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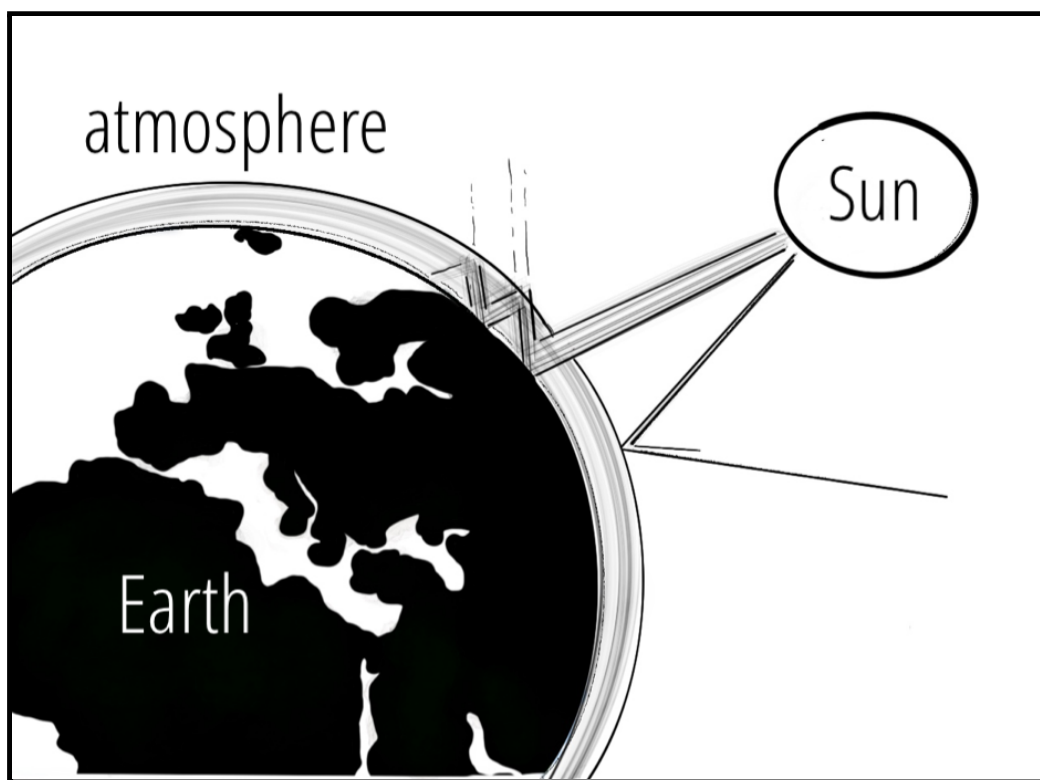
CLIMATE CHANGE

Climate change is the long-term alteration in Earth's climate and weather patterns. It includes both human-induced global warming and its large-scale impacts on weather patterns. Even the ancient Greeks had proposed that humans could change temperatures and influence rainfall by chopping down trees, plowing fields or irrigating a desert. During the past few hundred years of development of industry, oil, gas, and coal have powered homes, cars, and factories. These energy sources and cutting down forests and farming livestock release a gas called CO₂ into the atmosphere.

Scientists have been observing Earth for a very long time. They use various kinds of instruments and satellites to collect many types of information about Earth's atmosphere, land, ocean and ice. This information tells us that Earth's climate is getting warmer. In fact, many of the warmest years on record have happened in the past 20 years. This rise is called global warming.

The reason for global warming is that some of the gases in Earth's atmosphere trap heat from the Sun—like the glass roof and walls of a greenhouse. These greenhouse gases keep Earth warm enough to live on.

- 1) Sunlight shines onto the Earth's surface, where the energy is absorbed and then radiate back into the atmosphere as heat.
- 2) In the atmosphere, greenhouse gas molecules trap some of the heat, and the rest escapes into space.
- 3) The more greenhouse gases like CO₂, concentrate in the atmosphere, the more heat gets locked up in the molecules. This leads to global warming.



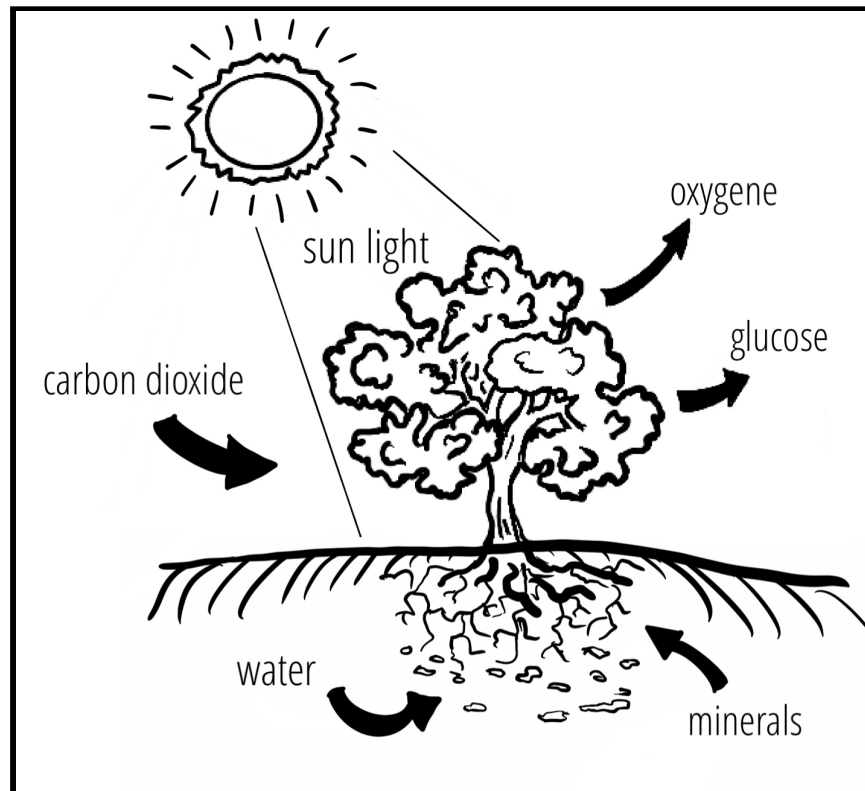
Climate change affects all regions around the world. So all living beings have to face the consequences of the phenomenon. Global warming causes polar ice sheets and glaciers to melt and warming water to expand. The combination of these changes is causing sea levels to rise, resulting in flooding and erosion of coastal and low lying areas. Some places will receive more rainfall, which

could lead to flooding, while other places will get less, which might mean extreme heat waves and drought.

Climate change is happening so fast that many plants and animal species are struggling to cope. Many terrestrial, freshwater and marine species have already moved to new locations. Those species that do not adapt to climate change will disappear.

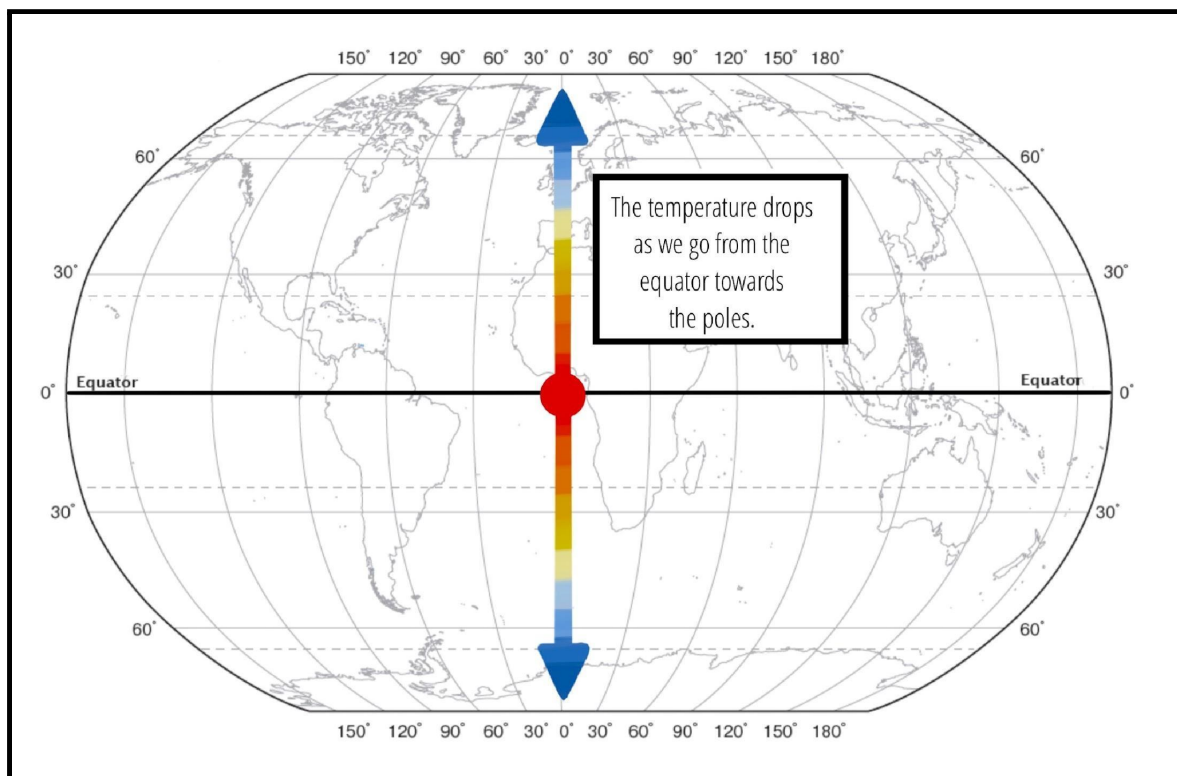
Plants make oxygen

Plants make oxygen through a process called photosynthesis. Plants need three basic things to live: water, sunlight, and carbon dioxide (CO₂). Plants take in water and minerals from the soil and carbon dioxide from the air. Plants use sunlight as energy. Photosynthesis starts when chlorophyll absorbs energy from sunlight. Plants use this energy to change water and carbon dioxide into oxygen and nutrients called sugars. The plants use some of the sugars and release oxygen into the air. Photosynthesis is necessary for life on Earth.



Difference between climate and weather

Climate describes the typical weather conditions in an entire region for a very long time. Climate change is often monitored by averaging rainfall and temperature. Weather, on the other hand, is only temporary and it can change many times in a day. The sunshine of the morning can turn to heavy rain at noon, just to return in the evening.



Meteorology

The science that deals with the phenomena of the atmosphere, especially weather conditions is called meteorology.

Basic instruments for forecasting found in homes are thermometer, barometer, wind vane, and rain gauge. The thermometer measures temperature, and the barometer measures atmospheric pressure. Atmospheric pressure is also called barometric pressure. This is the weight of the air as

felt at any given spot on Earth. The wind vane shows the direction in which winds are blowing and a rain gauge measures the amount of rain that has fallen over a specific time period.

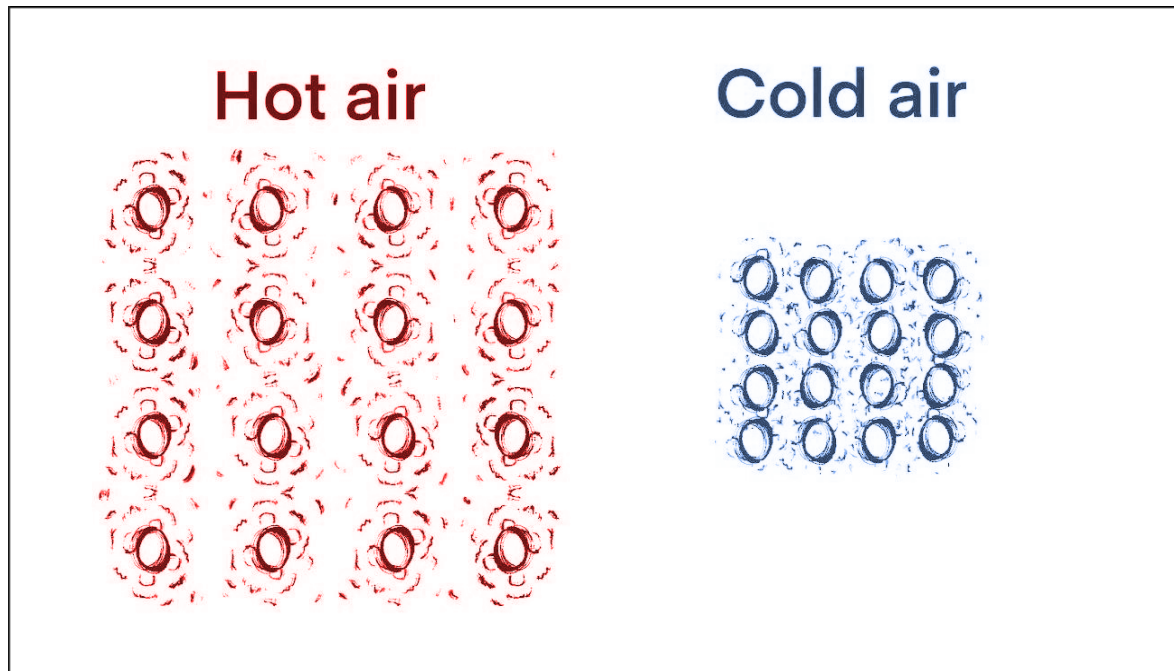
Scientific weather forecasts are made by combining computer generated-models, meteorological satellite observations, and a knowledge of trends and patterns. Weather satellites are used to photograph and track large-scale air movements. Weather satellites can be either polar orbiting, seeing the same swath of the Earth, or geostationary, hovering over the same spot on Earth by orbiting over the equator while moving at the speed of the Earth's rotation.

Meteorological satellites see more than clouds and cloud systems. They collect various types of environmental information like effects of pollution, city lights, fires, auroras, sand and dust storms, snow cover and ice mapping, etc.

Meteorologists language for explaining phenomenons.

Air Pressure is the weight of air pressing down on earth. Air is made up of molecules that are constantly in motion. As air warms up, the molecules start to vibrate and bump into each other, increasing the space around each molecule. Because each molecule uses more space for motion, the air expands and becomes less dense (lighter). Same number of air molecules occupy a larger space or the same sized space with increased air pressure. A high pressure system occurs when cool and dry air spirals in a clockwise direction in the Northern Hemisphere, bringing mild weather and sunny, blue skies.

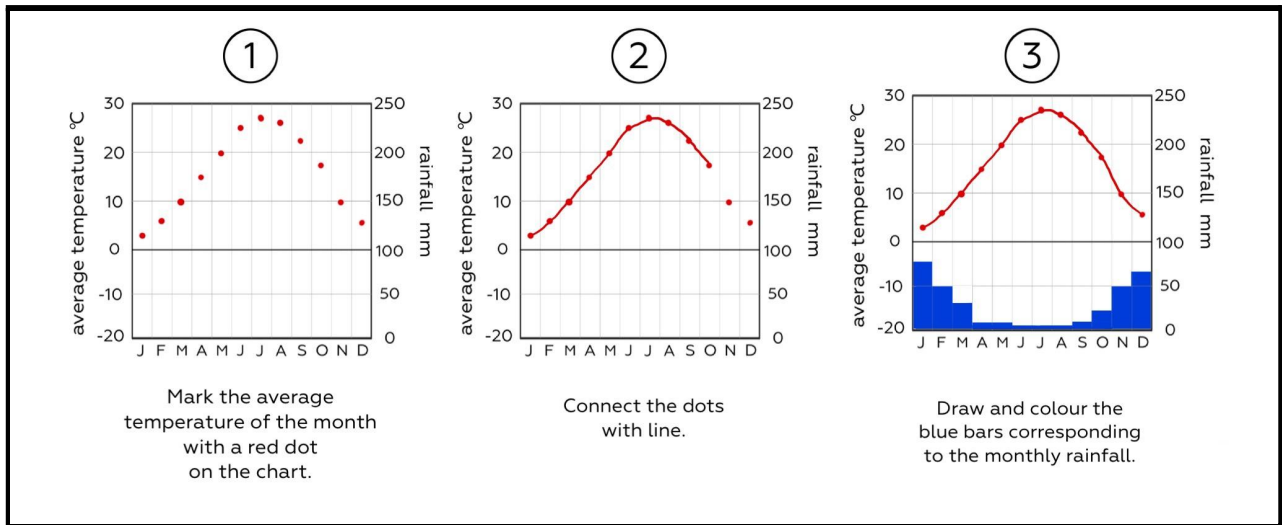
The opposite effect happens when air cools. As the temperature drops, molecules move more slowly, stopping vibrating. So they are taking up less room. The amount of space the air takes up shrinks, or reduces the air pressure. A low pressure system is moist, warm air that generally brings stormy weather. Winds spiral into a low-pressure center in a counterclockwise rotation in the Northern Hemisphere.



Air pressure can change from place to place, and this causes air to move, flowing from areas of high pressure toward areas of low pressure.

Humidity is the amount of water vapor in the air. Relative humidity refers to how much moisture is in the air compared with how much moisture the air can hold. We feel much hotter than the actual temperature when the relative humidity is high. If the relative humidity is low, we can feel much cooler than the actual temperature.

How to make a climate diagram?



In the diagram, the left y-axis shows the temperature degrees celsius. You can also mark the degrees in fahrenheit. The right y-axis shows the amount of rainfall. The x-axis at the bottom of the diagram shows the months. You can easily turn the climate diagram to the weekly weather chart. All you have to do is change the months on the x-axis to days.

Traffic

Throughout its history, man has had a need to move from place to place. First, man got their food from the hunt followed by movement of the animals. Traffic begins to develop between settlements on traderoads. Due to population growth, New inventions had to be developed to transport people and goods. Industrialization enabled large growth in public transport and freight transport. They were able to transport over long distances. The downside was that fossil fuels had to be burned. It caused pollution and deterioration of breathing air.

Air holds lots of tiny particles. They are called aerosols. Some aerosols are picked up naturally. These aerosols are for example dust and pollen. But the air can also carry soot, smoke, and other particles

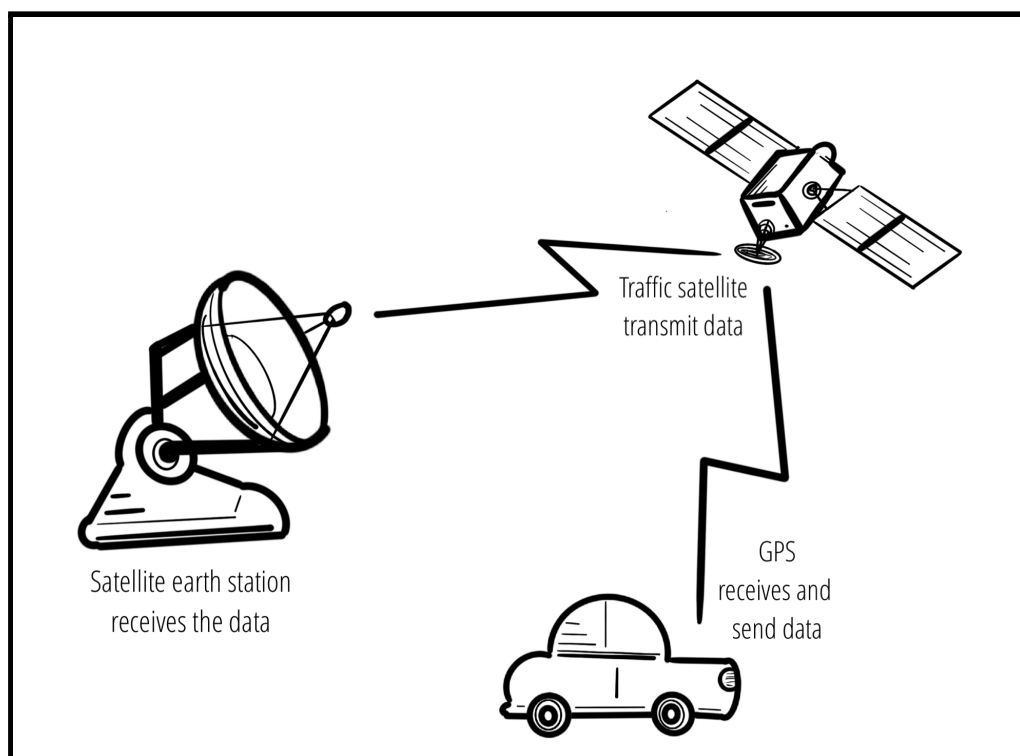
from car exhaust and power plants. These are major contributors to air pollution. Air pollution is a threat to health.

Traffic is electrifying rapidly, so the use of internal combustion engines is reduced. In the near future cars and public transports, buses, trams, and trains will use cleaner energy sources. Air pollution will be reduced and urban respiratory air will be improved.

Traffic monitoring by satellites

Communications and Navigation satellites carrying television, telephone, GPS and internet signals over the planet. They also transmit signals from traffic cameras.

For people, traffic satellites will lead to better information about traffic, particularly if combined with route planners and navigation systems. They make route choices easier. They help you to choose the right public transport. They help you to avoid traffic jams and as a pedestrian, it can tell you the safest road.



Road safety

Much has been done for safe movement in traffic. Speed limits tell you how fast you can drive on the road. Road cameras transmit information about the weather conditions and volume of traffic to the traffic monitoring center. If there is bad weather, info signs will low down the speed limits on the areas. Speed traps and -cameras will film the speeding drivers. There are lots of different traffic signs, which tell you what traffic rules there are in that sector. There are also Instructions painted on the road surface for example lanes.

The traffic lights show who is allowed to continue the journey at the intersections. For pedestrians there are walking and cycle paths on the side of the roads. Pedestrian crossing helps to cross roads safely. Also there might be a tunnel or bridge to help you to cross the road.