

I am so excited to have you in 7<sup>th</sup> grade Science! I know the words “summer assignment” tend to send chills down any middle school student’s spine, but I think that you will find that this assignment will be very beneficial to you as we start the school year in the fall and even a little fun! Failure to complete all of these assignments will forfeit your opportunity to remain in PAP Science. I will **NOT** accept late work. Extra credit will be given to projects turned in early. Teachers will be back at school starting August 17<sup>th</sup>, 2015. Bring it by anytime to the office. Make sure your name is on every page!




**Summer Assignment Overview**

Task #	Due Date	Task Description	✓	Objective
1	First Day of School	<b>7.12D Cell Organelle Tutorial &amp; Chart</b>		Complete the practice worksheets and use them to study for cell test
2	First Day of School	<b>7.12F Cell Theory Tutorial</b>		Complete the cell theory worksheet to study for the cell test
3	First Day of School	<b>Cell Project</b>		Create a cell analogy poster
4	First Day of School	<b>STEM Career Project</b>		Research a career in STEM and <b>follow the rubric</b> to create a poster that shows what you learned
5	Second Week of School	<b>Prefix/Suffix List</b>		Study the list, complete the practice words and be ready for a test the second week of school. (make flashcards if you need to!)
6	Second day of School	<b>Summer Project Exam</b>		<p>(You must pass this in addition to completing all assignments).</p> <p><b>Summer Project Exam Review</b></p> <ul style="list-style-type: none"> <li>○ Know all vocabulary words in the Cells reading.</li> <li>○ Know significance of Hooke and Van Leeuwenhoek</li> <li>○ Know 3 parts of cell theory</li> <li>○ Know features that are common to ALL cell types (eukaryote and prokaryote), give examples of each</li> <li>○ Be able to describe functions of organelles found in both plant and animal cells</li> <li>○ Be able to label certain components on both a plant and animal cell diagram.</li> <li>○ Be able to identify cell components in an analogy</li> </ul>

My email address is [dquinn@pasadenaisd.org](mailto:dquinn@pasadenaisd.org). If you have any questions about the summer assignment you can get in touch with me through email.

## Using your Pasadena ISD school email

Below are instructions for logging in to your school issued, professional school email account.

- 1: go to [login.microsoftonline.com](http://login.microsoftonline.com)
- 2: enter your full email address in the username area (studentusername plus @pasadenaisd.org)  
**for example** *ab0123456@pasadenaisd.org*
- 3: enter your password (you may be redirected, don't panic)
4. This will take you to Outlook (your email).
5. Click on  New to make a new email.
6. Type in my email address [dquinn@pasadenaisd.org](mailto:dquinn@pasadenaisd.org) and write any questions you have over the summer project.
7. Click  Send to send the email you wrote.
8. You will need to check your email periodically to see if I've responded. It should be within a day or 2.
9. To reply to my email, click on  Reply .

### Email etiquette:

This is your professional email, not your personal email. All emails are subject to being searched. Do not send anything inappropriate or threatening. This could result in a discipline referral and/or loss of email privileges.



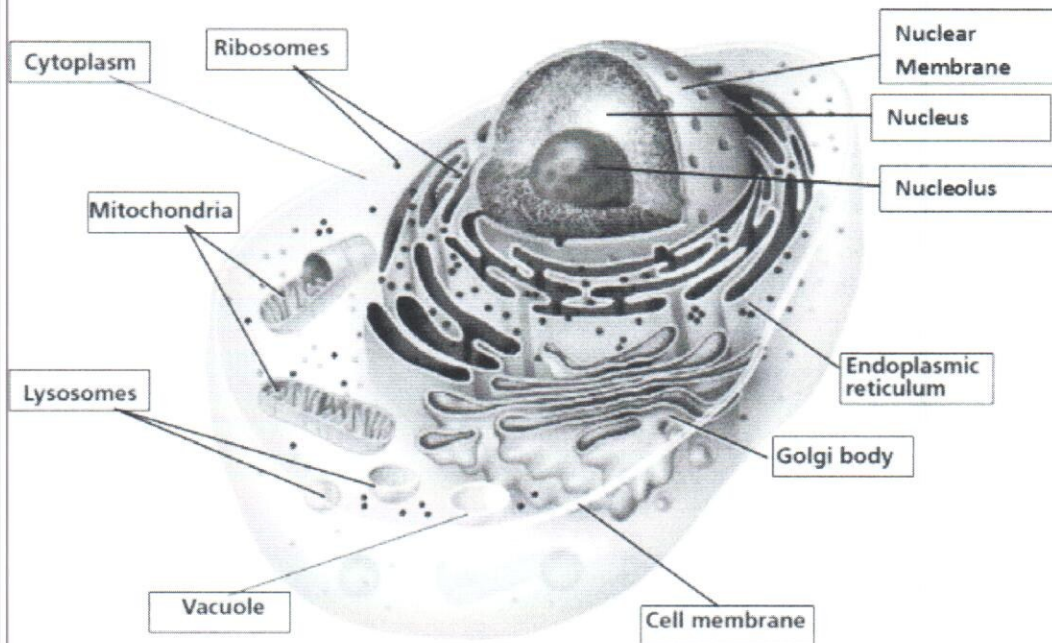
Name: \_\_\_\_\_ Teacher: \_\_\_\_\_ Pd. \_\_\_\_\_ Date: \_\_\_\_\_

## **STAAR Science Tutorial**

### **TEK 7.12D: Cell Organelles**

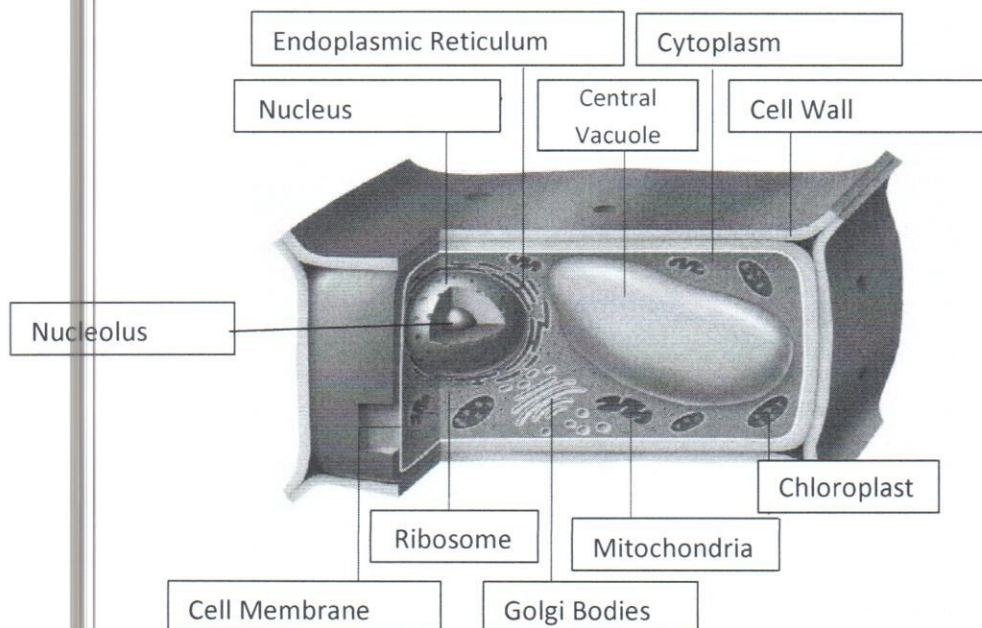
**TEK 7.12D: Differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole.**

- The main organelles in an animal cell are labeled below:



- The main organelles in a plant cell are labeled below.

### **Plant Cell**



- An organelle is a part of a cell with a specific structure and function.
- The three main differences between plant and animal cell organelles are that: (1) chloroplasts are found in plant cells, not in animal cells; (2) the cell wall is found in plant cells, not in animal cells; it creates a plant cell's rectangular shape; and (3) a large central vacuole is found in plant cells; the vacuoles in animal cells are smaller.
- The function of the cell membrane is to control what materials can enter or leave the cell.
- The function of the cell wall in plant cells is to give the cell membrane added support and give plant cells their box-like shape.
- The nucleus, usually found near the center of an animal cell, and along the edge of a plant cell, holds the organism's genetic information and directs most all of the activities in the cell. It is this genetic information (DNA/ Chromosomes/ Genes) which determines the traits of the organism.
- The nuclear membrane controls the movement of materials in and out of the nucleus.
- The nucleolus contains RNA to be sent out into the cytoplasm to manufacture proteins by the ribosomes.
- The cytoplasm is a jelly-like substance that fills the entire cell to hold organelles in place.
- Mitochondria act as the energy converter and manager of the cell. They take glucose (made by the chloroplast in plant cells or obtained from food in animal cells) and turn it into smaller chemical energy molecules (ATP) for the cell to use through a process called cellular respiration (both plant and animal cells).
- The chloroplast in plant cells collects radiant energy from the sun and uses it to convert carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) into a sugar (glucose) (site of photosynthesis).
- The vacuole stores food, water, wastes and other materials.  
The central vacuole in plant cells helps maintain turgor pressure in plants. Turgor pressure is the internal cell pressure against the cell wall, caused when the vacuole is full of water. It helps plants to stand tall.
- Lysosomes break down and recycle waste within the cell. The "stomach" of the cell.
- The Endoplasmic Reticulum (ER) is the organelle, found in both a "smooth" and "rough" form that provides a maze-like assembly line for the production of proteins and other substances. The rough ER is covered with ribosomes, which gives it the rough appearance seen through a microscope.
- Ribosomes make protein molecules from amino acids.
- Golgi Bodies gather simple molecules and combines them to make molecules that are more complex. It then takes those big molecules, packages them in vesicles, and either stores them for later use or sends them out of the cell.



Can you fill in this chart now after reading? Try it!

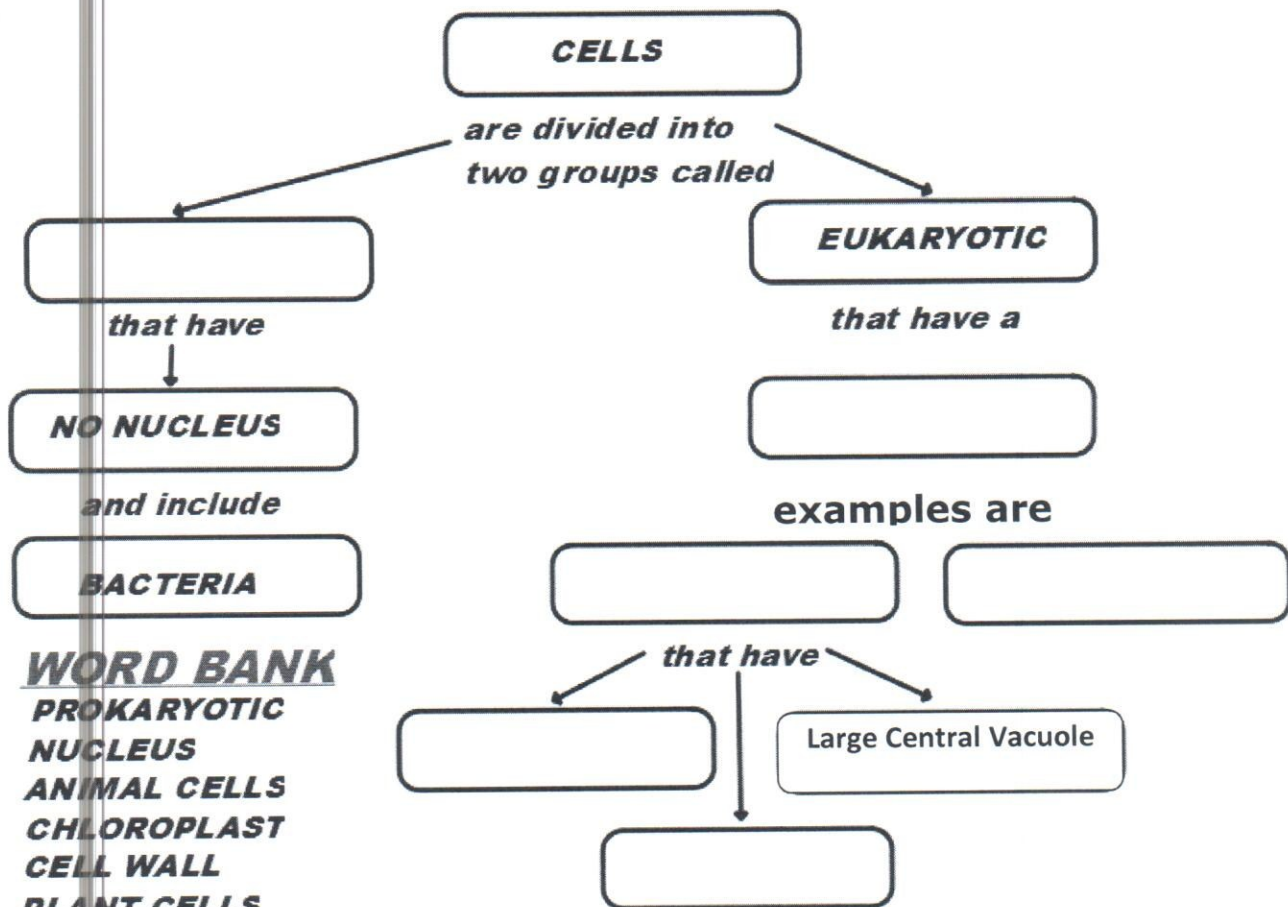
Organelle (structure)	FUNCTION (job)	Location (plant, animal or BOTH)
	*converts radiant energy from sun to make food (glucose) for the plant	
	*breaks down a sugar called glucose to produce energy molecules called ATP *the site of cellular respiration	
	* break down and recycle waste within the cell	
	*produces proteins (How? They link amino acids, the building blocks of proteins, together in the order that is specified by mRNA)	
	*stores food, water, waste (plants need to store large amounts of water & food)	
	*controls cell activities *contains most of the genetic material (DNA) of the cell	
	*support *protection *controls movement of materials in/out of cell *barrier between cell and its environment *maintains homeostasis (balance)	
	*controls movement of materials in/out of nucleus	
	*jelly-like substance that fills the entire cell to hold organelles in place.	
	* assembly line for the production of proteins and other substances	
	* manufactures, stores and ships certain cellular products	
	*contains RNA for protein manufacture	
	*give the cell membrane added support and give plant cells their box-like shape	

Now, check your answers with the cell organelle chart that I provided.

**Practice Questions**  
**Fill in the blanks of the following questions**

1. \_\_\_\_\_ This structure is the outer covering of a cell and is involved in regulating movement of molecules in and out of the cell.
2. \_\_\_\_\_ Where genetic material is stored and controls the cell's activities.
3. \_\_\_\_\_ In a plant cell, this helps give the plant its rigid structure and its cells their rectangular shape.
4. \_\_\_\_\_ In a plant cell, this structure uses radiant energy from the Sun to produce glucose from carbon dioxide and water.
5. \_\_\_\_\_ In a plant cell, this structure stores water, sugar and other materials. It helps maintain \_\_\_\_\_ in plants, which helps them to stay structurally strong.
6. \_\_\_\_\_ contains digestive enzymes and break-down waste within the cell.
7. \_\_\_\_\_ The organelle that acts as an assembly line for the production of proteins and other substances.
8. \_\_\_\_\_ The organelle that specifically assembles proteins from amino acids.
9. \_\_\_\_\_ Cellular respiration occurs in this organelle because this produces energy (ATP) for cell activities. Sometimes it is called the "powerhouse of the cell"
10. \_\_\_\_\_ Cell organelles are located in and surrounded by.
12. \_\_\_\_\_ The structure of the cell that prepares and packages proteins for use within the cell
13. \_\_\_\_\_ The double membrane surrounding the nucleus that controls what enters and leaves it
14. \_\_\_\_\_ contains RNA to be sent out into the cytoplasm to manufacture proteins by the ribosomes.





### WHAT ARE THE DIFFERENCES BETWEEN PLANT AND ANIMAL CELLS?

Animal Cells:

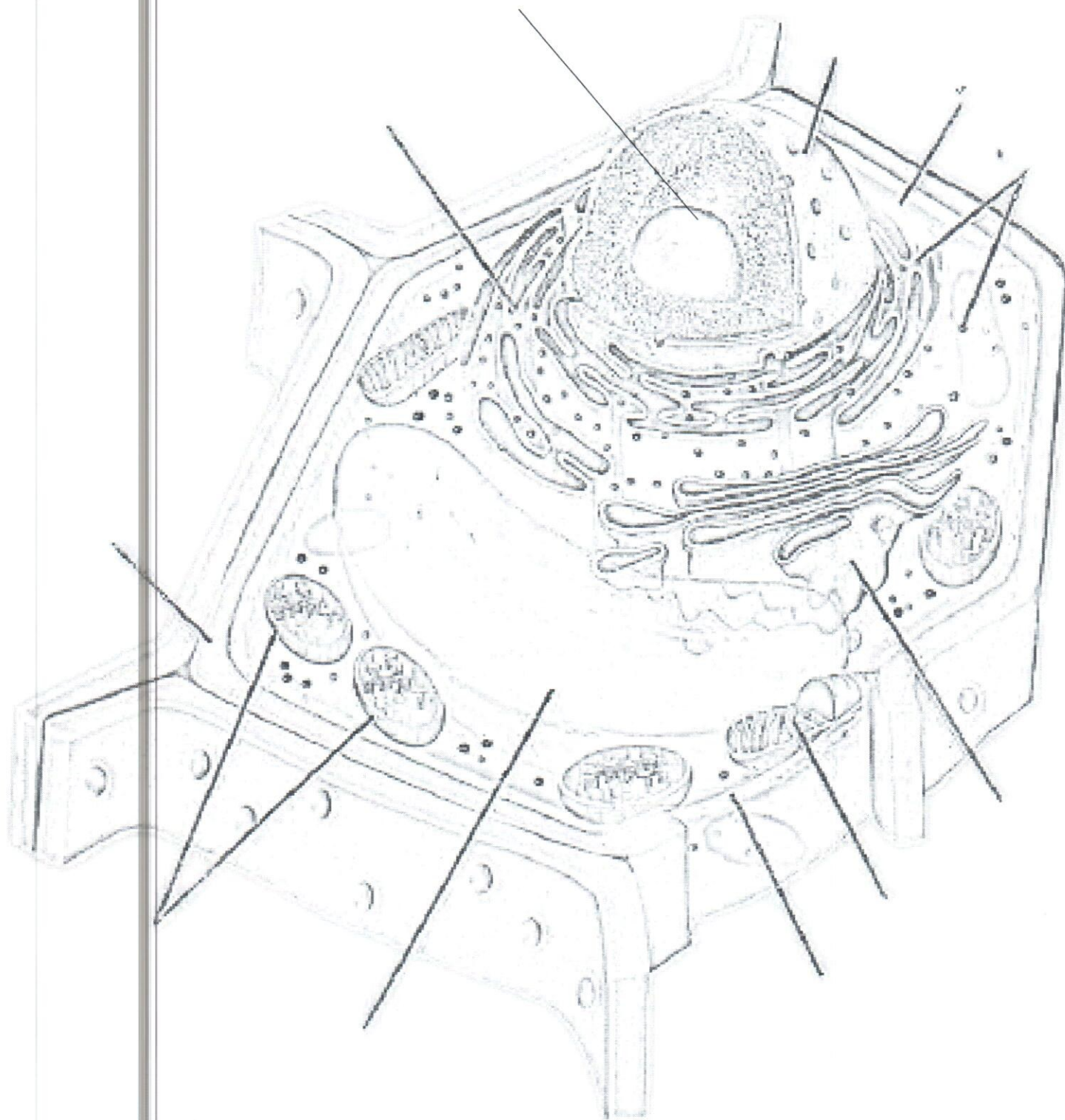
Plant Cells:

### EUKARYOTIC CELLS VS. PROKARYOTIC CELLS

WHAT'S THE DIFFERENCE?

# Plant Cell

Using the cell organelle tutorial, practice labeling the cell below. Do NOT cut this out use this for your cell poster.

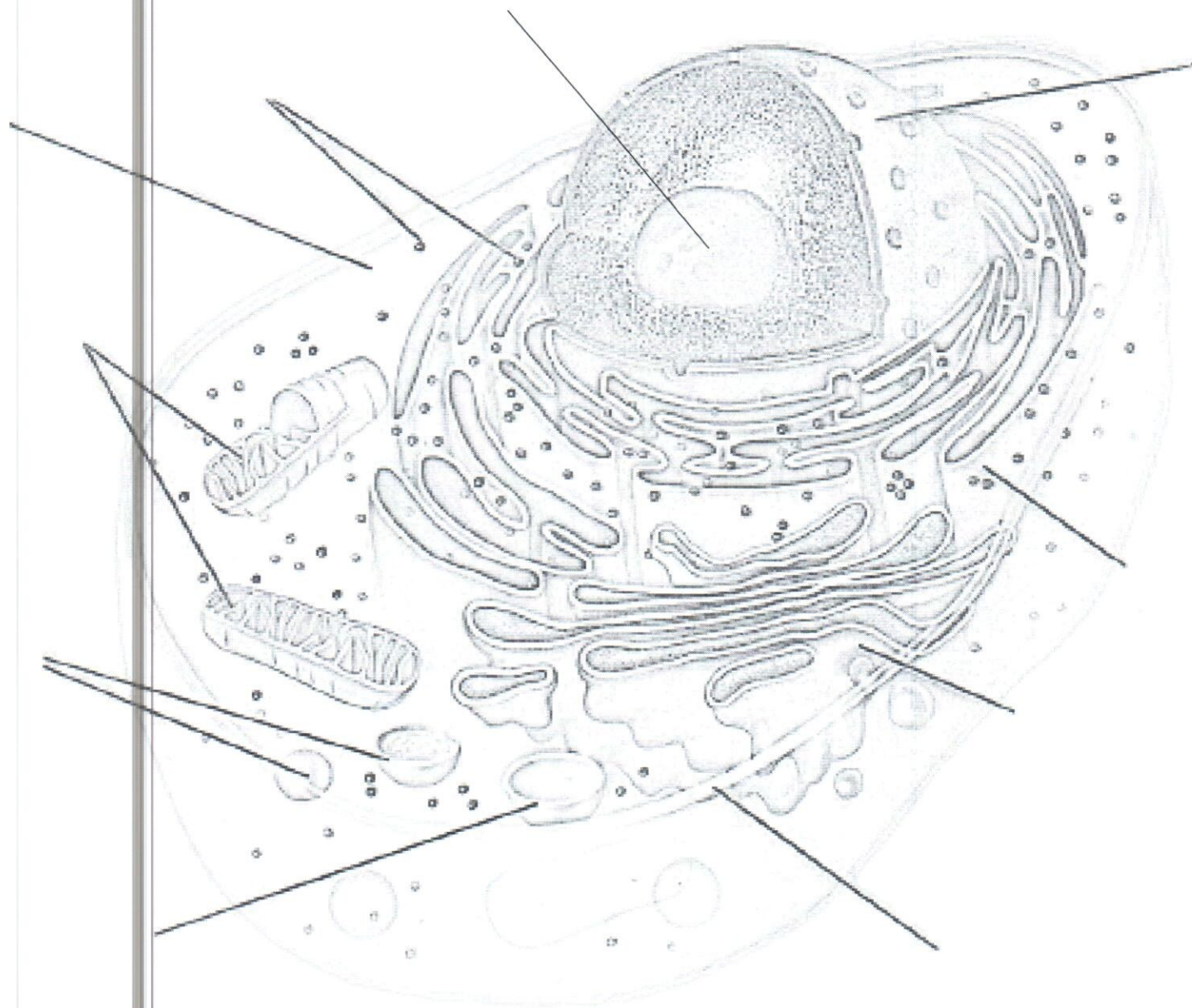




Name \_\_\_\_\_

# Animal Cell

Using the cell organelle tutorial, practice labeling the cell below. Do NOT cut this out use this for your cell poster.



## CELL ORGANELLE CHART

ORGANELLE	LOCATION	DESCRIPTION	FUNCTION
cell wall	plant, not animal	*outer layer *rigid, strong, stiff *made of cellulose	*give the cell membrane added support and give plant cells their box-like shape
cell membrane (plasma membrane)	both plant/animal	*plant – located inside cell wall *animal – outer layer; cholesterol *selectively permeable	*support *protection *controls movement of materials in/out of cell *barrier between cell and its environment *maintains homeostasis (balance)
nucleus	both plant/animal	*large, oval *one of few organelles you can see under microscope	*controls cell activities *contains most of the genetic material (DNA) of eukaryotic cells
nuclear membrane	both plant/animal	*surrounds nucleus *two layers *selectively permeable	*controls movement of materials in/out of nucleus
cytoplasm	both plant/animal	*clear, thick, jellylike material *organelles are located within cytoplasm	*supports/protects cell organelles *jelly-like substance that fills the entire cell to hold organelles in place.
endoplasmic reticulum (ER)	both plant/animal	*network of tubes or membranes *can be Rough ER (with ribosomes) *can be Smooth ER (without ribosomes)	*assembly line for the production of proteins and other substances
ribosome	both plant/animal	*occur in large numbers *small particles in cytoplasm or attached to ER	*produces proteins (How? They link amino acids, the building blocks of proteins, together in the order that is specified by mRNA)
mitochondrion	both plant/animal	*bean-shaped with inner membranes	*breaks down a sugar called glucose to produce energy molecules called ATP *the site of cellular respiration
vacuole	<b>plant</b> – very few/large; known as Central Vacuole <b>animal</b> – small	*fluid-filled sacs	*stores food, water, waste (plants need to store large amounts of water & food)
lysosome	plant – uncommon animal - common	*small, round, with a membrane	*break down and recycle waste within the cell
chloroplast	plant, not animal	*green, oval usually containing chlorophyll (green pigment)	*converts radiant energy from sun to make food (glucose) for the plant (photosynthesis)
nucleolus	both plant/animal	*spherical shape, inside nucleus	*contains RNA for protein manufacture
golgi body (golgi apparatus)	both plant/animal	*membrane layers, near nucleus	*manufactures, stores and ships certain cellular products



NAME \_\_\_\_\_

PERIOD \_\_\_\_\_

### CELL ORGANELLE CHART

Copy the chart provided to help you learn the cell functions and structures

ORGANELLE	LOCATION (PLANT, ANIMAL)	DESCRIPTION	FUNCTION
cell wall			
cell membrane (plasma membrane)			
nucleus			
nuclear membrane			
cytoplasm			
endoplasmic reticulum (ER)			
ribosome			
mitochondrion			

NAME \_\_\_\_\_

PERIOD \_\_\_\_\_

vacuole			
lysosome			
chloroplast			
nucleolus			
golgi body (golgi apparatus)			



## **STAAR Science Tutorial 41**

### **TEK 7.12F: Cell Theory**

***TEK 7.12F: Recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life.***

- A **cell** is the basic unit of function and structure in all living organisms. There are many species of single-cell organisms than can carry out all of the functions necessary to life within their single cell.
- The first scientist to see a “cell” through a microscope was Robert Hooke in the year 1663. He thought that the rectangular compartments that he saw in the bark of the cork oak tree looked like the small rooms or cells in which the monks of a monastery lived. Today we also refer to small rooms in prisons or jails as cells.
- Only plant cells are rectangular, but we still use the term “cell” to refer to the smallest self-contained unit of any living organism.
- At about the same time as Hooke first observed plant cells, Anton van Leewenhoek observed bacteria, single-cell organisms we now call protists, and small multi-cellular organisms such as hydras. In the next hundred years, the quality of microscopes improved and many scientists studied all life forms to better understand their detailed structures.
- In 1838, German scientist Matthias Schleiden concluded that all plants are made of cells. The next year Theodor Schwann, another German, concluded that all animals were also made of cells.
- The last piece of the cell theory puzzle came in 1855, when Rudolf Virchow concluded that all cells formed from existing cells. Before this discovery, scientists had believed that life could appear spontaneously from non-living matter
- These combined discoveries are known as the **cell theory**, which states that:
  - All living organisms are made of cells;
  - The cell is the basic unit of structure and function of a living organism; and
  - All new cells are created from living existing cells.
- Today, we also know that cell nuclei contain the genetic code used to control the reproduction of life.
- All cells carry out the following functions:
  - Control the reproduction and repair of cells using genetic information stored in the nucleus of the cell;
  - Control the flow of chemical energy through the cell and the larger organism;

- Distribute and store materials used to create the complex molecules from which cells and the larger organism is built;
- Assemble complex molecules to build new cell structures;
- Process, recycle and dispose of waste;

### **Practice Questions**

1. A \_\_\_\_\_ is the basic unit of function and structure in all living organisms.
2. The first scientist to view a plant cell through a microscope was \_\_\_\_\_ in the year \_\_\_\_\_.
3. \_\_\_\_\_ was the first scientist to view an animal cell through the microscope.
4. The "cell theory" states that: (1) \_\_\_\_\_; (2) \_\_\_\_\_; and (3) \_\_\_\_\_.
5. The common functions of all cells include:
  - (1) \_\_\_\_\_;
  - (2) \_\_\_\_\_;
  - (3) \_\_\_\_\_;
  - (4) \_\_\_\_\_;
  - (5) \_\_\_\_\_.



# Cell Analogy Collage Poster Project—Due Tuesday, August 25<sup>th</sup>

## Overview/Purpose:

The cell is a complex structure made up of many parts that serve specific functions. It is often helpful to relate these structures to objects we are familiar with. This activity is designed to create an analogy from your own experience or everyday objects. You are to develop an analogy to help you better understand the functions of organelles.

## Requirements:

1. Draw a plant or animal cell on a 6" x 8" white paper. Include ALL 10 of the following structures from the chart below. Use the "STAAR Science Tutorial Plant and Animal Cell Organelle Packet" to develop an analogy collage from your own experiences or everyday object.

Plant Cell	Animal Cell
1. Cell Wall	1. Cell Membrane
2. Cell Membrane	2. Cytoplasm
3. Cytoplasm	3. Nuclear membrane
4. Central Vacuole	4. Nucleus
5. Nucleus	5. Endoplasmic Reticulum
6. Endoplasmic Reticulum	6. Golgi Body
7. Golgi Body	7. Ribosome
8. Ribosome	8. Mitochondrion
9. Mitochondrion	9. Lysosome
10. Chloroplast	10. Vacuole

2. Correctly identify your cell as a plant or animal cell.

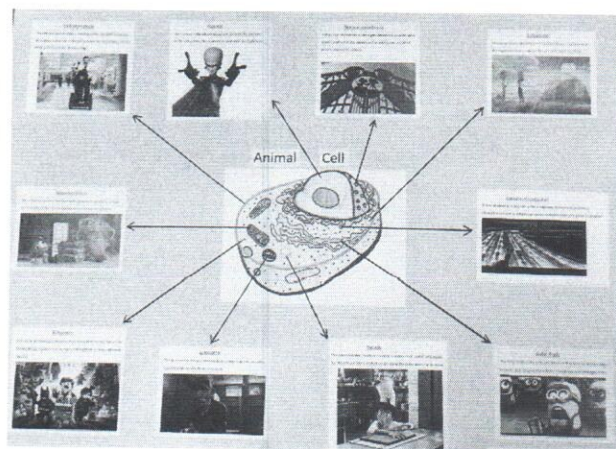
3. Find a magazine or newspaper picture, or an actual everyday object which has a similar function (or use) as each cell structure. Think in terms of household items, machinery, appliances, computers, etc. Write an analogy to show the similarity between the cell part and the everyday object. Be sure to explain the reasoning behind your analogies. (ex: the nucleus is like a brain *because* it controls and coordinates the activities of the whole cell in the same way the brain controls and coordinates activities of the whole body.)

4. Paste your cell drawing in the center of a 1/2 poster-sized paper. Use the other half for the STEM project.

5. Paste the pictures or everyday object at the edges of the poster. In each square, label the organelle and include your neatly written (or typed) analogy and reasoning and draw a pointer to the correct structure in your cell drawing.

## Grading

Requirement	Points Possible	Points Earned
1. Your Name	5	
2. Cell Drawing	10	
3. Identified Cell as Plant or Animal	10	
4. 10 structures labeled	20	
5. 10 analogy pics or objects	20	
6. 10 analogy reasons	20	
7. Neatness	15	





# STEM Project: Career Choices

(Due Tuesday, August 25<sup>th</sup>)

## Overview:

For this project, you will need to choose a career in Science, Technology, Engineering, or Math (STEM) to research and present to the class.

## Purpose:

The purpose of this project is to help motivate you towards a career goal. This activity encourages you to examine your possible career interest and build upon it personally and academically.

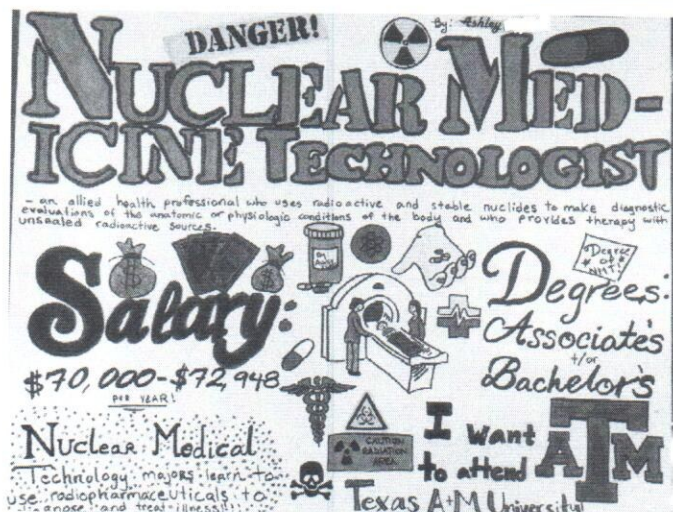
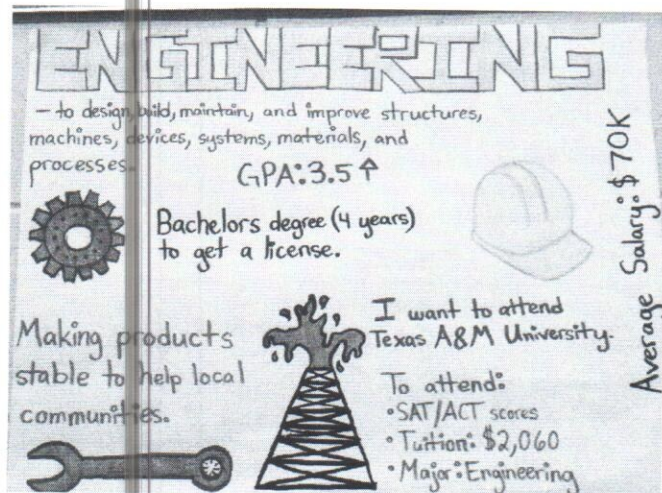
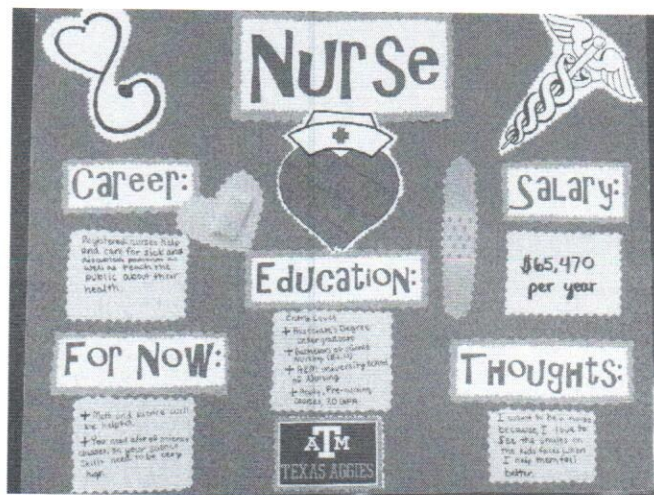
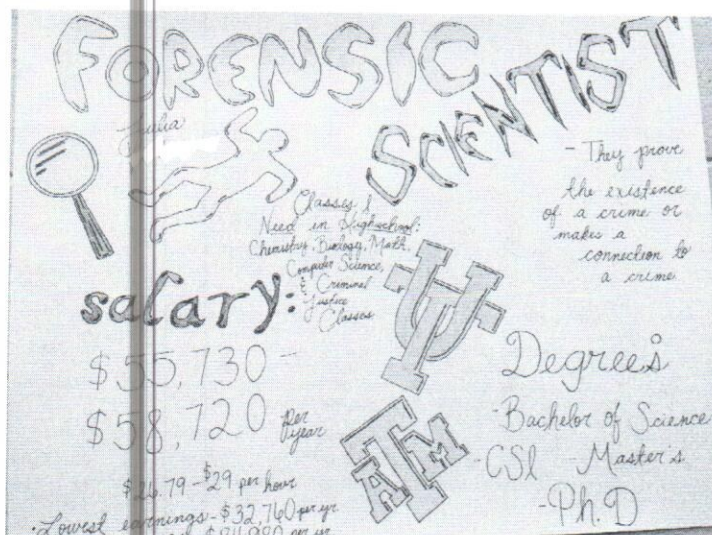
## Requirements:

1. Research the career
2. Create a poster based on your research. Use ½ of a poster board. Use the other half for the cell project!

## \*\*\*\*\*What needs to be turned in:

1. Completed Bibliography with no less than 3 sources
2. ½ Poster with rubric and bibliography attached to the back of the poster

Some examples are below.





## Research

You can use books, encyclopedias, or valid websites to conduct your research. The library is a great place to start, but websites such as Wikipedia, YahooAnswers, Askjeeves, about.com, and howstuffworks.com are among the few that you should use only as a starting point, but not as a reference! These will not count toward the 3 required sources. Be sure you understand and avoid plagiarism! Do not copy another person's work and call it your own. Always give credit where credit is due!

	Points Possible	Points Received
<b>Bibliography-15 points</b>		
1.Are there at least 3 VALID sources?	10	_____/10
2.Does each source include all of the information necessary to properly identify the source? (author's name, the title, the date, where it was published)	5	_____/5
<b>Poster-85 points</b>		
<b>Has the student included:</b>		
1. Student's name	5	_____/5
2. Name of the career	10	_____/10
3. Describe what someone in that career does	10	_____/10
4. Average Salary	10	_____/10
5. Drawn Pictures that identify the career	10	_____/10
6.Educational background required for career?	10	_____/10
7.Their personal thoughts on the career?	10	_____/10
8.What the student needs to do NOW to prepare?	10	_____/10
9.Is the poster neatly and creatively done?	10	_____/10
<b>Remember to attach this sheet to the back of your poster</b>	<b>Total Score</b>	_____/100
<b>Comments:</b>		

- 1) **Educational background** required for career (be specific)
  - a) What type of education beyond high school is required?
  - b) What are schools that are known for their excellence in this field?
  - c) What do you have to do to get into those schools?
- 2) Your **personal thoughts on the career.**
  - a) Which parts of the job are of interest to you and why?
  - b) Describe what someone does in this career
- 3) What **you need to do now to prepare**
  - a) What knowledge or skills are you learning in school now that will be used in this career?
  - b) What knowledge or skills need to be strengthened to be successful in this career?

## Bibliography

**Required Minimum of 3 sources for research report (must be a variety!)**

*For Bibliography: Use this key below to determine how to cite your sources*

### Book

- A--author
- B--book title
- C--Publisher company and city
- D--date published

### Encyclopedia

- A--author and article title
- B--book title
- C--Publisher company and city
- D--date published

### Web Site

- A--author (if found)
- B--web page title
- C--web page address
- D--date viewed

### Required Source #1

- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_
- D. \_\_\_\_\_

### Required Source #2

- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_
- D. \_\_\_\_\_

### Required Source #3

- A. \_\_\_\_\_
- B. \_\_\_\_\_
- C. \_\_\_\_\_
- D. \_\_\_\_\_



## STEM Careers (Science, Technology, Engineering, and Mathematics)

Aerospace Engineers

Health Services Administrators

Agricultural Scientists

High School Teachers

Airplane Pilots

Industrial Engineers

Anesthesiologists

Industrial Production Managers

Animal Scientists

Internists

Aquatic Technicians

Marine Biologists

Architects

Mechanical Engineers

Astronomers

Medical Laboratory Technicians Biologists

Computer Engineers

Geologists and Geophysicists

Optometrists

Pharmacists

Computer Support Specialists

Physical Therapists

Computer Systems Administrators

Medical Laboratory Technologists

Broadcast  
Technicians

Medical  
Sonographers

Cardiovascular  
Technologists

Meteorologists

Cartographers  
and Photogrammetrists

Nuclear Engineers

Chemical Engineers

Nuclear Medicine Technologists

Chemists

Obstetricians and Gynecologists

Civil Engineers

Occupational Health and Safety Specialists

Communications

Equipment Mechanics

Occupational Therapists

Water Treatment Plant Operators

Zoologists

Computer Operators

Park Rangers

Computer Programmers

Pediatricians

Computer Security Specialists



Physician Assistants  
Computer Systems Analysts  
Physicists  
Conservation Scientists  
Podiatrists  
Construction and Building Inspectors  
Psychiatrists  
Construction Managers  
Quality Control Inspectors  
Coroners  
Radiologic Technologists  
Data Communications Analysts  
Registered Nurse  
Dental Laboratory Technicians  
Respiratory Therapists  
Dentists  
Science Technicians  
Dietitians  
Ship Captains and Mates  
Drafters  
Ship engineers  
Electrical and Electronics Engineers  
Ship Pilots

Electricians  
Statisticians  
Engineering Managers  
Surgeons  
Engineering Technicians  
Surveying and Mapping Technicians  
Environmental Engineers  
Surveyors  
Environmental Scientists  
Transportation Inspectors  
Family and General Practitioners  
University and College Teachers  
Food Scientists  
Urban and Regional Planners  
Forensic Science Technicians  
Veterinarians  
Foresters  
Veterinary Assistants  
Forestry Technicians  
Sports Medicine



If it's not on this list, email me for approval!



## The Language of Life Science

Science is often difficult because of the vocabulary. It is very helpful if you are familiar with the prefix, suffix, and root words that science is based. You need to make flash cards for the following:

### Prefix

a- without /lacking  
ab- away from  
amphi-/amp- of both kinds  
anti- against  
aqua- water  
auto- self  
bi- two  
bio-life  
carn-flesh  
chlor- green  
cyt/cyto- cell  
de- from away  
derm- skin  
di- two  
dis-/dif apart from/ deprive of  
eco-environment  
ect- outside  
en/endo- in  
ento-insect  
epi- on /above  
extra- outside/beyond  
gastro- stomach  
geo- earth  
herb-plant  
hetero- different  
homo- same  
hydro- water  
hyper- over/above  
hypo- under/below  
inter- between  
intra- within  
macro- large  
meta- change

micro- small  
mono- one  
multi- many  
non- not  
omni- all  
phag- eat  
photo- light  
pre- before  
prot-/proto- first  
pseudo- fake/false  
sub- under  
tele- at a distance  
therm- temperature  
trans- across/beyond  
tri- three  
trop- turning  
zo- animal

### Suffix

-able/ -ible able / capable  
-ectomy cut out  
-graph instrument for making records  
-ism act of / condition  
-itis inflammation (swelling)/disease  
-meter measure  
-logy study of  
-phyll leaf  
-pod/ -ped foot  
-scope look/observe  
-vorous eating, feed on

**\*Be prepared to take a test on this prefix/suffix list the first week of class.**

Example of how to use this list

Word: **TELESCOPE**

**Step 1.** Look up the first part of the word under the PREFIX LIST

⌚ **tele** = at a distance

**Step 2.** Look for the rest of the word under the SUFFIX LIST

⌚ **scope** = look or observe

So, the whole word means "distance-look" or to look at something at a distance.

Note

- ⌚ The order of the words may not always seem right; don't worry about that.
- ⌚ Sometimes you can only find one part of a word but that can be a good clue about the meaning
- ⌚ You may have extra letters like **o** or **a** or **i** between two parts of a word — they don't mean anything
- ⌚ If you don't see a word in the suffix list, check the prefix list. Sometimes, words can be both a prefix and a suffix.

1. OMNIVOROUS feeding on everything
2. BIOLOGY \_\_\_\_\_
3. CARNIVOROUS \_\_\_\_\_
4. ECTODERM \_\_\_\_\_
6. PROTOZOAN \_\_\_\_\_
7. BIPED \_\_\_\_\_
8. MICROSCOPIC \_\_\_\_\_
9. ZOOLOGY \_\_\_\_\_
10. HERBIVOROUS \_\_\_\_\_
12. ENDODERM \_\_\_\_\_
13. ECOLOGY \_\_\_\_\_
14. MACROSCOPIC \_\_\_\_\_
15. ENTOMOLOGY \_\_\_\_\_