Name _____

Science Period _____

Learning Menu: *Structure and Function of Plant and Animal Cells*

Check off each activity once it's been completed. Everything needs to be completed by the end of Friday's class.

Appetizer:

____ Complete a venn diagram to compare and contrast *plants* and *animals/humans*.

Main Course: (these may be completed in any order you'd like)

____ Color-code animal cell organelles on animal cell diagram (use a *different* color for each cell organelle).

____ Complete "Animal Cell" chart (make analogies to compare functions of animal cell organelles with real-world objects)

____ Color-code plant cell organelles on plant cell diagram (use a *different* color for each organelle) to learn which organelles *plant* cells have that *animal* cells don't.

____ Complete "Plant Cell" chart (make analogies to compare functions of plant cell organelles with real-world objects).

____ Answer questions on the bottom of the plant cell chart.

____ Move each completed activity to your **"p__ science"** folder in google docs.

Dessert: (complete these only after all other activities have been completed)

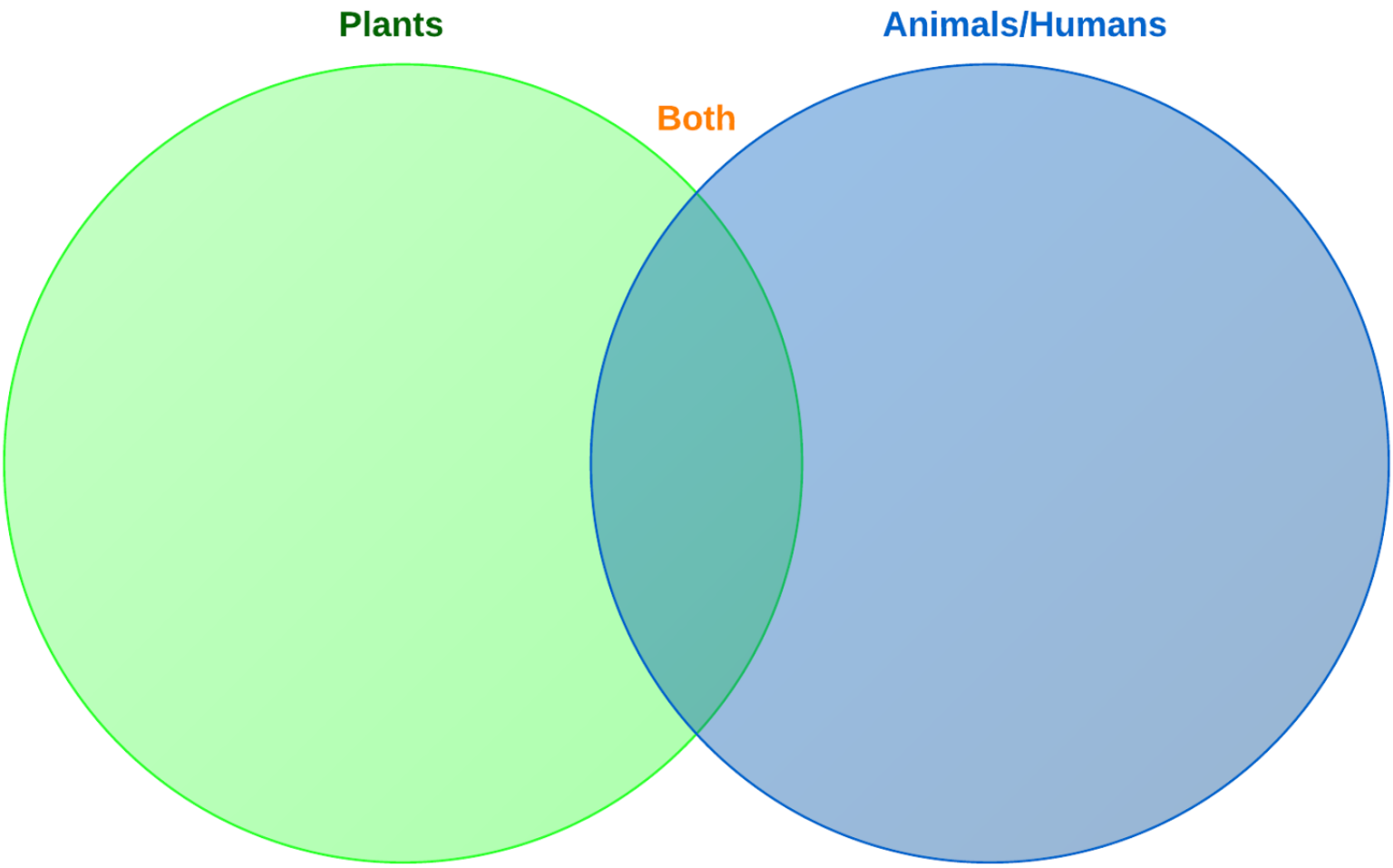
____ On the Plant and Animal Cell diagrams you colored, insert **pictures of *real-world objects*** that have a function that could be compared to the function of each cell organelle (you could use the same objects you used for your analogies)

____ Create a venn diagram to compare and contrast PLANT CELL organelles and ANIMAL CELL organelles.

____ Revisit the list of Human organs/tissues that you rank-ordered (it should be glued in your journal). Match each *organelle* to a specific *organ/tissue* (you'll know you've found a match when you've found organelles and organs/tissues with similar ***functions***).

____ Look at our list of "need-to-knows" for our O.S.U. "Healthy Cells = Healthy *YOU*" campaign. Are there any questions that you have already found an answer to? In google apps, create a document and start a list of possible answers to our questions as well as any NEW questions you now have.

We know that plants and animals are living things. In the Venn diagram, compare and contrast plants and animals/humans.



Animal Cell (includes humans!)

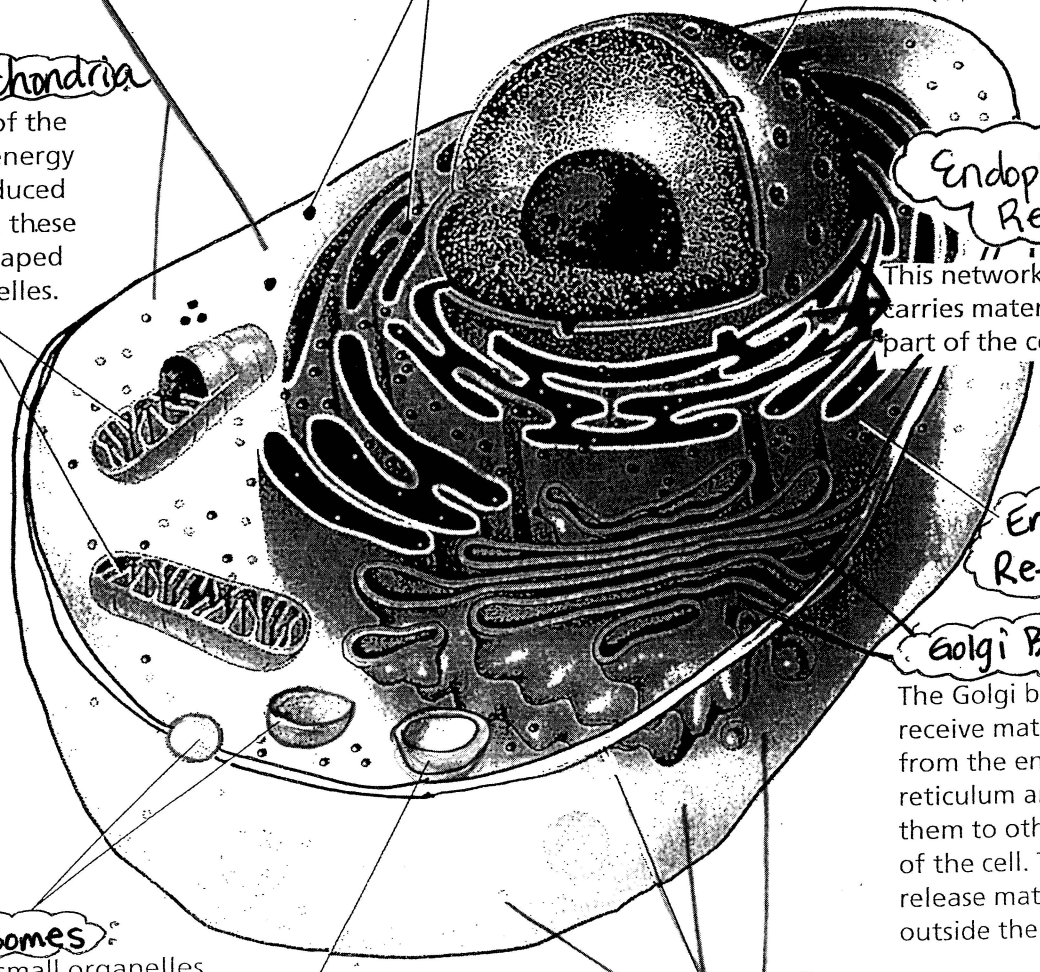
Label & Color

Ribosomes:
These small structures function as factories to produce proteins. Ribosomes may be attached to the endoplasmic reticulum, or they may float in the cytoplasm.

cytoplasm:
The cytoplasm includes a gel-like fluid in which many different organelles are found.

Nucleus:
The nucleus directs all of the cell's activities, including reproduction.
*Contains the cell's DNA

Mitochondria
Most of the cell's energy is produced within these rod-shaped organelles.



Endoplasmic Reticulum (ER)
This network of passageways carries materials from one part of the cell to another.

Endoplasmic Reticulum

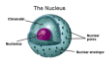
Golgi Body:
The Golgi bodies receive materials from the endoplasmic reticulum and send them to other parts of the cell. They also release materials outside the cell.

Lysosomes:
These small organelles contain chemicals that break down food particles and worn-out cell parts.

Vacuole:
Some animal cells have vacuoles that store food, water, waste, and other materials.

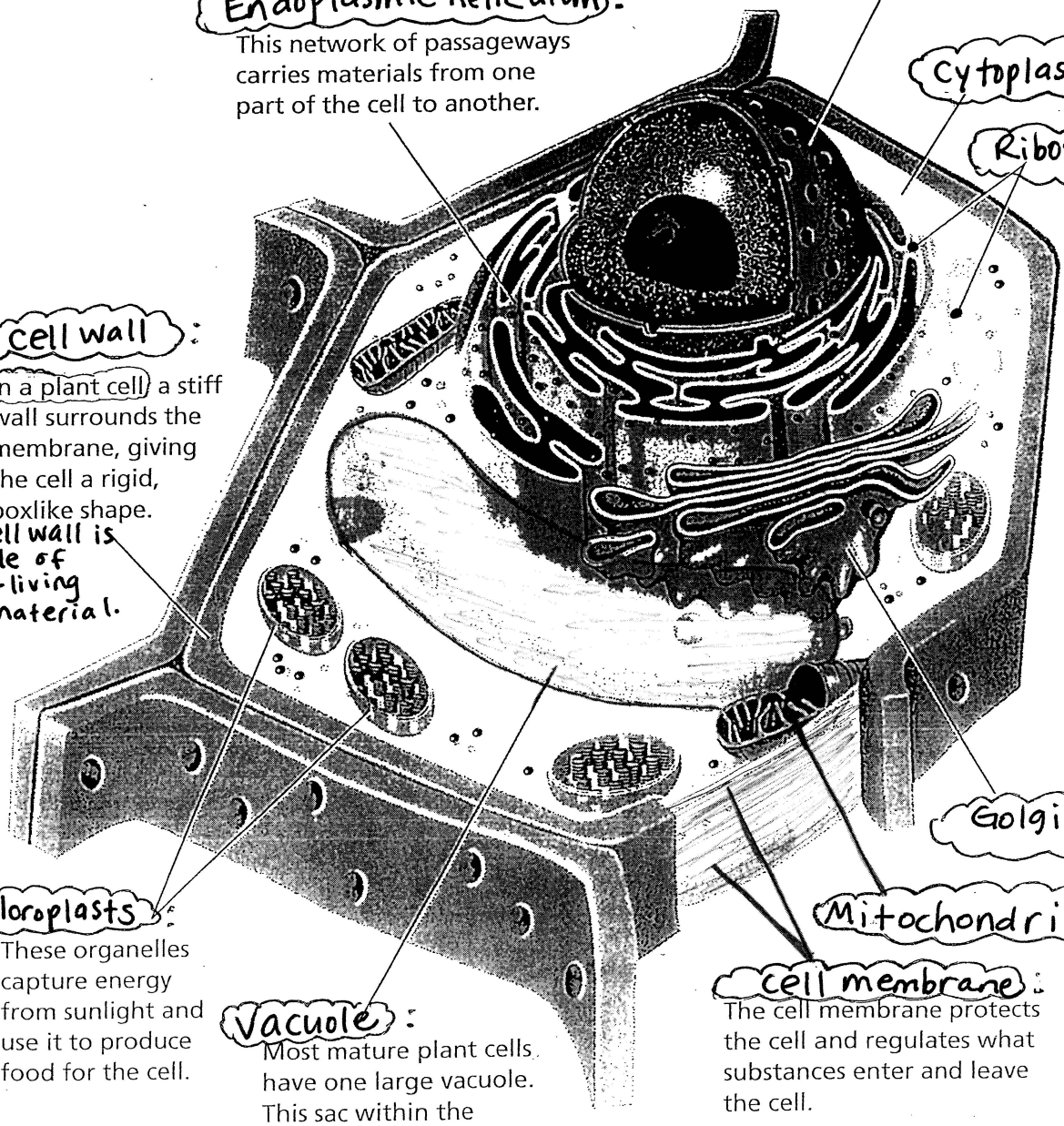
Cell Membrane:
Since an animal cell does not have a cell wall, the cell membrane forms a barrier between the cytoplasm and the environment outside the cell.
*surrounds the entire cell. ("thin skin")

Cells, Cells, They're Made of Organelles

Cell Organelle (***structure***)	**Function** (job) of this organelle	An ***ANALOGY*** that **compares** the function of this *organelle* to the function of a real-world example:	
Nucleus * (contains DNA) 	Directs all of the cell's activities, including reproduction.	The nucleus is like <u>*the human BRAIN*</u>	**Because**… *the nucleus controls the CELL just like the brain controls the human BODY.*
Ribosomes *	Function as factories to produce proteins.	The ribosomes are like…	**Because**…
Mitochondria*	Rod-shaped organelles that produce the cell's energy (convert energy in food molecules into energy the cell can use!)	The mitochondria are like…	**Because**…
Lysosomes	These small organelles contain chemicals that break down food particles into smaller pieces and break down worn-out cell parts	The lysosomes are like…	**Because**…
Vacuole *	*Some* animal cells have vacuoles that store food, water, waste and other materials.	The Vacuole is like…	**Because**…
Golgi Body *	Receives materials from the endoplasmic reticulum and **send them** to other parts of the cell. They also release materials outside the cell.	The Golgi Body is like…	**Because**…
Endoplasmic Reticulum *	This network of passageways carries materials from one part of the cell to another.	The Endoplasmic Reticulum is like…	**Because**…
Cell Membrane*	Protects the cell and determines which substances enter and leave the cell (a thin "skin" that covers the cell).	The Cell Membrane is like…	**Because**…
Cytoplasm*	A gel-like fluid that holds all of the cell organelles in place. *like the egg whites of a raw egg.	The cytoplasm is like…	**Because**…

Plant cell

Label & Color



Nucleus:
The nucleus directs all of the cell's activities, including reproduction.

Endoplasmic Reticulum:
This network of passageways carries materials from one part of the cell to another.

Cytoplasm

Ribosomes

cell wall:
* In a plant cell, a stiff wall surrounds the membrane, giving the cell a rigid, boxlike shape.

*cell wall is made of non-living material.

Golgi Body

Mitochondria

Chloroplasts:
These organelles capture energy from sunlight and use it to produce food for the cell.

Vacuole:
Most mature plant cells have one large vacuole. This sac within the cytoplasm stores water, food, waste products, and other materials.

cell membrane:
The cell membrane protects the cell and regulates what substances enter and leave the cell.

Does the FOOD I Eat Affect my *CELLS*?

What person doesn't wish for more energy at least a few dozen times a day? Of course, you know that a good night's sleep, regular exercise and effective stress management can give you a much-needed boost. But to further figure out why you're slumping, you need to pinpoint the energy-sucks in your diet. "Our bodies rely on the energy and nutrients we get from food, so what you eat – and how and when you eat it – can either *drain* you or *sustain* you," says Jennifer Sacheck, PhD, associate professor of nutrition at the Friedman School of Nutrition Science and Policy at Tufts University. The following fuss-free nutrition tweaks will give you more oomph every day.

Energy Drain #1: *You go long stretches without eating*
Food Fix: **Snack early, snack often**
We know, we know! It's tough to remember to break for a bite when you're in the thick of things. But every time you go more than two hours or so without eating, your blood sugar drops – and that's bad news for your energy level. Here's why: Food supplies the body with glucose, a type of sugar carried in the bloodstream. **Our cells then use glucose to make the body's prime energy transporter, adenosine triphosphate (ATP). Your brain needs it. Your muscles need it. Every cell in your body needs it. But when your blood sugar drops, your cells don't have the raw materials to make ATP. And then? Everything starts to slow down. You get tired, hungry, irritable and unfocused.** Grabbing a bite every two to four hours keeps your blood sugar steady. It's also important to eat something within an hour of waking up – that's when blood sugar is *lowest*.

Energy Drain #2: *You get frequent headaches, causing you to feel sleepy.*
Food Fix: **Drink water throughout the day to keep your cells hydrated**.
Our bodies are approximately 70% water. Because cells are the smallest unit of life, they too need plenty of water in able to function properly. With so many beverage choices on the market today, people often neglect to replenish their bodies with the most precious life-sustaining liquid – water. The ingredients in sodas and other less-than-beneficial beverages cause our cells become dehydrated, zapping our cells of the water they require. When too many cells are dehydrated, energy level drops and the onset of a headache can often be noticed. So, keep your cells healthy by drinking plenty of fresh water throughout the day – *every* day.

Energy Drain #3: *You're eating the wrong veggies*
Food Fix: Get your fill of broccoli and kale
OK, there's no such thing as a "wrong" vegetable, but for the most gusto, prioritize cruciferous ones, like broccoli, cabbage, Brussels sprouts, cauliflower and kale. These rock stars of the produce aisle contain isothiocyanates, compounds that activate a protein in our **cells** called Nrf2, which in turn generates mitochondria, the part of the cells responsible for converting glucose into ATP. "The more mitochondria you have, the better your muscles work and the less tired you'll be," explains Mladen Golubic, MD, medical director of the Center for Lifestyle Medicine at the Cleveland Clinic's Wellness Institute. If you aren't a big fan of broccoli or its cousins, try kicked-up preparations: toss broccoli into a quick stir-fry; mix shredded cabbage with vinegar; or season cauliflower with turmeric, cloves, cardamom, coriander and cinnamon.

Energy Drain #4: *You're not getting enough iron in your diet*
Food Fix: Iron is an essential nutrient for strength and stamina. Iron is a building block of muscle cells as well as hemoglobin, that part of your red blood cells that transports oxygen from your lungs to the cells throughout your body so it can make energy. Beef is the best source of iron, but you can also get your fill of iron from plant sources, including kidney beans and spinach (spinach also contains cell-protecting antioxidants!)

Source: *Health Magazine, September 2013*