**8th Grade**

*~Construct an experiment assignment~*

**State Standard**

MS-ESS3-4.Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems.

**Objectives**

* Design an experiment or argument that answers the question “If I make this small change in my life, how much will it effect the environment if everyone performed this task?”
* Determine a hypothesis.
* Conduct the experiment and analyze the results.
* Present and discuss the results of the experiment.

**Anticipatory Set/ Linking to Prior Knowledge**

* Learn how to design an experiment.
* Earth’s System
* Make sure the students understand:
  + Human Population: Number of humans in a certain area
  + Per Capita Consumption: Consumption of an individual
  + Natural Resources: Material of substances such as minerals, forests, water and retile land that occur in nature.

**Trip to Biotrek**

At Biotrek, students may learn about rainforest and plant resources. They might also see an exhibit on the effects humans have on the environment. Students will also be introduced to different types of renewable resources including solar and wind power.

**Materials and Time**

* Materials are decided by each individual student
* Must give student several weeks to design the experiment and conduct it.

**Instructions**

Make sure you discuss with your class about human population and impacts humans have on the Earth’s natural resources. When students go to Biotrek they will learn about what the Earth provides for us and how we affect the environment. They will also learn how individuals use these resources and how some people are using alternative or renewable resources. Also, explain how these resources affect the system as a whole. Then conduct the experiment after the trip to Biotrek.

**Resources for Students**

* <http://carbonconnections.bscs.org/curriculum/unit-03/carbon_calculator/index.php>
  + Carbon Calculator
    - Measure your Carbon Footprint or measure your impacts on our climate.
* <https://www.census.gov/popclock/>
  + Census Site
    - Population Data (As of June, 2014)
      * World Population 7,147,601,310
      * U.S. Population 318,304,130
      * U.S. is the third most populous country
      * California is the most populous state with 38,332,521

A Small Difference

Can Make A Big Difference



http://www.stephankinsella.com/wp-content/uploads/2010/08/planeta+manos.png

If I make a small change in my life, how much of an effect will it have on the environment if everyone performs this task? It is believed that every individual has an effect on the planet. We have learned about the human population and per capita consumption. For this assignment each student will develop their own argument and experiment by making small changes in their life. We will see how it can affect the environment. The experiment should have a value that is measureable. Once they conduct their experiment they should compare their results as if the entire class and the world would perform the experiment. The student will then argue how it will affect the environmental resources and the earth as a whole.

**Due Date:**

**Examples of Potential Experiment**

* Individuals look at the electric meter and see how much electricity their family uses a week. Then make the effort to turn off all the lights when leaving a room and see how much electricity you can save. If individuals save energy there will be less energy produced.
* Individuals start to recycling their water bottle; they can count how many recycled items they have collected over a period of time. They can then state that these bottles will not be going to landfills. There argument could be; if many people recycle the amount of trash in landfills will decrease. This will help the system as a whole because if we have less trash in landfills then there will be less land used as landfills.

Expanded Example of Recycling Water Bottles

Argument: If people recycle water bottles then there will be fewer water bottles in landfill.

Experiment: I will recycle and count all the water bottles that I use in the next two weeks. Then I will calculate if a class of 30 students all recycle the same amount of bottles, then I will find how many bottle will not go to the landfill.

|  |  |
| --- | --- |
| Data Day | # of Water Bottles |
| 1 | 3 |
| 2 | 2 |
| 3 | 4 |
| 4 | 1 |
| 5 | 3 |
| 6 | 2 |
| 7 | 2 |
| 8 | 2 |
| 9 | 5 |
| 10 | 3 |
| 11 | 2 |
| 12 | 1 |
| 13 | 2 |
| 14 | 3 |
| Total | 35 |
| Class (Total X 30) | 1050 |
| World (Total X 70,000,000) | 2,450,000,000 |

Conclusion

If we recycled our water bottles we could save up to 2,450,000,000 bottles. With all these bottles being reused, there would be less use for landfills and we could reduce the amount of land used for landfills. We learned that landfills are being built in rainforests; with the reduction of landfill use we would have more rainforests. More rainforests means more oxygen will be produced because of the abundance of trees that would be saved.