Chapter - 2

In Search of the Source of Wind

Introduction

Wind is the horizontal movement of air. This chapter is an enquiry into the causes ofdifferent types of wind and their effects. In this chapter, In search of the source ofwind , children will be able to gain an understanding of the atmosphere and itsvariations due to Global pressure Belts and Coriolis force.

CONCEPTS

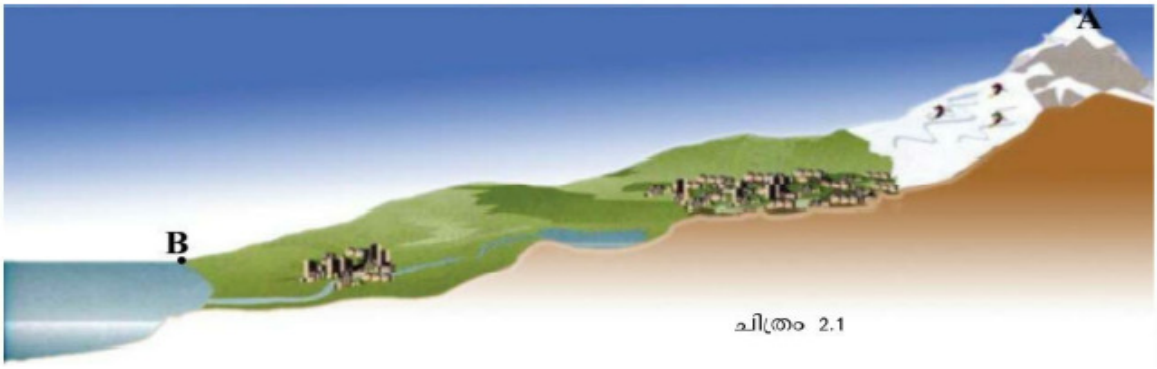
- Atmospheric pressure is the weight of atmospheric air
- Heat, height and humidity are the causes for difference in atmospheric pressure
- The winds blow in the pressure belts are planetary winds
- The speed and direction of winds are based on the pressure gradient, Coriolis force and Friction
- Trade winds, Westerlies, and Polar winds are different planetary winds
- Sea breeze and land breeze are occur as result of non-equilibrium warming of land and sea.
- Local winds are caused by a small area pressure difference .
- Cyclones and anticyclone are examples of variable winds

Questions

1. What is the average weight of atmospheric air on the earth surface? (1)
2. Instrument used for measuring atmospheric pressure. (1)
3. What are the winds that result from the pressure difference experienced over a small area. (1)
4. Name the area where the trade winds converge. (1)
5. The direction of Westerlies (1)
6. The factor other than heat and humidity which causes pressure difference. (1)

7. Name the local wind that called “Doctor”. (1)
8. The scientist who discovered Coriolis force. (1)
9. Name the pressure belt which is known as Doldrums (1)
10. Name the hot wind blowing in North Indian Plain. (1)
11. Define the following: (1score each)
    a) Humidity
    b) Coriolis force
    c) Atmospheric pressure
    d) Isobars
    e) Cyclones
    f) Pressure Gradient
    g) Wind
    h) High pressure
    i) Low pressure
    j) Anticyclones
12. Differentiate the following: (2score)
    1) Mountain and Valley breeze
    2) Cyclones and Anticyclones
    3) Land breeze and sea breeze
13. Why do mountaineers carry oxygen cylinders? (2)
14. Name the winds continuously blow towards the equatorial low pressure belt. (2)
15. Why you feel clog of ears when travelling to high altitude. (2)
16. Which are the important Monsoon winds?
17. Mountain and valley breeze are variable winds. Which among them blow during the day time? Why? (2)
18. What are the winds blowing from Subtropical high pressure belt? (2)
19. Why the Equatorial low pressure region is known as Doldrums? (2)
20. Why low pressure is felt in the polar region? (2)

21. The area where the air pressure is highest is marked as A and B. Why? (2)



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22. What are the factors that cause the pressure difference? (3)

23. What are the factors that control the speed and direction of wind? (3)

24. What are the factors that cause the formation of monsoon winds? (3)

25. Classify the winds as given in the example: (3)

Cyclones—Variable winds

Trade winds-.....

Foehn- .....

Monsoon wind- .....

26. Briefly explain Mountain breeze and Valley breeze. (4)

27. Complete the table: (4)

Global pressure belts	Latitudinal position
Polar high pressure belt	
Sub polar low pressure belt	
Subtropical high pressure belt	
Equatorial low pressure belt	

28. Briefly explain Cyclones and anticyclones. (4)

29. Complete the table: (4)

Winds	Blowing time (day/night)
Land breeze	
Sea breeze	
Valley breeze	
Mountain breeze	

30. Explain the global pressure belts based on the indicators given. (4)

a. Global pressure belts

b. Latitudinal position

31. Complete the table (4)

Local winds	Place of blowing	features
Chinook	a.....	Snow eater
Foehn	b.....	Reducing the severity of cold
Harmattan	Sahara desert	c.....
Loo Rajasthan desert	d.....	

32. Heat, humidity and altitude are inversely proportional to atmospheric pressure'

- substantiate. (4)

33. Describe the given winds based on the direction and pressure belts. (5)

a. Trade winds

b. Westerlies

c. Polar easterlies

Answer Key

1. 1034mg per centimetre square
2. Mercury Barometer
3. Local winds
4. Inter Tropical Convergence Zone (ITCZ)
5. West
6. Altitude
7. Harmattan

8. Admiral Ferrel
9. Equatorial Low pressure belt
10. Loo
11. a) The quantity of water present in the atmosphere

    b) The force that cause deflection of the direction of freely moving objects on the earth surface.

    c) The weight of atmospheric air

    d) The imaginary lines joining places having the same atmospheric pressure.

    e) Cyclones are low pressure area surrounded by high pressure areas.

    f) Pressure gradient is the pressure difference experienced at the horizontal level.

    g) Horizontal movement of air

    h) If the pressure in an area is higher than the surroundings, it is high pressure.

    i) If the pressure in an area is lower than the surroundings, it is low pressure.

    j) Anticyclones are high pressure area surrounded by low pressure areas.
12. 1). Valley breeze are winds that blow from the relatively lower temperature valley during the day time, as the air at the top of the mountain warms up. But during the night the air in the mountainous region cools and it blows towards the valley, it is mountain breeze.

    2) Cyclones are low pressure area surrounded by high pressure areas. Anticyclones are high pressure area surrounded by low pressure areas.

    3) During the day, the land heats up rapidly so there low pressure is felt and wind blows form the sea to the land at night , however, the land cools much faster than the sea and experiences high pressure. So wind blow from land to sea.
13. There is a decrease in atmospheric pressure due to the rarification of air with altitude.
14. North east trade wind , South east trade wind
15. This is due to the low pressure in these places.
16. South east monsoon winds and North east Monsoon winds
17. Valley Breeze, Valley breeze are winds that blow from the relatively lower temperature valley during the day time, as the air at the top of the mountain warms up.
18. North east trade wind , South east trade wind
19. The winds here are very weak as the air in the equatorial low pressure area rises massively.
20. The air thrown away due to the rotation of earth.
21. B, The pressure decreases as the height increase.

22. Altitude, heat, humidity
23. Pressure gradient, Friction, Coriolis effect.
24. The apparent movement of the Sun.

    Coriolis force

    Differences in heating
25. Trade winds

    Local winds

    Variable winds
26. The valley winds that blows from the valley to the mountain during the day time Mountain breeze, which blows from the top of the mountain in to the valley at night.
27. 90° North and South

    60° North and South

    30° North and South
28. Cyclones are low pressure area surrounded by high pressure area.

    Anticyclones are high pressure area surrounded by low pressure areas.
29. Day time

    At night

    Day time

    At night
30.

Polar high pressure belt	90° North and South
Sub polar low pressure belt	60° North and South
Subtropical high pressure belt	30° North and South
Equatorial low pressure belt	0°

31. a. Slop of the Rockie Mountains

    b. Northern slop of the Alps Mountains, c. Doctor, d. Raise the summer temperature.
32. Heat increases pressure decreases

    Humidity increases pressure decreases

    Height increases pressure decreases

33. **Trade winds**

- North east in the northern hemisphere
- South east in the southern hemisphere
- wind blow towards the equatorial low pressure belt
- ITCZ

Westerlies

- Wind blows from the subtropical high pressure region
- direction is from the west.

Polar Easterlies

- The wind blows from the Polar high pressure region
- Direction is from the east.