

Name of Program: How to Reduce Your Carbon Footprint

Target Audience: All

Strategy for Implementation: Group discussion with activity

Time of Year to Implement: Anytime, perhaps around Earth Day

Relevant Learning Goal: Goal 1: Social Responsibility - As a member of the IMSA community, it is essential that students understand how their actions affect others and impact the world around them/globally. We challenge our students to develop sustainable skills which include being mindful, accountable, virtuous members of the IMSA community and society at large.

Specific Lesson Outcomes:

- Students will recognize, develop, and apply sustainable practices
- Students will promote an equitable environment
- Students will foster respect for self, others, and the community

Purpose: Students will learn about their carbon footprint, the importance of reducing our emissions of greenhouse gases, and ways that they as individuals can reduce their carbon footprints.

Planning and Preparation:

- There is an accompanying Google Slide presentation:
<https://docs.google.com/presentation/d/1EuFp1jA0lq46tCrhxw9RyRHY3Ebr3OqW1ZChu-sZgNA/edit?usp=sharing>
- You may wish to have students calculate their carbon footprint prior to the program
<https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/>
- Feel free to edit or adapt the program for your own wing

Introduction:

- You've probably heard of carbon footprints but many may not know exactly what a carbon footprint is, why it's important, or what steps they can take to help reduce their footprint. You may wish to start the program with a brief

discussion with students about what they think carbon footprints are, why it matters, and what they do to reduce their footprints already. Even if students already know about carbon footprints, hopefully they'll learn some new ways to reduce their footprints from the program that they can potentially implement.

Program Agenda:

- What is your carbon footprint?
 - A carbon footprint is the total amount of greenhouse gas emissions that come from the production, use and end-of-life of a product or service
 - Includes carbon dioxide, methane, nitrous oxide, and fluorinated gases, which trap heat in the atmosphere, causing global warming
 - The bulk of an individual's carbon footprint will usually come from transportation, housing, and food
- Video explaining climate change and some of its effects:
<https://youtu.be/EtW2rrLHs08>
- Why your carbon footprint matters
 - Greenhouse gas emissions that we generate are the leading cause of Earth's rapidly changing climate
 - the atmosphere's share of carbon dioxide—the planet's chief climate change contributor—has risen by 40 percent since preindustrial times
 - According to the World Economic Forum's 2016 Global Risks Report, the failure to mitigate and adapt to climate change will be "the most impactful risk" facing communities worldwide in the coming decade
 - Some negative impacts of climate change include:
 - Increased frequency of natural disasters including storms, floods, heatwaves, and droughts. This is because as Earth's atmosphere heats up, it collects, retains, and drops more water, changing weather patterns and making wet areas wetter and dry areas drier
 - Exacerbated air pollution and as air pollution worsens, so does respiratory health
 - According to the World Health Organization, "climate change is expected to cause approximately 250,000 additional deaths per year" between 2030 and 2050. As global temperatures rise, so do the number of fatalities and illnesses from heat stress, heatstroke, and cardiovascular and kidney disease

- The likelihood of being displaced by a disaster is now 60 percent higher than it was four decades ago—and the largest increases in displacement are driven by weather- and climate-related events
 - Displacement comes with its own health threats, such as increases in urban crowding, trauma, social unrest, lack of clean water, and transmission of infectious diseases
- As ice sheets melt into the seas, our oceans are on track to rise one to four feet higher by 2100, threatening coastal ecosystems and low-lying areas. Island nations face particular risk, as do some of the world's largest cities, including New York, Miami, Mumbai, and Sydney
- The earth's oceans absorb between one-quarter and one-third of our fossil fuel emissions and are now 30 percent more acidic than they were in preindustrial times
 - This acidification poses a serious threat to underwater life, particularly creatures with calcified shells or skeletons like oysters, clams, and coral. It can have a devastating impact on shellfisheries, as well as the fish, birds, and mammals that depend on shellfish for sustenance. Rising ocean temperatures are also altering the range and population of underwater species and contributing to coral bleaching events capable of killing entire reefs—ecosystems that support more than 25 percent of all marine life
- According to a 2014 IPCC climate change report, many species now face "increased extinction risk due to climate change." And one 2015 study showed that mammals, fish, birds, reptiles, and other vertebrate species are disappearing 114 times faster than they should be
- Ways to reduce your carbon footprint resulting from transportation
 - In 2017 carbon dioxide emissions from transportation surpassed emissions from electricity generation as the top source of greenhouse gases
 - Going carless for a year could save about 2.6 tons of carbon dioxide
 - In the U.S., public transportation saves 37 million tons of carbon emissions every year
 - Fly less often

- One round-trip flight between New York and California generates 20% as much greenhouse gasses that your car emits over an entire year
 - Tips for Reducing Emissions While Driving
 - Speeding and unnecessary acceleration reduce mileage by up to 33%, waste gas and money, and increase your carbon footprint
 - Properly inflated tires improve your gas mileage by up to 3%
 - Use the correct grade of motor oil and keep your engine tuned
 - Some maintenance fixes, like fixing faulty oxygen sensors, can increase fuel efficiency by up to 40%
 - Cut down on air conditioning as much as possible
 - Use cruise control
 - Remove unnecessary weight from your car
 - Carpool and combine errands to make fewer trips
 - Ways to reduce your carbon footprint resulting from your diet
 - Eat less meat
 - Production of red meat uses a lot of feed, water and land. Cows themselves also give off methane emissions
 - To get a single pound of beef, it takes over 5,000 gallons of water
 - Red meat can have up to 100 times the environmental impact of plant based food
 - Beef gives off more than six pounds of carbon dioxide per serving
 - The amount created per serving by rice, legumes carrots, apples or potatoes is less than half a pound
 - Eat locally-produced food
 - It has been estimated that 13% of U.S. greenhouse gas emissions result from the production and transport of food
 - Avoid processed foods
 - Reduce food waste to help reduce carbon footprint
 - On average, Americans waste around 40 percent of the food they buy
 - Organize your fridge regularly to check on what you already have, and make grocery shopping lists before you go to the store to prevent buying things you don't need
 - Don't cook more food than you can eat
 - Extend the life of your food by freezing them properly

- Be wary of bulk: Low-priced food might seem like a good deal, but it's not if you don't end up eating it before it goes bad
- Ways to reduce your carbon footprint in your home
 - In the average American home, 25 percent of energy is used to heat spaces, 13 percent is used to heat water, 11 percent is used for cooling and the remainder is spent on appliances
 - Keep blinds closed to help keep temperature stable inside
 - Turn off lights and appliances when you're not using them
 - In the U.S. alone, "vampire power" is responsible for draining up to \$19 billion in energy every year
 - LED lights use up to 85 percent less energy, last up to 25 times longer and are cheaper to run than incandescent lights
 - Look for an Energy Star symbol when buying new products
- Recycle to reduce your carbon footprint
 - Americans generate about roughly 258 million tons of trash a year, 169 million tons of which ends up in landfills and incinerators
 - American's recycled and composted 89 million tons of municipal solid waste — this saved the same amount of energy as generated by 25 million homes
- Ways to reduce your carbon footprint through consumer choices
 - Don't buy clothing that will either wear out quickly or that you'll barely wear
 - Donate old clothes and shop vintage
 - 15.1 million tons of textile waste was generated in 2013, of which 12.8 million tons were discarded
 - Use reusable shopping bags
 - Invest in quality products that last
- Other ways to help
 - Find local climate action groups or meetups in your area
 - Speak to your local representative
 - Vote on policies that protect the environment
- Video: <https://youtu.be/eRLJscAlk1M>

Potential Activities:

- Students can calculate their own carbon footprints either before or during the program, discuss and compare results, and talk about ways that they can reduce their footprints based on their results.

- <https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/?redirect=https-301>

Assessment:

- What is a carbon footprint?
- Why is it important for us to reduce our carbon footprints?
- What are some ways that you can reduce your carbon footprint?

References:

- <https://www.nytimes.com/guides/year-of-living-better/how-to-reduce-your-carbon-footprint>
- <https://cotap.org/reduce-carbon-footprint/>
- https://www.huffpost.com/entry/7-instant-ways-to-reduce-your-carbon-footprint_b_59321992e4b00573ab57a383
- <https://www.nrdc.org/stories/global-climate-change-what-you-need-know>