Green Schools Network

Gobartimes

ACTIVITY SHEET

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Why talk about carbon dioxide?

Carbon dioxide (CO_2) is one of the primary greenhouse gases produced by human beings through combustion of fossil fuels such as coal, oil and natural gas in power plants, automobiles, industrial facilities and other sources. Other Green House Gases (GHG) include: water vapor, methane, nitrous oxide and ozone.

The earth's atmosphere always seemed to have contained carbon dioxide in varying amounts. This greenhouse gas allows light radiation to pass through while absorbing some of the heat radiation (produced by light) radiating the earth's surface. This causes the earth's surface and atmosphere to be 33 degrees celsius warmer than it would otherwise be. Humans, as all life on earth have always been a part of the carbon cycle. But things have drastically changed after the industrial revolution;large scale burning of fossil fuels alongwith deforestation has caused increasing atmospheric carbon dioxide levels (upto 40% since the industrial revolution). This has led to an enhanced greenhouse effect and consequent climatic change.

Name.....

School Name .....

Class..... **Date**.....

Gobar Gyan:
What goes around comes around!

While carbon dioxide maintains the greenhouse effect of the earth keeping the earth warm, an increase in the amount of carbon dioxide in the atmosphere has led to increased global warming. The climate change that takes place due to an increase in the carbon dioxide concentration is largely irreversible for 1,000 years after emissions stop.

CO_2 emissions don't just cause global warming; they are also a major source of air pollution. Scientific experts now believe the world faces an epidemic of illnesses that are exacerbated by air pollution. These illnesses include cardiovascular disease, asthma, chronic obstructive pulmonary disease, lung cancer, and diabetes. Our transport vehicles are largely responsible for releasing these harmful CO_2 emissions in the atmosphere that cause air pollution and climate change. But we need transport for movement, so how do we control these emissions? Are we going wrong somewhere? Let's find out.

Type of vehicle	CO_2 emissions per km	Distance between your house and school in kms	CO_2 emitted each day: (CO_2 emissions per km x kms traveled x no of trips made)
Two wheeler	28gm/km		
3 wheeler	78gm/km		
Diesel car	208gm/km		
Petrol cars	223gm/km		
Mini Buses	300gm/km		
Large buses	515gm/km		

Hi! I am Pandit Gobar Ganesh. You will find me in Gobar Times—a magazine that tells you how your everyday life is linked to the world around you. Hooked, huh? If you want to know more about me and GobarTimes visit us at:

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The CO_2 facts:

- **While Bhutan, Afghanistan, Nepal, Zimbabwe, Srilanka, New Zealand & Hong Kong emit 0.1% of the total CO_2 emissions, U.S alone contributes a 22.2% (the highest!).India ranks 5th with a 4.9%.**
- **A Stanford university study has found that for each 1 degree Celsius increase in temperature caused by CO_2 emissions, the resulting air pollution could lead to more than 20,000 deaths worldwide every year with many more cases of respiratory illnesses & asthma.**

Example: If you use a diesel car to go to school, which is 6 kms from your house, you emit 208gms x 6kms x 4trips* = 4992 gms (4.992,approx 5 kg) of carbon dioxide in one day.
(*Remember, each time you are dropped off at school, the driver has to drive home, so there are 2 round trips a day)

However, if you take a bus to school, the amount of CO_2 emitted by the bus would be shared by 50 people i.e. the average seating capacity of the bus. Therefore, if your school is 8 kms away, the total CO_2 emissions made by you are: 515gm x 8km x 2 trips =8240 gms = 8.2 kgs

$$\text{Emissions per person} = \frac{8240}{50} = 164 \text{ gms!!}$$

Compare your results with others. What do you find?

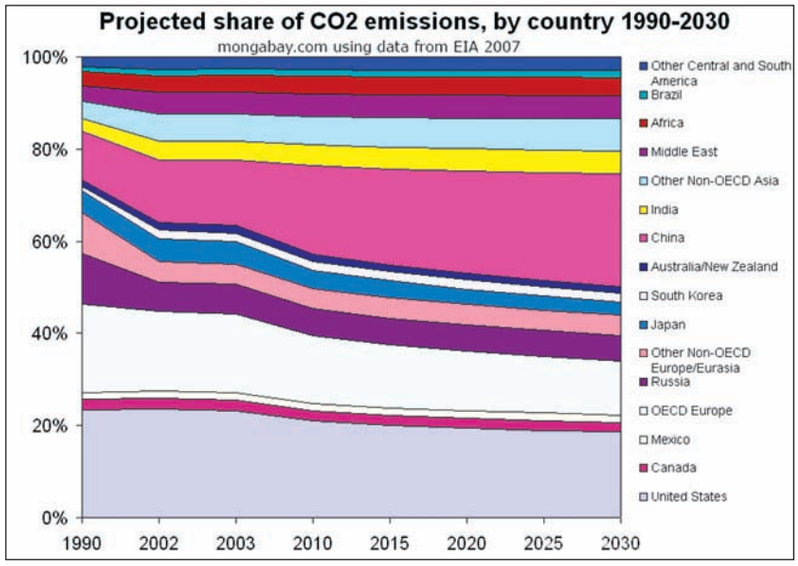
In cities across the globe, the personal automobile is the single greatest polluter, as emissions from a billion vehicles on the road add up to a planet-wide problem. Driving a private car is a typical citizen's most air polluting activity. The negative effects of automotive emissions are maximum when you sit in traffic surrounded by cars, their engines idling. Everyone in a traffic jam is getting poisoned and our atmosphere, choked.

Vehicles with poor gas mileage contribute the most to global warming

The only way to save us from this ongoing 'self-destruction' is to reduce the number of vehicles on the roads by switching to mass transit. Your calculations from the above activity would have revealed the same. Mass transit systems are not just environment friendly by reducing the amount of pollution but also more energy efficient.

All governments invest a huge amount of capital in the public transport industry for the convenience of its people. Name the public transport available in your city. Tick the ones you can use for commuting to school. Calculate the carbon emissions for each one of them and compare these with those of your private vehicle.

Public Transport	Transport I can use	CO_2 emissions
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____



The Kyoto Protocol, a protocol to the United Nations Framework Convention on Climate Change (UNFCCC or FCCC), establishes legally binding commitments for the reduction of 4 greenhouse gases (carbon dioxide, methane, nitrous oxide, sulphur hexafluoride), and 2 groups of gases (hydro fluorocarbons and per fluorocarbons) produced by the industrialized nations, as well as general commitments for all member countries.

The 'Reduce Carbon Dioxide eMission'!!
(1 pound = 0.453 592 37 kilogram)

- **Reduce the number of kilometers by walking, biking, carpooling or taking mass transit wherever possible:** Avoiding just 16 kms of driving every week would save about 500 pounds of carbon dioxide emissions a year! Walking and biking will also keep you fit. Keep your car tuned up, check your tires weekly to make sure they're properly inflated and when it is time for a new car, choose a more fuel-efficient vehicle.
- **Support local farmers markets:** They reduce the amount of energy required to grow and transport the food to you by one fifth and you also get to save good money. Try and buy organic foods as much as possible.

You could also do a quick check at home and save a lot more carbon dioxide emissions that come from the household:

- **Go for compact fluorescent light bulbs and tube lights (cfl):** Save 60% energy (and your money) while you also get to save about 300 pounds of carbon dioxide emissions a year.
- **Clean/replace filters on your furnace and air conditioner:** save 350 pounds of carbon dioxide a year. It also ensures faster cooling.
- **Choose energy efficient appliances** when making new purchases.
- **Use less hot water:** Heating water takes up a lot of energy. Use less hot water by installing a low flow showerhead (350 pounds of carbon dioxide saved per year) and washing your clothes in cold or warm water (500 pounds saved per year) instead of hot.
- **Use a clothesline instead of a dryer whenever possible:** save 700 pounds of carbon dioxide emissions in 6 months time.
- **Turn off electronic devices you're not using:** This will save us thousands of pounds of carbon dioxide emissions every year.
- **Buy recycled paper products:** it takes less 70 to 90% less energy to make recycled paper and it prevents the loss of forests worldwide. Besides, they are more aesthetic and presentable.

A carbon footprint is "the total set of GHG (greenhouse gas) emissions caused directly and indirectly by an individual, organization, event or product".

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