Introduction and Evaporation

Concepts: [{Optical illusions (rainbows)}], [{Precipitation}], [{Water vapour}], [{Heated intensely}], [{Evaporation (transformation process)}]. Humidity Definition: [{Amount of water vapour or moisture in the air}]. *Variations: [{Zero in deserts}], [{Up to 4% in rainforests/coastal areas}].* Physical Effect: [{High humidity = sweat doesn't evaporate/sticky}], [{Low humidity = skin feels dry/lips chapped}]. *Measurement:* Absolute Humidity: [{Amount of water vapour in a unit volume of air}], [{Expressed in kilograms per cubic metre}]. *Relative Humidity (RH): [{Ratio of water vapour present vs. total capacity}], [{Measure of dryness or moisture}], [{Expressed as a percentage}].* Formula: [{ (Amount of WV / Total capacity WV1) x 100 }]. * Temperature Relation: [{Colder air holds less water}], [{Maximum limit = Dew point}], [{Condensation begins below dew point}].

condensation etc

Condensation Definition: [{Change of water vapour to liquid (water) or solid (ice)}]. Process: [{Moisture-laden air contacts a cold surface}], [{Atmosphere must be fully saturated}]. Surface Requirement: [{Blade of grass}], [{Window}], [{Dust particles in the atmosphere}]. Forms of Condensation: Dew: [{Temperature above 0°C}], [{Water droplets on surfaces}]. Frost: [{Temperature below 0°C}]. Mist and Fog: [{Cooling of a larger layer of air near the ground}]. Clouds Definition: [{Floating masses of super--cooled water droplets and ice crystals}]. Types of Clouds: Cirrus: [{Thin, wispy}], [{Streak across the sky}], [{High altitude}], [{Made of ice crystals}]. Stratus: [{Low-lying}], [{Large grey sheets}], [{Covering the entire sky}]. Cumulus: [{Massive, billowing}], [{Extend to great altitudes}], [{Towering thunderstorm clouds (Cumulonimbus)}]. Precipitation Definition: [{Water vapour becomes more than air capacity}], [{Condensed droplets fall to Earth}]. Forms of Precipitation: Snow: [{Directly into ice}], [{Temperatures so low water vapour doesn't turn to liquid}], [{Snowflakes}], [{Snow drifts}]. Hailstones: [{Ice pellets}], [{Too large/heavy for winds to carry}], [{Fall from cumulus clouds}], [{Repeated updrafts of air}]. Rain: [{Most important form}], [{Showers (short period)}], [{Drizzles (small, fine droplets)}], [{Sleet (rain mixed with snow)}]. Importance: [{Major source of fresh water}], [{Essential for survival}], [{Inundation/flooding (heavy rain)}], [{Droughts (lack of rain)}]. Measurement: [{Rain gauge}], [{Disdrometer}], [{Rainwater harvesting (percolation pits)}].

Types of Rainfall

1. Convectional Rainfall * Process: [{Equatorial and tropical climates}], [{Intense heating of Earth's surface}], [{Air becomes less dense and rises}], [{Cooling of rising air}], [{Condensation occurs}], [{Cumulonimbus clouds}], [{Huge downpour}].

2. Orographic Rainfall (Relief Rainfall) Process: [{Caused by the relief or orography of the land}], [{Moisture-laden winds encounter mountains/hills}], [{Forced to rise along the slope}], [{Cooling and condensation}], [{Heavy rain on windward side}]. In India: [{Western Ghats}], [{Himalayan foothills}], [{Monsoon rains}]. Rain Shadow Regions: [{Leeward side of mountains}], [{Air descends and becomes drier}], [{Coimbatore gets less rain}].

3. Cyclonic or Frontal Rainfall Process: [{Tropical and temperate zones}], [{Cold air mixes with warm/moist air}], [{Associated with cyclones or depressions}]. Front: [{Point where warm air mass meets cold air mass}], [{Warm air is lighter/forced to rise}], [{Condensation and rain}].

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Page 1 of 1.

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