



CLASS: VII	DEPARTMENT: SCIENCE 2023-2024	DATE: 06.09.2023
HANDOUT	TOPIC: WINDS, STORMS AND CYCLONES	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

We live on the earth which is surrounded by air. The layer of air surrounding the earth is called atmosphere. The moving air is called wind. It is formed by the heat of the sun or it may be said that unequal heating of different parts of the earth forms wind.

**Air Exerts Pressure**

Air is a mixture of gases surrounding the earth. Air exerts pressure due to its own weight. The pressure exerted by air on all the bodies at all times in all directions is called air pressure.



Can with hot water being cooled.

As cold water is poured over the can, some steam condenses into water reducing the amount of air inside. The pressure of the air inside the can decreases than the pressure exerted by the air from outside the can. As a result, the can get distorted.

**High-speed winds are accompanied by reduced air pressure.**



When we blow into the mouth of the bottle the air near the mouth has a higher speed. This decreases the pressure there. The air pressure inside the bottle is higher than near the mouth. The air inside the bottle pushes the ball out.

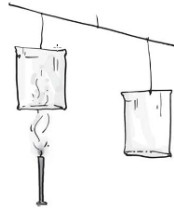
**Air expands on heating and contracts on cooling.**



Fig. 8.6 The shape of the balloon in hot and cold water

The air in the bottle gets heated resulting in the inflation of the balloon due to the expansion of air and deflated due to the contraction of air on cooling.

**Warm air is lighter than cold air.**



As the warm air rises up, it pushes the bag above the candle.

**Formation of wind:**

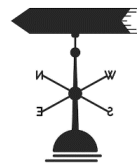
- Air expands on heating and contracts on cooling.
- The warm and moist air is lighter and rises up. The cooler air at higher altitudes is heavy and sinks downwards.
- When the warm air in a particular region rises up, the atmospheric pressure in that region falls.
- Air moves from the region where the air pressure is high to the region where the pressure is low.
- High-speed winds are accompanied by reduced air pressure.

Changes in air pressure bring changes in the weather and also result in the blowing of winds.

Wind speed plays an important role in the formation of storms. The instrument that measures the wind speed is called an **anemometer**. A **wind vane** measures the direction of the wind.



Anemometer



Wind vane

**Wind Currents**

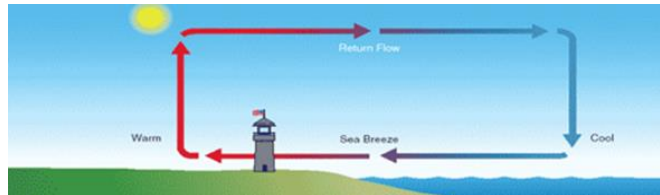
The wind is the movement of air which depends on the difference in air pressure in two regions.

Wind currents are generated due to:

- Uneven heating between the equator and the poles of the earth
- Uneven heating of land and water of oceans.



The wind flow pattern because of uneven heating on the earth



## Thunderstorm

Thunderstorms develop in hot, humid tropical areas like India very frequently. The rising temperatures produce strong upward rising winds. These winds carry water droplets upwards, where they freeze, and fall down again. The swift movement of the falling water droplets along with the rising air create lightning and sound.

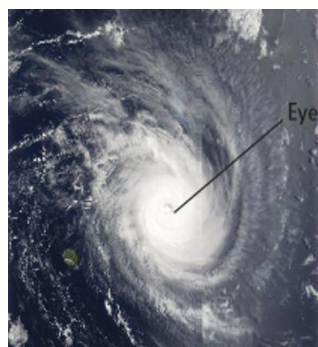
### Precautions to be taken

If a storm is accompanied by lightning, we must take the following precautions:

- Do not take shelter under an isolated tree. If you are in a forest, take shelter under a small tree.
- Do not take shelter under an umbrella with a metallic end.
- Do not sit near a window. Open garages, storage sheds, metal sheds are not safe places to take shelter.
- If you are in water, get out and go inside a building.

## Cyclones

A cyclone is a weather condition consisting of a system of high-speed winds revolving around a central area of very low pressure. The centre of a cyclone is a calm area and is called the **eye** of the storm. Cyclones develop over tropical seas. It is a violent storm with a wind speed of 150-250 km/h. It is accompanied by strong winds and heavy rains. Factors like wind speed, wind direction, temperature and humidity contribute to the development of cyclones. When a cyclone reaches the land, it becomes comparatively weaker due to several factors such as friction with land and shortage of moisture.



### Destruction Caused by Cyclones

Cyclones cause widespread destruction and loss of life in coastal areas. The low pressure in the eye lifts the water surface in the centre. The rising water may be as high as 3-12 m and appear like a water wall moving towards the shore. As a result, the seawater enters the low-lying coastal areas and can destroy roads and railway tracks, wash away vehicles, damage houses, drown

people and animals, and damage crops causing a great loss of life and property. The cyclone also reduces the fertility of the soil.

### **Effective Measures to Prevent Cyclone Disasters**

- Construction of cyclone shelters.
- Afforestation.
- Connecting roads for evacuating people to safer areas.
- Generating public awareness about the measures that can be taken by the people to avoid damage.

### **Precautions to be taken in a cyclone-hit area**

- Do not drink water that could be contaminated by floods (to avoid water-borne diseases).
- Do not touch wet electric switches and fallen electric power lines. Do not use electrical appliances, if wet.
- Avoid driving on roads through standing water as floods may have damaged the roads.
- Co-operate with the rescue teams and help your neighbours and friends.

### **Advanced Technology has helped**

- By making use of satellites and radars, a cyclone alert (or cyclone watch) is now issued 48 hours in advance of any expected storm and a cyclone warning is issued 24 hours in advance.
- The message is broadcast every hour or half-hour when a cyclone is nearer the coast.
- Several national and international organisations cooperate to monitor cyclone-related disasters.

### **Tornadoes**

A Tornado is a dark funnel-shaped cloud formed on the land, such that it reaches from the sky to the ground. Most of the tornadoes are weak. A violent tornado can travel at speeds of about 300 km/h. Tornadoes may form within cyclones.



### **Protection from Tornadoes**

- One should take shelter in a room situated deep inside the home having no windows or in a basement.
- Shut all the doors and windows and take shelter under the study table.
- Bend down on your knees and protect your head and neck using your arms. Stay indoors until it is safe to come out.

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