Answer to Practice Quiz #3

1. A cell membrane is selectively permeable because it is structured in such a way that it allows certain molecules to pass through while blocking others.
2. The activity of selective permeability protects a cell because it allows it to take in components which are needed (O2, etc.) and maintain a barrier to molecules or ions which may be harmful to the cell.
3. There are examples of selective permeability everywhere. The one we looked at with the respiratory system involved the exchange of gases taking place in the lungs. The membranes of the alveoli and capillaries allow for the passage of oxygen gas but restrict other substances which might make their way to the lungs (particulate matter such as pollen, nitrogen gas from the atmosphere, etc.). As well, capillary tissue allows oxygen gas to diffuse through, while preventing proteins, hormones, antibodies and other components of the blood from diffusing out.
4. High, Low
5. The body must maintain a concentration (pressure is also involved) gradient such that oxygen gas is always flowing into the blood while CO2 diffuses out. This means that the oxygen concentration in the blood must be lower than that of the atmosphere (which is 20%) and the concentration of CO2 in the blood must be higher than the atmosphere. The maintenance of the concentration gradients ensures that these gases will always flow in the proper direction.
6. Surface area is important for diffusion rates because an increased surface area to volume ratio means that there is more interactive surface for the diffusion reaction to take place. The more points of contact for diffusion, the quicker it will proceed. Your body maximizes surface area in the alveoli and capillaries of the lungs. These structures are super-tiny, which means there’s a lot surface area in proportion to their volume. This is beneficial because it allows a greater quantity of oxygen to be extracted from the atmosphere than if the ratio of surface area to volume were lower.
7. A
8. B
9. D
10. A
11. B
12. 1.h 2.e 3.b 4.g 5.c 6.d 7.a 8.f
13. Red blood cells, buffy coat (white blood cells + platelets), and plasma
14. Please visit this website for a detailed explanation:

<http://learn.genetics.utah.edu/content/inheritance/blood/>

Extra Credit

Only you can determine the answers to these questions….