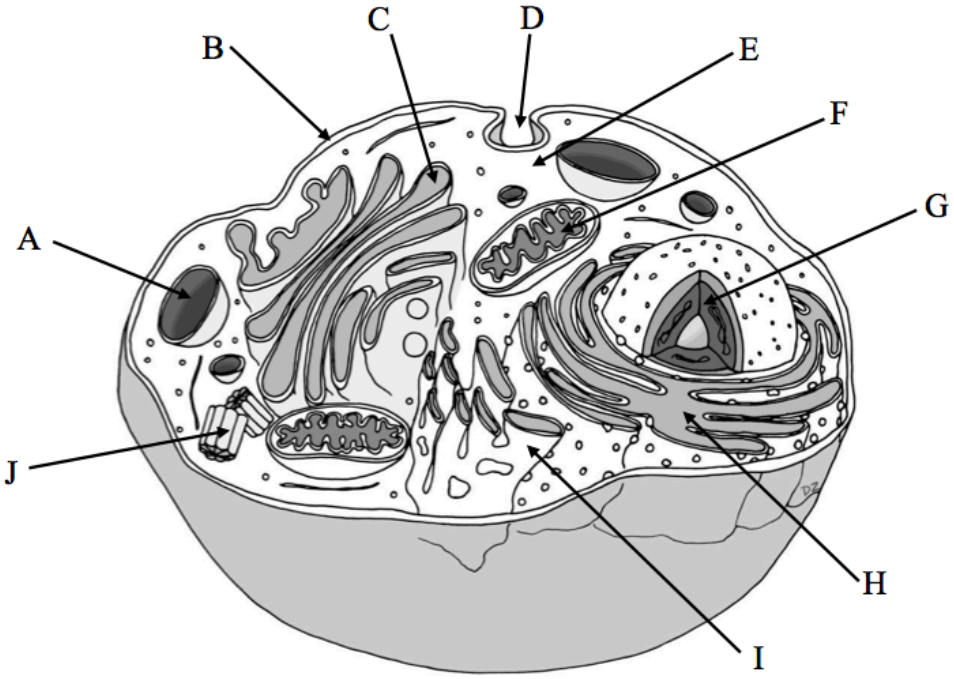
Last Name Boyle First Name Nathan

Homework # 1 **Due February 3 – AT THE BEGINNING OF CLASS!!!!!!!**

Behold the cell!



(1 pt) Is the above cell an animal or plant cell? How can you tell?

Animal Cell. It does not have a rigid cell wall, central vacuole, or other distinctive organelles of a plant cell.

(4 pts) Fill in the following table with the name of the organelle and the appropriate letter from the diagram above. YOU MAY USE AN ORGANELLE or A LETTER more that once because many organelles have more than one function!

DESCRIPTION	ORGANELLE	LETTER
An alcoholic whose is in a position to constantly require detoxification would be likely to have cells with a large amount of this	Smooth ER	I
This determines what goes into and out of the cell.	Cell Membrane	B
This organelle is called the post office of cell.	Golgi Apparatus	C
Muscle cells, which require a lot of energy, would have many of these organelles	Mitochondrion	F
Membrane organelle that ribosomes attach to during protein synthesis	Rough ER	H
You would see lots of these in cell that specialize in getting rid of waste and debris	Lysosome	A
This is the swampy liquid environment inside the cell.	Cytoplasm	E
Chromosomes are found here.	Nucleus	G

(2 pts) For this table, put a checkmark if you will find the structure listed in the cell listed.

Organelle	Bacterial cells	Plant Cells	Animal Cells
Cell Wall	X	X	X
Chloroplast		X	
Cytoplasm	X	X	X
Endoplasmic Reticulum		X	X
Chromosomes	X	X	X
Cytoskeleton		X	X
Mitochondria		X	X
Ribosomes	X	X	X

One of the important things about eukaryotic cell having membrane bound organelles is that it allows for COMPARTMENTALIZATION of processes. This means that different processes can occur in different areas of the cell at the same time, allowing the eukaryotic cell to multi-task and separate incompatible reactions. For example, you would not want to have protein synthesis in the same area where you are destroying cellular debris!!

(3 pts) Why might compartmentalization be important for the following organelles:

- Lysosome Because lysosomes break down proteins into their constituent molecules, their operation must be separated from the inside of the cell. If it were not, it would probably begin to break down other organelles, leading to cell death.

- Nucleus The nuclear membrane is key to both protecting the cell's genetic material and protecting the command center. Were these processes occurring in an unprotected area chromosomes might, for instance, be broken down by lysosomes and the cell might confuse foreign genetic material for its own much easier.

- Mitochondria Compartmentalization is important because the mitochondria needs very specific molecules to generate adenosine triphosphate. Were there no membrane, the cell simply could not function.