

## Answers to Chapter 2

<b>2.1</b>	<b>Plant &amp; Animal Cells</b>
1.	Be able to write the cell theory in your words. Check page 29 of text
2.	My cells are eukaryotic because they all have a nucleus.
3.	The most obvious difference between eukaryotic and prokaryotic is the absence of a nucleus in prokaryotic. Also..prokaryotic cells tend to be simple, one-celled bacteria. Eukaryotic cells can be part of large multi-cellular organisms like humans!
4.	Nucleus coordinates the cells activities through the chemical DNA. DNA carries coded instructions.
5.	When we exercise we use muscles. Muscles require energy. This energy is liberated by the mitochondria through cellular respiration. Glucose + oxygen → carbon dioxide + water + usable energy. So..we need oxygen to liberate the needed energy and we breath heavier.
6.	Not all plant cells contain chloroplasts. Chloroplasts are where photosynthesis occurs but you need sunlight for this. Cells that are not likely to receive sunlight (like roots or the underneath of leaves) probably won't have chloroplasts.
7.	Plant cell wqalls contain cellulose and this provides support and protection from injury to plants.
8.	Plants make their own food by photosynthesizing. They also have mitochondria because they need a way of liberating or releasing their energy when they need it. Plants need energy to live and grow too! Plants undergo cellular respiration as well.

## Answers to Plant & Animal Cell – labelling organelles

1. mitochondria	6. nucleus	11. lysosome
2. chloroplast (plant only)	7. cell wall (plant only)	12. cytoplasm
3. rough endoplasmic reticulum	8. cell membrane	13, flagellum (animal only)
4. ribosomes (dots on E.R.)	9. vacuole	
5. smooth endoplasmic reticulum	10. Golgi Body	

<b>2.3</b>	<b>Importance of Cell Division</b>
1.	Three reasons for cell division: reproduction, growth and repair.
2.	If 99.9% of bacteria are killed, there are some that remain (0.1%). Over time these bacteria will reproduce and the surface will NOT be bacteria free. (Bacteria can reproduce fairly quickly – doubling ever 20 min!)
3.	Asexual reproduction requires only 1 parents whereas sexual reproduction requires 2 parents. Asexual reproduction produces exact copies (clones) whereas sexual reproduction produces genetically different offspring. Asexual reproduction the parent cell merely divides. Sexual reproduction requires that the parents create 'gametes' or 'half cells' first. Then these gametes combine and produce the offspring. The gametes are often called egg and sperm.
4.	Chemicals go in/out of cell by diffusion and osmosis. Diffusion – chemicals move in/out of cell from areas of high concentration to areas of low concentration.

	Osmosis – is the movement of a fluid across a membrane. Often the fluid is water. The fluid moves towards an area of greater solute concentration. Ie: water would move from less salty water to really salty water. Salt is the solute.
5.	When a cell gets too big, the water and chemicals cannot move quickly enough in/out of cell. Although the cell is larger, the relative size of the membrane is small. Small cells are move efficient at osmosis and diffusion.
6.	A wound means some cells are damaged. These damaged cells must be replaced. So nearby cells divide and replace them. This takes a bit of time so the wound heals over a few days.

<b>2.5</b>	<b>The Cell Cycle</b>
1	DNA replicates (doubles) at the end of interphase
2	The parent cell must double its DNA so each of the 2 daughter cells receives the SAME genetic information. If it didn't double, then the daughter cells would receive ½ of the parent's DNA.
3	Chromosomes are visible during mitosis because they thickened up. During interphase, they are all strung out, thin and hard to see (called chromatin at this stage).
4	Mitosis is a process. The cell gradually moves from one stage to the next, so yes, it can appear to be between 2 stages. We give names (prophase, metaphase, anaphase and telophase) to the most obvious points.
5	a) new cell wall forming – telophase (in plant cell) b) nuclear membrane disappears – prophase c) daughter chromosomes begin to separate – anaphase d) cell begins to pinch together – telophase (in animal phase) e) Thick chromosomes in 2 distinct areas of cell - telophase f) cell grows and copies its own DNA - interphase
7	Interphase is not 'resting' stage. During this stage the cell is growing and doing 'its job'. Ie: A muscle contracts, a nerve cell fires, a stomach cell excretes stomach acid etc. Etc. Also near the end of this phase, the cell doubles its DNA. There is no 'resting'.

<b>2.9</b>	<b>Specialized Cells</b>
1	Complex organisms are made of specialized cells because every cell cannot do every job for the body. The body has to divide up the duties and assign certain cells to do certain duties.
2	Your body needs to: digest food, absorb digested food, bring oxygen in to cells, get rid of carbon dioxide, coordinate our movements, send messages, filter waste out of blood etc. Etc.
4	Different cells must be using different parts of the DNA they were given. Since all my cells came from 1 fertilized egg cell, they must have all the same DNA. But since they look different, they must be using different parts of the DNA.
5	Plant cells differentiate and specialize like animals cells, but in different ways. For example, plant cells need to create photosynthetic cells with lots of chloroplasts and obviously animal cells do not need to do this. Animals get their nutrients by digesting food. Special cells are need for this. Plant cells have guard cells that prevent water loss from leaves and animals would not need this. Animals are covered in skin to prevent water loss. Animals often have muscle cells to move bones. Plant cells do not need this.
6	Single-celled organisms do not show specialization because they can meet all their own needs

since they are so small. Diffusion and osmosis help the cell bring in nutrients, oxygen and water and get rid of waste.
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