Organelles and Cell Structures

Introduction: This activity will be used as bellwork for students to review organelles and cell structures. The cards will be laminated and cut out. The cell pictures will be colored to identify only one organelle and then laminated. At the beginning of class the three sets of cards will be distributed- organelle, function, picture. Students will then move around and find the students who hold the cards that match. On later dates, the cards may be used as flash cards to review for the EOC exam.

NOTE: This topic has already been covered in detail in the first semester.

Grading: Students will be given bellwork credit (normally 10 points) for their participation in the activity. Quizzes may include vocabulary from this exercise.

Frameworks:

- MC2B2 Compare and contrast prokaryotes and eukaryotes
- MC2B3 Describe the role of subcellular structures in the life of a cell- organelles, ribosomes, cytoskeleton
- MC2B5 Compare and contrast the structures of an animal cell to a plant cell

RIBOSOME	An organelle synthesized by the nucleolus, composed of RNA and protein; consists of two subunits, not surrounded by a membrane; functions in protein synthesis (links amino acids together to form polypeptides/proteins); may be "free" in the cytosol or attached to the endoplasmic reticulum
MITOCHONDRION	An double membrane organelle, with its own DNA, that is the site of cellular respiration. ATP production begins in the cytosol; glucose is converted to pyruvate. In the presence of O_2 pyruvate enters the mitochondria & is converted to acetyl coenzyme A which enters the Krebs Cycle (citric acid cycle). A small amount of ATP is produced in glycolysis & the Krebs cycle. Most of the ATP generated during cellular respiration is by the electron transport chain.

CHLOROPLAST	Double membrane organelle in plant cells and some protists that contain pigments & function in photosynthesis. The light dependent reaction occur within thylakoid membranes; energy is transferred & molecular oxygen is produced. The light independent reactions (Calvin cycle) occurs within the stroma of the chloroplast. CO_2 is combined with hydrogen & sugar is produced. This organelle has its own DNA.
LYSOSOME	Organelle containing hydrolytic enzymes that functions in the breakdown of wastes, food and the destruction of worn out organelles and cells. Many of these organelles are found in cells that specialize in phagocytosis, such as white blood cells. They are not found in plant cells.

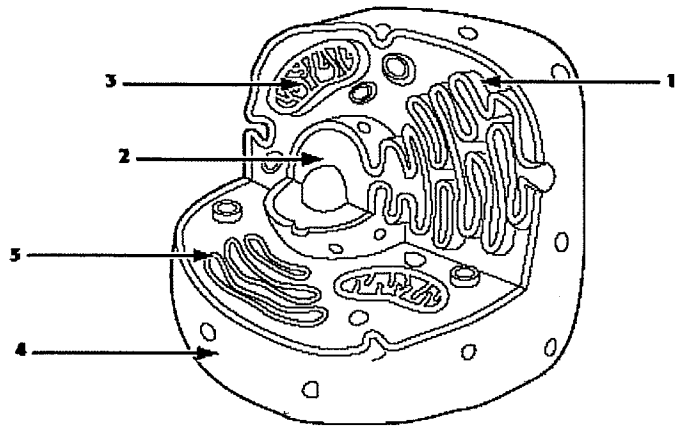
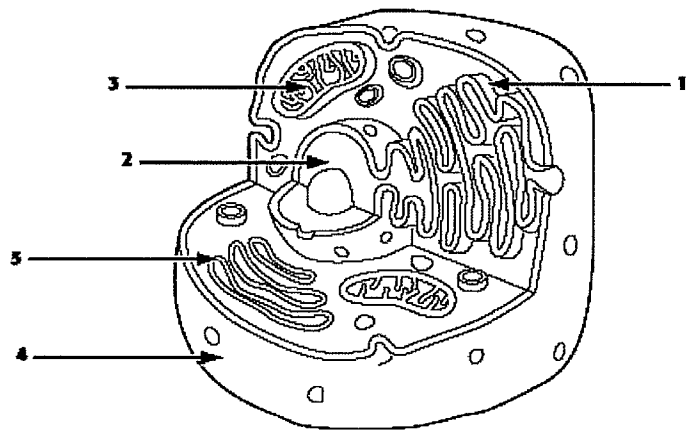
Golgi complex	Membranous organelle resembling "flattened sacs" called cisternae located close to the endoplasmic reticulum. This organelle receives products from the ER, sorts, packages and exports them. These organelles are extensive in cells that specialize in secretion. Lysosomes are formed from this organelle.
Smooth Endoplasmic Reticulum	Part of the "endomembrane" system- this membranous organelle is continuous with the nuclear membrane and the cell membrane. It has a variety of functions including storage of calcium, detoxification and lipid synthesis. This organelle is extensive in cells that specialize in steroid production.

Rough Endoplasmic Reticulum	Part of the "endomembrane" system- this membranous organelle is covered with ribosomes & is continuous with the nuclear membrane & cell membrane. It transports & modifies the proteins that are produced by its attached ribosomes, It produces vesicles containing proteins.
Cytoskeleton	This structure provides a framework for a cell, anchors the organelles, and functions in the movement of things within the cell. It is composed of protein fibers such as actin, microtubules and intermediate fibers.

Vacuole	Large membrane-bound space that may serve as storage for food, waste or water. It may have a specialized name depending on its function.
Nucleus	Contains the chromosomes in a eukaryotic cell; usually the largest organelle and centrally located. This organelle is surrounded by a double membrane. It has small pores that allow small molecules to move in and out.

Nucleolus	Located within the nucleus. Synthesizes ribosomal RNA and forms the subunits of ribosomes. This structure is only visible when the cell is in interphase.
Peroxisome	This organelle contains enzymes that transfer hydrogen from various substances to oxygen, producing hydrogen peroxide. In the liver, they function in detoxification. They split in two when they reach a certain size. They are an important source of stored energy in plant seeds.

Centrosome	AKA the microtubule organizing center. In animal cells it contains a pair of centrioles. This structure replicates during interphase and moves to opposite poles of the cell and forms the spindle apparatus.
Cilia and Flagella	Specialized arrangements of microtubules found in many cells such as sperm, cells that line the respiratory tract and *Paramecium*.

 3 1 2 5 4	 3 1 2 5 4