**Osmosis Experiment:** Changes in Altitude.

**Background**: The definition of osmosis is the ability for molecules to pass through a semi-permeable membrane from an area of low concentration to high concentration.

-Inside the body, osmosis plays a huge part in the cells, however it plays an important factor within the digestive system as well. After the digestive system has broken down the food, all that is left is the key nutrients that your body needs to survive. This process, allows the body to absorb the nutrients into the intestines and individual cells.

-The rate of osmosis depends on the pressure. When our rocket is reaching the height of 10,000 ft, the pressure is significantly decreased compared to the surface of the earth. Because of the low pressure, it will cause the rate of osmosis to flow down, therefore limiting the amount of liquid that can be entered or exited.

**Idea:** Now, replicating the digestive system in our rocket might be a little hard, but what came to mind is the water that our cells absorbs. There are many types of water brands out there, but which one is best when it comes to absorbing and releasing water through our cells. The idea is to use a substance (gummy bears for now) and allow them to sit in the different type of waters until they can no longer expand. We will place them in a sealed cylinder (vacuumed if possible) and send them up and compare them to ones done on the surface of the earth.

**Items:**

* Gummy bears (any kind, but I think the forest one might be good)
* Fiji water
* Tap water
* Mineral water
* Arrow head
* Aquafina
* (Can use other liquids as well to test osmosis)
* Alcohol (maybe…)
* Energy drink? (Monster, Gatorade, Rockstar…)
* Juice (fruit juices?)
* Cylindrical Containers that may/not have the ability to be vacuumed sealed.
* Go Pro (if needed to time lapse and see the changes)

**Budget:** I am thinking no more than $40 and that is a really big overestimate. Realistically, somewhere between $20-$30 should suffice, but it may change depending on the number of tests we might be doing.

Also, if we don’t have the go Pros, then I might be thinking of another $100 or so.

Grand Total ~ $120-$140

(I will be doing a spread sheet if needed to input prices, leave that to me)

**Purpose:**

* Determine what beverages are good when you fly?
* How much liquid is actually being absorbed at different altitudes and pressure?
* What type is water is best absorbed and well off for the body?
* Will certain water types benefit your hemoglobin as you receive less oxygen at high altitudes than lower ones?

**Dilemma:** It’s not a bad project, though the space it will take up will inhibit some of the rocket to fly (unless we design it around it). The project does take time for the results to kick in, so depending on the time the rocket is in the air for, results may/may not be as what we might expect.

**Backup plan:** If this doesn’t turn out to be expected, we can do an experiment that involves pressure. Such as the amount of hemoglobin at certain altitudes and the effect altitude has on the blood. Or, we can conduct a marshmallow. Maybe we can design a capsule that will keep the marshmallow from expanding and contracting. Little background info, the marshmallow pressure test shows that at high pressure, the marshmallow will decrease in size and shrink. However, at low pressure, it causes the marshmallow to expand. Maybe we can see if we can combine bio and some physics to create an capsule that will help maintain a constant pressure on the inside while the varying pressure on the outside.

**\*Hey guys, sorry for not too long of a research, my classes and work are taking a huge toll on me, since this was not a very in-depth research paper, I would like to apologize first and if you guys do like my ideas/concept, then Ill will dedicate more time into research this. Thanks a lot! \***