<sub>2</sub>O shown below.

**Marks**  
**6**



Which phase exists in the fields labelled **A**, **B** and **C**?

<b>A: solid</b>	<b>B: liquid</b>	<b>C: gas</b>
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What are the temperature and pressure for the normal boiling point of water?

**100 °C and 1 atm**

Use the phase diagram to explain why it takes longer to hard boil eggs on the top of a 6000 m high mountain rather than at sea level.

**The air pressure is lower at 6000 m than at sea level.**

**The boundary line between regions B and C shows that lowering the pressure lowers the boiling point. When the water is boiling, it will be at a lower temperature at 6000 m than at sea level.**

**If the temperature is lower, a longer period of time is required to effect the same level of cooking.**

The unusual property of water, with the solid being less dense than the liquid, can be deduced from the phase diagram. How?

**The equilibrium line between the solid and the liquid (represented by the line between regions A and B) slopes to the left.**

**If you begin in the solid region close to this line and you increase the pressure, you will cross the line vertically and go into the liquid region.**

**The liquid is *more* stable at *higher* pressure so it must be more dense than the solid.**