Goals

My goal for this packet is........

_________________________________________

_________________________________________

_________________________________________

_________________________________________

This is my goal because..........

_________________________________________

_________________________________________

_________________________________________

_________________________________________

I know I have accomplished this goal when....

_________________________________________

_________________________________________

_________________________________________

_________________________________________
The Cell. I can Statements

_____ I can state the cell theory

_____ I can name various organelles inside the cell

_____ I can name the function of these organelles

_____ I can state various cell processes

_____ I know which organelles carry out these processes

_____ I can state the difference between plant and animal cells.

_____ I can identify the 5 levels of cellular organization.
The Cell: Parts and Functions

**Cell wall** - Outermost non-living layer of the cell. Found only in some cells. Rigid layer.

**Cell Membrane** - Controls or regulates what goes in and out of the cell. Found in all cells. Outermost living layer of the cell.

**Cytoplasm** - Cell Fluid. All of the material outside of the nucleus and inside the cell membrane.

**Chloroplast** - Found in plant cells and plantlike organisms. Puts CO₂ and H₂O together (using energy from the sun) to make glucose. This process is known as photosynthesis.

**Mitochondria** - Powerhouse of the cell. Converts glucose (sugar) into usable energy. The organelle where respiration takes place.

**Endoplasmic Reticulum** - Moves products from the nucleus to the cytoplasm, or from the cytoplasm out through the cell membrane. Transports materials throughout the cell.

**Ribosome** - Makes all the proteins produced by the cell.

**Vacuole** - Storage sacs. (help in digestion, waste, and food storage). Aids in transportation of products in the cell.

**Lysosome** - Digestive sac. Contains digestive enzymes for cellular digestion.

**Golgi Complex** - Produce and release products. They are especially common in tissues that secrete products (glands).

**Nucleus** - Control/Regulatory center of the cell. Information center of the cell. Found in all cells except monerans.

**Nucleolus** - Small body within the nucleus. Makes ribosomal RNA.

**Chromosomes** - Blueprint or master plan of the cell. Structure within the nucleus that contain the genetic information. (DNA)

**Centrioles** - Cylinder shaped structures containing 9 pattern microtubules which help separate chromosomes during cell division.
**Metabolism** - The sum of all the building-up and breaking-down activities in the cell.

**Respiration** - The process in which simple food substances are broken down and energy is released. Takes place in the *mitochondria*.

**Fermentation** - Anaerobic respiration. Food is broken down and energy is released without the use of oxygen.

**Diffusion** - The process by which molecules of a substance move from an area of high concentration of that substance to an area of low concentration of that substance.

**Osmosis** - The diffusion of water into or out of the cell.

**Active Transport** - Energy requiring process that helps “carry” a substance across the cell membrane.

**Photosynthesis** - Process by which organisms use energy from sunlight to make their own food. Takes place in the *chloroplast*.

**Additional notes:**

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
3.1 Guided Reading Cell Biology

As you carefully read through the text, answer the following questions as completely as possible!

Introduction

1. Cells make up all __________ __________, including your own body!

2. Cells can differ in __________ and size, and the different shapes usually means they have different _____________________.

Introduction to Cells

2. What is a cell? Explain.

3. Some organisms like bacteria consist of only ___________ cell, while other organisms, like humans, consist of ___________________ of cells.

Observing Cells

4. Most cells are so small that you cannot see them without the help of a _____________________.

5. Who observed cells for the first time?

6. How are light microscopes different from electron microscopes? Explain.

Cell Theory


8. Describe the three components of cell theory.
Specialized Cells

9. The cell’s function is partly based on the cell’s ______________________.

10. Describe three examples of how a cell’s function depends on its structure.

Levels of Organization

11. Specialized cells are organized into ______________________.

12. How are cells, tissues, and organs related? Explain.

13. What is an organ system? Describe an example of an organ system.

Review

14. Summarize the three points listed.

3.2 Guided Reading Prokaryotic and Eukaryotic Cells

As you carefully read through the text, answer the following questions as completely as possible!

Introduction

1. Explain how bacteria cells are similar to human cells.

Prokaryotic and Eukaryotic

2. The two basic types of cells are called ______________________ and ______________________.

3. What is the main difference between prokaryotic and eukaryotic cells?

4. What is the nucleus? Explain.

5. All prokaryotic organisms are ______________________-celled.

6. What are the two types of prokaryotes?
7. List several types of eukaryotes.

8. List and describe the several structures that are found in both prokaryotic and eukaryotic cells.

**Eukaryotic Cells**
9. Eukaryotic cells usually have multiple ____________________________.

10. What are chromosomes composed of?

11. What are organelles? List several types of organelles found in eukaryotic cells.

**Prokaryotic Cells**
12. Prokaryotic cells are usually ____________________________ and _____________________ than eukaryotic cells.

13. Explain how DNA is stored in prokaryotic cells.

### 3.3 Guided Reading Cell Membrane
As you carefully read through the text, answer the following questions as completely as possible!

**Introduction**
1. What do your cells have to helps to guard them from unwanted intruders?

**The Plasma Membrane and Cytosol**
2. All cells have a barrier around them that separates them from the environment and from other cells; this barrier is called the ____________________________.

**The Plasma Membrane**
3. The plasma membrane is made of a double layer of special lipids, known as ____________________________.
4. Describe the structure of phospholipids.

5. What is the cytoplasm made mostly of?

6. Describe how the phospholipid molecules are arranged to keep the cell’s contents separate from the environment.

7. What is the function of the plasma membrane.

8. The plasma membrane is semipermeable. What does this mean?

**Cytosol**

9. What is cytosol?

10. How is the cytosol related to the cytoplasm? How are they different?

### 3.4 Guided Reading Cell Nucleus

As you carefully read through the text, answer the following questions as completely as possible!

**Introduction**

1. Where is DNA found in the body?
Nucleus

2. The nucleus is only found in ___________________ cells.

3. The nucleus contains the _______________ ________________ (DNA) of the cell.

4. The genetic material is like a set of instructions. What do these instructions tell the cell how to build?

5. What surrounds the nucleus?

Chromosomes

6. What are chromosomes?

7. How are chromosomes and genes related?

Nucleolus

8. What is the job of the nucleolus?

9. What are ribosomes and what are their functions?

3.5 Guided Reading Organelles
As you carefully read through the text, answer the following questions as completely as possible!

Introduction

1. Do brain cells have the same internal structures as your other cells? Explain.
2. Why can it be said that eukaryotic cells are like factories?

3. What are organelles? What types of cells are they found in?

4. What is a nucleus? Describe its function.

5. What are mitochondria? Describe their function.

6. What are vesicles? Describe their function.

7. What are lysosomes? Describe their function.

8. What are ribosomes? Describe their function.

9. What is the endoplasmic reticulum? Describe its function.

10. What is the Golgi apparatus? Describe its function.

11. What is the cytoskeleton? Describe its function.
Review

12. Summarize the points listed.

3.6 Guided Reading Plant Cell Structures
As you carefully read through the text, answer the following questions as completely as possible!

Introduction

1. Do plant cells have cells like you have? Explain.

Plant Cells

2. Even though plants and animals are both ________________________, plant cells __________________ in some ways from animal cells.

3. Describe the three main differences between plant and animal cells.

Vacuoles

4. What is the function of the plant cell's large central vacuole? Explain.

Cell Wall

5. What is the function of the plant cell's cell wall? Explain.

Plastids

6. What are plastids?
7. One type of plastids are called chloroplasts. What are chloroplasts needed for?

8. What are leucoplasts?

10. List two types of organisms which cannot conduct photosynthesis.

11. List two types of organisms which can conduct photosynthesis.
**Animal Cell Coloring**

Directions: Give the function for each cell structure and then *color and label* the animal cell.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Membrane</td>
<td>red</td>
</tr>
<tr>
<td>Nucleoplasm</td>
<td>yellow</td>
</tr>
<tr>
<td>Mitochondria</td>
<td>red</td>
</tr>
<tr>
<td>Lysosome</td>
<td>pink</td>
</tr>
<tr>
<td>Cytoplasm</td>
<td>leave white</td>
</tr>
<tr>
<td>Microtubules</td>
<td>brown</td>
</tr>
<tr>
<td>Ribosome</td>
<td>blue</td>
</tr>
<tr>
<td>Nucleolus</td>
<td>gray</td>
</tr>
<tr>
<td>Golgi Apparatus</td>
<td>purple</td>
</tr>
<tr>
<td>Smooth Endoplasmic Reticulum</td>
<td>green</td>
</tr>
<tr>
<td>Rough Endoplasmic Reticulum</td>
<td>orange</td>
</tr>
<tr>
<td>Nuclear Membrane</td>
<td>dark brown</td>
</tr>
</tbody>
</table>

**Questions:**

1. Give the function of the nucleus. ______________________________________
2. What makes up the cell membrane? ________________________________
3. Where does cellular respiration take place? _________________________
4. Where does protein synthesis take place? __________________________
5. Where are the ribosomes made? _________________________________
6. Give two ways that an animal cell differs from a plant cell. __________
   ___________________________________________________________________
7. Do plant cells contain mitochondria? ______________________________
8. How can you tell rough ER from smooth ER? _________________________
9. Where are cell products modified and packaged in vesicles for transport?___
10. Where is DNA found in a cell? ____________________________________________

11. Where are the old organelles broken down (digested) to be recycled in the cell?

___________________________________________________________

Animal Cell
**Plant Cell Coloring**

**Directions**: Define each of the parts of the plant cell and then *label and color* the cell parts on the drawing of the plant cell.

<table>
<thead>
<tr>
<th>Part</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Membrane</td>
<td>black</td>
</tr>
<tr>
<td>Cell Wall</td>
<td>light green</td>
</tr>
<tr>
<td>Cytoplasm</td>
<td>yellow</td>
</tr>
<tr>
<td>Chloroplasts</td>
<td>dark Green</td>
</tr>
<tr>
<td>Golgi Apparatus</td>
<td>light blue</td>
</tr>
<tr>
<td>Mitochondria</td>
<td>red</td>
</tr>
<tr>
<td>Microtubules</td>
<td>brown</td>
</tr>
<tr>
<td>Nucleoplasm</td>
<td>gray</td>
</tr>
<tr>
<td>Nuclear Membrane</td>
<td>black</td>
</tr>
<tr>
<td>Nucleolus</td>
<td>tan</td>
</tr>
<tr>
<td>Ribosomes</td>
<td>orange</td>
</tr>
<tr>
<td>Rough Endoplasmic Reticulum</td>
<td>dark blue</td>
</tr>
<tr>
<td>Smooth Endoplasmic Reticulum</td>
<td>violet</td>
</tr>
<tr>
<td>Vacuole</td>
<td>pink</td>
</tr>
</tbody>
</table>
PLANT CELL
Cell City Analogy

In a far away city called Grant City, the main export and production product is the steel widget. Everyone in the town has something to do with steel widget making and the entire town is designed to build and export widgets. The town hall has the instructions for widget making, widgets come in all shapes and sizes and any citizen of Grant can get the instructions and begin making their own widgets. Widgets are generally produced in small shops around the city, these small shops can be built by the carpenter's union (whose headquarters are in town hall).

After the widget is constructed, they are placed on special carts which can deliver the widget anywhere in the city. In order for a widget to be exported, the carts take the widget to the postal office, where the widgets are packaged and labeled for export. Sometimes widgets don't turn out right, and the "rejects" are sent to the scrap yard where they are broken down for parts or destroyed altogether. The town powers the widget shops and carts from a hydraulic dam that is in the city. The entire city is enclosed by a large wooden fence, only the postal trucks (and citizens with proper passports) are allowed outside the city.

Match the parts of the city (underlined) with the parts of the cell.

1. Mitochondria ________________________
2. Ribosomes ________________________
3. Nucleus ________________________
4. Endoplasmic Reticulum ________________
5. Golgi Apparatus ______________________
6. Protein ________________________
7. Cell Membrane ______________________
8. Lysosomes ________________________
9. Nucleolus ________________________
The Life Saver Problem

Think about these questions:

- How do large particles, those too large to diffuse through the cell membrane get through?
- Do cells have mouths?
- Does swallowed food mingle or mix with the organelles?
- Which cell organelle could function as a mouth?
- Why do swallowed yeast cells stay together in clusters in the Paramecium?

These questions set the stage for the simulation you are about to do.

Materials: (per group)

1 plastic bag
15 cm of string (approximately 6 inches) (paper = 8 ½ inches in width)
1 Life Savers mint for each student

The Problem: To get the Life Savers into the bag according to these rules:

1. The Life Savers must enter through a solid part of the bag.
2. The inside of the bag may not be directly open to the external environment.
3. The Life Savers entering the bag must remain clustered together.
4. May work with their hands in the bag to act as the inside of a cell.
5. Must show your teacher the solution before you may eat any Life Savers.

Activity Summary:

1. Make a drawing to describe the process of a cell eating a large particle.

2. Do the Life Savers penetrate the cell membrane (plastic bag)? Explain.

3. How do large particles, those too large to diffuse through the cell membrane get through? Explain.

4. Which cell organelle could function as a mouth? Explain.

5. Does swallowed food mingle or mix with the organelles? Explain.

6. Why do swallowed yeast cells stay together in clusters in the Paramecium?

Your teacher can show an additional video to help. http://dictybase.org/Multimedia/phagocytosis/phagocytosis.htm
Cell Booklet Contents

✓ Make sure each page includes important information about the cell.
✓ All pages should be numbered
✓ All pages should have a titled.
✓ All pages should have some picture or graphic on it.
✓ For ideas of what to draw, think about the job the cell part does, then think about something in your world that does a similar job. If you can include an analogy either in the picture or graphic is an excellent way to communicate the information. Example: The cell membrane lets nutrients into and out of the cell, kind of like a doorway lets people into and out of rooms. Somehow, showing the c. membrane as a gate or door which opens and closes to let the proper materials in or out would be great.

Cover
Creative title
Cell picture (either hand-drawn, computer generated, etc.)
Your name (first and last) and class period

Inside Cover: Table of contents (Do this when you are done!!!!)
Page 1: What are cells?
Page 2 Who discovered cells?
Page 3 What is the cell theory?
Who is responsible for the cell theory?
Page 4 Difference between multicellular and unicellular?
Page 5 What are organelles? Found on or near page 70 in science text
Page 6 Cell Wall Found on or near page 72 in science text
Page 7 Cell membrane Found on or near page 72 in science text
Page 8 Nucleus Found on or near page 74 in science text
Page 9 Difference between chromatin and chromosome? Found on or near page 75 in science text
Page 10 Cytoplasm Found on or near page 76 in science text
Page 11 Endoplasmic reticulum Found on or near page 77 in science text
Page 12 Ribosome Found on or near page 78 in science text
Page 13 Mitochondria Found on or near page 78 in science text
Page 14 Vacuole Found on or near page 78 in science text
Page 15 Lysosome Found on or near page 79 in science text
Page 16 Chloroplast Found on or near page 80 in science text
Page 17 Chlorophyll Found on or near page 81 in science text
# Cell Parts Chart

<table>
<thead>
<tr>
<th>Organelle</th>
<th>Type of Cell (Bacteria, Plant, or Animal)</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Membrane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nucleus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear Membrane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nucleoplasm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nucleolus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cytoplasm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ribosomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endoplasmic Reticulum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mitochondria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloroplasts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chromosomes/DNA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golgi Complex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lysosomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuole</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrioles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Microtubules</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cell Labs

Onion
*Elodea*
Human cheek (mouth)
Onion Cell

Recorded observation via the microscope are of little value and importance and are unacceptable if they are not realistic!!!!

Directions:
1. The left plate is for recording the observation without stain being added, this will be called unstained onion cell.
2. The right plate is for recording the observation after stain has been added, this will be called stained onion cell.
3. First do the unstained by making a wet mount of the onion tissue. Remove a skin of tissue from the onion piece and made into a wet mount. This will be demonstrated by your teacher. Watch and listen closely.
4. Use the best power possible to see detail. Sketch one cell and make it fill as much of the plate area as possible.
   **Again sketch only one cell.**
5. Label by writing the name of the organelle than drawing a line to it.
6. Use shading (use a pencil) to show details.
7. Stain will be added by the method demonstrated by your teacher.

Plant cell organelles:

<table>
<thead>
<tr>
<th>Unstained labels</th>
<th>Stained Labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Wall</td>
<td>Cell Wall</td>
</tr>
<tr>
<td>Cytoplasm</td>
<td>Cell membrane</td>
</tr>
<tr>
<td>Nucleus</td>
<td>Cytoplasm</td>
</tr>
<tr>
<td></td>
<td>Nucleus</td>
</tr>
<tr>
<td></td>
<td>Nucleolus</td>
</tr>
<tr>
<td></td>
<td>Chromatin</td>
</tr>
<tr>
<td></td>
<td>Nuclear membrane</td>
</tr>
<tr>
<td>miscellaneous vacuoles</td>
<td>Large water vacuole</td>
</tr>
</tbody>
</table>

Do not draw lines to the label list. Write the words, this is practice, practice is learning. Zero score on lab if you draws lines.
The size of those cells:

Place ruler on the stage, and focus on the millimeter marks. Estimate in millimeters the diameter of the visible field (the lit-up circle area). So if the field appears in your estimation to be two and ½ millimeters (diameter) you than look at the length of the cells and in your estimation it takes ten cells to cross the diameter of the field. The onion cell length equals (2.5 mm divided by 10) 0.25 mm or ¼ of a millimeter. Use this method to estimate in millimeters the average width and length of onion cells. Because microscopes work with such small distances, the unit called a micrometer is used. Micrometer are 1/1000th of a millimeter. To convert millimeters to micrometers multiple by 1000. In the above sample 0.25 mm would be equal to 250 micrometer.

Measure the width and length of onion cells. To do this, be sure to carefully read the above paragraph.

1. Width of an onion cell in millimeters _____, in micrometer ______
2. Length of the onion cell in millimeters ________, in micrometer _________
3. How many onion cells placed end to end would be one centimeter _________

Safety check

4. When the microscope is on high power, only use the _____________ to focus.

Critical thinking question:

5. How would humans be different if we had cell walls around our cells?
   Use a minimum of 30 words to use.
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
Plant cell: *Elodea*

Recorded observation via the microscope are of little value and importance and are unacceptable if they are not realistic.

**Directions:**
1. Make a wet mount of one leaf from an *Elodea* plant.
2. Use the best power possible to see detail.
3. Sketch one cell and make it fill as much of the plate area as possible.

**Again sketch only one cell.**
4. Use shading (use a pencil) to show details.
5. Label by writing the name of the organelle and drawing a line to it.
6. Do not draw lines from the parts list, you need to write the name to practice.
   
   These are the parts to label:

   - Cell wall
   - Cell membrane
   - Cytoplasm
   - Chloroplasts
   - Large water vacuole
   - Nucleus
   - Nucleolus
   - Nuclear membrane.

1. After sketching, stimulate the cells with brightest light possible (#5), you will see motion. Describe the motion.

   ____________________________________________________________

   ____________________________________________________________
2. The **large water vacuole** is easier to **see** (than the onion cell)?
   What are two reasons it is easier to see?

   1st _________________________________________________________

   2nd _________________________________________________________

3. What are **CHOLOROPLASTS**? List 4 facts.
   They are _________________________________________________
   They are _________________________________________________
   They are _________________________________________________
   They are _________________________________________________

4. The nucleus is difficult to see. Notice how in the label list it is printed in a lighter color. Describe in a minimum of twenty words why it is harder to find the nucleus (than the onion cell).

   _________________________________________________________
   _________________________________________________________
   _________________________________________________________
   _________________________________________________________

5. What is the width and length of an **Elodea cell** in microns?
   width: ___________ length: _______

   Critical Thinking Question:

6. How many molecules of **CO₂** does it take to make one molecule of glucose? **Explain** how you got this answer. Check your textbook or your notes for the chemical equation for photosynthesis. Use the index in the textbook to find those pages which have information.

   _________________________________________________________
   _________________________________________________________
   _________________________________________________________
   _________________________________________________________
   _________________________________________________________
Animal Cells: Cheek cell

Recorded observation via the microscope are of little value and importance and are unacceptable if they are not realistic. Take your time when sketching.

Directions:
1. Use the best power possible to seen detail.
2. Sketch one cell and make it fill as much of the plate area as possible. **Again sketch only one cell.**
3. Use shading (use a pencil) to show details.
4. Label by writing the name of the organelle than drawing a line to it.
5. The left plate is for recording your observation without stain being added, this will be called the unstained cheek cell.
6. The right plate is for recording your observation after stain has been added, this will be called the stained cheek cell.
7. First do the unstained by making a wet mount of the cells collected from a rubbing of your inner cheek. Your teacher will demonstrate how to do this.
8. Stain will be added by the method learned in the onion lab and your teacher will review this today.

Cell membrane   Cytoplasm   Nucleus   Nuclear membrane   Chromatin   Nucleolus   Miscellaneous small vacuoles

Do not draw lines to the label list. Write the words, this is practice, practice is learning. Zero score on lab if you draws lines.
**ELODEA: Observing the Effects of Diffusion in a Living Cell**

**Purpose:**

To see for yourself how water moves into and out of plant cells.

**Procedure:**

1. Remove a leaf from a sprig of *Elodea*.
2. Make a wet mount slide of the leaf.
3. Examine the leaf under the high-power objective of your microscope.
4. Draw a **(ONE)** cell and label Cell Wall, Cell Membrane, Cytoplasm, Nucleus, Large Water Vacuole, Chloroplasts in the w/o salt solution plate.
5. Add one drop of a salt solution to the edge of the cover glass.
6. Use a small piece of paper towel held on the opposite side of the cover glass and wick the salt solution under the cover glass. Yes, this should pull the salt solution under the cover glass.
7. Draw a **(ONE)** cell and label Cell Wall, Cell Membrane, Nucleus, Cytoplasm, Large Water Vacuole, Chloroplasts in the with salt solution plate.

**Critical Thinking and Application:**

1. How did the cells you observed in step 4 compare with those in step 7? Use a minimum of 30 words the answer.

   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
2. Use the term "diffusion" to explain the differences observed in the cells. Use a minimum of 30 words the answer.

3. What is the term for the diffusion water through membranes? ______________

4. Before refrigeration, some foods were preserved by adding large amounts of salt to them. What explanation can you offer to explain how salt preserved food? Use a minimum of 30 words the answer.

5. Other than salting to preserve meat, fruits preserved in a similar manner. What could be used to extract moisture from fruits and thereby preserve them. (Hint: something tastier was used)

6. A how remedy is to sprinkle liberal amounts of table salt on weeds to kill them. Describe how salt (regular table salt: NaCl) works as a weed killer? Use a minimum of 30 words the answer.

Critical thinking question:

1. Why do plant cells need a cell wall? Use a minimum of 30 words to answer.
**Across:**

1. The outer covering of the nucleus, controls what enters and exits the cell.
3. A specialized part of a cell that performs a special function / a small organ in a cell
7. These small organelles make proteins
12. the ‘brain’ of the cell / the control center containing DNA
14. Small body within the nucleus. Makes ribosomal RNA
15. Organizing centers for microfilaments (spindle fibers) during mitosis
16. Transportation network of the cell. Highway of the cell

**Down:**

2. Only in plant cells, this organelle converts sunlight into energy for the cell
4. Hereditary material
5. Found only in plant cells, this surrounds the cell
6. Large vesicle that stores food or water for the cell - very large central one in plant cells
8. The powerhouse of the cell - makes energy in the form of ATP
9. The shipping/receiving and packaging center for the cell - the 'post office' in the cell
10. ‘Digestive sacs’ - These contain digestive enzymes
11. All living things are made of what basic unit.
13. Cell fluid
Scroll down, and find information below the animal cells to answer these questions.

1. Which is described as the site of protein synthesis ___________? And what does “synthesis” mean ________________?

2. What is the name of the stack of membrane-bound vesicles___________? The important task this organelle does is ____________________?

3. What is the prominent structure found inside the nucleus_________? And what does this structure do _________________? These parts that are produced go where ________________ and do what ________________?

4. Which is described as membrane-bound sacs that plays roles in digestion and release of waste products___________________?

5. Which part appears “pebbled” when viewed by the electron microscope ____________________? Why is it “pebbled” ________________?

6. Which are described as the power centers of the cell _______________?
Scroll down, and find information below the plant cells to answer these questions.

7. What is the part that is described as containing the chlorophyll ________?

8. What part is a rigid protective covering _________________? It maintains the _________ and fluid collected in vacuoles pushes out against it cause _______ pressure that is responsible for the ________ of fresh vegetables.

9. What part is common in animal cells, but rare in plant cells _________?

Cells Alive.com

Puzzles

Challenge your partner to see who can assemble the animal cell jig saw the quickest

Your time __________ partners time __________

Challenge your partner to see who can assemble the plant cell jig saw the quickest

Your time __________ partners time __________
Streaming video: Active Transport

1. What is the concentration gradient?

2. To go up the concentration gradient slope takes?

3. Plant roots have a ______ concentration of _______ than the surrounding soil. And to get these materials to enter the roots they must be ______ against the concentration gradient and it takes ______________ to do this.

4. Some materials get through a membrane against the concentration gradient with the help of _______ or _______ proteins. These special proteins are specific to the ___________ they move through. With these _______ or _______ proteins it is possible to move materials both ways. Sometimes it is said that they ______ materials across the membrane.

5. Lindsay has _______ __________. She is not able to transport _______ ions actively across membranes. As a result fluids and sodium leave areas of her body causing _______ to become _______ and sticky. This affects many areas of her body, but her _______ are especially affected.

6. During sleep how much of our energy is used for active transport of materials across cell membranes?

7. Materials to large to fit through the membrane openings may be brought inside by ____________ and this involves the cell ______________________

8. Similarly large materials maybe released by a process called ____________
1. How are living cells examples of open systems?

2. What must enter living cells for them to remain alive?

3. What is energy?

4. What does cellular respiration require? & 

5. What are the products of cellular respiration? & 

6. What is $C_6H_{12}O_6$? , what is $C$? what is $H$? and what is $O$? . What are the $6,12,6$?

7. What is cellular respiration?

8. How is the cell membrane important to every living thing?

Stream video: Cellular Respiration 3:16

Streaming video: Passive Transport 4:00

1. What does the cell membrane do?

2. What substances are regulated by the cell membrane?

3. What is semi (selectively) permeable?

4. How is the movement of molecules (substances) described?

5. What is a gradient?

6. What is passive transport?

7. What is osmosis?

8. How is a protective mask a semi (selectively) permeable membrane?