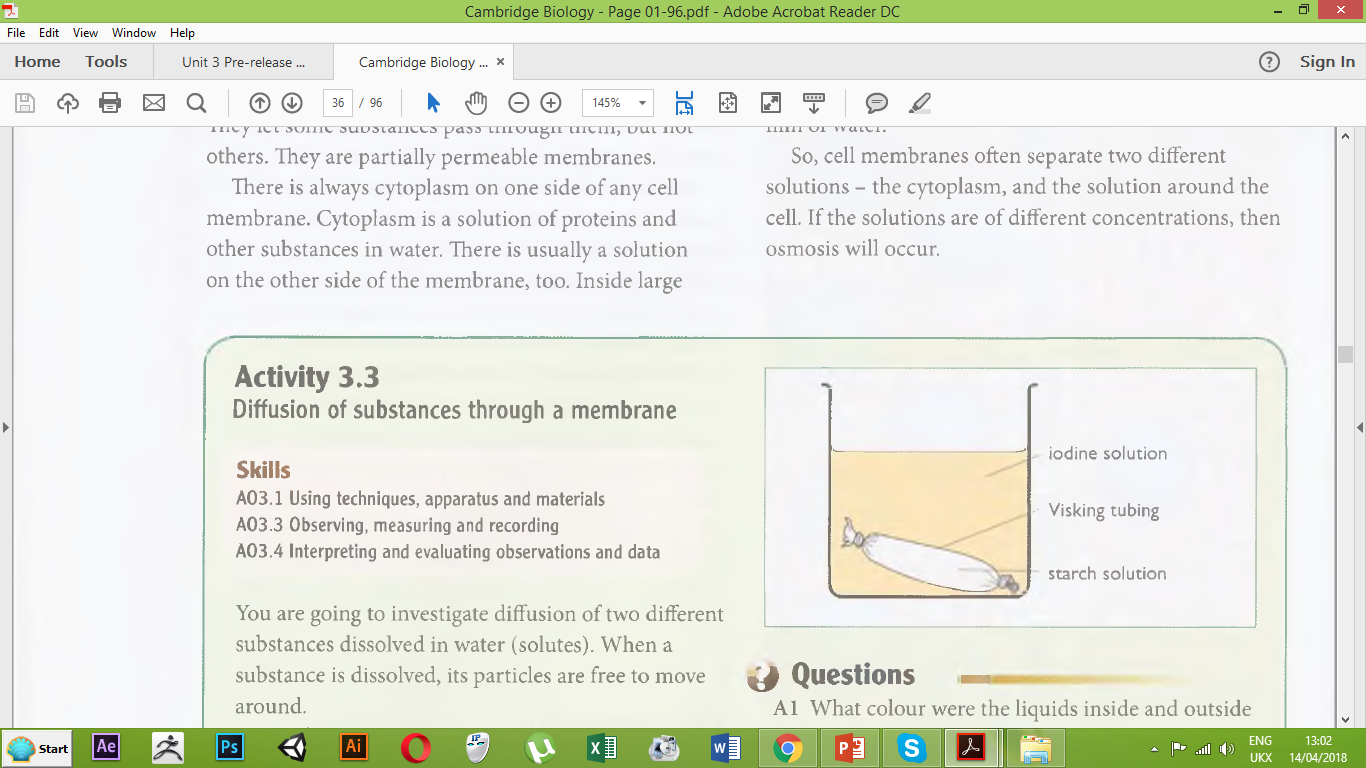
**Diffusion of substances through a membrane Skills**

**A03.1 Using techniques, apparatus and materials  
A03.3 Observing, measuring and recording   
A03.4 Interpreting and evaluating observations and data**

You are going to investigate diffusion of two different substances dissolved in water (solutes). When a substance is dissolved, its particles are free to move around.

In this investigation, you will use starch solution and iodine solution. The solutions will be separated by a membrane made out of Visking tubing. Visking tubing has microscopic holes in it. The holes are big enough to let water molecules and iodine molecules through, but not starch molecules, which are bigger than the holes.

1. Collect a piece of Visking tubing. Moisten it and rub it until it opens.
2. Tie a knot in one end of the tubing.
3. Using a pipette, carefully fill the tubing with some starch solution.
4. Tie the top of the tubing very tightly, using thread.
5. Rinse the tubing in water, just in case you got any starch   
   on the outside of it.
6. Put some iodine solution into a beaker.
7. Gently put the Visking tubing into the iodine solution, so   
   that it is completely covered, as shown in the diagram.
8. Leave the apparatus for about 10 minutes.

**Questions...**

**A1** What colour were the liquids inside and outside the tubing at the start of the experiment?

**A2** What colour were the liquids inside and outside the tubing at the end of the investigation?

**A3** When starch and iodine mix, a blue-black colour is produced. Where did the starch and iodine mix in your experiment?

**A4** Did either the starch particles or the iodine particles diffuse through the Visking tubing? How can you tell?

**A5** Copy and complete these sentences.

At the start of the experiment, there were starch molecules inside the tubing but none outside the tubing. Starch particles are too \_\_\_\_\_\_\_\_\_\_\_ to go through Visking tubing.

At the start of the experiment, there were iodine molecules \_\_\_\_\_\_\_\_\_\_\_ the tubing but none \_\_\_\_\_\_\_\_\_\_\_ the tubing. The iodine molecules diffused into the tubing, down their \_\_\_\_\_\_\_\_\_\_\_ gradient.

When the starch and iodine molecules mixed, a \_\_\_\_\_\_\_\_\_\_\_ colour was produced.