1. Compare and contrast prokaryotic and eukaryotic cells using a Venn diagram.

Prokaryotes Both Eukaryotes

More primitive

DNA in a single loop Have DNA DNA as thread-like strands chromatin in nucleus

No nucleus True Nucleus

No membrane bound organelles Membrane bound organelles

Small, primitive Cell membrane larger, more modern

 Ribosomes

1. Name the components of the nucleus. Nuclear envelope, nucleolus, chromatin, nucleoplasm, nuclear pores
2. Compare and contrast the structure and function of the rough endoplasmic reticulum and the smooth endoplasmic reticulum using a Venn diagram.

Rough ER Both Smooth ER

Studded with ribosomes membrane-bound no ribosomes

Synthesizes proteins tubules and sacs synthesizes lipids

Transport material detoxify drugs and alcohol

1. Name the organs of the body that would have a higher number of rough ER and smooth ER.

Liver and pancreatic cells would have a lot of rough ER. Cells in the testes and ovaries have a lot of smooth ER (steroid production and secretion).

1. How does the Golgi apparatus work with the endoplasmic reticulum? Golgi apparatus receives the proteins form the ER and modifies, sorts and packages the proteins for export.
2. Describe the structure and the function of lysosomes. Lysosomes are membrane-enclosed sacs with hydrolytic enzymes for intracellular digestion.
3. If cells were unable to make catalase, how could this be fatal? Without catalase, the body could not break down toxic hydrogen peroxide into water and oxygen gas. The buildup of the hydrogen peroxide could be fatal.
4. Describe what happen once a lysosome encounters a vesicle with a bacterium that the cell has just ingested. The lysosome fuses with the vesicle and release its hydrolytic enzymes. The enzymes break down the bacterium.
5. What is the role of vesicles in the cell? Vesicles are used to store and transport materials around the cell.
6. Describe what happens to a plant if there is not enough water in its central vacuole. Turgor pressure decrease and the central vacuole shrinks and pulls away from the cell wall. This is the case when a plant wilts.
7. Compare the structure of a chloroplast to the structure of a mitochondrion. How are they similar? How are they different? Similarities: double-membrane organelle, contain their own DNA. Differences: chloroplast has thylakoid, grana, and liquid stroma and is involved in photosynthesis. Mitochondria have cristae and fluid-filled matrix and is involved in cellular respiration.
8. Use a Venn diagram to compare and contrast microfilaments and microtubules. Include their functions, where they are found and their structural differences and similarities.

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| Microfilaments  | both  | Microtubules |
| Two strands of actin wound together  | maintain cell shape | Protein that forms hollow tubes |
| Produce cleavage furrow | Involved in cell division | Involved in providing mobility |
|  | Protein fibres in the cytoskeleton | Produces spindle fibres during cell divison |

1. Describe the role of intermediate filaments play in the cytoskeleton. Intermediate filaments are proteins that help maintain the cell shape and anchor some organelles. They also form the internal scaffolding of the nucleus.
2. Describe the structure and function of a flagellum. A flagellum is composed of microtubules and helps an organism move.