SUSTAINABLE LEADERS IN ACTION

October 2020
Volume 1 - Issue 3

Insights of the Month

SUSTAINABLE CONTRA COSTA

CLEANER CONTRA COSTA CHALLENGE

Written by:
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Illustration by:
Luca Mathius

October's Action of the Month is Have a Say! Climate change is something that is greatly detrimental to the global population. Whether it be bolstering drought conditions in the Western US, wildfire seasons, or causing sea levels to wash away villages in Bangladesh -- climate change threatens our livelihoods. And yet, despite the dire warnings our climate system produces, many countries' leaders have failed to implement any notable policies to mitigate the effects of climate change. Now, more than ever, we have countless studies, and research efforts to support the claim that climate change is affecting our lives today. This is why October's Action of the Month is so important -- we all have the power to make serious changes within our own governing bodies whether it be on a local, state, or federal level. In short, now is the time to ACT. It is important to educate yourself in what our county, and our country is doing to further the teachings of sustainability.

Voting is imminent for all local, state, and federal elections -- choose candidates who understand the importance of sustainability, and who value our climate system. Additionally, consider taking a course on sustainability, climate science, or climate politics to learn more about how to get involved. Whether it be voting in elections, gaining knowledge in the field of sustainability, or even pursuing a career in sustainability, environmental science, or environmental policy, you can be a part of the generation that secures a better future.

Click Here to browse free courses on sustainability. Click Here to learn more about Contra Costa County's Office of Sustainability, and their commitment making our community safer.

Water Scarcity

Written by: Alexi Lindeman **Illustration by : Luca Mathius**

Water: what we need to drink, produce energy, grow food, and manufacture goods. We couldn't survive without it. You would think that there's plenty of water — it does cover most of our planet — but, the reality is quite the opposite. Only 2.5% of the world's water is freshwater. Of that, 69% of freshwater remains locked in glacier and ice caps, while 30% is underground. The last 1% is in lakes, streams and rivers. With all of that taken into consideration, only 0.007% of Earth's water is available for billions of humans. Unfortunately, humans have been overusing and sullying the scintillating liquid of life.

Causes of Water Depletion

Agriculture consumes 70% of the world's freshwater. So as our population increases, agriculture productivity will increase accordingly and use even more water. Furthermore, there has been a rise in meat consumption per capita (per person), leading to a quadrupling in meat production in just the last 50 years. Animal products require more water, as seen in this chart (water use and protein) and this chart (water use and calories).

The second greatest consumer, industry, uses 19% of the world's freshwater. In power plants, water is heated up (through burning fossil fuels, or nuclear fission) to produce steam which turns turbines to generate electricity. In both manufacturing and electrical plants, water is needed to cool down machinery. Furthermore, the extraction, processing, and waste disposal add on to industry's water footprint. Mining metals and fossil fuels requires large amounts of water, often mixed with chemicals/heavy metals. This toxic water is placed in tailing ponds and can sit for 30-40 years! Unfortunately, these ponds can infiltrate groundwater supply or flood onto nearby lands or streams, thus potentially contaminating drinking water.

Lastly, multipurpose (domestic) withdrawals consume 11% of the world's freshwater. You may have guessed that lawns are water vampires, especially in arid regions like California. In fact, watering an average American lawn for 20 minutes every day for 7 days is equivalent to showering for 4 days straight or taking more than 800 showers! Indoors, toilets surprisingly use the most water (26.7% of indoor water) with washing machines following behind (21.7% of indoor water).

Future Implications

As the world's population draws towards 10 billion people, as climate change further inundates and threatens life, as consumerism and its subsequent poisons of waste and pollution run rampant, and as nature's ecosystem services of filtration and provision wither away in the presence of industrialization and capitalism — the world will fight over water. By 2025, ⅔ of people may face water shortages. CMIP5 climate models also forecast that US water yields will decline by 20% in 2060. In California, we have already witnessed the effects of persistent droughts and the devastation of catastrophic blazes. Besides this, water scarcity raises the problem of food insecurity. How can we feed a larger population with less water in a warming climate?

Solutions

Luckily, there are worldwide water conservation efforts in the form of policies, technology, and awareness. Theater usage per US citizen has even declined with the creation and implementation of efficient toilets, taps, and irrigation systems. Find out how you can reduce your household water use by clicking here! You can also look into drought-tolerant landscaping!

The Local Vegetarian

Enjoy take-out and saving the environment? Try Both!

We know that healthy eating means working towards a more sustainable planet. According to a study at Oxford, if everyone took on a healthy veggie diet, we could cut global warming by two thirds and save 8 million lives by 2050. That's pretty big motivation--but where to start? Exploring veggie dining and recipes is essential to making that change within yourself.

And so, we've compiled a list of well-reviewed restaurants and small businesses that are sure to catch your interest. Many of these restaurants have been up-to-standard with social distancing rules (including delivery options and sanitary guidelines), and come in a variety of cuisines. Within the Contra Costa Area, vegetarian food isn't as hard to find as one might think. (Bonus points for small businesses and ▯ black-owned businesses)!

Photo by Max Tcheng Written by Sarah Khan

Concord

- Veggie Today ‖ $$ ‖ ★★★★½

An Asian-based restaurant with numerous vegetarian options, including favourites such as Vermicelli Noodles with Marinated Meat (tofu).

- Next Level Burger ‖ $$ ‖ ★★★★½

a 100% plant-based American Burger joint known for its completely organic ingredients, known for its popular vegan-based fast food options, including milkshakes and loaded fries.

- The Lettuce Inn ‖ $$ ‖ ★★★★½ ‖ ▯

Our hardcore veggie-lovers may want to consider this place! The Lettuce Inn is a health-focus small business with artisanal salad options with many raw-food based dishes.

- Hello Pho ‖ $ ‖ ★★★★

This is a small business with Vietnamese veggie options. It's a great place for beginners trying to minimize meat in their diet as well. Check out their vegetarian pho and Fresh Spring Rolls!

Walnut Creek & San Ramon

- True Food Kitchen ‖ $$ ‖ ★★★★

A health-focused restaurant with a fantastic assortment of wholesome items that include both pescatarian and vegetarian foods. Consider the popular Ancient Grain Bowl or Spaghetti Squash Casserole.

- Veggie Grill ‖ $$ ‖ ★★★★

A New American-cuisine grill! It's 100% plant-based, & known for fast food/casual meals including burgers and sides like Tempura Green Beans or Crispy Cauliflower bites.

- Fresh Millions Restaurant ‖ $ ‖ ★★★★

Their specialties include all kinds of sandwiches, bowls, salads, and wraps. They focus on customizable options for all kinds of eaters, which is another excellent choice for those dipping their toes into vegetarianism.

Wildfires

Written by Morgan Gllem
Photographs by Max Tcheng

The wildfires in California, Oregon, and Washington continue to only worsen. Due to increased greenhouse presence in the atmosphere, temperatures have been rising, allowing for fires to start much easier. The other major issue can be linked to something known as fire suppression. Fire suppression is when small fires are stopped, leading to an abundance of dead biomass that can lead to larger fires as it gives more fuel for the fires, as explained in this article from UC Berkeley.

We need to take further action to control the fires that are raging throughout the west coast or else destructive fires could become a new norm. To prevent this in the future, we must come to the realization that smaller fires are necessary in order to prevent larger, more devastating fires. Fire suppression, along with climate change, must be acknowledged to prevent devastating fires from destroying on such a large scale, you can help by donating to wildfire relief funds such as the Wildfire Relief Fund or the California Wildfire Relief Fund.

Agriculture and Land Degradation

Article and Photograph by Alexi Lindeman

The first civilizations were founded on the banks of rivers, where sediments could wash onshore and fertilize the land. In those times, wilderness lay untouched. Now, not a single place on Earth lies unstained by humanity's hand. As a result, most land has degraded (lost natural fertility, became polluted, or decreased in vegetation cover). Of all the land in the world, 75% is classified as degraded, and by 2050 that could increase to 90% If you look at this map by the UNEP, most of the stable soil lies in Canada and Russia, or places sparsely inhabited due to the cold. The rest remains degraded, severely degraded, or void of vegetation (desert or glaciers).

Causes

Agriculture uses the majority of the world's arable land like it uses the most water — described in the Water Scarcity article on page 3. Of the land available, only 71% is habitable. Half of that habitable land goes towards agriculture; as a result, agriculture degrades most of the land. To keep up with a growing population, diverse forests, grasslands, and marshes are replaced by only a handful of crops. Oftentimes, commercialized agriculture utilizes monoculture — single crop — which can severely deplete the soil's nutrients as that one crop uses it all up. On the other hand, if there are various species, they all use different nutrients. Furthermore, during the harvesting season, the bare soil doesn't have any roots to hold it down, thus making it vulnerable to water and rain erosion.

A study approximated that "36 billion tons of soil is lost every year due to water and deforestation and other changes in land." Once the land is degraded, it's extremely hard to reverse or impossible to revert back to its original state. Oftentimes, land is simply abandoned when it can no longer support life. For instance, The NRCS (National Resource Conservation Service) found that 30% of US farmland has been abandoned due to erosion, waterlogging, or salination.

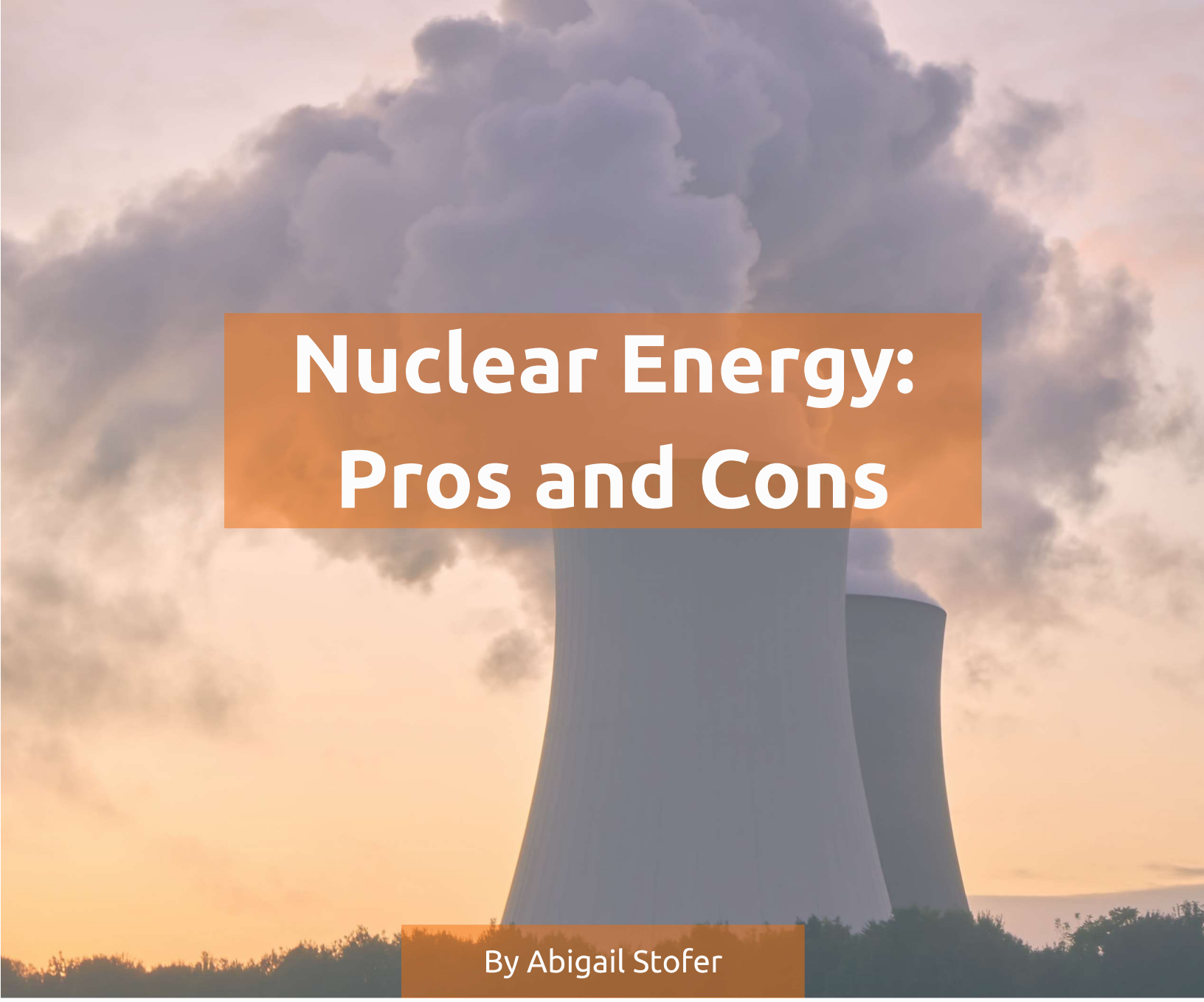
In less developed countries, many farmers rely on the slash and burn technique, creating cropland by cutting and burning vegetation. However, after a couple of years the soil becomes deprived of nutrients. When that happens, the soil is very hard to revive and farmers abandon the land. Consequently, more forests are slashed and burned to create temporary nutrient rich soil. Rainforests are particularly susceptible to land degradation as the warm and humid climate promotes fast decomposition of nutrients and yields soil with low nutrient holding capabilities. Read more here!

Solutions

In the 1930s, the US faced the consequence of careless habitat destruction: the Dust Bowl. After years of monocropping, the wheat died due to the lack of nutrients, and the land left bare and dry quickly eroded and produced suffocating dust storms. On top of that, wheat and maize (corn) production declined up to 36-48 percent.

Since then, numerous land preservation techniques have arisen. Some reduce topsoil erosion by contour plowing (prevents water from streaming down a slope), not plowing or no till (plowing loosens soil and makes it susceptible to erosion) or growing crops year-round. Others increase soil's nutrient content by switching between different crops (crop rotation), planting legumes (beans) in between rows as they add nitrogen — a vital nutrient for plants — to the soil, or mulching. Learn more here.

Although this may seem like a problem out of your control, you can help too! By buying local, organic, or from environmentally friendly farms you promote the growth of sustainable land management rather than destructive commercial agriculture! You can also eat less land-intensive foods like poultry instead of beef. Check out this chart to see different food's land footprint and start making a difference today!



Nuclear Energy: Pros and Cons

By Abigail Stofer

Nuclear energy comes from the process of fission, where the nucleus of a Uranium atom is continuously split inside a nuclear power plant, releasing vast amounts of energy. These split atoms release fission products, which then start a chain reaction. In this process, the heat from the split warms water, liquid metal or molten salt--which produces steam that will then turn the turbines driving the generators and thus creating electricity.

The idea of nuclear energy is that it provides high amounts of energy for a large quantity of time from a small amount of matter. According to the World Nuclear Association, there are about 440 power reactors currently making up 10% of the world's electricity. The US alone has more than 100 reactors.

Nuclear energy has become a hot topic of debate over the past decade, and to no surprise. With countries around the globe rushing to find clean, inexpensive ways to produce energy, nuclear energy has emerged as a front runner. However, there are both benefits and complications.

Pros

Low Carbon Emissions

The Nuclear Energy Institute estimates that nuclear energy produces 62% of all emission-free electricity in the United States. Unlike many of its predecessors, nuclear energy plants do not produce greenhouse gas emissions like Methane and Co2. It has been found that the average nuclear energy plant emissions are 29 tonnes of Co2 per gigawatt hour of energy (GWh), which is considerably favorable to solar (85 tonnes per GWh), fossil fuels (1,054 tonnes per GWh), and coal (888 tonnes per GWh).

Constant and Plentiful Source of Energy

Nuclear energy is not reliant on solar or wind power. Nuclear energy plants can also run with minimum interruptions or maintenance necessary. Just a small amount of Uranium can be used to fuel a 1,000 megawatt electric plant, equivalent to a city of about half a million people. While renewable resources only have the capacity to power office buildings or residential areas, nuclear energy can be expanded to fit the needs of a larger scale.

Cheap to Run and Here for the Long Run

The estimated cost to run a nuclear energy plant is 33-50% of a coal plant and 20-25% of a gas combined-cycle plant. Additionally, the average life cycle of a nuclear power plant is anywhere from 40-60 years. Even though the upfront cost to build a plant is steep, the low operating costs certainly outweigh the initially shocking cost.

Predictable and Not in Short Supply (Yet)

Unlike fossil fuel power plants, nuclear power plants are not affected by the unpredictability of oil and gas costs, making it more reliable and stable. Additionally, nuclear energy plants use less fuel, instead of depleting resources. It is estimated that after at least 80 years the uranium supply will become an issue, but there are already other possibilities being explored in order to extend the timeline.

Economic Impact

According to the Nuclear Energy Institute, one nuclear plant is estimated to provide anywhere from 500-1,000 permanent jobs, plus temporary construction jobs. This is very favorable compared to coal plants, which provide 90 jobs and natural gas plants, that provide 50 jobs. Additionally, one nuclear plant will make about $500 million annually in the sales of goods and services.

Photo by: Alexi Lindeman

Cons

Accidents

There have been three major incidents to date: 3 Mile Island (Pennsylvania, 1979), Chernobyl (Ukraine, 1986), and Fukushima (Japan, 2011). In the case of Chernobyl, the environmental effects of this fallout were immediate, as for kilometers, the surrounding pine forest dried up and died, and fish, cattle, and horses died from the radiation. The effects on the population were not as immediate. 54 people died, more than 100,000 people were forced to relocate, and the International Atomic Energy Agency projects there will be at least 4,000 long-term deaths from the radiation poisoning. While extremely rare, these devastating explosions and meltdowns have brought to light just how dangerous nuclear plants can be.

Nuclear Waste

A typical nuclear power plant generates 20 metric tons of nuclear waste per year. This waste is highly radioactive, dangerous, and must be carefully handled and stored. While this radioactivity will subside through the process of radioactive decay, this will take hundreds of years, and is highly toxic for workers to be exposed to.

Expensive Up-Front Costs

With the steep price of building a nuclear reactor, many countries are hesitant to try nuclear energy. In recent years, the price of building a plant has risen from $4 billion to $9 billion, not including the costs of maintenance. For comparison, a wind turbine costs $1.3 million to $2.2million. This construction also takes between 5-10 years, so countries will have to wait to reap the rewards of this endeavor.

Not Renewable

While it may seem like we have plenty of Uranium to harness now, eventually, our natural supply will start to dwindle and we will risk completely running out of it. Additionally, the process of obtaining this Uranium is an expensive process, as it has to be mined, synthesized, and activated before it can be used in a power plant.

So what do you think? Do the pros outweigh the cons? Is nuclear energy the emerging future or does it impose too much of a danger on the surrounding environment and population?

Photo by: Chloe De Smedt

Easy Plant-Based Recipes

Written by Abigail Stofer

Eating lower down the carbon food chain and finding good plant-based recipes can be hard. Especially in an increasingly fast moving society, it can be so much easier to grab a burger and go. Here are two recipes that are plant-based, easy, delicious, and adaptable.

Green Goddess Cream Cheese Sandwich:

Prep time: 15 minutes
Cook time: 6 minutes

This is the perfect quick and easy sandwich for school, picnics, and more! Chock full of greens, this sandwich has plenty of room for personalization and substitution, making it a sandwich that can appeal to many. The Green Goddess spread is bright, fluffy, fresh, and provides a delightful contrast to the crunch of the vegetables.

Ingredients:

- 7 oz cream cheese
- 2 tablespoons Italian flat leaf parsley, minced
- 2 tablespoons fresh basil leaves, minced
- 1 tablespoon tarragon leaves, minced
- 1 ½ teaspoon chives, minced
- 1 clove garlic, pressed
- 1 ¼ lemons, juiced
- salt(to taste)
- pepper(to taste)
- 4 slices sandwich bread
- Extra virgin olive oil
- 1 ½ zucchini, sliced
- Fresh baby spinach leaves
- 1 thinly-sliced cucumber
- 1 heirloom tomato, sliced
- 1 avocado, pitted and sliced
- alfalfa sprouts

1. In a small bowl, mix the cream cheese, parsley, basil, tarragon, chives, garlic, and lemon juice together. Season to taste with salt and pepper, then set aside.
2. Heat a grill pan over high heat. Brush the sliced zucchini with olive oil. Then season with salt and pepper. Cook for about 3 minutes then flip and repeat on the other side.
3. Spread one side of each slice of bread with the cream cheese mixture.
4. Stack the vegetables over the cream cheese in the following order (to avoid falling apart once eating): zucchini, baby spinach, cucumber, tomato, and avocado. Season with a sprinkle of salt and pepper, then top with alfalfa sprouts. Place the second slice of bread on top.
5. Slice into halves, serve, and enjoy!!

Mediterranean Vegetable Spaghetti

Prep time: 10 minutes
Cook time: 15 minutes

A simple and beautiful pasta dish that is sure to please! Only taking about 25 minutes, this brown rice spaghetti is bursting with flavor, not to mention color, between the peppers, tomatoes, spinach, and olives. Just like the sandwich recipe above, this recipe also allows for plenty of personal flair and is the perfect dish when time is short.

Ingredients:

- 10 oz brown rice spaghetti
- 1 red bell pepper, diced small
- 1 yellow bell pepper, diced small
- 2 plum tomatoes, in eighths (discard seeds)
- Salt
- ½ jalapeno
- 2 tablespoons dried herbes de provence
- 2 tablespoons tomato puree
- 2 tablespoons apple cider vinegar or juice from 1 lime
- 1 zucchini, halved then sliced into thin half-rounds
- 1 bunch of spinach, chopped
- Handful of black olives

Directions:

1. In a pot, bring pasta water to a boil.
2. Place peppers, plum tomatoes, salt, jalapeno, and herbes de provence in a separate saucepan. Add a ¼ cup water and allow the mix to simmer and cook down. If the liquid dries up before the tomatoes and peppers start to release their juice, add more water, 1 tablespoon at a time.
3. After a few minutes, add the tomato puree and apple cider vinegar or lime juice
4. Cook spaghetti in the pot according to package directions.
5. Once the tomatoes and peppers start to meld into sauce, add cherry tomatoes, zucchini and spinach. Mix well and cook for about 5 to 7 minutes.
6. Drain the pasta. Then stir the noodles, olives, and extra sprinkling of herbes de provence into sauce.
7. Serve and enjoy!!

Vegan Peanut Butter Salted Fudge Pops

Recipe from Pollan's mostly plants
Written by Nicole Wan
TIME: 10 minutes plus 4 to 5 hours freezing
6 to 8 servings

Salty, sweet, and fun to eat--these fudgy pops are a perfect bite for any time of the day! The coconut milk provides a rich and creamy flavor, and the combination of peanut butter with chocolate is, of course, timeless. Fun ice pop molds are highly recommended.

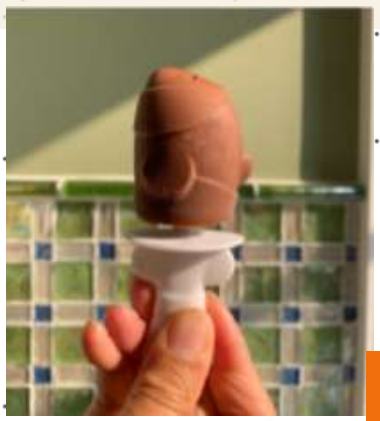
Ingredients

- One 13.5-ounce can full-fat coconut milk
- 1 cup semisweet chocolate chips (vegan)
- 3 tablespoons creamy peanut butter
- 2 tablespoons agave nectar
- 1 teaspoon pure vanilla extract
- Sea salt
- Ice pop molds
- 6 to 8 ice pop sticks

Directions:

Photos by Nicole Wan

1. Pour the coconut milk into a saucepan over medium heat. Add the chocolate chips, peanut butter, agave nectar, vanilla, and a pinch of salt. Stir until the ingredients are melted and well-incorporated, about 2 to 3 minutes. Pour into a large liquid measuring cup or pitcher.
2. Pour the fudge mixture into the molds and freeze for 30 minutes, then remove from the freezer and insert a stick into the center of each mold. Freeze until solid, at least 4 hours, before serving.
3. To remove a pop from the mold, fill a coffee mug with warm water and briefly submerge the mold. Pull the stick gently upward to release the pop. Enjoy!



By: Nicole Wan

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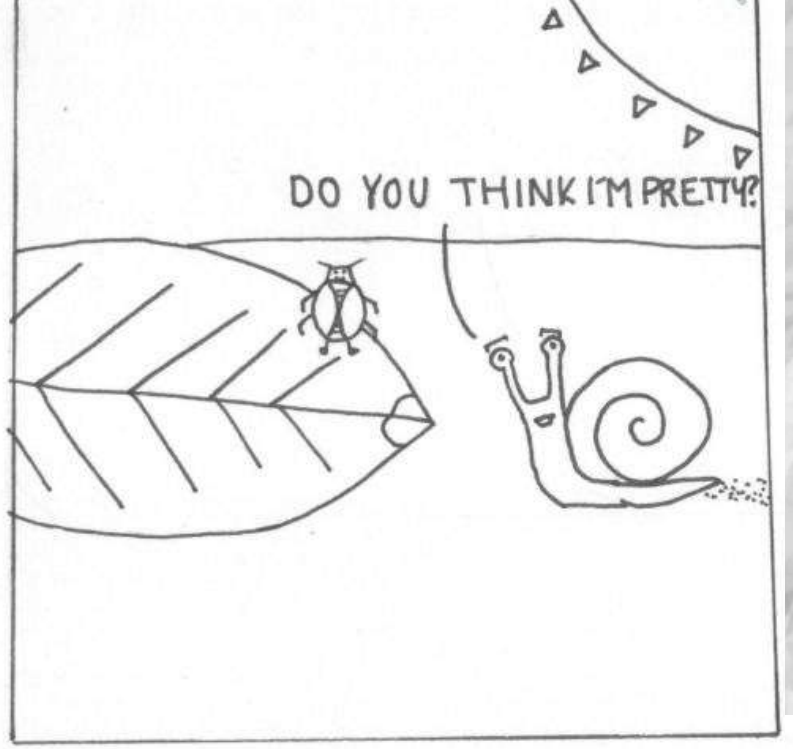

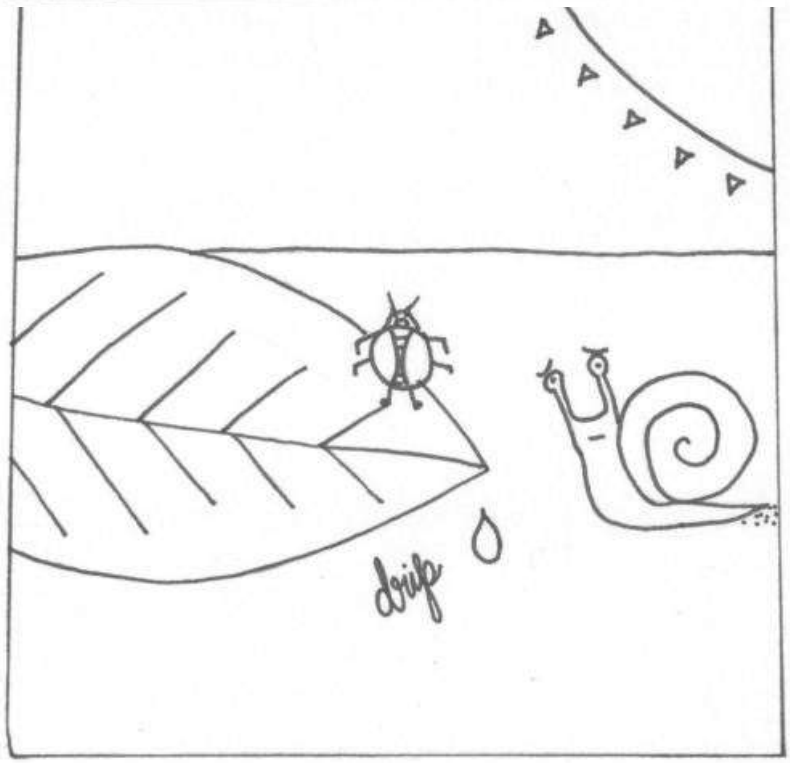

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