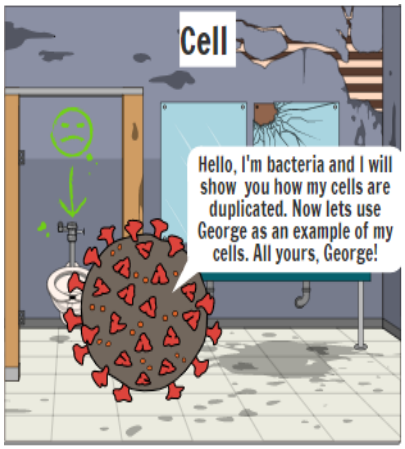
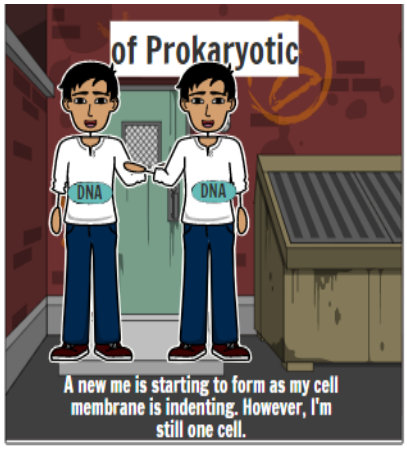
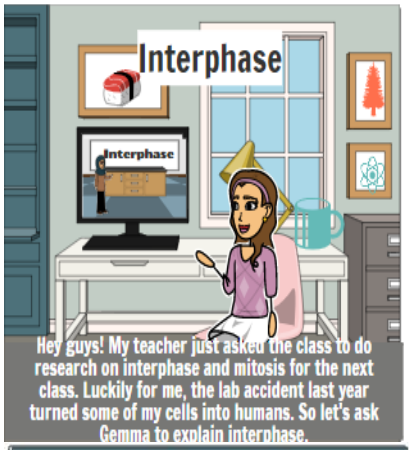
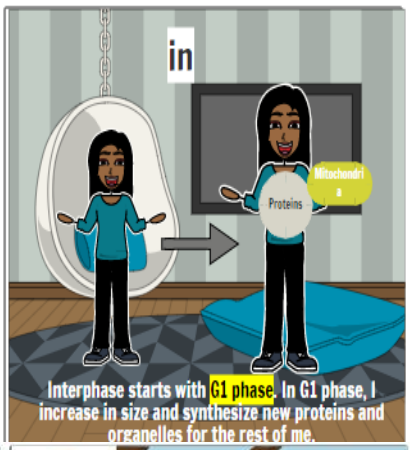

Cell
Hello, I'm bacteria and I will show you how my cells are duplicated. Now lets use George as an example of my cells. All yours, George!

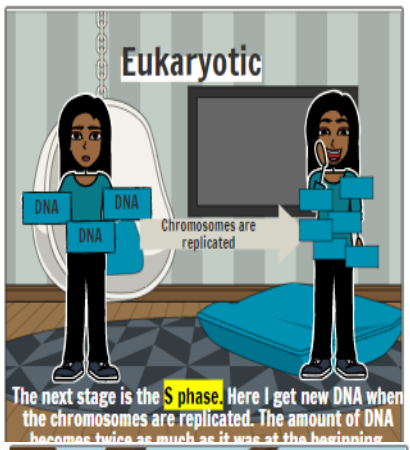

Division
Thanks Mr. Bacteria
DNA
DNA
DNA
First, I have one DNA and a cell membrane in me. Then, my DNA duplicates.

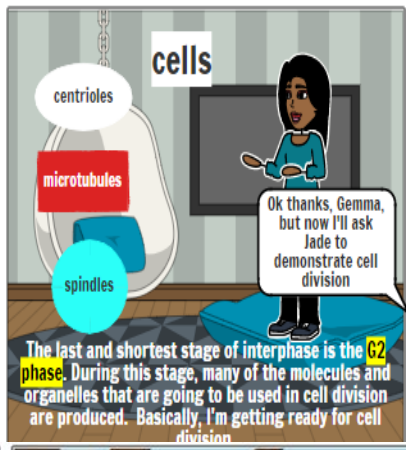

of Prokaryotic
DNA
DNA
A new me is starting to form as my cell membrane is indenting. However, I'm still one cell.

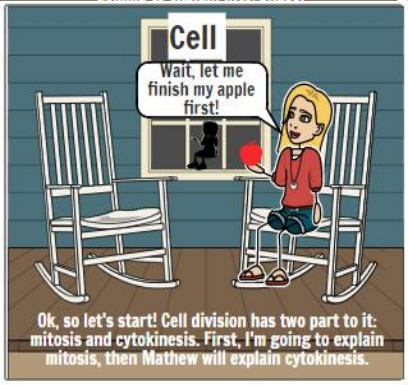

Cells
Hi George!
Hi George!
DNA
DNA
Now, I finally have a new me, with its own DNA and cell membrane!

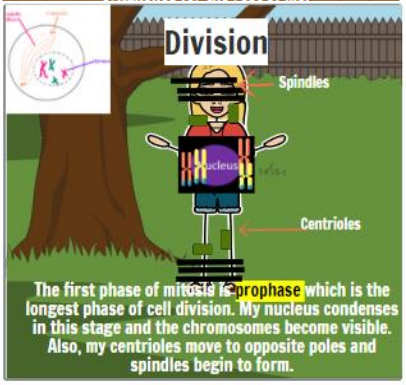

Interphase
Interphase
Hey guys! My teacher just asked the class to do research on interphase and mitosis for the next class. Luckily for me, the lab accident last year turned some of my cells into humans. So let's ask Gemma to explain interphase.

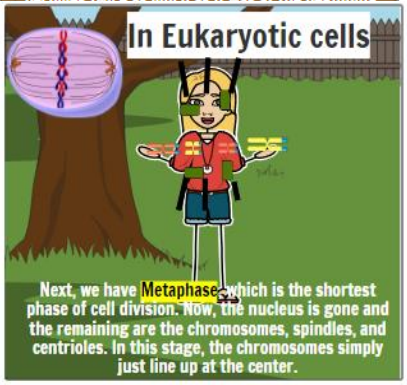

in
Mitochondria
Proteins
Interphase starts with G1 phase. In G1 phase, I increase in size and synthesize new proteins and organelles for the rest of me.


Eukaryotic
DNA
DNA
DNA
Chromosomes are replicated
The next stage is the S phase. Here I get new DNA when the chromosomes are replicated. The amount of DNA

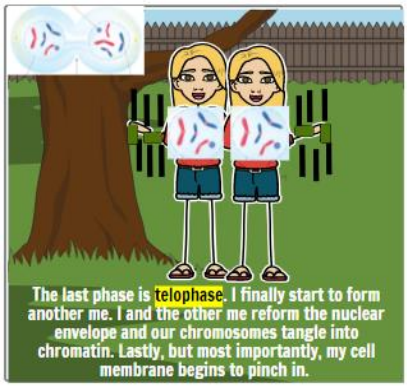

cells
centrioles
microtubules
spindles
Ok thanks, Gemma, but now I'll ask Jade to demonstrate cell division
The last and shortest stage of interphase is the G2 phase. During this stage, many of the molecules and organelles that are going to be used in cell division are produced. Basically, I'm getting ready for cell

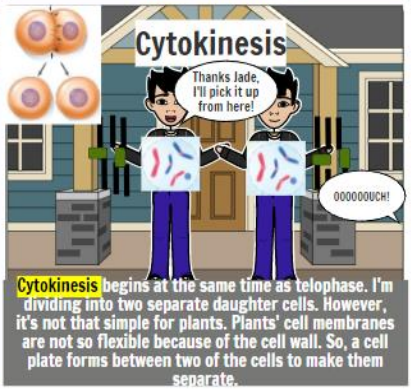

Cell
Wait, let me finish my apple first!
Ok, so let's start! Cell division has two part to it: mitosis and cytokinesis. First, I'm going to explain mitosis, then Mathew will explain cytokinesis.

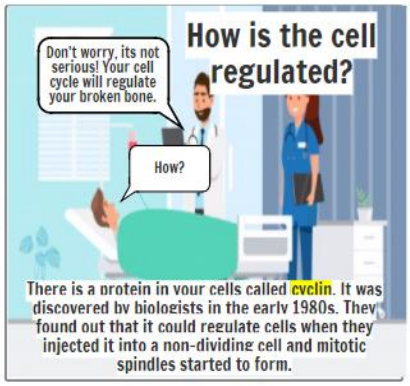

Division
Spindles
Nucleus
Centrioles
The first phase of mitosis is prophase which is the longest phase of cell division. My nucleus condenses in this stage and the chromosomes become visible. Also, my centrioles move to opposite poles and spindles begin to form.

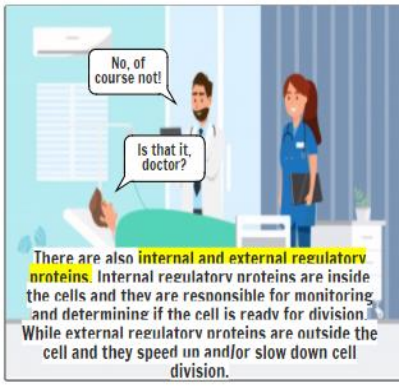

In Eukaryotic cells
Next, we have Metaphase, which is the shortest phase of cell division. Now, the nucleus is gone and the remaining are the chromosomes, spindles, and centrioles. In this stage, the chromosomes simply just line up at the center.

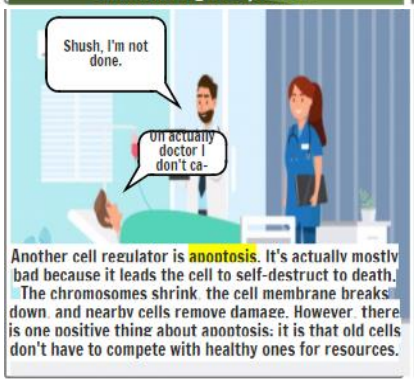

(Mitosis)
The third phase is Anaphase. The sister chromatids of my chromosomes now separate and they move to opposites poles.


The last phase is telophase. I finally start to form another me. I and the other me reform the nuclear envelope and our chromosomes tangle into chromatin. Lastly, but most importantly, my cell membrane begins to pinch in.

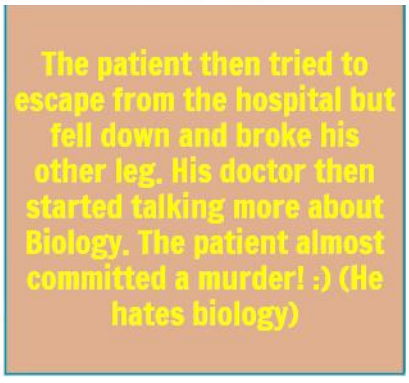

Cytokinesis
Thanks Jade, I'll pick it up from here!
OOOOOOUCH!
Cytokinesis begins at the same time as telophase. I'm dividing into two separate daughter cells. However, it's not that simple for plants. Plants' cell membranes are not so flexible because of the cell wall. So, a cell plate forms between two of the cells to make them separate.


How is the cell regulated?
Don't worry, its not serious! Your cell cycle will regulate your broken bone.
How?
There is a protein in your cells called cyclin. It was discovered by biologists in the early 1980s. They found out that it could regulate cells when they injected it into a non-dividing cell and mitotic spindles started to form.


No, of course not!
Is that it, doctor?
There are also internal and external regulatory proteins. Internal regulatory proteins are inside the cells and they are responsible for monitoring and determining if the cell is ready for division. While external regulatory proteins are outside the cell and they speed up and/or slow down cell division.


Shush, I'm not done.
Oh actually doctor I don't ca-
Another cell regulator is apoptosis. It's actually mostly bad because it leads the cell to self-destruct to death. The chromosomes shrink, the cell membrane breaks down, and nearby cells remove damage. However, there is one positive thing about apoptosis: it is that old cells don't have to compete with healthy ones for resources.


Ok, now I'm done!
Well that's rude!
Ok, thank you for wasting my time.


The patient then tried to escape from the hospital but fell down and broke his other leg. His doctor then started talking more about Biology. The patient almost committed a murder! :) (He hates biology)


Thank you! I'm sorry if you didn't like it. I like it though (I know, shocking!)