



Highly Commended

Science Writing

Year 7-8

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OLIPHANT SCIENCE
AWARDS 2020



Climate Change the way Forward

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2020 Oliphant Science Awards

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COULD YOU IMAGINE?

Climate change is a current problem humans face from their actions. The causes of climate change, also known as global warming, is the consistent rapid warming of the earth's atmosphere caused by human activity. Climate change poses an unprecedented threat to human civilization and the ecosystems on this planet. Yet as days after days pass by, the more toxic gases spread through our atmosphere and the more our government refuses to take action, the more we approach the vile disasters that await us. The time to change, the time to act, and the time to awaken is now.



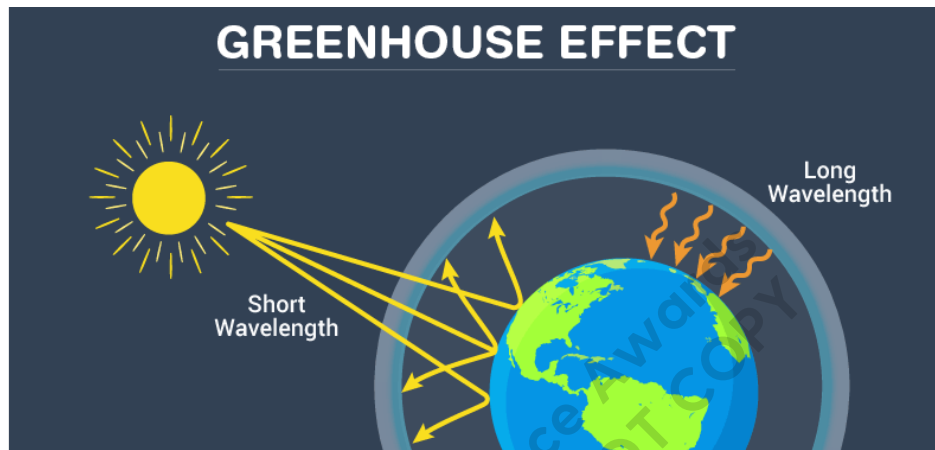
SO HOW DOES IT WORK?

Climate change is a change in the statistical effects of the climate system that continue for several decades or longer. Climate change may be due to natural processes, such as changes in the Sun's radiation, volcanoes, or internal effects in the climate system, or due to human influences such as changes in the composition and formation of the atmosphere or land use. Energy from the Sun is the ultimate aspect of climate on Earth. The solar energy received by the earth depends on how much the sun emits and how far the earth is from the sun. Part of this sunlight is reflected space by the atmosphere, clouds, land, ice, water surfaces, and aerosols particles.

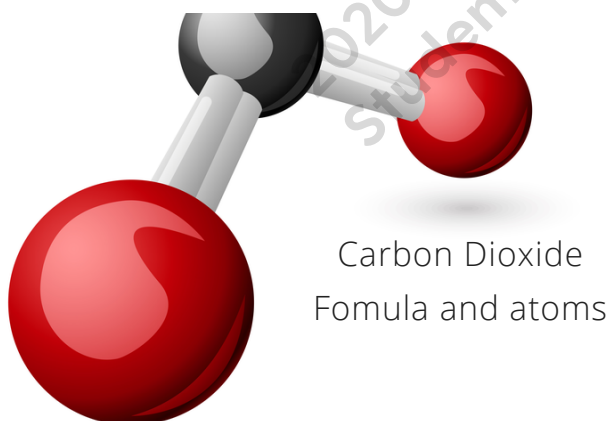
(Australian Academy Of Science, 2020)



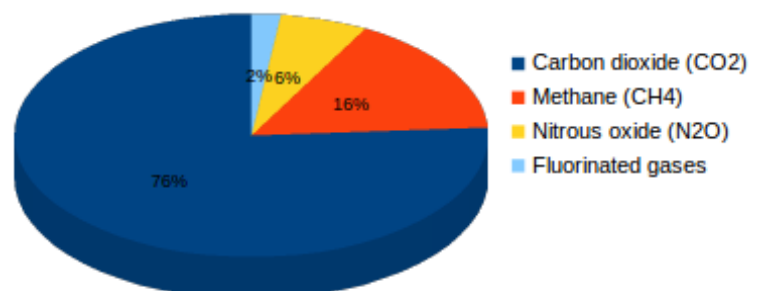
The solar energy absorbed by Earth is returned to space as infrared (heat) radiation. In the process, it interacts with the whole climate system such as the atmosphere, oceans, and land surfaces. The flows of radiation in the atmosphere are very important in determining climate. The main gases that make up the atmosphere, nitrogen, and oxygen do not make contact with infrared radiation, but certain gases absorb the radiation that flows upwards from the Earth's surface and re-radiate it in all directions. (Climate Change In Australia.gov.au, 2020.)



By doing this they hinder the outward flow of infrared energy from Earth to space. This is called the 'greenhouse effect', and the gases that cause it by interacting with infrared radiation are called greenhouse gases. The atmospheric concentrations of some greenhouse gases are being affected by human activities. Greenhouse gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), and synthetic gases, such as chlorofluorocarbons (CFCs) and hydrofluorocarbons (HFCs). (Climate Change In Australia.gov.au, 2020.)



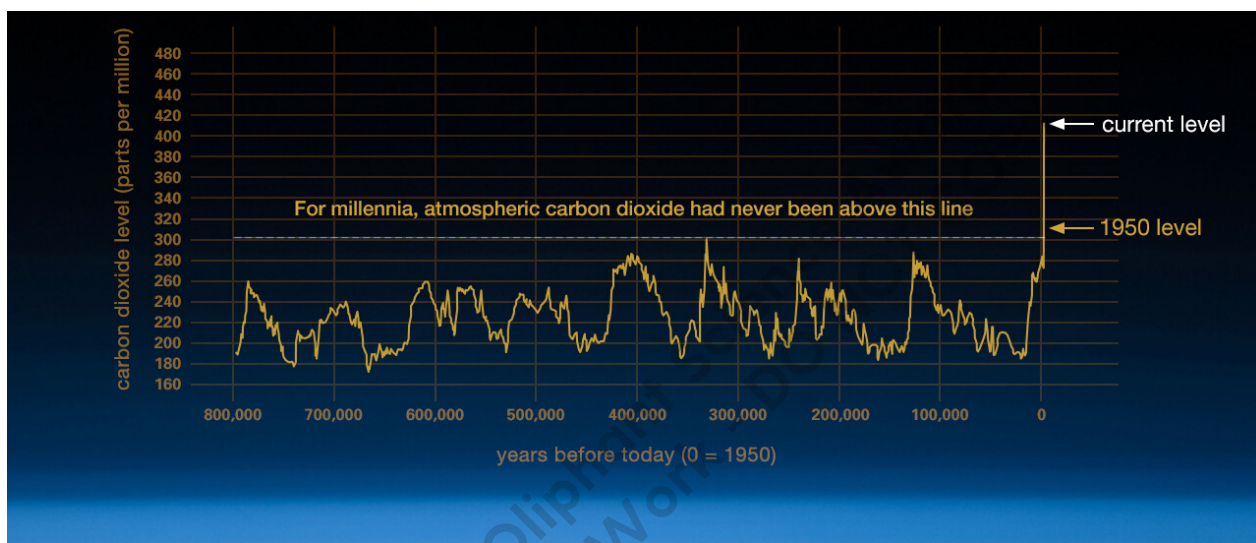
Forcing greenhouse gases - Global emissions



How Does Climate change WORK

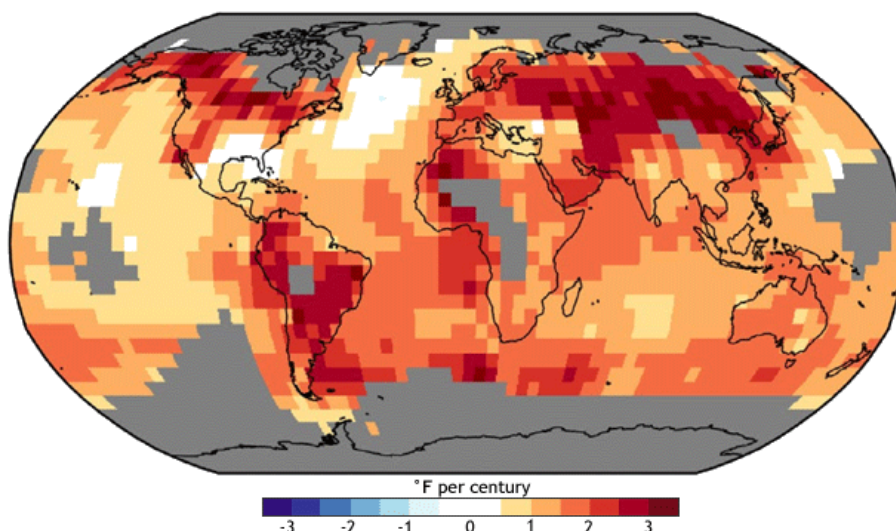


Atmospheric concentrations of carbon dioxide (CO₂), methane and nitrous oxide began to rise around two hundred years ago. The concentration of CO₂ has increased from 280 parts per million before 1800, to 396 parts per million in 2013. This history of greenhouse gas concentrations has been established by a combination of modern analysis of ancient air bubbles in polar ice. Particularly important is CO₂. (NASA, 2020) .Enormous amounts of this gas are exchanged between the atmosphere, land, and oceans, as land and marine plants grow, die and decay, and as carbon-rich waters circulate in the ocean. For several thousand years until around 200 years ago, this carbon cycle was in balance and steady. Since the 19th century, human activities of CO₂ emissions from fossil fuel combustion, cement manufacture, and deforestation have disturbed the balance, adding CO₂ to the atmosphere faster than it can be taken up by the land biosphere and the oceans. (NASA, 2020)



Dramatic increase of Carbon dioxide emission since the 19th century

On average over the last 50 years, about 25% of total CO₂ emissions were absorbed by the ocean making seawater more acidic and 30% was taken up on land. Growth of atmospheric CO₂ induced by plant growth increased nutrient availability and response to changes in warming and precipitation. The other 45% of emissions are accumulated in the atmosphere. This constant emission of carbon dioxide has now contributed to what we call climate change. Climate change is the ongoing rise of the average temperature of the Earth's climate system. The rising of global surface temperatures, also includes its effects, such as changes in precipitation, frequent droughts, heatwaves, polluted water, and much more.



Increase in Rapid warming in the world

THE PATH WE HAVE PAVED FOR OURSELVES

Global sea level has risen 8 inches since reliable record-keeping began in 1880. By 2100, it is forecast to rise by another 1-8 feet. This is the result of the addition of water to the melting of the ice sheet and the expansion of seawater as it heats up. Since the 1900s, many glaciers around the world have rapidly melted. Human activity underlies this phenomenon. In particular, after the industrial revolution, emissions of carbon dioxide and other greenhouse gases raised the temperature, even more at the poles, and as a result, glaciers are rapidly melting, breaking into the sea, and retreating to the earth. This rapid melting affects not only us but also the poor wildlife in the South and the North Pole regions. Wildlife, like polar bears, depends on the ice caps and the ice itself as its surface for safety between the water and itself. (Hancock, 2020.)

Rising sea temperatures mean the reef is at increased risk of heat stress and massive bleaching of corals. As a consequence of the rising sea temperatures, this reduces the capacity of corals, which serve as important habitats for irreplaceable marine life on the reef. Tropical sea surface temperatures have increased from 0.4 to 0.5 ° C since the late 19th century. This is one of the greatest threats to the long-term future of the Great Barrier Reef. Climate change has also contributed to the acidity of ocean water. On average over the last 50 years, about 25% of total CO₂ emissions were absorbed by the ocean making seawater more acidic. Higher sea levels affect many areas of overall ocean health, including coastal erosion, storm surge size, and shallow waters protected for marine organisms. Small changes in sea level mean flooding the country, leading to significant changes in tidal habitats. (Great Barrier Reef Foundation. 2020.)





Our future lies in the SEED OF OUR ACTION

RENEWABLE ENERGY

For the past 150 years, humans have relied heavily on coal, oil, and other fossil fuels, which power everything from cars to factories, and as a result, greenhouse gases released from burning those fuels have increased the temperature of the atmosphere.

Renewable energy is one of the great changes the world can make to mitigate the effects of rising temperatures. Renewable energy is generated from sources that naturally replenish themselves and never run out. The most common sources are solar, wind, hydro, geothermal, and biomass. This is because renewable energy sources, such as sun, wind, do not emit carbon dioxide and other greenhouse gases that cause global warming. Using renewable energy is creating jobs, making the electricity network more sustainable, and increasing access to energy in developing countries. All of these factors have contributed to the renewal of renewable energy. (National geographic, 2015.)



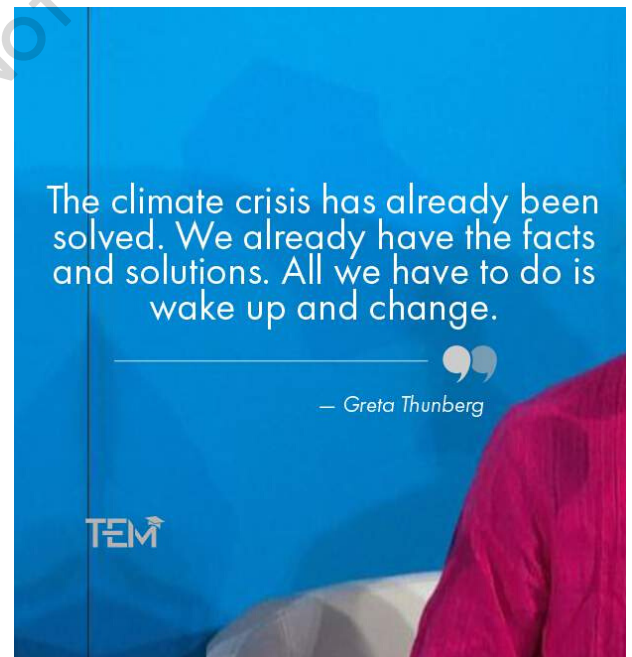
COMMUTE

Millions of people drive to work every day. The downside of petroleum cars is that millions of vehicles emit greenhouse gases that destroy our atmosphere. Vehicle emissions contribute to the top causes of climate change. There are always other options that you can utilize to make your transport eco-friendly. Taking public transportation to work is a great way to cut out emissions. Riding your bike to work is also incredibly helpful to the environment and is a great method to remain fit and healthy.



LET YOUR VOICE BE HEARD

Greta Thunberg is a Swedish environmental activist who has gained recognition for promoting the view that humanity is facing an existential crisis arising from climate change. She is known for her youth and her inspirational speaking manner, both in public and to political leaders. Speak up, let your voice be heard like Greta. Speaking your mind and the simple voice of a child can make a difference in society and a chance to stop global warming. Making your voice heard is not all about making speeches on tv and protests. A journey of a thousand miles starts with the first step. Start by spreading the word against fellow peers or colleagues and educated minds on the horrible disaster climate change is causing in our world. From there, by taking care of the pennies the pounds will take care of themselves. Though the light at the end of the tunnel is dimming, we can brighten it, giving us hope. The time to act and the time to change is now.(Active sustainability.com, 2020.)



REDUCE WATER WASTE



Saving water reduces carbon pollution. That's because it takes a lot of energy to pump, heat, and treat your water. By stopping the waste of water, take shorter showers and turn off the tap while brushing your teeth. The EPA estimates that if just one out of every 100 American homes were retrofitted with water-efficient fixtures, about 100 million kilowatt-hours of electricity per year would be saved, avoiding 80,000 tons of global warming pollution. (Department of Agriculture, Water and the Environment, 2020.)

CONCLUSION

Climate change, a global conundrum, and a taunting worry that will and is affecting our world severely. A never-ending vexation that wraps around us like a treacherous hug. Yet as days after days pass by, the more toxic gases spread through our atmosphere and the more our government refuses to take action, the more we approach the vile disaster that waits for us. The time to change, the time to act, and the time to awaken is now.



Change your thoughts and you change the world.

Norman Vincent Peale

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