Terraforming Mars

New Mexico

Supercomputing Challenge

Final Report

April 2, 2014

Team Number 88

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Executive Summary

We choose this project because our team really is interested in this because it is a neat topic about space, and this topic is really interesting. It draws people's attention because maybe one day we will be able to live on Mars if this is possible.

Also, our project last year was about space stations and how the people interact with each other and their environment we also have started the NetLogo program based on our research on the problem. Also, we will use programing code from last year's project to add into this one using Star Logo. Our project last year was to see how a space station could recycle resources in a bio-dome type area. We also tested how the levels of oxygen and CO2 would level out. This is same type of problem with similar variables.

We hope to find a way to terraform Mars using small algae and soon use plants on the surface of Mars. Since there really isn't any water, algae is our good source to use for terraforming this planet. Scientists assume that there are bodies of ice under the surface of Mars, and we hope to use a nuclear plant pump to gather the water, and bring this water to the surface for our use.

We have come together afterschool and, when we have time to work on it, we have also worked on it when we can. We have all pitched in and helped each other get out of our problems.

Problem Statement

The basics of our problem involves trying to terraform Mars. We will do this by putting bacteria on the surface that will breathe in carbon dioxide and give off oxygen. Our main problem

in this task is the lack of water. Plants wouldn't be able to live up there because they need all three elements for that plant to grow and survive. Those three elements are soil, carbon dioxide, water.

The first two should be found on Mars usable amounts. Some planetologists believe that Mars might once have had oceans. This means that there might be underground water supplies. We will assume there is, and that it just needs to be pumped to the surface. Details about this pumping are not part of our project

To determine the feasibility of changing Mar's atmosphere, our model will simulate adding photosynthetic organisms to the Martian environment in order to create oxygen by using natural photosynthesis. This will make it similar to earth conditions.

We would like to see how long it will take to make a livable environment on Mars. It is important to terraform Mars to make another place for humans to live besides earth because our needs for living space and resources are constantly increasing.

Method and Software

We are using NetLogo to model how we are going to terraform Mars. We know NetLogo is a more powerful resource that can handle more agents than the StarLogo that we have recently used in the past.

Plan of action with methods- We will use NetLogo to model our project. We will use programing from last year's project to add into this one using Star Logo TNG. Our project last year was to see how a space station could recycle resources in a bio-dome

type area. We also tested how the levels of oxygen and CO2 would level out.

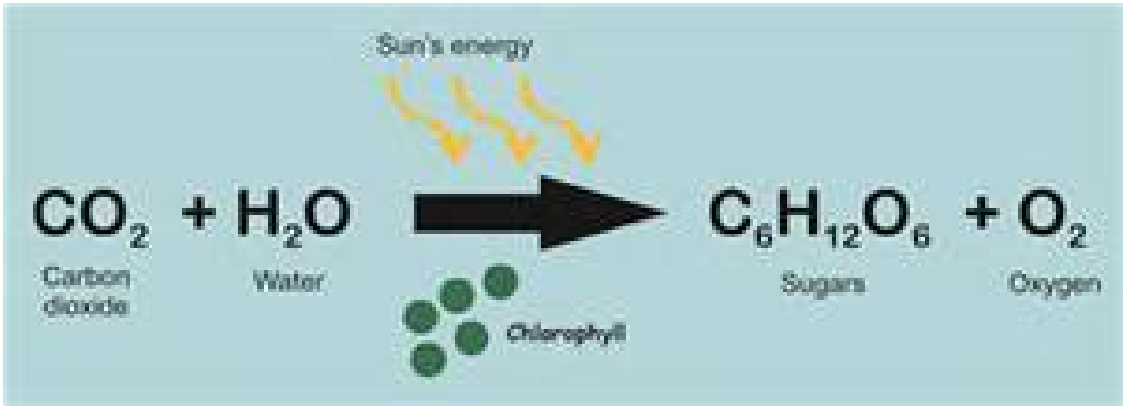
Results, Conclusions, and Achievements

The one major thing we have learned from this project is how to run NetLogo and we are starting to learn about NetLogo and how to place agents or turtles.

We have also learned a lot about space such as learning about the surface or layers of Mars and what to put on Mars to live and what not to put on so we don't die, we think it would be really cool to be in Mars because of the gravity so we can flip around. We have overcame a lot of obstacles to get this far.

Verified and Validated

Our model shows how carbon dioxide is taken in by plants and releases oxygen just like earth. It is realistic because it shows exactly the same thing as photosynthesis as long as there are inputs like the picture below:



Citations and Acknowledgments

References:

The links we used were:

- *http://news.yahoo.com/terraforming-mars-those-believe-gingrich-thinking-small-213500067.html*
- *http://www.bibliotecapleyades.net/universo/terraforming/terraforming11.htm*
- *http://www.nasa.gov*
- *http://en.wikipedia.org/wiki/Terraforming_of_Mars*
- *http://en.wikipedia.org/wiki/Windmill*
- *http://en.wikipedia.org/wiki/Geothermal_energy*
- *http://www.ehow.com/about_6626967_do-solar-panels-produce-electricity_.html*
- *http://en.wikipedia.org/wiki/Nuclear_power*
- *https://answers.yahoo.com/question/index?qid=20070508061802AA31ddK*
- *http://ccl.northwestern.edu/netlogo/faq.html*
- *http://en.wikipedia.org/wiki/Propane*
- *http://www.bing.com/videos/search?q=propane+how+it's+made&FORM=VIRE1#*