

CLASS: VII
CHAPTER: 2
UNDERSTANDING THE WEATHER
Exam-Preparation Notes

Based on the latest NCERT Social Science textbook: *Exploring Society: India and Beyond, Part-I*, Chapter 2.

Big Questions: How can we measure and monitor the weather around us? How do weather predictions help us prepare for heavy rain, storms, drought and heat waves?

1. WHAT IS WEATHER?

Weather is the state of the Earth's atmosphere at a particular time and place.

Weather is constantly changing and may be described as hot, cold, rainy, cloudy, humid, snowy or windy.

Atmosphere: The layer of gases surrounding the Earth. The lowest layer is the **troposphere**.

Troposphere: The layer closest to Earth's surface where land-based plants, animals and humans live and breathe and where almost all weather phenomena occur. It extends about **6–18 km** above the ground. It is thinner at the poles because cold air contracts and thicker in the tropical zone because warmer air expands.

2. ELEMENTS OF WEATHER

The five elements together describe the weather at a particular place and time:

Element	Meaning
Temperature	How hot or cold the atmosphere is.
Precipitation	Any form of water such as rain, snow, sleet or hail that falls from the sky.
Atmospheric pressure	The pressure exerted by the weight of the air above and around us.
Wind	Movement of air, including its speed and direction.
Humidity	Amount of water vapour present in the air.

3. WHY DO WE MEASURE WEATHER?

People may experience the same temperature differently. For example, what feels chilly to one person may feel pleasant to another. Therefore, weather elements need commonly agreed measurements and standards.

Accurate weather information helps people plan travel, farming, outdoor activities and safety measures. It also provides data for weather forecasting.

4. NATURAL CLUES AND WEATHER PREDICTION

People have traditionally observed Nature for signs of changing weather. Examples mentioned in the chapter include:

- Birds flying low may provide clues about changing weather.
- Ants carrying or shifting their eggs to higher ground may indicate expected heavy rain.
- Loud frog croaking may be associated with approaching rain.
- Squirrels gathering nuts can provide traditional seasonal clues.
- Pine cones open and close in response to environmental humidity.

Important: Traditional observations can provide useful clues, but modern weather forecasting relies on systematic measurements and scientific methods.

5. METEOROLOGY AND FORECASTING

Meteorology is the systematic study of weather and its evolution. It forms the basis of weather forecasting.

Forecast: To predict or find out in advance, in this context, the future weather.

Meteorologists collect weather data, analyse it and use scientific methods to predict how weather may behave over a region in the coming hours, days or weeks.

6. WEATHER INSTRUMENTS

Different instruments are used to measure different elements of weather.

Weather element	Instrument	What it tells us
Temperature	Thermometer	How hot or cold the air is.
Precipitation	Rain gauge	Amount of rainfall/precipitation collected.
Atmospheric pressure	Barometer	Pressure exerted by the atmosphere.
Wind direction	Wind vane / weather vane	Direction from which the wind blows.
Wind speed	Anemometer	Speed of moving air.
Humidity	Hygrometer	Amount of water vapour/relative humidity.

7. TEMPERATURE

Temperature tells us how hot or cold the atmosphere is. It is measured using a **thermometer**. Common temperature scales include **Celsius (°C)** and **Fahrenheit (°F)**.

Some thermometers measure ambient temperature, while others record maximum and minimum temperatures. Digital thermometers are increasingly preferred because they can be precise and record more data.

Temperature range = Maximum temperature – Minimum temperature.

Mean daily temperature = (Maximum temperature + Minimum temperature) ÷ 2.

8. PRECIPITATION AND RAINFALL

Precipitation includes rain, snow, sleet and hail falling from the sky. **Sleet** is frozen or partly frozen rain, while **hail** consists of small hard balls of ice.

Rainfall is measured with a **rain gauge**. Rainwater enters through a funnel and is collected in a cylinder. The depth of collected water is measured, usually in millimetres (mm).

Good rain-gauge site: an open area, away from obstructions, on a flat and stable surface.

9. ATMOSPHERIC PRESSURE

Atmospheric pressure is the pressure exerted by the weight of air above and around us.

Pressure is generally **higher near sea level** and **lower at higher altitudes** because the air is thinner at greater heights.

The instrument used to measure atmospheric pressure is a **barometer**. The chapter commonly expresses pressure in **millibars (mb)**. Normal atmospheric pressure near sea level is around **1013 mb**; a pressure below 1000 mb indicates a depression.

A significant drop in pressure can be associated with a **low-pressure system**, which may develop into a storm or cyclone.

10. WIND

Wind is the movement of air from areas of high pressure to areas of low pressure.

Two important features of wind are **speed** and **direction**.

A **wind vane** shows wind direction. An **anemometer** measures wind speed. Wind speed may be expressed in kilometres per hour (km/h).

Wind information is important for weather forecasting. Pilots and sailors use wind data because it influences flying and sailing. Farmers may also use wind direction to understand where rain may come from.

11. HUMIDITY

Humidity is the amount of water vapour present in the air. It is affected by factors such as temperature, wind, pressure and location.

Humidity is commonly expressed as **relative humidity**. Air with no water vapour is rated 0%, while air saturated with water vapour is 100%. The chapter gives dry weather as typically around **20–40%** relative humidity and humid weather as usually around **60–80%**.

Humidity is measured with a **hygrometer**. Humidity is important in processes such as food processing, and museums monitor it to help preserve exhibits.

Key idea: When humidity is high, evaporation generally occurs more slowly. This can make wet clothes dry more slowly and can affect how comfortable we feel.

12. WEATHER STATIONS

A **weather station** brings together instruments used to measure weather. Readings are taken at regular intervals, helping scientists monitor, map and forecast weather.

An **Automated Weather Station (AWS)** is a self-operating system that uses sensors to measure and record data such as temperature, humidity, wind speed and direction, precipitation and atmospheric pressure.

AWS information is useful in areas such as agriculture, aviation, navigation and environmental monitoring. The chapter notes that an AWS was set up by the National Disaster Management Authority at a glacial lake in Sikkim in 2023 to provide early information about upcoming weather conditions.

13. PREDICTING THE WEATHER

Meteorologists collect weather data over time, study the patterns and use scientific methods to predict future weather.

Accurate weather predictions are especially important for preparing for extreme events such as **droughts, floods, cyclones and heat waves**. Forecasts can help governments mobilise resources and issue warnings.

For example, if stormy weather is expected at sea, fishermen can be warned not to venture out. If a cyclone threatens a coastal area, evacuation may be necessary.

14. HOW THE ELEMENTS OF WEATHER WORK TOGETHER

Think of weather as a system in which several elements are measured together:

TEMPERATURE
↓
PRECIPITATION • ATMOSPHERIC PRESSURE • WIND • HUMIDITY
↓
OBSERVATION + MEASUREMENT
↓
WEATHER DATA
↓
ANALYSIS BY METEOROLOGISTS
↓
WEATHER FORECASTS & WARNINGS

15. WEATHER VS. CLIMATE — EXAM POINT

Weather refers to atmospheric conditions at a particular time and place. **Climate** refers to the longer-term pattern of weather of a region. The chapter links weather closely with climate and develops the topic further in the next chapter, “Climates of India.”

16. IMPORTANT TERMS

Ambient: Relating to the immediate surroundings.

Atmosphere: The layer of gases surrounding Earth.

Forecast: A prediction or statement about future weather.

Meteorology: Systematic study of weather and its evolution.

Water vapour: Water in gaseous form.

Acclimatise: Adjust to a new climate or condition.

Statistics: Gathering and analysing data to detect patterns, understand events or make predictions.

17. QUICK REVISION — ONE-MINUTE RECALL

- Weather = state of Earth's atmosphere at a particular time and place.
- Troposphere = lowest atmospheric layer; almost all weather occurs here.
- Five elements = temperature, precipitation, atmospheric pressure, wind and humidity.
- Thermometer → temperature.
- Rain gauge → precipitation/rainfall.
- Barometer → atmospheric pressure.
- Wind vane → wind direction.

- Anemometer → wind speed.
- Hygrometer → humidity.
- Weather station → combines instruments and records weather data regularly.
- Meteorology → systematic study of weather.
- Forecasting → using observations, measurements and scientific methods to predict weather.

18. EXAM-READY ANSWER POINTS

Why is weather measured? To communicate weather conditions using common standards, monitor changes, prepare forecasts and plan activities safely.

Why is a weather station useful? It brings together several instruments and records weather elements regularly, providing data for monitoring, mapping and forecasting.

Why are weather forecasts important? They help people and authorities prepare for hazardous events, protect lives and property, and organise resources.

Why does pressure decrease with altitude? At higher altitudes there is less air above the surface, so the pressure exerted by the air is lower.

Why is humidity important? It affects evaporation and comfort and is important in activities such as food processing and preservation of museum exhibits.

19. FINAL FLOW CHART

Observe weather → Measure its elements → Record data → Analyse patterns → Forecast future conditions → Issue warnings → Prepare and take suitable action

Source check: These notes were prepared against the current Chapter 2 text of NCERT's *Exploring Society: India and Beyond, Part-I*. Key chapter facts include the five elements of weather, instruments, weather stations, meteorology and forecasting.

■cite■turn1view0■turn2view0■