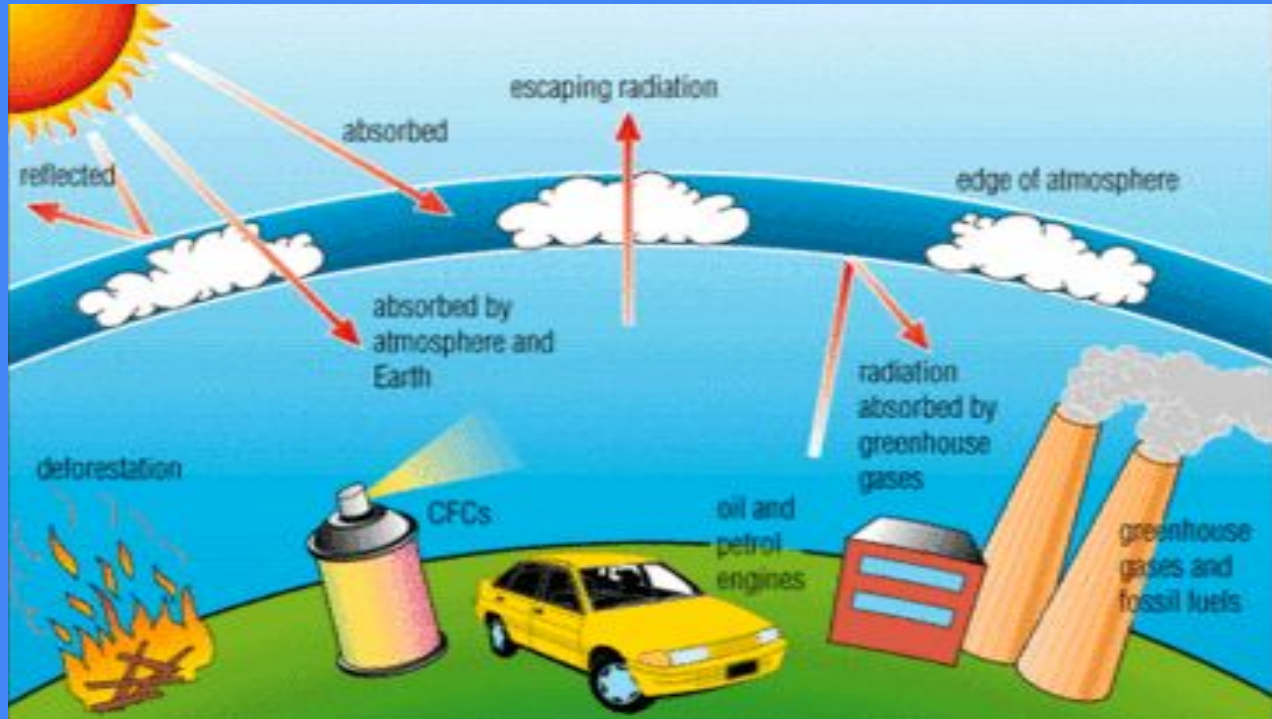


People and Climate Change

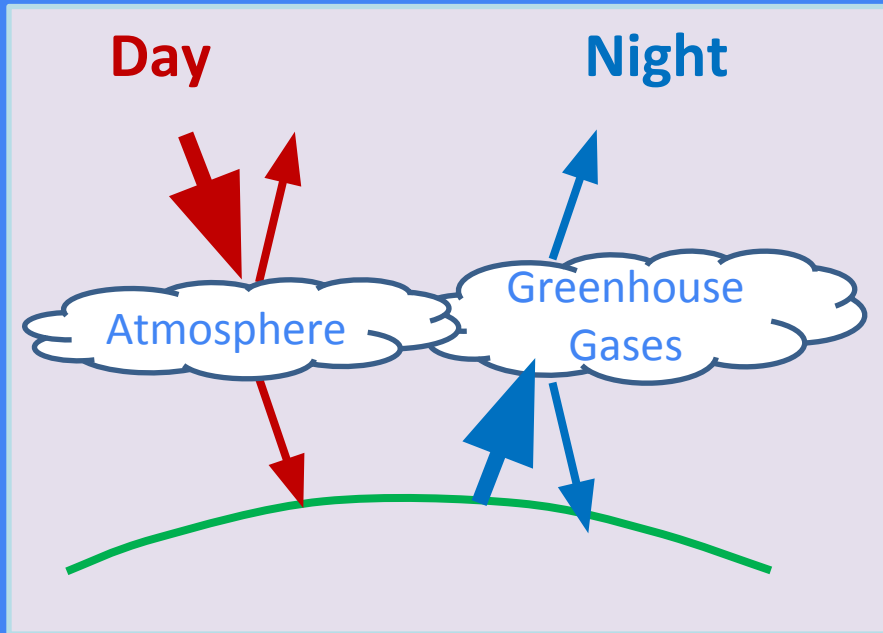


Atmospheric Gases

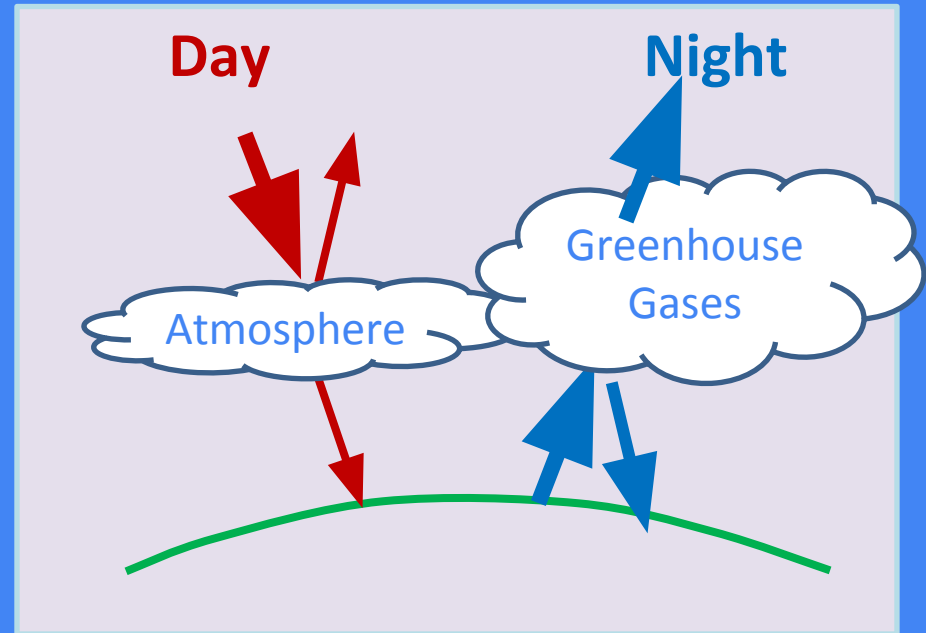
	GAS	% Abundance
	Nitrogen	75-78%
	Oxygen	21-23%
	Argon	1%
Key Greenhouse Gases	Water Vapor	0.3%
	CO₂	0.06%

Natural vs. Enhanced Greenhouse Effects

Natural



Enhanced



Natural vs. Enhanced Greenhouse Effect

Natural

Effect

Enhanced

- Slow cooling at night due to slow release of heat

- Sources of gases:

- Evaporation & transpiration
- Volcanoes
- Forest fires
- Respiration by organisms
- Weathering of rocks

- Even slower release of heat at night = less cooling = higher temps

- Sources of gases:

- Burning fossil fuels
- Deforestation
- Respiration by people (?)
- Factory smoke

Explain how city traffic can increase Earth's average temperature



World's Most polluted city: New Delhi, India



A file image taken Nov. 21, 2019 shows heavy smog engulfing India Gate in New Delhi, India.

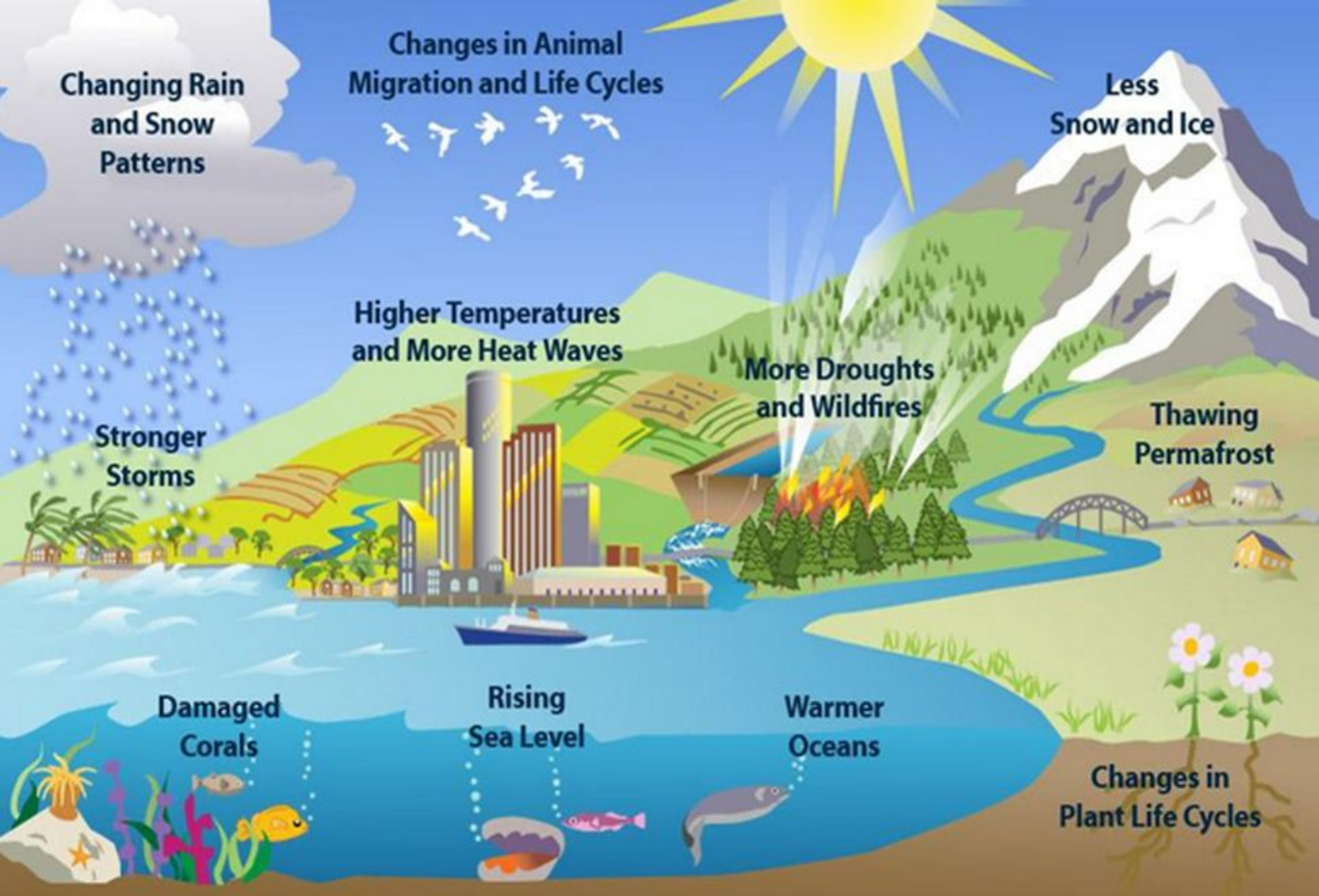


Clouds hover over the sky at India Gate during the lockdown to limit the coronavirus on April 20, 2020 in New Delhi, India

Climate Change

- Last 100 years . . .
 - 1.53°F increase in global temperature
 - Much more RAPID than in the past
- Land areas = a larger temperature increase than water (specific heat capacity)
- People have increased the amount of greenhouse gases present . . .





Impacts of Global Warming

Impacts of Global Warming

- More intense heat waves
- Increased droughts and floods
- Changes in weather patterns



- Decrease in human health

- More respiratory disease
- More infectious diseases (most diseases tolerate heat better than cold: flu, too)
- Malnutrition (no longer

can grow same crops/amounts)

Impacts of Global Warming:

More Respiratory Disease

● The Air Quality Index (AQI)

indicates ...

○ How clean or polluted the air
is

○ Associated health concerns

○ Indicates who is at the most risk—usually the elderly, children, & the ill

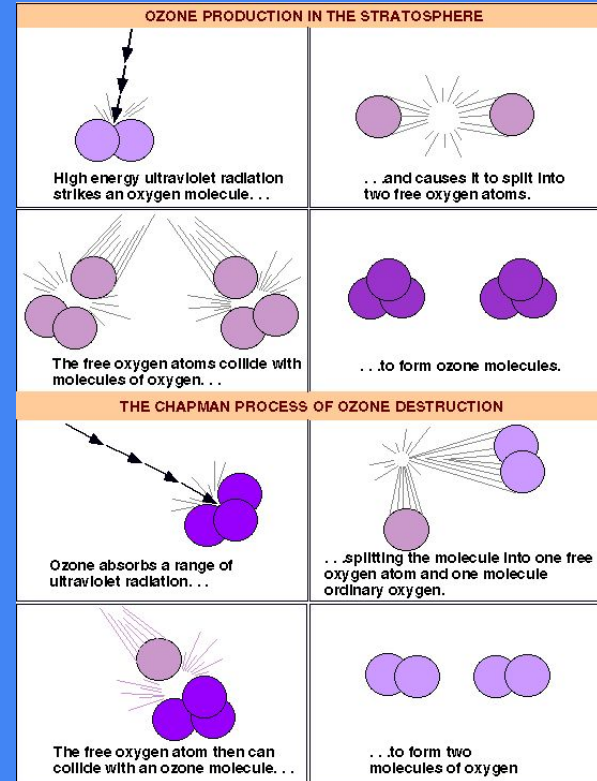
● 2 greatest threats in US:

○ Ground-level ozone

○ Aerosols □ Airborne
particles

Ozone: Climate & Health

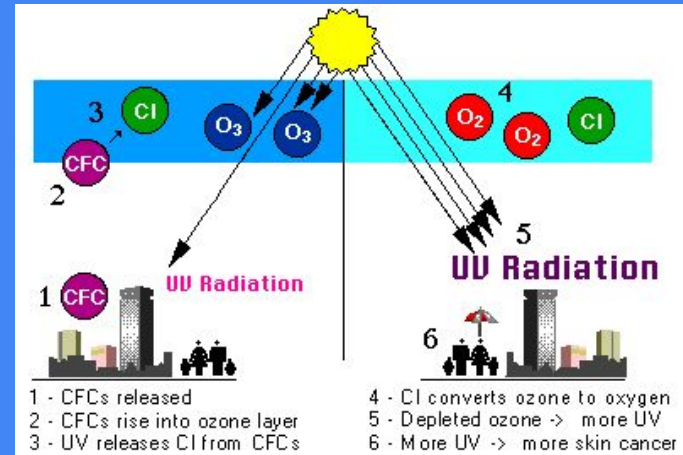
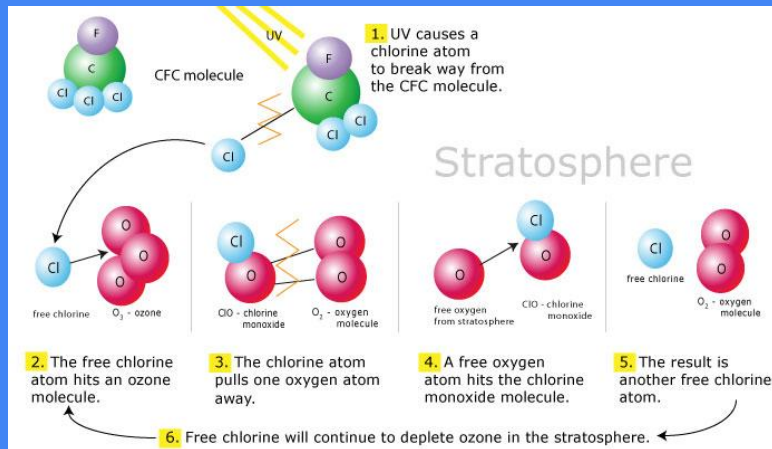
- Stratospheric Ozone—Good!!!
 - Absorbs incoming UV energy—constantly breaks up & reforms
 - Minimizes UV's carcinogenic effect (ability to cause cancer)



Ozone: Climate & Health

- Stratospheric Ozone—Good!!!

- CFCs (chlorofluorocarbons) break up the ozone without absorbing UV = more UV reaches ground = more skin cancer



Ozone: Climate & Health

- Tropospheric (aka Ground-level) Ozone—Bad!!

- Forms when UV light reacts with chemicals (hydrocarbons & nitrogen oxides) coming from:

- Fossil fuel power plants

- Automobiles

- Gasoline vapors

- Oil refineries

- Effects: . . .



Ozone injury to yellow-popular



Ozone injury to milkweed

Effects of Ozone: Climate & Health

- Plants close stomata, slowing photosynthesis & growth
- Materials (rubber, textile dyes, fibers, & paints)
 - fade, weaken, become brittle & crack
- Cell damage by oxidation
 - Respiratory problems: difficulty breathing, chest pain, coughing, worsens asthma, bronchitis, & emphysema,
 - Cause eye irritation, nausea, headaches, and worsens heart disease

Response to Low Air Quality: 1970 Clean Air Act

- National air quality standards to protect public health
- Pollutants focused on...
 - Particle Pollution
 - CFCs: ozone depletion
 - Aerosols: ozone depletion & reflect solar radiation
 - Ground level ozone: damages living tissues
 - Sulfur dioxide & nitrogen dioxide: acid rain
 - Carbon monoxide: reduce oxygen in blood

Potential Impacts of Global Climate Change on Human Health

Global climate change effects:

- Temperature
- Sea level
- Precipitation

