

Monty Green Gazette

Written by Environmental
Science Students

Published and edited by:
Ms. Kleinfield
Environmental Science
Teacher MHS



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“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).”

MONSANTO

Monsanto has released its first direct-to-consumer product, a GM sweet corn containing Bt toxin, designed to protect the plant by rupturing the stomach of any insect that feeds on it. Monsanto claims the toxin will break down before the corn makes it to your dinner table, but rats fed the GM corn showed organ failure and the toxin has been detected in the bodies of pregnant women.



Should we be able to choose what we eat and feed our families? Most European nations have said “no” to GMOs. Labeling of foods containing GMOs is not required in the US.

<http://s2.djyimg.com/n3/eet-content/uploads/2014/04/monsanto-corn.jpg>



Mountain Top Removal in Appalachia

Kate Hackett

This past summer I had the opportunity to go on a weeklong service project in Appalachia. While I was there I went to a talk about mountain top removal. The man who spoke showed a video about the effects that mountain top removal has on the people who live near the mountains and I was absolutely blown away. One woman in the video mentioned how she got her water tested and found high levels of arsenic in the same water that she was bathing her two-year-old daughter in. Hearing that made me feel so awful for the families and people who are becoming ill and being severely harmed by all the negative impacts associated with mountain top removal. There are also benefits from mountain top removal such as finding energy resources like oil, but I believe it is important to raise awareness of the negative impacts that mountain top removal has on society. Going to Appalachia really opened my eyes to a whole new perspective on this controversial topic and I think many people would benefit from seeing this problem up close and personal.

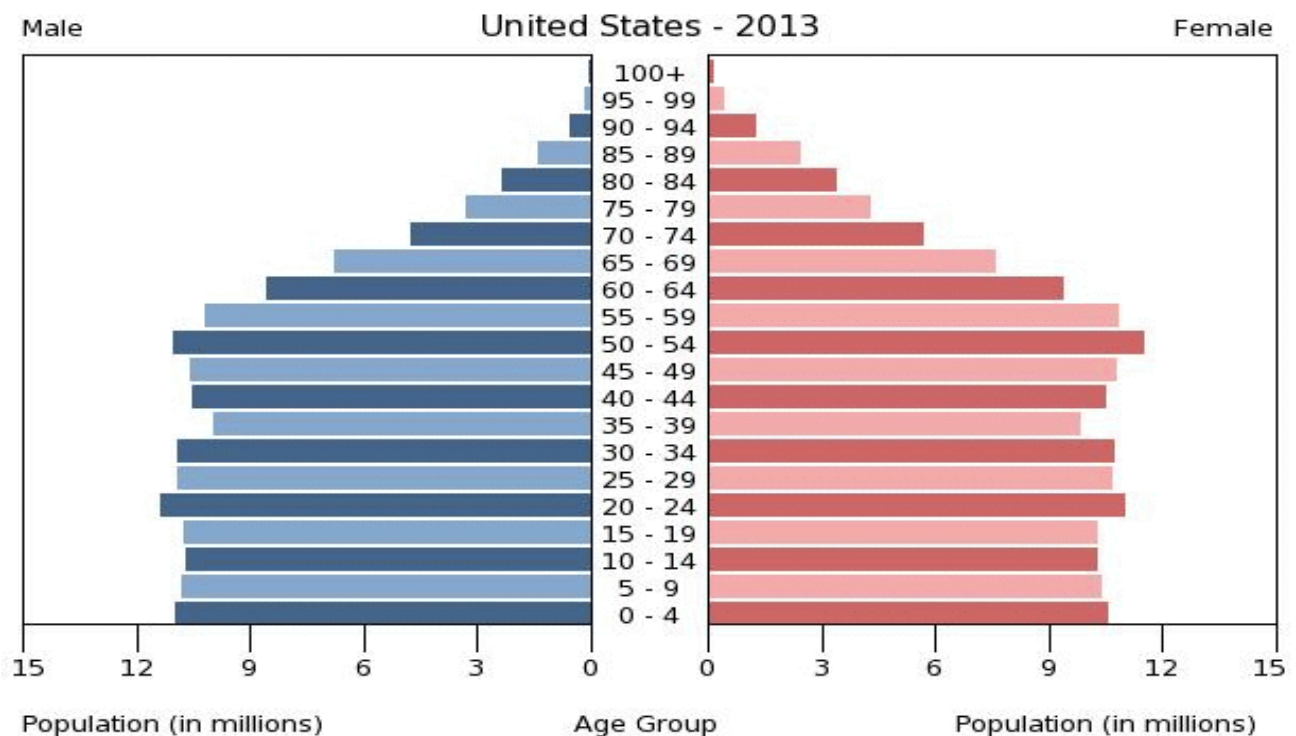
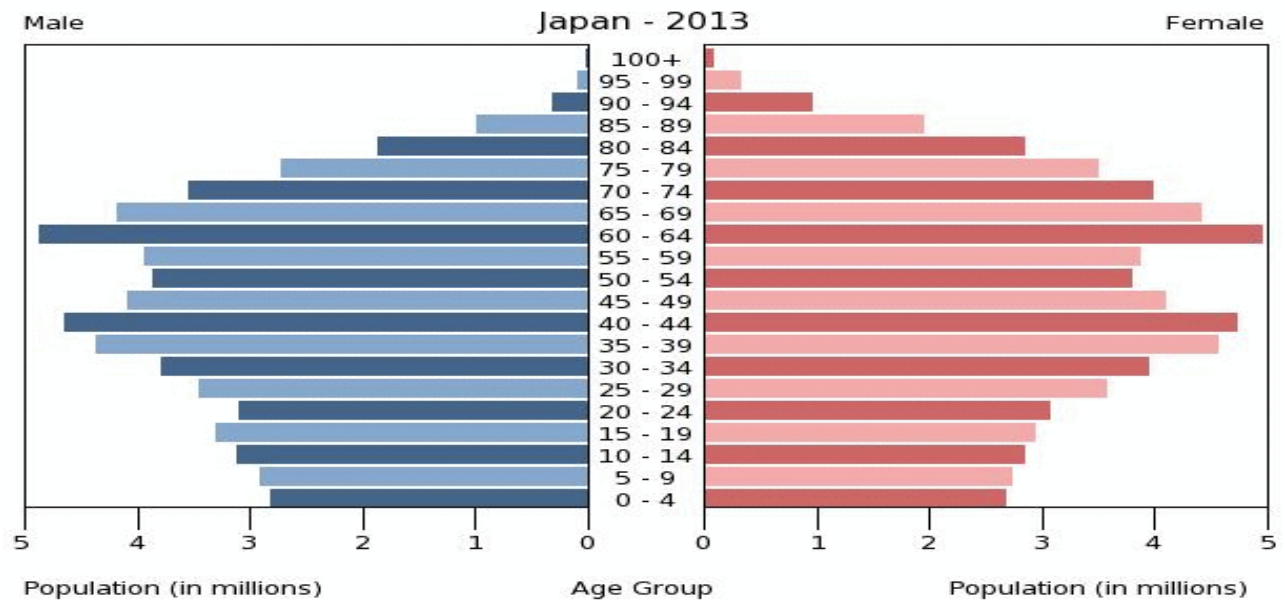
Demography of Japan

Gabriel Shindnes

No one person can predict the future, but there are several tools that help postulate a reasonable outcome. Meteorologists observe air movement, stockbrokers analyze market trends, and demographers observe population pyramids. A population pyramid is a specific diagram that allows demographers, a population trend analyst, to correctly examine population changes in any region of the world that ranges from the size of Montgomery Township to North America. A typical and intuitively logical population pyramid is wide at the bottom and narrows down as you reach older populations.

Although this typical structure is applicable to several countries, one outlier is Japan. In recent years, a large proportion of Japanese woman have been obtaining a higher education and then head straight for the workforce. Once they have taken an introductory position at some global company, instead of establishing families woman strive to achieve a higher position and a greater salary at their company. This trend continues well into their late thirties. It is at this time that woman attempt to start a family, but unfortunately reality hits for most of them. A woman's biological clock can only be in its reproductive stage for so long and starts to wind down once woman reach their early forties, coincidentally when most woman want to start a family in Japan. Although some succeed in having a

baby, this situation is not the same for every Japanese family. As a result, the Total Fertility Rate (TFR) of Japan is extremely low and only a very small proportion of the Japanese population consists of children. In addition the average life expectancy in Japan is the highest on Earth. With a small base of children and a larger than average proportion of elders, the population pyramid is inverted. As you would assume this creates a significant problem for the Japanese economy. The elderly cannot be supported by Social Security benefits due to a small middle-aged population and this trend will continue if the Japanese government won't make any noteworthy amendments in the future to their law system.



Flooding in Ireland by Caoimhe Tyndall

Since November 2009, the country of Ireland has never been hit with such incredible flooding. All throughout coastal towns and river-cities in Ireland, storms have caused high-tides to burst over the beach walls and rivers to overflow their boundaries. Rainstorms have also contributed to the unnatural and un-safe amounts of water in what are normally quite dry areas. Although the Irish are very tolerant about the constant rain in their country, no European country has ever experienced such dreadful conditions. The flooding began the week of February 15th and continued on for about a week, causing trees to collapse, roads to be submerged, and homes to lose power. The water that submerged towns and cities in Ireland caused an estimate of 30,000 homes to be without electricity. The people stuck in these homes also had no access to food stores, medical help, fresh water or other necessary supplies. Counties of Port Laoise, Cork City, Clonmel and Dunmanway were hit especially badly, as the ocean water exploded over the boundary walls, and the rivers overflowed into the streets. The Environmental Agency of Ireland officially issued severe flood warnings on the second day of flooding, and ensured that every family remain inside their homes on the highest floor possible. While I was visiting University College Cork, the faculty announced this state of emergency and ensured that everyone on campus remained locked inside the university library, to protect the students from the powerful flooding. While the water was an incredible inconvenience to most people, the kayaking club of UCC took advantage of the water-covered streets to practice for their upcoming competition (photo attached). Crews have been working hard to clear the streets and homes of water and have been slowly bringing back power to homes that lost it. The flooding has slowly decreases over the week, but the impact of this shocking weather and unending rain will forever remain a part of the Irish culture.



Irish flooding <http://www.irishtimes.com/news/environment/further-flooding-in-cork-city-as-river-lee-bursts-banks-1.1678975>

Eat This Instead: If you like the taste of eel, opt for Atlantic- or Pacific-caught squid instead.

5. Imported Shrimp

Why It's Bad: Imported shrimp actually holds the designation of being the dirtiest of the Dirty Dozen, says Cufone, and it's hard to avoid, as 90% of shrimp sold in the U.S. is imported. "Imported farmed shrimp comes with a whole bevy of contaminants: antibiotics, residues from chemicals used to clean pens, filth like mouse hair, rat hair, and pieces of insects," Cufone says. "And I didn't even mention things like E. coli that have been detected in imported shrimp." Part of this has to do with the fact that less than 2% of ALL imported seafood (shrimp, crab, catfish, or others) gets inspected before its sold, which is why it's that much more important to buy domestic seafood.

Eat This Instead: Look for domestic shrimp. Seventy percent of domestic shrimp comes from the Gulf of Mexico, which relies heavily on shrimp for economic reasons. Pink shrimp from Oregon are another good choice; the fisheries there are certified under the stringent Marine Stewardship Council guidelines.

6. Atlantic Flatfish

Why It's Bad: This group of fish includes flounder, sole, and halibut that are caught off the Atlantic. They found their way onto the list because of heavy contamination and overfishing that dates back to the 1800s. According to Food and Water Watch, populations of these fish are as low as 1% of what's necessary to be considered sustainable for long-term fishing.

Eat This Instead: Pacific halibut seems to be doing well, but the group also recommends replacing these fish with other mild-flavored white-fleshed fish, such as domestically farmed catfish or tilapia.

7. Atlantic Salmon (both wild-caught and farmed)

Why It's Bad: It's actually illegal to capture wild Atlantic salmon because the fish stocks are so low, and they're low, in part, because of farmed salmon. Salmon farming is very polluting: Thousands of fish are crammed into pens, which leads to the growth of diseases and parasites that require antibiotics and pesticides. Often, the fish escape and compete with native fish for food, leading to declines in native populations. Adding to our salmon woes, the U.S. Food and Drug Administration is moving forward with approving genetically engineered salmon to be sold, unlabeled, to unsuspecting seafood lovers. That salmon would be farmed off the coast of Panama, and it's unclear how it would be labeled. Currently, all fish labeled "Atlantic salmon" come from fish farms.

Eat This Instead: Opt for wild Alaskan salmon now, and in the event that GE salmon is officially approved.

8. Imported King Crab

Why It's Bad: The biggest problem with imported crab is that most of it comes from Russia, where limits on fish harvests aren't strongly enforced. But this crab also suffers from something of an identity crisis, says Cufone: "Imported king crab is often misnamed Alaskan king crab, because most people think that's name of the crab," she says, adding that she's often seen labels at supermarkets that say "Alaskan King Crab, Imported." Alaskan king crab is a completely separate animal, she says, and it's much more responsibly harvested than the imported stuff.

Eat This Instead: When you shop for king crab, whatever the label says, ask whether it comes from Alaska or if it's imported. Approximately 70% of the king crab sold in the U.S. is imported, so it's important to make that distinction and go domestic.

9. Shark

Why It's Bad: Problems associated with our eating too many sharks happen at all stages of the food chain, says Cufone. For one, these predatory fish are extremely high in mercury, which poses threats to humans. But ocean ecosystems suffer, too. "With fewer sharks around, the species they eat, like cownose rays and jellyfish, have increased in numbers," Cufone says. "And the rays are eating--and depleting--scallops and other fish." There are fewer of those fish in the oceans for us to eat, placing an economic strain on coastal communities that depend on those fisheries.

Eat this instead: Among the recommendations for shark alternatives are Pacific halibut and Atlantic mackerel.

10. Orange Roughy

Why It's Bad: In addition to having high levels of mercury, orange roughy can take between 20 and 40 years to reach full maturity and reproduces late in life, which makes it difficult for populations to recover from overfishing. Orange roughy has such a reputation for being overharvested that some large restaurant chains, including Red Lobster, refuse to serve it. However, it still pops up in grocer freezers, sometimes mislabeled as "sustainably harvested." There are no fisheries of orange roughy that are considered well-managed or are certified by the Marine Stewardship Council, so avoid any that you see.

Eat This Instead: Opt for yellow snapper or domestic catfish to get the same texture as orange roughy in your recipes.

11. Atlantic Bluefin Tuna

Why It's Bad: A recent analysis by *The New York Times* found that Atlantic bluefin tuna has the highest levels of mercury of any type of tuna. To top it off, bluefin tuna are severely overharvested, to the point of reaching near-extinction levels, and are considered "critically endangered" by the International Union for Conservation of Nature. Rather than trying to navigate the ever-changing recommendations for which tuna is best, consider giving it up altogether and switching to a healthy, flavorful alternative, such as Alaska wild-caught salmon.

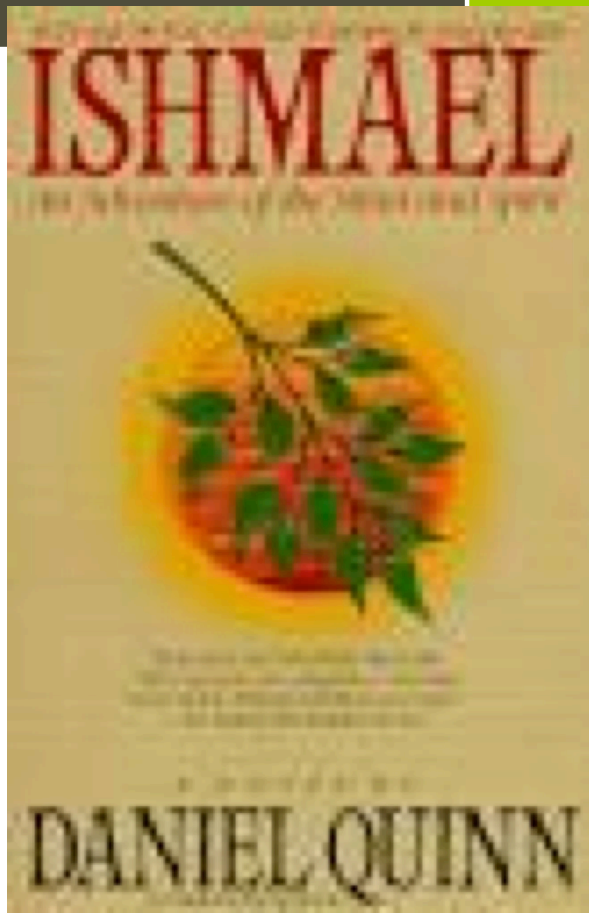
Eat This Instead: If you really can't give up tuna, opt for American or Canadian (but not imported!) albacore tuna, which is caught while it's young and doesn't contain as high levels of mercury.

12. Chilean Sea Bass

Why It's Bad: Most Chilean sea bass sold in the US comes from fishermen who have captured them illegally, although the US Department of State says that illegal harvesting of the fish has declined in recent years. Nevertheless, fish stocks are in such bad shape that the nonprofit Greenpeace estimates that, unless people stop eating this fish, the entire species could be commercially extinct within five years. Food and Water Watch's guide notes that these fish are high in mercury, as well.

Eat This Instead: These fish are very popular and considered a delicacy, but you can get the same texture and feel with US hook-and-line-caught haddock.

"By The Editors of Prevention | Healthy Living – Mon, Nov 18, 2013 1." (2013): n. pag. Web. <By The Editors of Prevention | Healthy Living – Mon, Nov 18, 2013 11:22 AM EST>.



Ishmael

A Book Review by Dylan Kuay

Ever heard of the phrase “stop to smell the roses”?

Most people might think they know what it means, but how many actually know what it means? Basically, on the simplest level, most of us just assume that one should just find a rose outside and take a good sniff. Emphasizing the word “outside”, on the deeper and towards the environmental standpoint, one must stop whatever he is busy doing on his daily basis to observe what revolves around him, while there is still something there. According to the book *Ishmael*, a student with “a desperate urge to save the world” learns from

a special teacher. This teacher is unique; he is a talking gorilla name Ishmael, who has the ability to transfer his long acquired knowledge to his student. Ishmael points out significant events that have occurred over time in hope his student can understand what he is trying to convey. He illustrates his points by telling stories of man and beast and how they have interacted with the greater world over time. Finally, when the student gets the big picture, he has to carry out the mission that his teacher was unable to accomplish. He was told that it is not easy to achieve success and that he must work with his mind before acting recklessly. So, he decides to share the information he gained to help save the world. Now that you have been enlightened with the knowledge of life, what would you do to help save the world with the power that you own?

ISBN: 055337540

Water Purification Simulation Chandler Windom

There is a multi-step process involved in the purifying of drinking water that comes out of your own tap. The MHS AP Environmental classes did their own purification tests to see if they can make nasty water drinkable. The classes started with dark green, disgusting, smelly water mixed with dirt, coffee grounds, egg- shells, orange peels and dead leaves. The first step of the process is aeration, this means using a fish tank bubbler to add dissolved oxygen to the liquid. After three days of aeration, the water had changed drastically. The solids were all but decomposed, the green color had changed to brown and the pungent smell had decreased slightly. The second step is to add Alum into the water, Alum is potassium aluminum sulfate that reacts with minerals in an alkaline environment. The Alum creates a 'floc' that can be removed from the liquid. After the flocculation the water became an even lighter brown color and the smell's pungency also decreased.

The next step is a series of filters. The first involves three layers; fine gravel, course sand and fine sand. Pouring the water through the filters removed all solid particles, causing the color of the water to become increasingly lighter. The second filter involved the use of activated charcoal. Activated charcoal is typically used in fish tanks because toxins bind to the carbon. In water treatment plants the carbon filters are quite thick and so for the lab the water had to be poured through the filter several times. But the carbon had immediate effects on the liquid. The color became like that of apple juice and completely transparent, although it had little to no effect on the odor.

The last step of the process is the addition of chlorine (bleach) to the water and then filtration. The bleach gets rid of any odor the water might still have and should make it completely clear and color-free. The bleach also insures the death of any pathogens in the water. In the lab, however, the chlorine did not completely dispose of the coloring of the water. The classes discovered that it's actually quite difficult to purify water to the extent that anyone would drink it. It's hard to imagine that many people all over the world drink unpurified water that contains disgusting and harmful substances everyday.



PDF]

Carolina“ Wastewater Treatment Kit

tyang-web.cuhsd.org/.../Ch%2020%20Water%20Pollution/Waste+Water...



Our food crisis began way before Monsanto.

It began when we stopped caring about where our food came from.

It began when we no longer knew the people that grew our produce and raised the animals we eat.

It began when we stopped cooking and started eating out of boxes and ate fast-food meals in our cars.

It began when we started trusting companies that rely solely on profit to feed us.

Monsanto exists because of our neglect.

How we became so disconnected from such an important part of our very being is hard to understand.

It's time to re-connect!

Learn more at eatlocalgrown.com

<http://tiny.cc/Truth>



Gray -water: The Answer to Water Conservation?

By: Chris Perkins

Year after year, decade after decade, the world population continues to skyrocket, along with the demand for clean, useable water. Scientists have predicted that the world population will most likely stabilize around 10 billion, further compounding the matter of water conservation. Currently, 70% of the earth's surface is covered by water, yet more than 97% of that water is nearly useless, as it is salt water. Clearly, that leaves the entire world, currently 7 billion people, with only a meager 3% of freshwater. To exacerbate the issue, nearly 25% of freshwater is found underground, and can be costly and at times, inefficient, to extract.

The many negative effects of this is seen in the impoverished nations within Africa, South America, and South East Asia. Unfortunately, studies have shown that 780 million people lack access to an improved or clean water source. While these numbers are astounding, they serve as a reminder, and a motivator for those *with* clean water to work towards conserving water, as well as providing clean water to those less fortunate.

So how can we help? While the majority of water is actually used towards generating electricity, there are still various actions that people can take to conserve water usage. Beyond the obvious of not letting the water run when brushing your teeth or doing the dishes, people can make an effort outside the bathroom or the kitchen. One of the greatest wastes of water is through the use of sprinklers, where people turn their sprinklers on during the day where it is the warmest, and thus the most water evaporates. If sprinklers were used perhaps in the morning or even at night, the marginal gain (for watering plants as well as conserving water) would be much greater. Another easy way to conserve water is by only doing large loads of laundry. Almost 25% of household water is used on doing the laundry. Regardless of the amount of clothes, washing machines use the same amount of water, so doing large loads would not only be more efficient, but also save up to 2,000 gallons of water a year!

While these solutions have proven to reduce water consumption by nearly 40% within households, scientists have been working on other possibilities, including that of reusing some of the wastewater that people normally discard. It's known as gray water. This form of water is the wastewater from baths, showers, sinks, and washing machines. Although gray water is not necessarily drinkable, it has many uses, and has been implemented in various developed nations. Its uses include watering plants, washing cars, and flushing toilets. One country that has implemented this idea is Australia. In the past 5 years, the city of Sydney has saved nearly 65,000 gallons of water! Perhaps the solution to solving the issue of water conservation is not found in factories and major industries, but within our own homes.

Relyea, Rick, and David Courard-Hauri. "Water Resources." *Environmental Science for AP**. By Andrew J. Friedland. New York: W. H. Freeman, 2012. N. pag. Print.
"About Greywater Reuse." *Home*. N.p., n.d. Web. 24 Apr. 2014.

Clean Water Act Amendment 2014 Proposal by Chris Perkins

An Amendment Clause: An amendment that mandates the annual inspection of underground storage tanks (UST) in order to prevent hazardous leakages.

Enactment Clause:

Be it enacted by the United States Federal Government, and that the inspection of underground storage tanks be mandated every 6 months.

Sections:

Section I: An underground storage tank is defined as a tank or combination of tanks that store potentially harmful and dangerous chemicals underground.

Section II: This amendment will establish a voluntary committee in each state, which will inspect, maintain, and inform companies of possible leaks in any UST's. The creation and funding of this committee will come from the Environmental Protection Agency (EPA).

Section III: The inspection of each UST will occur every 6 months. The USTs that will be targeted are those that contain more than 25,000 gallons of chemicals, and those that are located near large bodies of water or underground aquifers.

Section IV: The inspection will be carried out with the use of Pipeline type inspection cameras, which will search for cracks and potential sources of leakage within inspected UST.

Section V: If a crack or potential leakage source is found during inspection, the committee will inform the company whose USTs are being inspected upon delivering the results of the inspection.

Section VI: If a company has a UST that is in fact leaking, the company will be given exactly 1 month to improve the condition of the tank and ultimately stop the leak. If a company fails to do so within the first month, a fine of \$5,000 will be given. If the fine is not paid, an additional fine of \$25,000 will be given. Finally, if this fine is still left unpaid, the company will be given a \$100,000 fine along with the possible removal of the UST(s).

Effective Date: This amendment will take effect at the start of the 2018 fiscal year.

Intent: Pollution of lakes, rivers, streams, and ponds have led to the destruction of various habitats and the ultimate loss of life. While a major problem but often overlooked, underground storage tank leaks have led to the pollution of thousands of underground aquifers and streams. Such leaks have resulted in polluted water sources, increased pH in bodies of water, algal blooms, and deaths of aquatic and land animals. By requiring an annual inspection for potential leaks, this amendment will minimize the possibility of leaks in USTs to occur, and prevent leaks from continuing.

Financial Statement: While the committee being created in each state is voluntary, and is funded by the EPA, this amendment will cost approximately \$5,000 for the remaking and distribution of the Clean Water Act.

The Dangers of Leaking Underground Storage Tanks." *Eric T. Schneiderman*. N.p., n.d. Web. 24 Apr. 2014

Uranium Mining has been the most significant form of industry in all of New Mexico since the 1950's. Although the industry helped the economy flourish at the beginning of it's 30 year phenomenon, by the 1980's, Uranium mining left the state's breathtaking landscape destroyed, and the workers permanently sickened. The largest mine in New Mexico extracted over 28 million pounds of radioactive heavy metal and violated over 70 acres of traditional Navajo land. Almost all of the uranium in New Mexico is found in what is known as the Grants Mineral Belt, however, you can see these mines from miles away, atop almost every red rock mountain in the state. On a Native American Service Immersion trip last spring to Tohatchi, New Mexico, I had the privilege of not only meeting many Navajo Indians, but also learning about the harm that Uranium mines have caused them and the other local people of Tohatchi and Gallup. Due to the poorly ventilated underground mines, the locals of New Mexico have abnormally high rates of lung cancer and black lung. The cause of this sudden rise in these lung diseases in Navajo Indians was obvious, especial because before Uranium Mines were built, there was no sign of Cancer among the Navajo tribe. By 2005, the effects were so particularly pronounced, that the Navajo tribe declared a moratorium on Uranium on their reservations to protect the health and lives of their people. After this declaration, the U.S. Environmental Protection Agency took action to help clean up the large amounts of radioactive contamination in New Mexico, Wyoming, Arizona, and other surrounding states.

New Mexico

<http://truth-out.org/news/item/21959-toxic-legacy-uranium-mining-in-new-mexico>

<http://america.aljazeera.com/articles/2013/12/21/navajo-nation-opposesuraniummineonsacredsitainnewmexico.html>



UNICEF Tap Project

By Ashley Yao

The month of March is known for a lot of things: the first day of “spring” (which in our case was 30 degree weather), St. Patrick’s Day, and the start of “March Madness”. But one thing it’s probably not known, as is World Water Month. Every year in March, UNICEF join forces with charitable organizations like water.org and other sponsors to bring awareness to the scarcity of potable water around the world.

Less than 1% of the world’s water is accessible for human use.

768 million people do not have access to safe, drinking water.

3.4 million (almost the entire population of Los Angeles) dies from water related diseases each year.

Over 2.5x more people in the world lack water than live in the United States.

Faced with the challenge of presenting facts like these to the public, UNICEF came up with a creative way to educate the public. It presented a program sponsored by companies like Giorgio Armani that gave people the opportunity to donate clean drinking water to kids in need. Called UNICEF Tap Project, it asked anyone with a smartphone to enter in “uniceftapproject.org” onto their web browser, set down their phones, and avoid touching or tapping their phones for at least 10 minutes. Ten minutes of inactivity would equal one day’s worth of clean water, twenty minutes two day’s worth, and so on and so forth. The catch is that if you moved your phone before the ten minutes had passed, you would not have really “donated” any clean water, and you would have to start all over again.

Some of you may ask whether an incentive like setting your phone aside is really needed for these companies to sponsor the funding for clean water. If they have the resources, why do we need to be incentivized in the first place? There is no simple explanation, but there is no doubt that more of the public is being educated on the facts (like the ones above) of water scarcity globally. Also, it does make it easier for people to donate to the project without having to actually take out their wallets. Instead they would be taking out their phones, setting them aside for ten, twenty, even thirty minutes.

Unfortunately, this program ended at the end of March, but we hope other charitable organizations like UNICEF will come up with creative ways to encourage people to think globally about issues like water scarcity, potable water, and access to proper sanitation.

www.unicefusa.org/campaigns/tap-project/

By Chris Perkins

As the world rapidly becomes more and more technologically advanced, scientists and engineers have began shifting their attention towards a sustainable future. This very idea has inspired the creation of solar panels, wind turbines, fluorescent light bulbs, and one of the most popular inventions of the 20th century, the hybrid automobile.

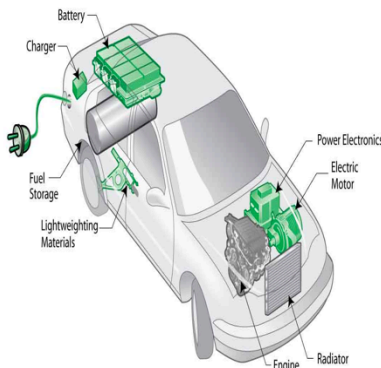
The hybrid is unique as it utilizes electric power or a combination of electricity and gasoline. These innovative cars are significantly more efficient in their use of fuel than cars that rely on internal combustion (IC), and can travel up to twice the distance using the same amount of fuel as an IC car. So what does this mean, and why have they become so popular? By being able to travel twice the distance on a single tank of gas, consumers naturally will enjoy spending less money, something that always grabs peoples' attention. Furthermore, by consuming less fuel, automobiles will be emitting less harmful gases into the atmosphere, thus preserving the ozone. But are these impacts significant? By driving a hybrid, are you being as environmentally safe as the media says you are?

While the answer is still up to debate, numerous environmentalists around the world say no. Despite their groundbreaking design, hybrids in fact negatively affect the environment in various ways. One aspect of the hybrid that has notably affected the environment is the production process, beginning at the mining of precious metals used in the making of the car. The construction of these vehicles uses scarce metals, including lithium, neodymium, and lanthanum. Lithium and lanthanum are crucial, as they comprise parts of the battery used in hybrids. Neodymium is needed to create the magnets used in the electric motors. Likewise, with the mining of these scarce metals also comes a series of issues. The most common form used when extracting these metals is by pumping harmful acids into deep holes in the ground to dissolve surrounding rock and other materials. The metals are then removed from the ground, leaving the damaging acids behind. As the acid collects and begins to flow over land or enter underground streams, it begins to dissolve other metals and elements, creating a highly acidic environment (reaching a pH as low as 2.5).

How does this impact the environment and the animals living within it? As the acid continues to build up, erosion, contamination of water supplies, and change in habitat quickly ensues. The pH of soil and water can drastically decrease to an acidity of 3-4, a level that is deadly for plants and animals. This ultimately leads to disastrous consequences for all forms of life, possibly resulting in a major loss of life. So, is the hybrid really that environmentally safe?

Relyea, Rick, and David Courard-Hauri. "Earth Systems." *Environmental Science for AP**. By Andrew J. Friedland. New York: W. H. Freeman, 2012. N. pag. Print.

"Negative Environmental Impacts of Hybrid Vehicles." *LoveToKnow*. N.p., n.d. Web. 24 Apr. 201



Water Pollution: Sources and Solutions: Chris Perkins



The last 80 years have been marked by great development in technology, agriculture, and industry. Yet have these rapid developments come at a cost? Based off events that occurred at places such as the Chesapeake Bay, the Gulf of Mexico, and the Klamath River, many scientists would strongly argue yes. The reason being that with these developments come major issues regarding water pollution that have not only destroyed wildlife, but have also negatively impacted many businesses.

The first major source of water pollution originates at the many factories that have sprung up across developed nations. During the production process, harmful gases such as methane, carbon dioxide, and sulfur dioxide are released, and combine with other chemicals eventually forming acid rain. So we've all heard of acid rain, but why is it harmful, and how does it actually impact our environment? Other than corroding and decomposing certain buildings and statues, acid rain poses a rather large threat to aquatic life. As this acid rain enters waterways, ponds, and lakes, it begins to lower the pH of water, often to an extent where organisms such as fish can no longer survive. As the fish population declines, the population of animals that rely upon the fish as a food source also decline. In the same way, businesses that rely on the fish populations to fuel their market slowly diminish as less and less fish are caught.

Surprisingly, the second largest contributing factor to water pollution is accumulated waste from farm animals! Along coasts stretch a string of various poultry and dairy farms. In 2014, these farms have commercially developed, and house up to hundreds of thousands of cows and poultry animals. Naturally, these many farm animals produce large quantities of waste that, through poor irrigation and disposal, enter bodies of water. Not only is it rather nauseating to think of tons of animal waste entering drinking-water sources, but it also poses a large threat to the many delicate ecosystems found in lakes, rivers, and streams. Within the animal waste contains large concentrations of nutrients such as phosphorus. As these nutrients enter water, they lead to algal blooms. As the algae dies, its decomposition absorbs oxygen, ultimately leaving less oxygen for fish. This has led to mass fish deaths along the East coast.

While there are many causes of water pollution, what are some of the solutions? On the topic of harmful gas emissions, various programs have been implemented to create a credit system. This system works by granting companies certain amount of carbon or sulfur credits, which allows these companies to emit certain amounts of pollutants. In return for emitting minimal pollutants, the companies receive a compensation payment. As far as animal waste goes, various programs for improving irrigation have been instituted. Some of these programs include creating manure lagoons, which serve as a basin in which animal waste is deposited.

Relyea, Rick, and David Courard-Hauri. "Water Resources." *Environmental Science for AP**. By Andrew J. Friedland. New York: W. H. Freeman, 2012. N. pag. Print.

"Water." *Pollution Facts, Effects of Pollution, Clean Act*. N.p., n.d. Web. 21 Apr. 2014.



GMO corn: nutritionally void

The nutrition statistics for GMO corn are bone chilling. Here is what the report indicates:

- Organic corn has 14 ppm of manganese. GMO corn has only 2 ppm.
- **Real corn has 7 times more manganese!**
- Organic corn has 6130 ppm of calcium. GMO is stripped down to 14 ppm.
- **Real corn has 437 times more calcium!**
- Organic corn has 113 ppm of magnesium. GMO corn is vacant, with only 2 ppm.
- **Real corn has 56 times more magnesium!**

GMO corn contains alarming glyphosate levels

The amount of formaldehyde and glyphosate in GMO corn is unbelievable. To break it down, American EPA standards allow glyphosate in water of up to .7ppm. European tests indicate that animals begin experiencing liver damage at .0001 ppm of [glyphosate](#) in water. Putting these two statistics together, America's water levels contain glyphosate that is 7,000 times greater than the amount required for animal liver damage!

GMO corn takes that statistic up yet another notch. GMO [corn](#) contains 13 ppm of glyphosate, or the equivalent of 130,000 times more toxicity than EPA water standards!

The formaldehyde level of GMO corn is unspeakable

In a similar study on GMO corn, Dr. Huber found out that animals avoid GMO corn at all costs. When given a choice between both GMO and non GMO varieties of corn, animals always go for the real organic corn. Huber also found out that .97ppm of formaldehyde is toxic to animals. The [GMO](#) corn he tried to give the animals contained **200 times that amount!**

http://www.naturalnews.com/040210_GM_corn_March_Against_Monsanto_glyphosate.html#ixzz2zd39BYd7