**Questions on cell membranes**

1. Describe the fluid mosaic model.   
   The fluid mosaic model depicts the cell membrane as a dual layer of phospholipids, with the hydrophilic ends on the outsides and the hydrophobic tails facing inwards. This liquid layer of phospholipids contains proteins floating throughout. Other integral parts of the membrane structure are glycoproteins, glycolipids, and cholesterol.
2. Name the parts of a phospholipid and draw an example, labelling all parts.  
   Each phospholipid is composed of two main parts, the hydrophobic head and the hydrophilic tail. The head contains a negatively charged phosphate group and another possibly charged/polar small group. The tails are nonpolar and can easily interact with other nonpolar molecules.
3. On your diagram, label the hydrophobic and hydrophilic parts of the phospholipid.
4. Explain why the hydrophobic and hydrophilic sections of the phospholipid bilayer are so important for cell membrane structure.   
   It is important for the phospholipids to have both a hydrophobic and hydrophilic section because both support the function of the phospholipid and the formation of the cell membrane. The hydrophilic head allows contact with the aqueous fluid on either side of the membrane, forming electrostatic interactions. The hydrophobic tails easily interact with other nonpolar molecules, but not water. The tails being in the interior of the bilayer is more energetically favourable. These sections of the phospholipid combine to create an effective barrier between the interior and exterior of the cell.
5. Explain why cholesterol can stabilise the phospholipid bilayer.   
   Part of the cholesterol molecule interacts with the heads of the phospholipids, slightly immobilizing the membrane’s outer surface and making it less soluble to very small water-soluble molecules.
6. Describe the effect temperature can have on cholesterol.   
   Below 37 degrees the cholesterol makes the membrane less fluid by restraining phospholipids movement.
7. State the 2 main types of proteins located in the cell membrane and describe how they are different.  
   Integral proteins go into the membrane’s hydrophobic core and have both polar and non-polar regions, and peripheral proteins are not embedded in the bilayer, instead being present on the inside and outside surface of the membrane.
8. Describe the 6 major functions of proteins within the cell membrane.

* Transport: proteins provide a channel across the membrane for particular solutes
* Cell-cell recognition: Some glycoproteins serve as identification tags that allow other cell’s proteins to recognise that cell
* Signal transduction: a membrane protein (receptor) allows interaction with their specific chemical messenger (e.g. hormone), changing the protein shape and relaying the message to the inside of the cell
* Enzymatic activity: Some enzymes are built into the membrane, and change the rate of reaction
* Intercellular joining: Membrane proteins of adjacent cells may hook together in various kinds of junctions
* Attachment to the cytoskeleton and extracellular matrix (ECM): Some parts of microfilaments of the cytoskeleton may be bonded to membrane proteins. This helps with cell shape and stabilises the location of certain proteins. Proteins that bind to the ECM can coordinate extracellular and intercellular changes