Reduction of CO2 through Recycling In Las Cruces

New Mexico

Supercomputing Challenge

Final Report

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Team 96

Picacho Middle School

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Executive Summary:

In this report we explain how to reduce CO2 from the earth by recycling and how to protect the earth. We are also going to try to encourage people to recycle paper, plastic bottles, glass and other important materials that will help the reduction of CO2. We are going to talk about our StarLogo model that will show how recycling can reduce the production of CO2. We focus on the materials that our school is recycling: paper, aluminum, cardboard, and plastic.

CO2 (Carbon Dioxide) is known to be a greenhouse gas, which traps heat in the atmosphere of the Earth. A lot of CO2 is from natural processes like the respiration of animals. Humans are producing a lot of extra CO2 when we burn fossil fuels. Manufacturing products from raw materials takes more fuel than recycling. We will model the CO2 savings or conservation we get when we recycle materials at Picacho Middle School, and then show how much we could conserve if all of the Las Cruces schools recycled.

Statement of the problem:

How much CO2 is conserved when we recycle paper, aluminum, cardboard, and plastic? At our school we recycle an average of 16.1 lbs. of material per student each month. The average per student at the five schools that recycle is 16.2 lbs. per month.

Recycle volume in pounds

School	Jan	Feb	Mar	Apr	May	SUM	Pop.	Lbs/Student
Picacho Middle	2174	1947	5328	2138	1485	13072	812	16.1
Mesilla Park	1953	2124	3024	1625	330	9056	512	17.69
University Hills	2457	2036	3312	1967	1155	10927	410	26.65
Desert Hills	851	1416	2160	1283	1073	6783	733	9.25
Central Elem.	473	708	2016	1026	1320	5543	248	22.35
Camino Real	1418	708	1296	1026	1403	5851	1137	5.15

The city recyclers could not tell us how many pounds were recycled each of paper, aluminum, cardboard, and plastic, but they could tell us the average pounds of these materials in 1000 pounds of material. With this information we could figure out about how much of each material we were recycling.

% Materials/1000 lbs.					Lbs/Student/M
Paper	200		(20%)		3.24
Aluminum	100		(10%)		1.62
Cardboard	400		(40%)		6.48
Plastic	300		(30%)		4.86

We found a web site[1] that showed us how much CO2 is saved when our materials are recycled. The website showed these figures in metric tons of

	CO2 Savings/Ton
Paper	**0.0992**
Aluminum	9.8700
Cardboard	**0.0992**
Plastic	3.6300

CO2, so we had to convert our pounds into metric tons to do the calculations.

Method used to solve the problem:

We use the StarLogo program for our project to show the more we recycle the less carbon dioxide there will be. We put the set-up, clear all, put 200 recyclers, and scatter recyclers. The recyclers are following the steps to go forward and turn to 0 to 30 degrees. When they recycle the black ants change colors from black to red. They change because they are holding something to recycle. They are putting all the recycle in one place and there is less carbon dioxide.

Conclusion

We calculated that our school saves about 652 tons of CO2 each school year by recycling. When we multiplied the CO2 saved per student by all of the students in the schools we calculated that Las Cruces schools could save over 4,133 tons of CO2 emissions each year by recycling these common materials. We learned that next year nine more schools will be doing this. We think it would be a good idea to tell the students and teachers how important this is.

References

1 http://www.universe-projects.com/factsheets/recycling
2. http://en.wikipedia.org/wiki/carbondioxide