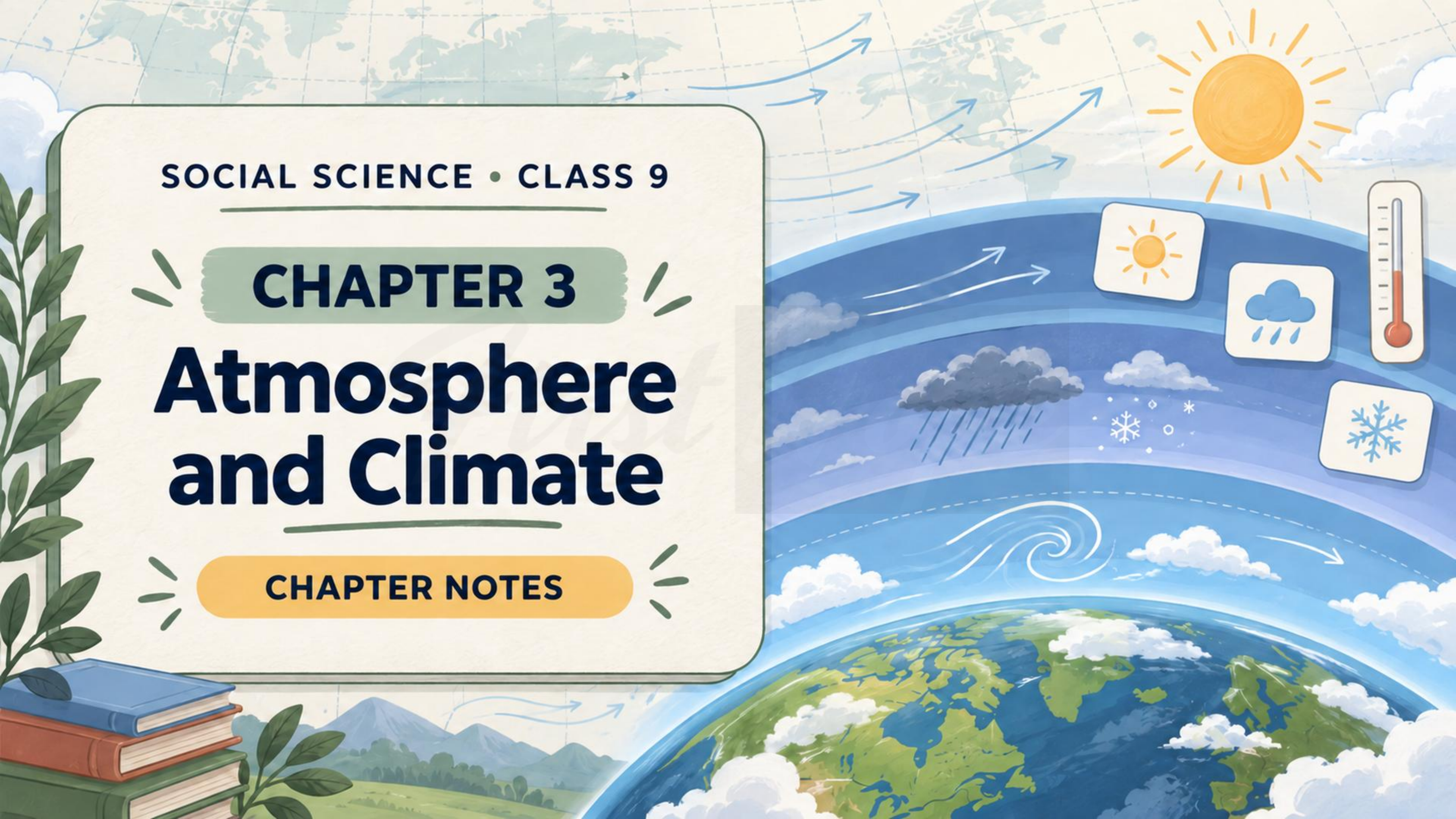


SOCIAL SCIENCE • CLASS 9

## CHAPTER 3

# Atmosphere and Climate

CHAPTER NOTES



# ATMOSPHERE AND CLIMATE

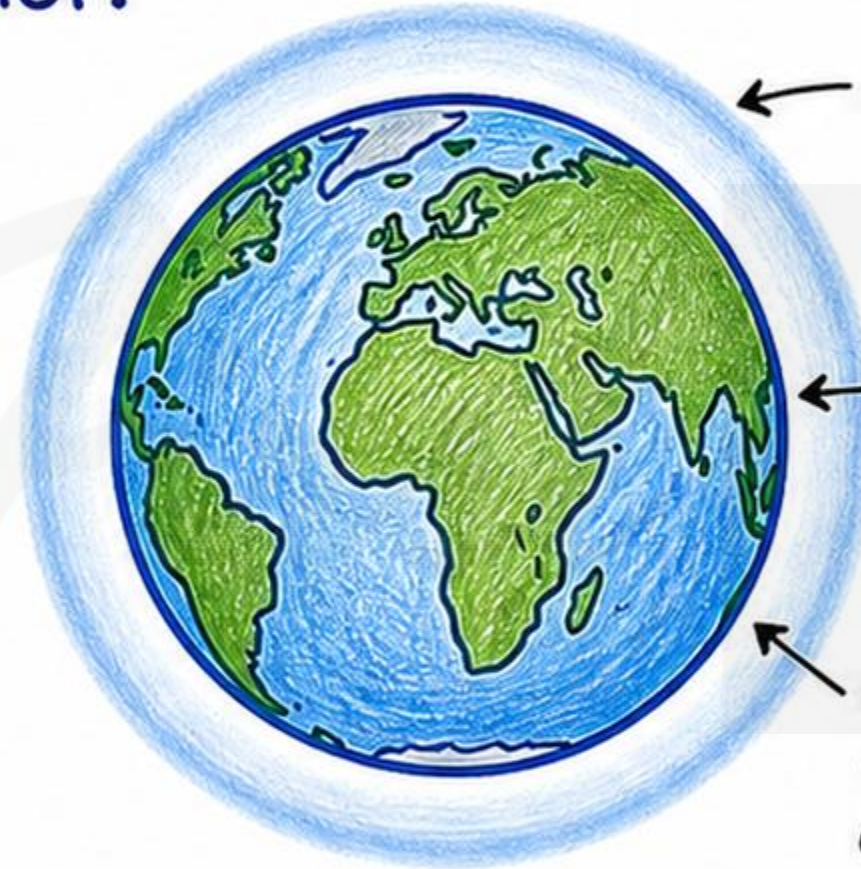
The atmosphere is the blanket of gases surrounding the Earth. Gravity holds it around the planet.



**SUPPORTS LIFE** — provides essential gases.



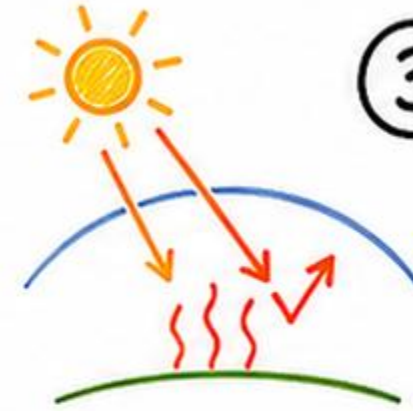
**SHIELDS EARTH** — filters harmful solar radiation, including ultraviolet radiation.



Atmosphere

Earth

Gravity holds the atmosphere around Earth.



③ **REGULATES TEMPERATURE** — traps part of the Sun's energy and reduces extreme heating and cooling.



④ **MAKES WEATHER** — air, water vapour and energy produce winds, clouds and rainfall.



⑤ **LINKS CLIMATE** — long-term atmospheric patterns shape climate.

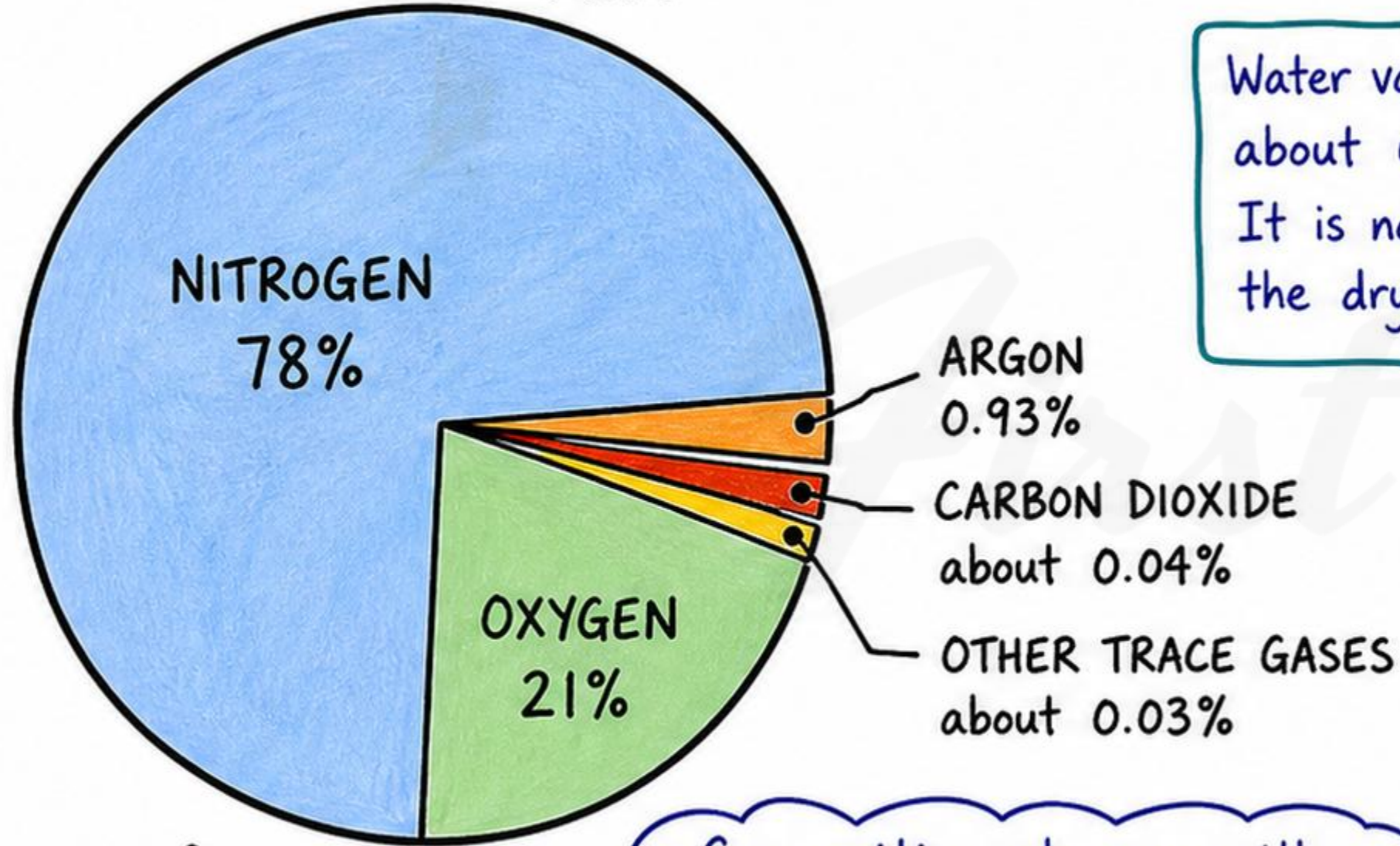


Landforms, oceans and the atmosphere interact continuously.

# COMPOSITION OF THE ATMOSPHERE

The atmosphere is a mixture of gases, water vapour and tiny dust particles.

DRY AIR



Water vapour is variable:  
about 0-4%.  
It is not included in  
the dry-air pie.

- **NITROGEN** — important for the nitrogen cycle and plant growth.

- **OXYGEN** — needed for respiration and supports combustion.

- **CARBON DIOXIDE** — used in photosynthesis and helps trap heat.

- **WATER VAPOUR + DUST** — help cloud droplets form; water vapour controls humidity and precipitation.



Composition changes with  
altitude; air becomes  
thinner upward.



Nitrogen + oxygen make up about 99% of dry air.



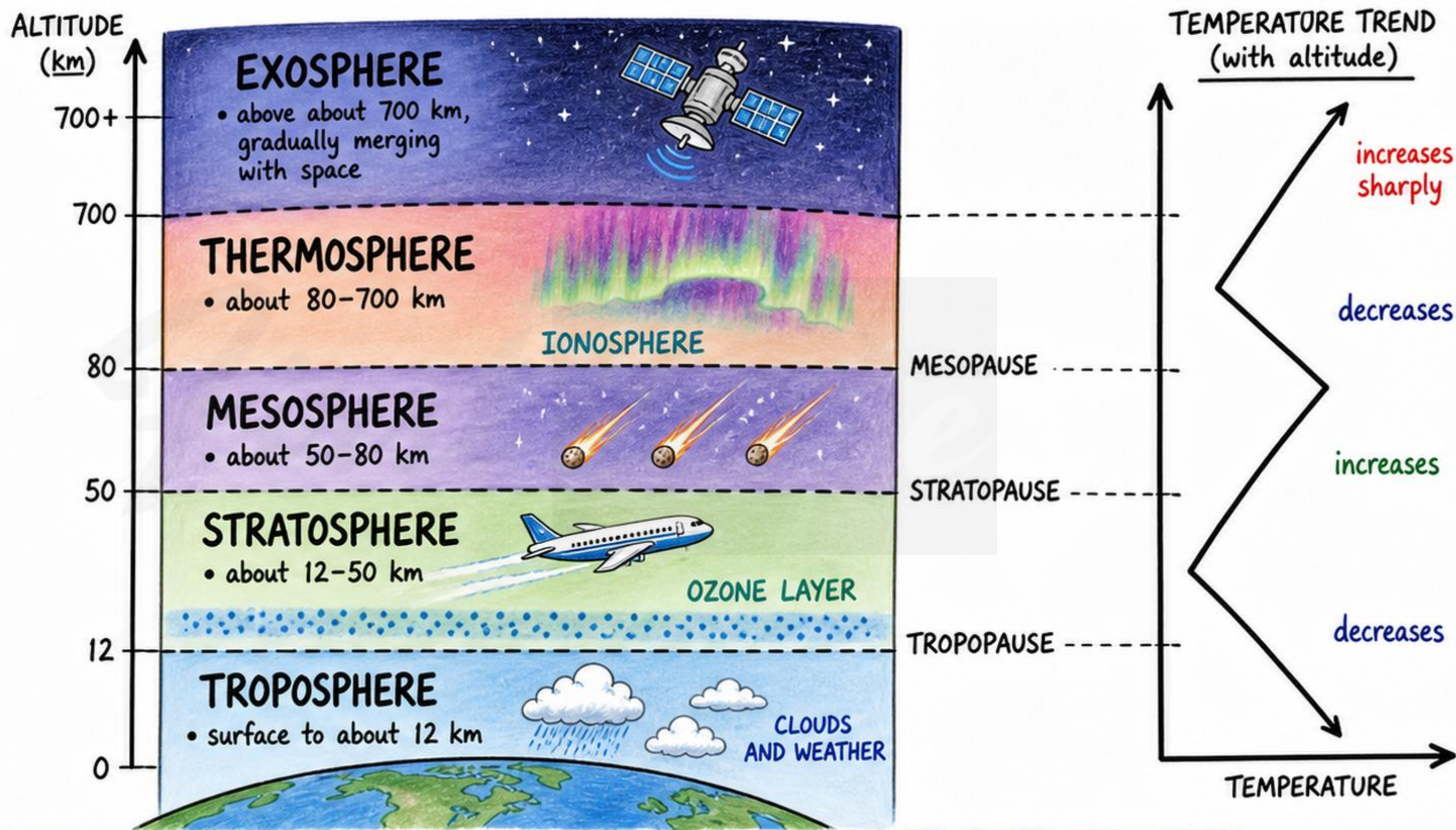
# STRUCTURE OF THE ATMOSPHERE

## DEFINITION:

The atmosphere is divided into layers mainly by changes in temperature and air density with altitude.

## KEY FACT:

Air is densest near the Earth's surface and becomes thinner upward.



MEMORY LINE:

From Earth upward:

**T - S - M - T - E**

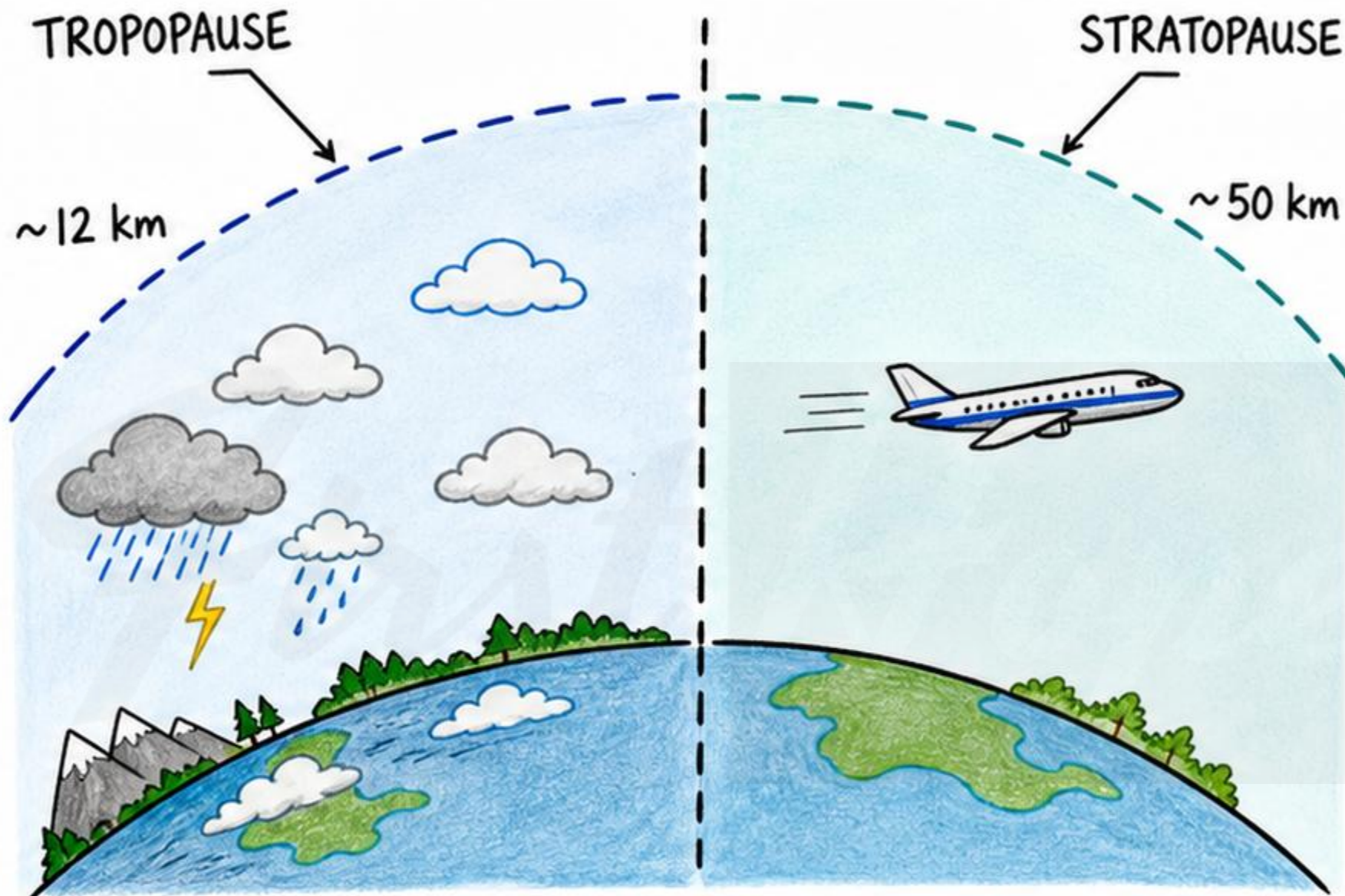
# TROPOSPHERE AND STRATOSPHERE

## TROPOSPHERE

- Lowest layer: surface to about 12 km on average.
- Contains most atmospheric water vapour, clouds and the air we breathe.
- Almost all weather occurs here: rain, fog, hail and storms.
- Temperature generally decreases as altitude increases.
- Air is densest near the surface.

### TROPOSPHERE:

weather + decreasing temperature

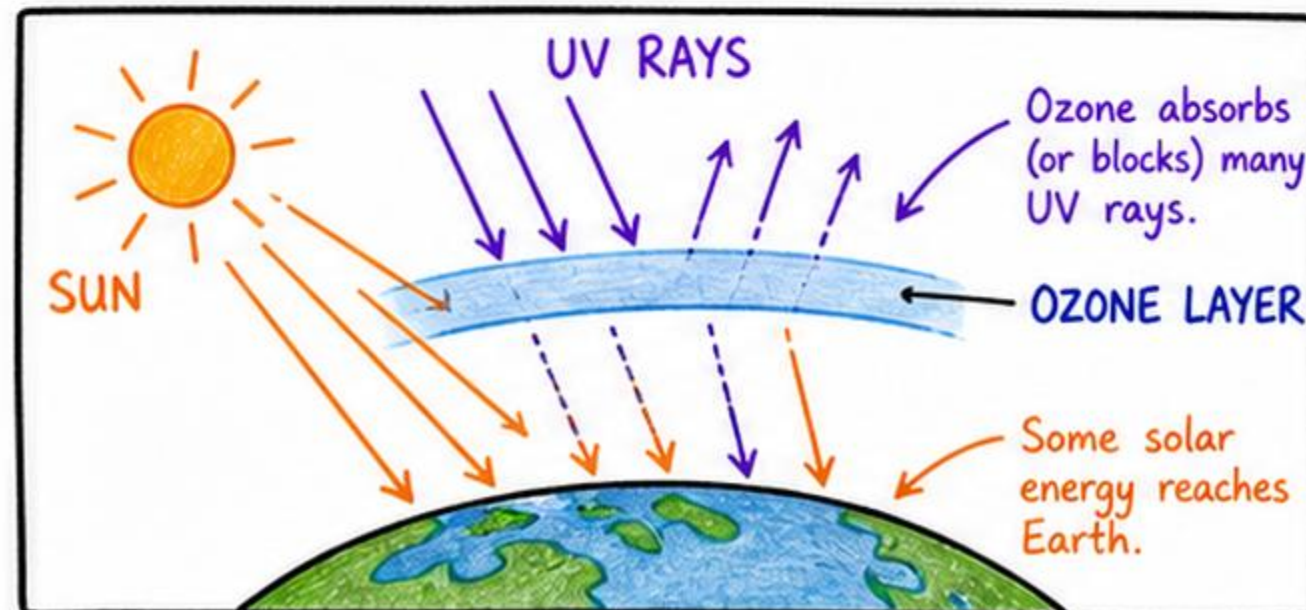


## STRATOSPHERE

- About 12-50 km above the Earth.
- Dry, stable air with very few clouds and little weather disturbance.
- The ozone layer absorbs much harmful ultraviolet radiation.
- Temperature increases upward because ozone absorbs solar energy.
- Many high-flying aircraft use the lower stratosphere because the air is relatively stable.

### STRATOSPHERE:

ozone + increasing temperature





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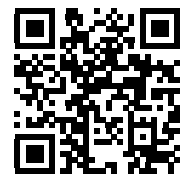


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