

Monty Green Gazette

Written by Environmental
Science Students

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Inside

The Benefits of Buying Local	2-3
Deforestation: The impact on orangutans and tigers	4
Test your energy IQ	5
Montgomery's Footprint	5
Environmental Book Review- Into the Wild	6
Tragedy of the Commons	6-7
Heal the World	7
China's Air Pollution	8
Bottled vs. Tap Water	9
MHS Solar Initiative	10



“The Montgomery High School Environmental Science Program, consisting of both courses and co-Curricular clubs, welcome contributions from community members with particular expertise, passion, or resources that support our goal to promote environmental stewardship. If you would like to offer a contribution, of talent or resource, to the MHS Environment Science Program please contact Jason Sullivan, MHS Science Supervisor (jsullivan@mtsd.us).”

Giving Back to Mother Earth

By: Ms. Kleinfield

At this time of year we are reminded of all the wonderful gifts “Mother Earth” has provided us; from diverse trees glistening with snow, fossil fuels to warm our homes and fireplaces, to the latest specie of the new puppy tied up with a red ribbon, to the fresh water we drink, shower, play and get hydroelectricity from, to the beautiful mountain ranges we ski on, the reefs we snorkel through, the wilderness we explore, the bounty on our table.

How can you give thanks and return what we have used, abused, polluted, and wasted?

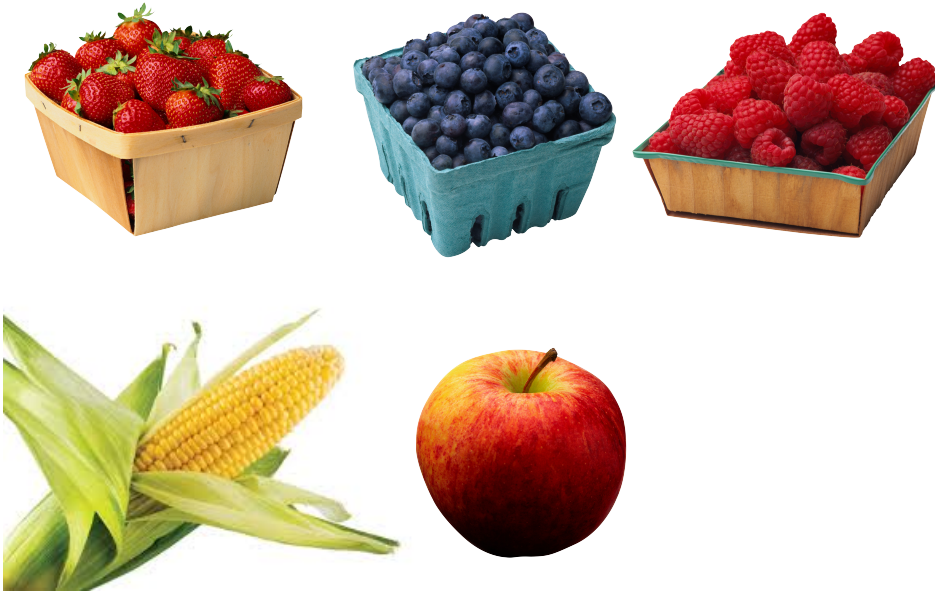
Think about the following:

- Plant a tree
- Use a refillable bottle instead of buying 8oz water bottles
- Stop littering



Follow me to Page

5



**Buy
Local
Produce!**

**By: Chandler
Windom**

**Buying local produce not only helps the local economy
but decrease our carbon footprint.**

Apples

Terhune Orchards

Cost: \$1.50 per pound

Distance Traveled: 32 Miles

Gallons of Fuel Burned: 1.5 gallons

CO₂ Produced: 27 pounds

Nutrition: 100% of nutrients available when freshly picked

Extras: Helps to stimulate local economy and small businesses. It's also fun to go and pick apples.

Chile

Cost: \$1.30 per pound

Distance Traveled: 5,095 miles

Gallons of Fuel Burned: 190 gallons

CO₂ Produced: 4,180 pounds

Nutrition: 50% of nutrients are lost after 1-2 weeks, even when refrigerated*

*note: supermarkets can keep apples in storage for up to 14 months before putting them on the shelves

Extras: It's easier to do all your grocery shopping at a grocery store

Why Local Produce?

By: Angela Chow

Despite recent medical advancements, today's youth is the first generation that is not going to outlive the previous generation. We often hear those horror stories of people suffering from cancer; even though, they did not show any inherited traces of it. Most scientists link the increasingly faltering health of humanity today to the intake of unhealthy foods full of chemicals.

In supermarkets today, it is common to find a banana from Guatemala or even an orange from Africa. These fruits, cultivated from countries far away, increase the amount of carbon emissions being released into the atmosphere. In order for these crops to arrive in a local supermarket, they must be transported thousands of miles across oceans, various terrains, and roads, contributing to increasing global warming. When they finally arrive at the grocery store, they are full of pesticides that were aggressively sprayed to preserve them during their long journey. Pesticides are full of toxins that are potentially damaging to the brain and nerve cells. Pesticides also contribute to pollution of drinking water when they experience "run off." As such, these agricultural chemicals pose an industrial health risk for farm workers, and wildlife.

Unfortunately, most large industrial farms *mono-crop*, resulting in a decrease of biodiversity that ultimately can destroy the soil and is unsustainable. However, locally grown foods are grown on small farms, which are more likely to produce a wider range of crops, therefore increasing the biodiversity which is desirable for a healthy ecosystem.

The average farmer spends about 80 cents on the dollar transporting, packaging, processing, and marketing the food product. Farmers who sell to local customers receive the full retail price without incurring these costs, thus revenue is kept within the local economy.

We are blessed to have a wide variety of easily accessible local food farms and products in Montgomery Township. These include: Terhune Orchards, Griggstown Quail Farm, Hillsboro Farm County Market, and Pennington Farm Market. Eating locally grown food is highly encouraged. It not only improves individual health, but also promotes environmental awareness and sustainability, boosts the local economy, and tastes great. Going green does start with a conscious effort and act. Take a stand. Simply purchasing local produce will benefit yourself, the environment you live in, and those around you.

"Parents may soon outlive obese children." *Health*. 25 11 2013: n. page. Print.
<<http://www.dailymail.co.uk/health/article-137523/Parents-soon-outlive-obese-children.html>>.



Notes from the W.W.F.

Deforestation can release large volumes of **greenhouse gases**. This is particularly severe in tropical forests growing on peat soils. In just one province of Indonesia (Riau Province, Sumatra), the average annual greenhouse gas emissions between 1990 and 2007 were an estimated 0.21 gigatons of CO₂, arising from deforestation, forest degradation and resulting peat fires. Why are they cutting down all of the trees? So they can plant rows of oil palm trees for an ever-expanding demand for palm oil.

So where is the problem? Besides the aforementioned release of gases, these forests are the home to the Sumatran tiger and the Orangutan.



In South-East Asia, alone, the likely equivalent of 300 football fields are deforested every hour, resulting in the deaths of more than 1,000 **orangutans** each year. Some 90% of orangutan habitat has been lost and at the current rate of deforestation, orangutans could be extinct in the wild in less than 10 years.

As few as 400 **Sumatran tigers** remain in Indonesia – about 12% of the estimated global population of 3,200 tigers. Accelerating deforestation and rampant poaching across the Sumatran tiger's range mean that unless authorities enforce the law, this subspecies will soon follow the fate of its extinct Javan and Balinese relatives.

Are there substitutes to palm oil?

There are a number of reasons why we continue to use palm oil in our products. As a crop, palm oil is 10 times more productive per hectare than other oil crops, such as soybean, sunflower or rapeseed. While it is high in saturated fat, unlike butter or other animal fats palm oil does not contain bad trans-fats.

The palm oil industry is large and employs hundreds of thousands of people worldwide. A report by the World Bank and Asia Development Bank stated that the Malaysian palm oil industry currently employs 570,000 people and produces export earnings of more than RM68 billion (about \$22 billion Australian dollars) per year.

Of even greater concern is the fact that demand for palm oil is predicted to increase, and forests constitute most of the remaining suitable areas for plantations.

While it is true that in some instances palm oil can be substituted for an alternate vegetable oil, it is an extremely versatile and abundant ingredient. Palm oil can, if produced sustainably, still be used to make the products we use every day without the expense to the environment.

"Orangutans." *W.W.F.*. N.p.. Web. 25 Nov 2013.

<http://wwf.panda.org/what_we_do/endangered_species/great_apes/orangutans/>.



Continued from page 1

- Use less water when showering
- Use energy efficient appliances.
- Turn off lights and unplug electrical appliances
- Eat less meat (reduces your carbon footprint)
- Give clothes away to be reused
- Take out library books or use e-books, instead of buying new books
- Buy local produce
- Carpool
- Don't irrigate lawn when it is raining!
- Check for leaking faucets
- Use insulation on water pipes
- Cover drafty windows.
- Turn thermostat down in house and wear more layers

Test Your Energy IQ

Johnson, Keith. "Six Myths About Renewable Energy." *Wall Street Journal* 23 09 2013, R1. Print.

- 1) What country produces the most electricity, in absolute terms, from renewable sources?
a) Iceland b) Norway c) U.S. d) China
- 2) What country gets the largest percentage of its electricity from renewable sources?
a) Iceland b) Norway c) Paraguay d) U.S.
- 3) Last year, what was the biggest source of new generating capacity in the U.S.?
a) Natural gas b) Wind power c) Nuclear-power upgrades d) Solar power
- 4) U.S. wind farms have roughly the same generating capacity on paper as the entire power sector in which country?
a) Luxembourg b) Spain c) France d) Australia
- 5) True or False? The Romans used geothermal energy?
a) true b) false
- 6) What country has the most installed solar-power capacity?
a) U.S. b) Spain c) China d) Germany



By: Ashish Reddy

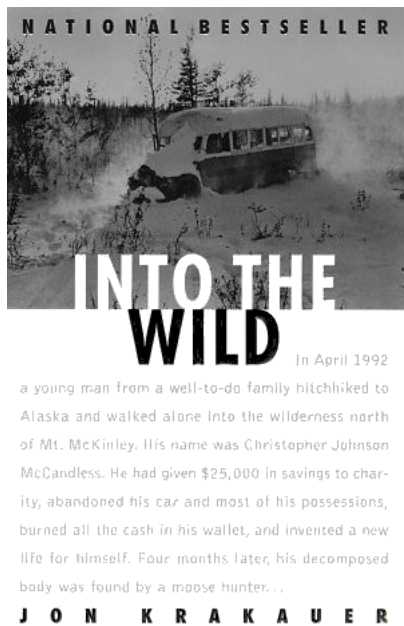
It is 5:30 pm, the sun is out, school is over, yet, most of the parking spots at the school are filled and all the lights are on. The cars in the parking lot belong to students who are still at the school. This picture could not be a better representation of why our ecological footprint is so high here in Montgomery.

For example, if the whole world lived like I did, we would need nearly four worlds to support everyone. Most families in Montgomery own three cars as nearly each family member that can drive has their own car. You look at this picture and ask yourself why the lights are on when the sun is out? We are overusing our electricity and just wasting it. No wonder our ecological footprint is so high.

Answers: 1) d China 2) a
Iceland 3) b wind power
4) d Australia 5) True
6) d Germany

(Continued)

Environmental Book Review By: Jessica Lee



Into The Wild is about a young man named, Chris McCandless. Chris was born into an economically stable family, but as he entered adulthood he no longer wanted materialistic items and a life of luxury. When he graduated from college, Chris donated the remainder of his college fund about \$25,000 to a charity and took off to live in the wild, off the land; he wanted to live a simpler life. However he soon realized that it was not as easy to live off the land as he had thought it would be. The book also talks about a few other adventurers who also tried to live off the land and explore the world. Some of these adventurers made it through their journeys, however many did not. One thing they all learned was it was not a simple task. Chris learned his lesson the hard way. He encountered many obstacles; many of the waterways he chose to travel had dried up or become murky to the point that he could not paddle his canoe; he had to either pull or carry it. Additionally, Chris learned that the food supplies in the forests in Alaska are very competitive. Many hunters go out in to the forests and hunt for the same animals. Because Chris did not do his homework, he was not equipped to live off the land and survive his adventure. Chris died a slow hungry death.



A big environmental issue in this book is the decrease in biodiversity due to the drying of lakes and the hunting that occurs in the forests. Because of this, *Into the Wild* makes the perfect book for anyone who wants to learn more about Alaskan wildlife, living off the land and environmental issues. This book would also make a great guide for any person who has plans on going into the wild to live off the land.

The Tragedy of the Commons By Nikki Jadav

Garret Hardin wrote an essay describing the Tragedy of the Commons. In it he made several points, the main one being that the population is growing exponentially, while our resources are finite. On top of this, the current population is overusing the finite resources for their own economic or personal benefit without regard for the future. People tend to have this incentive to overuse resources because their benefit is greater than the cost; they split the cost with everyone while they gain 100 percent of the benefit. Some examples of this overuse of finite resources include overfishing and deforestation. The tragedy is that common resources are being depleted because of increasing personal incentive, and this tragedy is detrimental to common resources such as rivers, farmland, and forests all over the world.

In his essay, Hardin discusses two possible solutions: private ownership and public ownership. All members enjoy publicly owned resources, such as parks, but have certain rules and regulations. One of the problems with this is that individuals don't bear the costs so they are more likely to abuse it. With private ownership, even though not everyone gets all the benefits, there is less abuse to the resource because the owner will always maintain in because it directly benefits them. Both of these solutions fix one aspect of the tragedy, but I believe the only way to decrease this problem is to make people more aware of the tragedy of the commons. People need to realize their individual effect on common resources, as little as it may seem, because every little effect adds up to a big one.

Tragedy of the commons continued:

In the school, there are many “commons” that we don’t realize we are harming. For example, the space we are given for unit lunch has trash left behind each day. One person may leave one candy wrapper on the floor, but if everyone were to do that, that effect adds up. Pretty soon, the commons and the hallways will go from a place we enjoy eating in, to a place we don’t even want to be in. We all have the incentive to eat how we want, and leave behind trash because we share the cost of dirtying the commons with the whole school. However, when this adds up, the space given to us to eat lunch will not be able to be enjoyed by anyone. Another common and finite resource in the school is the amount of printing paper we have. Everyone shares this, and therefore has an incentive to use however much they want. If people continue to use as much paper as they want to fulfill their own personal needs, the school will soon run out of printing paper, and it will hurt everyone. Therefore, it is important to realize our large impact instead of just thinking about ourselves.

Many people are aware of this tragedy but don’t give much thought to it. Be aware of how you are impacting the environment, whether it is the school, or your whole community. There are a finite amount of resources in the world, and it is important to use them productively instead of depleting them. Young, Raymond . "Tragedy of the commons defined ."

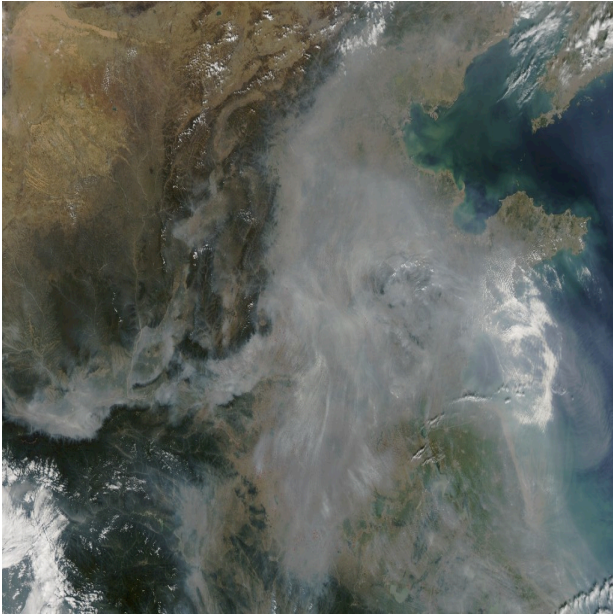
University of Michigan . University of Michigan , 28 September 2013. Web. 25 Nov 2013.

Heal the World By: Dhara Patel

As a student of the AP Environmental Science 4B class, I can say for a fact that being a senior in a period where most of your peers are given the option to leave for Early Dismissal is not easy whatsoever. In fact, most seniors would have rather dropped the class itself than given up a potential day to leave at 12:39 pm from MHS. For those of us who have decided to troop through a year of having a class 4th period, I can say that it has proven to be worth it. In a science course also known simply as “AP Enviro” where there are currently only 15 students in period 4B, we participate in so much more than just listening to a lecture and taking notes. This all became very clear while learning the concept of what an ecological footprint is, and how each person contributes to the greenhouse gases being emitted into the atmosphere. In order to understand this topic better, our teacher Mrs. Kleinfeld decided to take an unconventional approach and convey the information through a power point with song “Heal the World” by Michael Jackson playing in the background. In the power point, how to calculate a person’s ecological footprint and tips to reduce it such as using public resources, reusing paper, and eating less fast food that especially has beef in it were all included. All of these different ways in which we can each individually reduce our ecological footprint was an enlightening moment for the 4B period, and in addition to this we even participated in a sing-a-long to Michael Jackson’s song. In a follow up of this lesson, each student calculated their individual ecological footprint, and how many planet Earths it would take to sustain the life style they lived if every other human being followed it as well. The class average for the number of Earths was a staggering 5.46 planets, and the implications of this would be a total depletion of our resources. Although thankfully not everyone around the world consumes like we do, it behooves us all to be more eco friendly when it comes to our daily lifestyles. Simple things such as conserving water, decreasing the amount of cattle we eat, using sustainable energy such as solar, and using public resources are all ways we can decrease our ecological footprint and help Mother Earth. At the end of the day we only have one planet, and the sooner we start working towards preserving our finite space, the sooner we have to creating a clean Earth for generations to come.

Satellite Photos Show the Appalling Extent of China's Air Pollution

By Bryan Walsh: Reviewed by Caoimhe Tyndall



In the city of Harbin, children and adults of all ages roam the streets of China wearing masks to prevent the smog from polluting their lungs. Recently, in a large portion of northeastern China, the pollution levels have been disgustingly high. Children have been sent home from schools, highways have been closed and hospital admissions have soared higher than ever before. This long-lasting issue has suddenly become an atrocity more serious than ever before. Researchers and environmentalists only really zoomed into this epic after NASA posted photos recently taken by a satellite from space. Pictures of Chinese citizens wearing hospital masks as smog-shields tell one story, but pictures of the view of China from space tell another. The NASA Suomi-NPP satellite took a picture of what was supposed to be China from space, however all it captures is the country cloaked in sheet of smog. In the photos, surrounding countries and ocean areas are clear, however China is covered in a grey cloud caused by over-pollution and extreme carbon emissions. Until China cuts down on its carbon emissions and coal combustions, life in the country is going to remain extremely unhealthy.



This infestation is going to severely affect all the people of China, and those in neighboring countries, like Russia, as well. Specifically, the government will have to create laws to ban or limit the amount of coal combustion, carbon emission, and implement general recycling laws in order to reduce the air pollution in China, at least to a point where it can not be seen from space. It may cost the government, and the people of China a lot of money, but if it will save the environment, and later generations of people, the financial implication is necessary and well worth it.



Walsh, Bryan. "In China's Polluted Cities, the Smog May Be Here to Stay Read More: In China's Polluted Cities, the Smog May Be Here to Stay." *Time World*. Time Magazine, 21 Oct. 2013. Web. 5 Nov. 2013.



Bottled Water vs Reusable Bottles By Revathy Kumar

When we buy bottled water, we think of the convenience they bring, not the impact each bottle has on the environment. On average, you probably use at least one water bottle a day. That is at least 365 bottles total from you alone. Now imagine this number multiplied by millions of people. In 2007 alone, 34,200,000,000 Liters of bottled water were consumed in the United States alone. This translates to 58 million barrels of oil being used to just produce these bottles of water. This results in large carbon dioxide emissions, which adds to the warming of the earth. However, this tremendous impact can be prevented. By using a reusable bottle, not only can we reduce the barrels of oils needed to produce the same amount of water, but also we can save a significant amount of money. 29,000 barrels of oil would be required to produce the amount same amount of tap water as bottled water and it would be about 4200 times less expensive than bottled water. Now think if everyone at our school used a reusable water bottle? We can make a big impact by buying a school water bottle and using it instead of buying bottled water.

Our BPE-Free eco-friendly water bottles are only \$6.00 each and make an environmentally responsible holiday gift!

Come on down to the science wing or main office to pick up yours today!



MHS – Blue Ribbon School of Excellence AND Green Power Plant

By Brian Grieco – MTSD Energy Manager

Tuesday Sept. 20, 2011 was not a particularly memorable day. Protesters were occupying Wall Street in New York City, economic plans were being proposed in Washington, an oil rig exploded in Oklahoma (luckily no one was reported injured), the temperature topped out at a pleasant 76 degrees in the Montgomery Area, and this year's senior's were attending the ninth day of their sophomore year. For most of the previous school year classes on the second floor of the building were witness to constant activity above their heads as workers installed acres of solar panels on the roof of our high school. Finally, the switch was turned on and Montgomery High School's newest 1.06 megawatt rooftop solar farm began generating electricity. That day a mere 734 kWh were generated by twilight's end. This yawningly small amount of electricity generated in a few hours time was still enough to satisfy an average American household's electrical needs for 2-3 weeks. Our newly born solar field experienced its first sunny day that Thursday, coincidentally the official day of the 2011 autumnal equinox, and generated 3,216.4 kWh. If a single 100W light bulb were left to run on the 12 hours of energy generated from our solar field that day, it wouldn't flicker out for over three and a half years.

That day (Sept. 20th 2011), our high school and our district achieved another milestone in its history, as it was the first day that our school transcended into a power plant. Since the first electrical wires were installed in a tiny one-room school house in a small farming community north of Princeton University, our school district has consumed electricity from the electrical company but that sunny September afternoon was the first time that our massive solar field generated, for a few moments, more electricity than all our lights and air conditioning could possibly use. In what amounted to be a few minutes of time in the middle of a busy but not so memorable September day - while teachers were teaching and students were learning - we sent electricity generated from the sun back to the electrical company for all to use. It is unknown where that small amount of electricity ultimately went but what is important is that a few hundred pounds of coal didn't need to be burned that day because of our solar field.

Last year, what started as a mere 734kWh generated in one day has turned into 1.2 million kWh generated in a year; what started as a few hundred less pounds of coal burned in one day has turned into a few thousand less metric tons!

