9 ATMOSPHERE - WIND

9.1. Wind

We have air all around us. It blows in our houses, open grounds, fields and every where. But we cannot see air. Moving air is called wind. Wind does many wonders. It brings rain, cold weather and warmth too.

Observe the figures given below and identify the direction of the the wind.

Group work

- In the same way draw more figures and ask your friend to identify the direction of the wind.

Due to gravitational force, rotation and revolution of the earth, the wind always blows from one place to another. The intensity of the wind varies from place to place. Air has pressure, weight and it occupies space (volume). These are the properties of air.

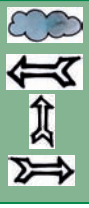
9.2. Atmosphere

Earth is covered with a blanket of air. This is called atmosphere. With the help of information on temperature, clouds and humidity, atmospheric conditions can be determined. Watch news on T.V. to know more about the weather. Is weather stable? Is it the same every day? Can you recall how was the weather one week ago? Was it hot or cold? Was it windy or cloudy? If we observe and record the weather daily, we can understand about it.

Symbols given below help us understand the atmosphere or weather report better.

1. Cloudy sky 
2. Clear sky 
3. Rains 
4. Hail storm 
5. Wind blowing from east to west 
6. Wind blowing from west to east 
7. Wind blowing from south to north 
8. Wind blowing from north to south 
9. Cold weather 
10. Hot Sunny day. 

Akash, Rafi, Jani, Mary, are studying in Vth standard. They noted the weather report for one week.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Weather							

Think and say

- Have you seen the weather report in the table given? How was the weather according to you?
- How many days was it cloudy and how many days was it cold during the last week?
- Which direction did the wind blow for most of the time last week?
- Was the weather cool on a cloudy day?
- Which day did it rain and what type of rain was it?
- Can we say that it will definitely rain on a cloudy day?
- According to the report, can you guess the season.

Do this

- You have seen in the above table how to write / represent weather report with symbols, haven't you ?

  Note down the details of the weather from Monday to Sunday with symbols as shown in the table.

Atmospheric table

Divide the class into four groups. Ask the first group to note down the details of the first week, second group of the second week and so on. Note them down in a chart and display.

Week/ days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1st week							
2nd week							
3rd week							
4th week							

Group work

Answer the following using the atmospheric table prepared by you:

- How many days were cloudy during the month?
- How many days did you see strong winds. What was the direction of the winds?
- How many days were sunny or cool?
- How many days did it rain during the month? What was the type of rainfall ?
- According to the details observed, guess what could be the season?
- Was your guess correct?

9.3. Seasons

According to the climate you have experienced, a year is divided into three seasons. They are winter, summer and rainy seasons. Let us know about each of the seasons. Seasons occur due to the earth's rotation round the sun when the axis of the earth slightly leans.

9.3.1. Observe the picture and discuss

- What do you see in the picture?
- What are the people in the picture doing?
- Why are they doing so?
- What might be the season?

Group work

- How is weather during winter season?
- What do you do to protect yourself from the cold weather?
- What type of clothes do you wear during winter?
- Do animals feel cold? What do they do to protect themselves from cold? What can we do for them?

Winter season

Weather is cool in the winter season. We find that even coconut oil freezes, sun rise is delayed and sun sets sooner during winter. We like to sit in the sun during this season. Everyone wears colourful sweaters, rugs and shawls. People return home as the sun sets. We find comfort sitting in sun. Butterflies sit on flowers. Nightingales sing during winter. Mango trees start blooming. The flowers begin to bloom everywhere. Nature looks beautiful with all these things.

9.3.2. Observe the picture and discuss

- What are the people doing in the picture?
- Why are they doing so?
- What season is it?
- During which months does the summer fall?
- How is the weather during summer season?
- What type of clothes are worn during summer?
- Birds may not find water in summer, what do they do to quench their thirst? What can we do?

Summer season

Gradually the weather gets hotter. Hot breeze blows during summer. Severe hot breezes make the environment uncomfortable. Weather is hotter during the months of April, May and June. We like to swim or stay in the shade. We like to drink cold water and wear light cotton clothes. Mangoes and sugar palm fruits are available in this season. We enjoy eating them. If we go out in sun, there is a danger of sun stroke / fever etc. Still children love summer season. Do you know why?

9.3.3. Observe the picture and discuss

- What are there in the picture?
- What is the boy doing? Why?
- What is the season?
- How can we guess that it is going to rain?
- What do you do during the rainy season?

- How do you feel when it rains? What do you do?
- How is the weather during the rainy season? During which month does the rainy season begin?

Rainy season

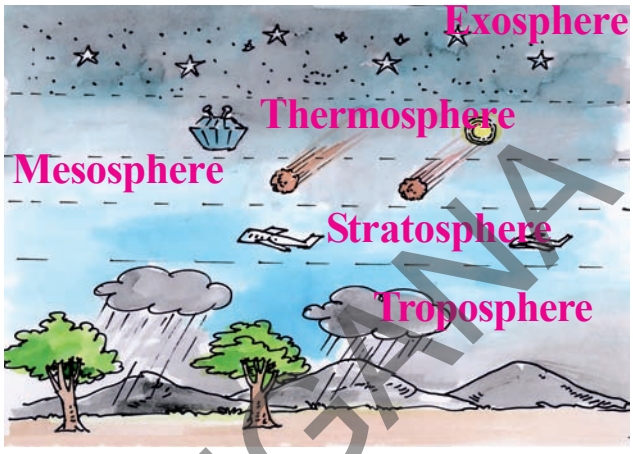
Dense clouds, rains, thunder, lightening, rain water, paper boats, umbrellas, earthworms and raincoats are the things that come to your mind when you think of the rainy season. The sky becomes cloudy, there is thunder and lightening before rain. It is a joy to play, in the rain. Ditches are filled with water, children play with paper boats, peacocks dance, frogs crock, wells, lakes, rivers, canals are filled with water and grass grows. Rainy season extends from July to August, then rains stop gradually. The temperature decreases and winter begins. When rains are plenty, crops grow in plenty and everyone is happy.

Group work

- How is the weather in each season different from the other two.
- Observe the calender and write the months in which three seasons occur.
- What type of clothes should be worn in each season?
- What are the vegetables and fruits available in different seasons?
- Which season do we plant trees? Why?
- What measures are to be taken during different seasons to remain safe and healthy? Why?

9.4. Layers of the Atmosphere

The air around us is called atmosphere. Air consists of many gases, dust particles, water vapour etc. Weather is predicted with information based on clouds, humidity, dryness, cold,heat,rainfall, etc.



The layers of air around the earth is called atmosphere. Earth's atmosphere is classified into 5 layers based on the differences in temperature. They are (1) Troposphere, (2) Stratosphere (3) Mesophere, (4) Thermosphere and (5) Exosphere

The layer nearest to the earth's surface is Troposphere. We live in troposphere and we breathe in the air of that layer. All aspects of atmosphere are present in this layer. As you go upwards the temperature in the layer decreases.

Weather is never stable. It goes on changing throughout the day. Sometimes the sky is cloudy, water vapour is high in the air, cool breezes blow and some times air is dry and hot breezes blow. For some days, it rains and on other days it is hot.

Atmosphere gets heated due to solar energy. But all parts on the earth surface do not receive the same amount of solar energy. Tropical regions receive more sunlight than the polar regions. Differences in temperature cause the winds flow and thus changes in atmosphere.

Sun's rays, wind, seas, rivers, trees, earth's surface, the terrain, altitude etc., are the causes for changes in the atmosphere.

Think and say

- Have you ever witnessed the sun rise and sunset? How did you feel? Write your experiences.

Do this

- Watch the news and read the news papers, find temperatures in the morning, afternoon, evening and at night. Collect information, discuss and display in your classroom.

9.5. Wind game

Satish came into the room making funny sounds. All the students surrounded him on hearing the sounds. Satish told them that he was making the sound with the help of a paper and they can also do so.

9.5.1. Can air produce sound?

Do this

Take a thick paper. Fold it into half and again into another half. Now you get three layers. This is paper whistle. Put this between your lips and blow air into it. Do you hear any sound? Think, from where does this sound come?

Think and say

- Who made the loudest and longest sound in your class?
- Can you make whistles with coconut leaves? Display them in your class-rooms?

Do this

Tup... Tup!?

Take an empty milk or water cover or any plastic cover. Check whether it is empty or not? Flatten it by pressing it against a table. Wasn't it easy!

Now, blow air fully into the cover and tie its mouth tightly with a thread. Hold it in your hand and ask your friend to burst it by clapping. What happened?

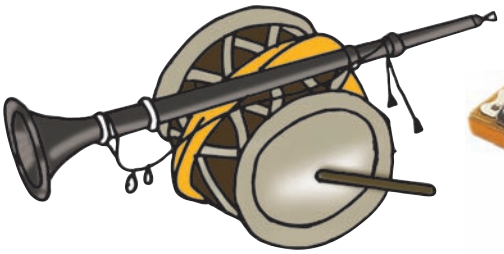
Think and say

- Can you flatten an air filled cover? Why not?
- What happened when you burst the cover?
- Did you hear any sound? How is this sound produced?
- Was the cover torn? Why?
- Blow air into a balloon and prick it with a pin : What happened? Discuss after observing?

9.6. Musical instruments that work with the help of wind

Observe the following pictures and identify them



Think and say

- How do you play these instruments?
- How are they related / connected to air?
- Name some more musical instruments.

Do this

Take an empty glass and a coconut shell. Cover the open ends of both with a polythene cover and tie with a thread or rubber band. These are your drums. Now, hit the drums with a broom stick. Observe the variations in sound.

Think and say

- Does the sound change if the vessel is large?
- Does the thickness of the paper have any relation with the sound produced?

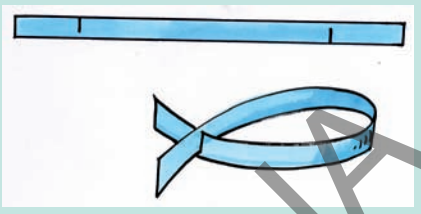
Mouth organ and Shehnai are played by blowing air into them. Variations in blowing emits different sounds. Coconut shell and the glass have air inside. Hence, they make sound when beaten with sticks. So we say that, air produces sound and occupies space.

9.7. Air pressure

A moving fish

Do this

Take a 12 cm long and 1 cm wide paper. On both the edges leave a centimetre distance and cut the paper partially. Join both the cut ends as shown in the figure like a fish. Drop the fish from a certain height and observe. What has happened? Know, why has it happened?



What is the distance?

Children you play with ball, don't you? In the same way let us play other games.

Do this

Take a piece of newspaper. Draw a line in your classroom. Stand on the line and throw the paper. Measure the distance of the paper from the line. Write down in the table. Now make a loose ball with the paper, and throw. Note down the distance. Now make a tight ball and throw and note down the distance.

S.No.	Thrown Object	Distance (cm/m)
1	Paper	
2	Loosely bound paper	
3	Tightly bound paper	

Think and say

- Which object reached the longest distance?
- What could be the reason for the paper falling at a shorter distance?
- What could be the reason for tightly bound paper ball falling at a greater distance when thrown?

The paper has air around it. So, it could not travel a long distance. It fell very near. Air did not let the paper travel long distance. When the paper is bound loose, there is air in the folds of the paper which made the ball travel smaller distance. When the ball is bound tight it was able to push the air and reach a longer distance.

9.8. Parachute

Do this

Take a polythene cover. Cut it into a square. On four corners tie rope individually. And then tie the four threads collectively to a small stone as shown in the figure. Throw the cover high into the air. Observe the stone falling along with the cover.'

Think and answer

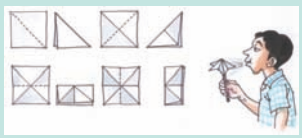
- What happens when the threads are not of the same size?
- When does the cover open - while being thrown up or while falling down?
- What is the reason for the cover to open up?

Observe the picture given. This is called a parachute. Parachute falls slowly to the ground because air stops it from falling freely. That is why, the person holding the parachute descends slowly to the ground. Aeroplanes and helicopters have parachutes. They are used in case of emergencies situations.

9.9. Power of air - Wind mill

Do this

Take a square shaped paper. Fold the paper into half and fold it further to make it square again. Now fold it vertically and horizontally. Now it looks like a flower. Place this on the tip of the pencil lead and blow air through your mouth. This acts like a windmill.



Group work

- Which direction does your wind mill rotate?
- Does it rotate in all directions?
- How long does it rotate?
- Why do wind mills and paper flowers rotate?
- What do you do to make the wind mill rotate continuously?
- You know how to prepare a paper flower. Observe how it moves.

Flowing air has power. It can move objects, that is why the paper flower and the wind mill rotate. This power of air is utilized in production of electricity with the help of wind mills. This is called wind electricity.

Do you know?

Air has many gases mainly, nitrogen, oxygen, carbondioxide, watervapour etc. They don't have any taste, odour or colour. In the same way air also has no smell, taste or colour. These gases are present in air in the form of minute particles. Nitrogen is present in higher quantity, followed by oxygen. Carbondioxide is present in a small quantity.

9.10. Why do we need air?

Think and say

- Close your mouth and nose for some time, and see what happens?
- How long can you stay like this? Why not for very long time?
- Take a balloon and blow air into it? Where does that air come from?

Air is necessary for the life of plants and animals

Air is necessary for plants and animals to live. They will die without air. Oxygen in the air helps organisms to live. Carbondioxide in the air is used in the preparation of food materials by plants. Plants release oxygen. Plants and animals take in oxygen and release carbondioxide. There is plenty of oxygen where there are plenty of trees. Oxygen dissolves in water. Water animals breathe oxygen dissolved in water.

Birds, animals, human beings etc., need air to live. Air is the elixir of life. Do you know what are the other uses of air? Do you know what is filled in the tyres of cars and buses?

Group work

- Which vehicle tyres are filled with air?
- What other objects do we fill air in?

9.11. Air pollution

Observe the picture and say

- What do you observe in the above picture?
- What happens due to that? What all mix with the air?
- What is air pollution? What should we do to stop air pollution?
- How do dust particles enter air?
- Let the sunlight fall in a room with the help of the reflection on a mirror or the surface of a steel plate. Observe the dust particles.

When we sweep the floor at home, when the roads are swept, when the vehicles move, the dust particles rise and mix with air. Smoke from kitchens, factories chimneys and burning wood pollute the air. Health is affected when we breathe polluted air. Some people smoke beedi, cigarette and release smoke into the air. By breathing this kind of air also we fall ill and get diseases. Not only people who smoke but people who breathe in that smoke also get diseases of the lungs, T.B., cancer etc. That is why, we should take precautions to prevent air pollution, it is our reponsibility. We should plant more trees. We should strictly punish the industries that emit dangerous smoke/ gases.

Keywords

atmosphere
wind blow
atmospheric table
winter season
summer season
rainy season
clothes according to the seasons
windmill
weight
occupies space
pressure / force of of air
pollution
parachute
clean air

What have we learnt?

1. Conceptual Understanding

a) How can you say that wind is blowing?

b) How is weather in different seasons?

c) What measures are to be taken during summer season?

d) What type of clothes should be worn during the different seasons?

e) Which season does the environment look green and beautiful? Why?

f) Give examples to prove that air produces sound.

g) Why does air get polluted?

2. Questioning and Hypothesis

a) What is happening in the picture? Why is it happening? What happens next?

b) Ask some more questions based on the picture?

3. Experiments - Field Observations

a) Dip an empty bottle into the water? What happens? Why does it happen?

b) Pour water on a brick? What do you notice? Why does it happen?

4. Information Skills, Projects

- Collect information about the things which work using air. Write their names and write two sentences on each as to how they are related with air.

5. Communication through Mapping Skills, Drawing Pictures and Making Models

a) Write about the making of a parachute? Make a model and draw a picture of it?

b) Make a flute out of hay stalk.

c) Make a drum using empty tins, polythene covers and rubberbands.

6. Appreciation, Values and Creating Awareness towards Bio-diversity

a) Name the instruments which produce similar sounds ? How do you feel on hearing them?

b) Polluted environment is harmful to health? What can you do to have a healthy environment?

c) There are many industries around Sultanpur which are emitting (giving out) harmful smoke. By breathing the smoke people are falling sick. Write a letter about this to the Pollution Control Board.

d) To have fresh air each one should plant a tree. Prepare a poster to explain the necessity for planting trees and display in your class.

I can do this

1.	I can explain the meaning of the terms - atmosphere, seasons, air, etc.	Yes / No
2.	I can demostrate experiments related to air.	Yes / No
3.	I can collect information on objects that run with air and can explain about them.	Yes / No
4.	I can write a letter to Pollution Control Board for prevention of pollution.	Yes / No
5.	I can make a poster wilh a message about planting more trees to get fresh air.	Yes / No
6.	I can explain the properties of air.	Yes / No