Who Do Organelles Do?

Name: _____ Date: _____

What Do Organelles Do?

- While a bicycle is large and made up of parts that you can easily see, cells are made up of parts that you cannot see without using a _____.
- Each organelle of the cell has a specific _____ to do.

Cell's Control Center

- _____ controls all the activities and hereditary functions of the cell (much like your _____).
- Nucleus is surrounded by a _____ _____ that contains thousands of tiny holes, or pores, which allow materials to move back and forth between the nucleus and the cytoplasm.
- Nucleus sends _____ in the form of special chemical messengers, which are delivered to the organelles.
- The nucleus contains the instructions for the organelles to carry out _____ _____.
- _____ pass between the nucleus and the cytoplasm through tiny pores in the nuclear membrane.

Cell's Control Center: Chromatin

- _____ is a mass of genetic material found in the nucleus.
- It is composed of _____.
- Contains all the information that directs all the _____ of the cell.
- When cells are ready to divide, the chromatin _____ and forms the chromosomes.

Cell's Control Center: Nucleolus

- _____ is a small structure inside the nucleus.
- _____ are made there.
- A cell can have up to _____ nucleoli.
- The number for each species is always the _____.

Organelles and Their Functions

- Inside _____ cells, there is a variety of tiny organelles.

- The work of the organelles makes it possible for cells to
  - _____ energy from food
  - to get rid of _____
  - and to do many other things that allow the cell to _____ and _____ the body

Organelles and Their Functions: Ribosomes

- _____ make up most the cell.
- _____ are small organelles that make the proteins.
- Since proteins are necessary for life, there are _____ ribosomes than any other organelle.
- Free-floating ribosomes make _____ for the cell.
- Ribosomes attached to the ER make proteins that are moved _____ of the cell.

Organelles and Their Functions: Endoplasmic Reticulum

- The largest organelle is the endoplasmic reticulum, or _____.
- It is a network of tube-like channels that winds through the _____.
- ER is the cell's _____ system for moving materials around the cell.
- Connects to the _____ _____.
- Two kinds of ER
  - _____ ER
  - _____ ER
- Smooth ER
  - Lacks _____, giving it a smooth appearance
  - Transports proteins throughout the _____
  - Builds and store lipids (_____)
- Rough ER
  - _____ the ribosomes, giving it a rough appearance
  - Provides a surface where _____ can be built
  - Increases the _____ _____ on which cell processes happen

Organelles and Their Functions: Golgi Apparatus

- _____ _____ is the organelle that packages the materials for the endoplasmic reticulum to transport.
- Is made up of a stack of three to twenty slightly curved sac-like membranes that _____ in the cytoplasm.

- Receives the proteins produced in the rough ER, inspects the proteins for flaws, and makes any changes needed, then sends them to the _____ _____.

Organelles and Their Functions: Vacuole

- A _____ is a fluid-filled storage container.
- Some _____ water, other liquids, or food particles.
- Some store waste products until they can be _____ from the cell.
- A membrane keeps the vacuole contents _____ from the cytoplasm.
- Found in _____ plant and animal cells.
- Those in plant cells are much _____.

Organelles and Their Functions: Mitochondria

- _____ are organelles that release the energy the cell needs to function.
- Often referred to as the "_____" of the cell.
- May be _____ or cylindrical in shape.
- Has _____ membranes.
- Outer membrane is _____ and has a structure like that of the cell membrane.
- Inner membrane has several _____.
- Folds on the inner membrane are called _____.
- The cristae provide the surface area needed for _____-producing reactions to take place.

Organelles and Their Functions: Chloroplasts

- _____ are large, green, oval-shaped organelles in which photosynthesis takes place.
- Found only in _____, many protists, and some prokaryotic cells.
- These organelles have a _____ membrane that surrounds them.
- Inside the membranes is a gel-like fluid called _____.
- _____ are made inside the chloroplast.
- The manufacture of sugars takes place on special disc-shaped structures called _____.
- The grana contain chlorophyll-filled sacks called _____.
- It is the chlorophyll that gives plants their _____ color.
- The job of the chloroplasts is to trap energy from sunlight and turn it into _____ energy.

Organelles and Their Functions: Vesicle

- The _____ is a small sac-like structure that forms when part of the smooth ER buds off.
- Vesicles help transport _____ and other materials that the cells need to be able to do the jobs for which they are designed.
- When needed, the proteins and other materials contained by the vesicles are released into the _____ to be used by the cell.

Organelles and Their Functions: Lysosomes

- _____ are specialized vesicles that float freely in the cytoplasm.
- They are formed in the _____ _____.
- They are responsible for _____ _____ and digesting materials such as food and worn-out cell parts.
- They play a role in _____ harmful bacteria.
- They contain powerful digestive chemicals that combine with white blood cells that surround bacteria and form a vacuole around the bacteria to _____ them.

Organelles and Their Functions: Cilia and Flagella

- Some cells have hair-like projections, called _____ and flagella that sick out from the cell's surface.
- Cilia are hair-like and generally cover the cell's entire _____.
- _____ are much longer, and usually limited to one or two per cell.
- Both structures are often found in _____.
- Protozoa are _____ creatures that live in water and wet place.
- Protozoa use cilia or flagella to _____ from place to place.
- In your body the movement of cilia in the trachea and bronchioles helps clear your _____ of dust.
- The hair cells of the _____ ear, which move in response to the vibration of sound waves are cilia that play an essential role in hearing.

Organelles in Cell Transport

- _____ organelles largely responsible for proteins moving throughout the cell
  - _____ (endoplasmic reticulum)
  - _____ Apparatus
  - _____
- The ER transports _____ products to the Golgi apparatus.

- The Golgi apparatus in turn packages _____ in other vesicles so the proteins can cross the cell membrane and leave the cell.
- The Golgi apparatus also transports _____ and creates lysosomes and vesicles involved in digestion.

Animal and Plant Cells

- While plants and animal cells share many common features and processes, they have distinct _____.
- These differences allow them to carry out _____ jobs.
- Differences
  - Vacuole are smaller in _____ cells and are larger in _____ cells
  - _____ cells have cell wall and chloroplast

Machines at Work

- _____ are constantly busy carrying out life functions.
- They are microscopic, but try to think of each organelle as an individual _____.
- Each organelle includes thousands of tiny molecular machines with multiple moving parts that work _____ to perform a specific job.
- Like machines designed by humans, these tiny molecular machines are amazingly _____.
- Solar-powered machines (_____) capture light energy and store it.
- Tiny electrical machines in nerve cells carry _____.
- Tiny mechanical machines in _____ _____ haul cargo and even build other machines.
- Every cell in every plant and animal functions because of the combined work of these _____ _____.
- If these machines were not _____, the cell would not be alive.
- But the complexity _____ end there.
- Most of these tiny molecular machines are made up of _____.
- _____ are required for every structure and function within the cell.
- There are tens of thousands of different kinds of proteins in each cell, each with a _____ _____ to do.
- But before we can understand proteins, we need to know about one _____ thing.

Machines at Work: Amino Acids

- The building blocks of proteins, which are called _____ _____.

- Think of amino acids as differently shaped, interconnecting _____.
- Instead of a typical set of blocks with about a dozen different _____.
- Imagine _____ different shapes with different chemical properties.
- When amino acids are joined together, they make _____.
- A _____ protein contains hundreds, or even thousands, of amino acids in a row.
- A specific protein is made only when the exactly the right amino acids join in just the right _____.
- The protein then folds into a _____ _____.
- Exactly the right shape is _____ for the protein to function the way it is supposed to.

Machines at Work: New Discoveries

- Each time a molecular biologist makes a new discovery about amino acids, proteins, or molecular machines, it becomes more challenging to imagine that such complex things could have happened spontaneously from _____ matter.
- If scientists from the nineteenth century who thought cells were simple little blobs could have known that our bodies are made up of _____ of cells
    - Each cell housing thousands of _____
    - Each organelle made up of tens of thousands of _____
    - Each protein made of hundreds or thousands of _____ _____.
- They might not have been as willing to accept the idea of _____.