

# 6

# WEATHER AND CLIMATE



In class VI you had seen how Ramya and Sowmya's mother predicted that it was going to rain. She also advised them to take an umbrella.

- On what basis did Ramya and Sowmya's mother predict that it was going to rain?
- Does it happen that each time you think it would rain, it rains?

Generally our elders try to predict rain. Sometimes their expectations come true and sometimes not. They look for some indicators to make such predictions.

- Do you know what they are? Discuss in groups and make a list of those indicators.

It is a common experience for everybody to hear elder people talking about the possible weather on a day before planning to celebrate a function of the family. They do it by observation of different seasons. Farmers listen to radio or watch T.V. for weather forecast. They depend on these weather predictions to plan their agricultural activities. These weather predictions effect our daily life.

- Where do these predictions come from?
- How does the meteorological department make these predictions?

The department collects data and uses it to make predictions.

**Let us do-1:** Observe the following table.

This is about weather of Hyderabad for

Weather	Day - 1	Day - 2	Day - 3
Maximum Temperature	28°C	27°C	29°C
Minimum Temperature	21°C	17°C	21°C
Rainfall	None	Light Shower	None
Sky may be	Clear	Cloudy	Cloudy
Wind	Very mild breeze	Mild breeze	Good breeze
Humidity	95%	90%	85%
Sun rise	6:25 a.m.	6:30 a.m.	6:31 a.m.
Sun set	5:40 p.m.	5:40 p.m.	5:41 p.m.

three consecutive days. Hyderabad is the capital of Andhra Pradesh.

- What aspects do you see in this weather record?
- On which day did it rain?

We find that these aspects of weather keep changing. The humidity changes, the wind changes, the temperature changes the sunrise and sunset times change too.

We find that there are some changes in a day. But most of the day is normal. The weather is a complex phenomenon that it can vary over very short periods of time. Sometimes its sunny in the morning but clouds appear from somewhere and it starts raining. Within a matter of a few minutes this gives way to bright sunshine. You must have had several such experiences. The temperature, humidity, rain, wind speed change. All this effects the life of human beings and other living organisms. This constitutes weather.

#### Do you know?

Many people died during the tsunami in Andaman and Nicobar islands in 2004. But the tribals who observed the ocean moving back and birds making sounds moved away from danger. They could predict the danger and save their lives.

#### Let us do-2: Plotting Graph

- Take a newspaper or watch the TV news and record the maximum and minimum temperature, rainfall, humidity and wind pattern of any 3 cities or towns in a table. Do this over a week.
- Take the figures of the maximum temperature over a week and plot the data on a graph. For example one is given here.

Day	Date	Maximum temperature
1	10-12-2011	30°C
2	11-12-2011	31°C
3	12-12-2011	31°C
4	13-12-2011	30°C
5	14-12-2011	30°C

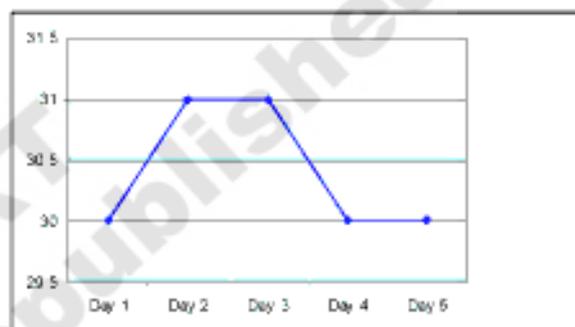


Fig. 1 Graph showing the variation of maximum temperature during 10-14 Dec. 2011 at Hyderabad.

- Draw graphs for the minimum temperature and humidity as well.
- Understanding weather reports-

#### Let us do-3: Understanding weather reports

##### Report 1:

*Isolated rain or thunder showers are lightly to occur over Chittoor, Nellore, Prakasham and some parts of Kadapa districts. Mainly dry weather will prevail over southern Telangana districts and northern coastal districts of Andhra Pradesh. Sky should be cloudy for the next two days in Kurnool and Ananthapur districts.*

##### Report 2:

*According to meteorological department report 42°C*

maximum temperature recorded at Ramagundam of Karimnagar district and 29°C minimum temperature recorded at Aarogyavaram of Chittore district. Because of cumulonimbus clouds 2mm of rainfall was recorded in Hyderabad. Scattered rainfall recorded in some parts of interior Rayalaseema. Remaining part of the state was dry.

- Which report explains what will happen?
- What aspects of the weather are discussed in both the reports?
- What are the differences in the weather situation given by the two reports?

The report that explains future conditions is a weather forecast. The report that explains about past conditions is a weather report. In common conversation we often refer to both as weather report.

### Measuring components of weather

We have different types of measuring instruments to measure different weather components. Do you know how we measure them? Let us know how to measure weather components like temperature, rainfall, wind speed, humidity etc.

### Measuring temperature of a place

The weather of a place can change every day. This is why we often say today's weather is very humid or it is too hot and so on. Generally mornings and evenings are pleasant during summers but we feel that it is very hot during noon.

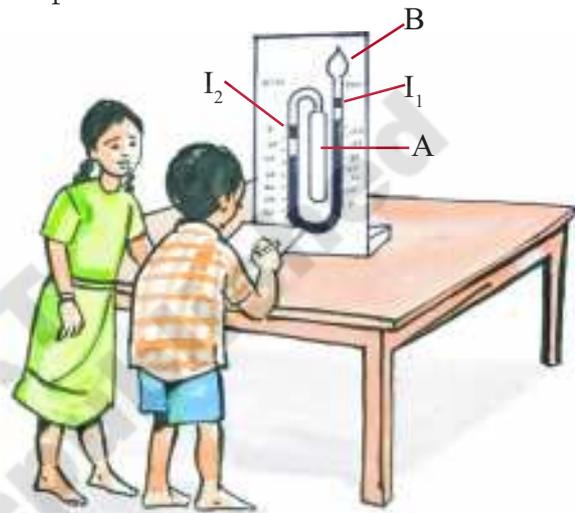
- How do we compare a place which is hot with a place which is cool?
- How do we determine the hottest part of the day?

We have already learnt that there are thermometers that help us measure the

temperature. There is a special thermometer to measure highest and lowest temperatures of a day.

### Activity 4:

Take a maximum minimum thermometer (MMT) from your school laboratory. Let us find out how to use it to measure the two temperatures.



Six invented the maximum minimum thermometer (MMT) thermometer to measure highest and lowest temperatures of a place. This consists of a cylindrical bulb A, connected through a U-shaped tube to spherical bulb B that contains alcohol.

When the temperature increases, the alcohol in the bulb A expands. The mercury in the U tube goes up to the bulb B side and the indicator ( $I_1$ ) also moves up. This indicates maximum temperature of the day. If the temperature decreases, alcohol in the bulb A contracts then the mercury in the U-tube goes to the A bulb side and the indicator ( $I_2$ ) also moves up. This indicates minimum temperature of the day. After taking readings the indicators  $I_2$  and  $I_1$  are brought to their original places by using a magnet.

Collect weather reports of a nearby city from

Date	Temperature at your school observed by MMT				Temperature obtained based on Radio or TV forecast		Comparison
	Minimum	Time	Maximum	Time	Minimum	Maximum	

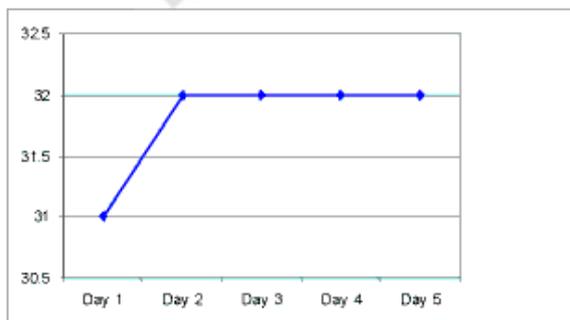
newspapers. Tabulate your observations for a week and compare them.

Write your observations in your notebook about the temperature that you have measured.

- When was the maximum temperature recorded?
- When was the minimum temperature recorded? Why?
- Is there any similarity in temperatures between your school and the nearest city?

### Activity 5

Pravin has measured temperature of his village with the help of MMT. He expressed his observation through a graph. Observe the graph.



Day	Date	Maximum temperature
1	10-12-2011	31°C
2	11-12-2011	32°C
3	12-12-2011	32°C
4	13-12-2011	32°C
5	14-12-2011	32°C

Graph showing the variation of maximum temperature during 10 to 14 Dec. 2011 at Guntur.

- For how many days did Pravin observe the temperature of his village?
- On which day was the highest temperature recorded?
- On which days did the lowest temperature fall?
- Do you find any relation between 10<sup>th</sup> and 14<sup>th</sup> of December 2011? What is that?
- Make a graph with your observations of maximum and minimum temperatures.

## Measuring rainfall

- How can we measure the amount of rainfall at a particular place?

Farmers estimate the rainfall based on the wetness of the soil after the rain. They call it as “PADUNU”. This much of rainfall is sufficient to start agriculture activities like ploughing. This is an approximate measure.

### Let us do - 6:

Take a 10cm wide beaker and insert a funnel of the same width. Keep the apparatus in an open place when it is raining. The rain water would be collected through the funnel into the beaker. After the rain is over, measure the amount of water collected in the beaker. If the depth of water is 1 cm then that the magnitude of rainfall is 1 cm.



Meteorologists measure the rain fall using a ‘Rain gauge’. It is also called Udometer or Pulviometer or Ombrometer. They can measure exact amount of rainfall. Rainfall is expressed in centimeters or millimeters.

In rural areas if there is rainfall at the right time farmers celebrate crop festivals.

- How do farmers celebrate the first showers?
- Try to find out reasons behind this?
- Discuss with your elders in your village/ town. You can also collect the songs they sing at that time. Display them on your school wall magazine.

## Direction of the wind

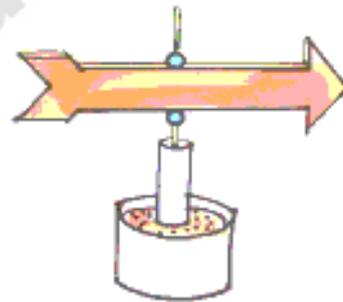
We feel happy in the mornings and evenings in summer. At that time cool breeze blows. We know that there is air in our surroundings and also that moving air is wind.

- Can we guess what the direction of wind is?

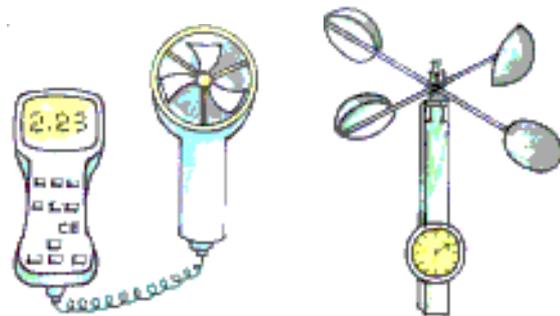
### Let us do-7:

Let us find the direction of wind by using card board pieces and a thin nail.

Take two cardboard pieces and cut them the shape of an arrow and paste them together. Insert a thin needle or iron wire as shown the figure in the middle of the arrow. The needle must be long enough to be fixed on a strong base and should allow the arrow to move along the direction of the wind.



We can also measure wind speed and direction with an Anemometer.



Observe the direction of wind. Tabulate your observation of wind direction.

Time	East	North East	North	North West	West	South West	South	South East
Early Morning								
Noon								
After Noon								
Evening								
Night								

- Does the wind move in the same direction the whole day?
- In which direction does it move in the morning?

### Humidity:

Why is it sweaty in Vijayawada and relatively less in Hyderabad in summer? Even though it is hotter, we do not sweat as much in Hyderabad. In places near a river or in coastal regions the weather in summer is sweaty.

In summer season if you are in coastal region you would feel very sweaty in addition to feeling hot winds. Vijaywada is more humid than Hyderabad.

- Why is Vijaywada generally more humid? Think about it.

### Let us do - 8:

Take about 10 ml water in a test tube. Heat it on a Bunsen burner or a candle. What happens? Think about it.

- Why do bubbles appear in water?
- Why is the water level reducing?
- Where did the water go?

When water is heated, it changes into water vapour. The vapour enters into the air. In the same way sea water changes into vapour due to heating by the sun.

The quantity of moisture in the air is the

‘humidity’ of the place. If the humidity is high when it is hot, we feel sweaty. We will learn more about humidity in subsequent classes.

### Think and discuss:

- Why do people living in hot and humid region wear cotton clothes?
- In which season is the quantity of moisture in the air high?

### Are weather conditions cyclic during the years?

We know that in the equatorial region it is very hot and in the polar region it is very cold. How can we say a particular place is cold or hot?

### Let us do - 9:

Observe the weather report (temperature and rain fall) of two places in our state. The average temperature and rain fall for the last 25 years of the particular month is given in the table. (See the table in next page)

- In which month was maximum temperatures recorded? Why?
- Comparatively which place is hot? Why?
- How can you say Arogyavaram is cooler than Ramagundam in summer?

If the same weather recurs periodically at a place it is considered as climate of that place.

Ramagundam			Aroyavaram	
Month	Average temperature in Celsius degrees	Average Rainfall in millimeters	Average temperature in Celsius degrees	Average Rainfall in millimeters
January	30	1	28	6
February	32	-	28	2
March	34	-	29	-
April	38	-	30	1
May	41	1	33	3
June	39	4	31	3
July	36	2	30	8
August	38	10	30	16
September	35	11	29	9
October	36	11	29	18
November	31	11	28	23
December	32	9	28	14

### What is Climate?

The average weather pattern taken over a long time, say 25 years, is called climate of that place.

Broadly, the same patterns of temperature, rainfall, humidity wind speed that have been generally continuing for a long time, say the last 25 years, at a place gives the climate of that place.

If we find that temperature at a place is generally high for large part of the year, we say the climate of that place is hot.

- When would you say that the climate of a place is rainy or cold?

### Let us do-10

Observe features of the following states, and specific places in India from an ATLAS. Try to write down something about the climate in these areas.

S. No.	State	Climatic Condition
1	Kerala	
2	Andhra Pradesh	
3	Rajasthan	
4	Jammu & Kashmir	
5	West Bengal	

The Indian Meteorological Department (IMD) studies climate of our country.

Climate describes the weather condition occurring over a relatively longer period of time in a given place. For example in the month of June. We expect the weather to be mild in Bangalore, humid in Kolkata, hot and dry in parts of Rajasthan, cold in Kashmir and rainy in Coastal Kerala. What does this tell us? Think about it. For example does it mean that in coastal Kerala it is always rainy in the month of June or if it would be always humid in Kolkata?

### Do you know?

The people living in an area adjust to the conditions of climate. For example the rain fall has being relatively less for the past two decades. Even in Rayalseema during rainy season the tanks and canals remain dry. The dried canals and tanks are now used for other purposes. The less rainfall has also led to developing ways to use less water. The change in rainfall pattern shows there may be shifts in climate over long periods of time. In areas which do not have a climate of rain when it rains heavily there is no way to drain out the water. As a result many areas were flooded and submerged in Kurnool in 2010 and also in other parts of Rayalaseema.

Now-a- days there is a complaint that climate is not as ordered as it was . Seasonal climatic condition do not appear as predictable and known. Give examples of such changes in your area after talking to elders.

### Climate and life style

Climate mostly effects on our daily life. We change our life style to suit that climate. We wear cotton clothes in summer. We want to drink cool water also. What do we like to do in winter? We take care to protect ourselves from rain. Imagine the precautions you would need to take if you were going to visit Kashmir or Ooty during winter. Discuss with your friend and write a note on these precautions.

### Keywords

*Weather, forecast, temperature, climate, humidity*

### What we have learnt

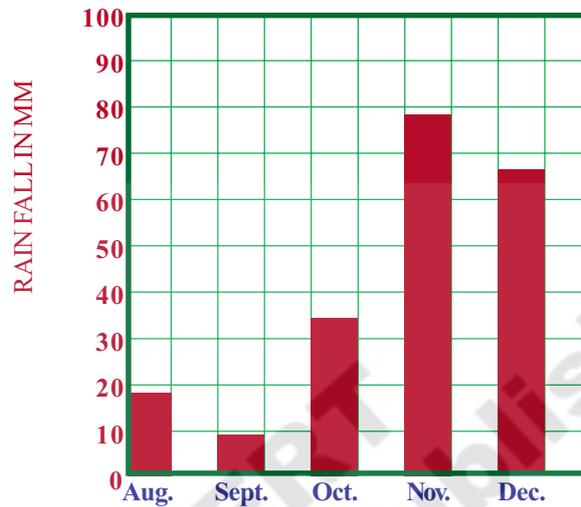
- Weather affects our life.
- The factors hot, cold, winds, rain etc describe the weather of a place.
- We can measure temperature of a place with maximum and minimum thermometer.
- The quantity of water vapour (moisture) in air is humidity.
- Humidity is measured by a hydrometer.
- Rainfall of a particular place is expressed in **millimeter (m.m.)**, **centi meter (c.m.)** and measured with a rain gauge.
- Anemometer is used to measure wind speed.
- Climate of a place can be defined after 25 years of weather observations.
- We adjust to the climate to live comfortably.

### Improving your learning

1. What aspects should you observe to know and predict the weather of your village?
2. Read a newspaper, collect the weather reports in it. Write about the various elements of the weather mentioned in the report.
3. Where is the meteorological department in your area? How is it useful to you?
4. It is hot and sweaty at a place. What could be the possible reasons for that?
5. Write true or false. Give reasons.
  - a. Minimum temperature is recorded in early morning. ( )
  - b. The direction and speed of wind is found by an Anemometer. ( )
  - c. In summer the winds blow towards the

earth from the seas/ocean in the afternoon ( )

- d. In our state the maximum temperature is recorded in the month of July. ( )
6. Observe the graph showing rainfall (in mm) of a place from August to December. Write down the observations from it and what inference you can draw.



7. Why do people need and observe weather?
8. Explain these symbols used in a weather forecast report.



9. Collect the weather reports from the news papers and make a profile of the weather in a city.
10. Every year we have floods in the rainy season. Why?
11. Observe your surroundings and try to predict how tomorrow would be?
12. Priya's mother said "It is very hard to stay at Vizag during summer" Why did she say so?
13. Collect different news papers and compare the weather reports. Are they same or not? Why?
14. Observe your surrounding immediately after rain. Express your feelings in the form of a song.
15. Prepare some questions to conduct a quiz programme in your class on this chapter.