Week one

- Part one
    - scientists have been using stars and their orbits to calculate the huge mass of the black hole at the center of the galaxy.
    - Epidemiologists use a reduction parameter or R0 to track the amount of infection spread from one person.
    - Newton's law of motion states that items with different mass and shape will still fall at the same rate when dropped.

- Part two

    - To get optimal growing conditions for tomatoes, an experiment has been written. This experiment should be done in the summer so the plants get an optimal amount of sunshine. First, get ten tomato seedlings that are the same size, type and brand. The second thing that is needed is to find an open area big enough to hold ten tomato plants with plenty of room for each. This open area also needs to have the same type of soil throughout to keep the experiment consistent. Once a patch has been chosen, divide the area into two rows of five and plant each seed into each small area, labeling them 1-5 after each is planted. The first row of two should receive one cup of water. The ones labeled two should receive two cups of water, the third row three, the fourth row four and the fifth row five. They all need to be measured each morning before being watered, also keep track of the amount of tomatoes produced and compare their sizes as well.

Week two

- Part one
    - The ice cube south pole neutrino observatory is a massive observatory located in antarctica. Building the ice cube was a huge accomplishment and required “300 physicists from 53 institutions in 12 countries” [1]This observatory tracks subatomic particles called neutrinos, which are massless high energy particles that help provide scientists with information about the rest of the universe. This is done by a massive underground monitoring system that “covers a square kilometer of the surface and extends down to 4,920 feet” [2] this depth is necessary so the sensors underneath the ice have enough room to scratch out and do their jobs of searching for neutrinos. Neutrinos are “messengers that provide information to probe the most violent astrophysical sources: events like exploding stars, gamma-ray bursts, and cataclysmic phenomena involving black holes and neutron stars” [1]. Its also been noted that their help with “ explaining the mystery of the origin of the highest energy cosmic rays” [3] could help show a clearer image of extra-galactic areas where these rays are originating The observers do this by tracking the neutrinos themselves, because they have “no charge they are able to pass through magnetic fields without having to change their path”[2]. This observatory was a huge step towards learning more about the galaxy and having evidence of when things occurred and how.
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- Sources
- [1] University of Wisconsin-Madison, IceCube Neutrino Observatory https://icecube.wisc.edu/about/overview
- [2] Space.com, IceCube: Unlocking the Secrets of Cosmic Rays https://www.space.com/41170-icecube-neutrino-observatory.html
- [3] wikipedia.com, IceCube Neutrino Observatory https://en.wikipedia.org/wiki/IceCube_Neutrino_Observatory

Week Three

- Part one
    - The baby was born 8lb, and 23in long.
    - The baby grew half an inch a day until her first birthday.
    - It took the radio transmission 30 minutes to get from the earth to the moon.
    - A hiker walked 60 km in four days, her average was 15km a day.

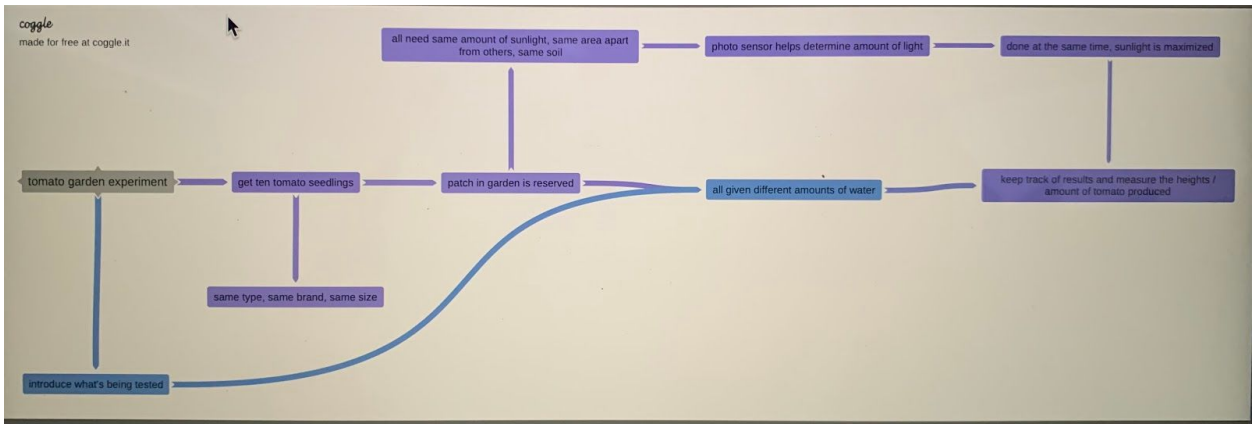
- Part two

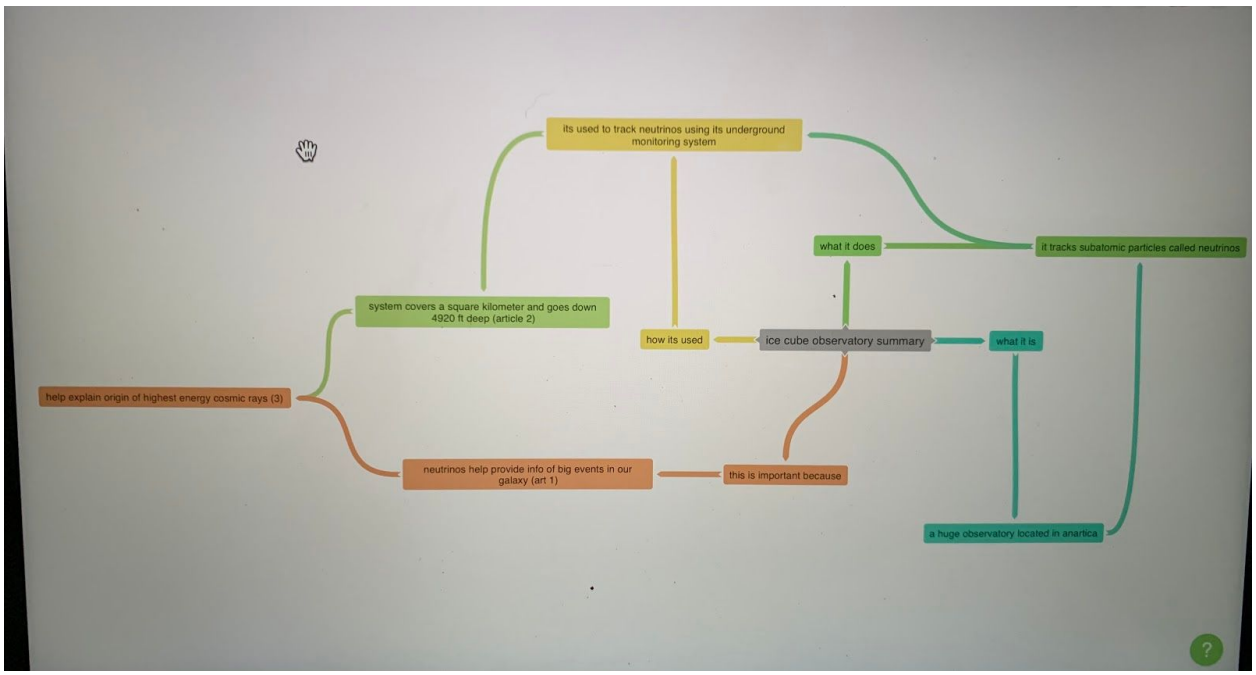
- to make a grilled cheese sandwich you will need bread, butter, cheese, a knife, a skillet, a burner and a plate. To get the bread go to the long cabinets next to the kitchen table and open the left one, look at the top shelf and there will be a green bag full of bread, grab it and put it on the counter to the left of you near the stove top. On the second shelf from the bottom in the same cabinet you will find paper plates, grab one and put it with the bread. Then walk to the fridge or turn 90 degrees left then walk five steps forward, turn another 15 degrees and walk two steps to the fridge. Open both doors, on your right at the top of the fridge door there's a small clear compartment, open it and grab the butter. Then walk to the stove top. On your left there are two drawers, one up top and one on the bottom. Open the bottom one and grab the blue skillet, in the top drawer open it and grab a butter knife. First turn the stove on medium heat using the bottom left burner and put the skillet on top. Take two pieces of bread and butter both sides, place them both next to each other on the paper plate and place all the cheese on one side and take the other piece of bread and sandwich it. Then put this on the skillet. While this begins to cook, to the left of you there is a cup with a yellow spatula in it. Grab it and flip the grilled cheese after about a minute. If the color of the bread is to your liking, repeat, the previous step is the other side. If the bread isn't dark enough, keep cooking it back and forth until it is. Once done, turn off the stove, move the skillet to a cool burner and use the spatula to move the sandwich back to the paper plate.

Week four

- Part one
    - The acceleration of earth's gravity (g) is measured with a pendulum. The length of the pendulum was measured at 20 cm. The pendulum was then hung straight down and the bobo was displaced 5 cm to the right. The pendulum was released and the number of times it completed a full swing was recorded over a minute. It was calculated that the pendulum returned to the original position every 0.90 seconds. The results were inserted into the formula predicted by newton's law and the gravity was 9.81 m/s2

- Part two
    - A sample of 20 infected people were gathered, each of them 5 feet and six inches tall. These trials were conducted in a room with no air conditioning so the air flow wouldn't play a part in the experiment. Petri dishes were arranged with .5 meter intervals out to 10 meters on the floor in front of the subject. The people were then asked to stand behind the dishes, staring down the line. Once each person got the urge to sneeze, the subject was required to aim the sneeze down the line without covering their mouth. This was repeated with each subject and the average horizontal distance after each subject sneezed was measured. The bacteria was then allowed to grow in the dishes for one week. After the week, the dishes with the largest colonies or bacteria were the ones at 8 meters, which means its possible to spread infection to someone who's eight meters away. This further informs the epidemiology of spreading bacteria




its used to track neutrinos using its underground monitoring system
what it does
it tracks subatomic particles called neutrinos
system covers a square kilometer and goes down 4920 ft deep (article 2)
how its used
ice cube observatory summary
what it is
help explain origin of highest energy cosmic rays (3)
neutrinos help provide info of big events in our galaxy (art 1)
this is important because
a huge observatory located in anartica