

DREAMLAND SCHOOL

CLASS - 7

SUBJECT - GEOGRAPHY.

Date - 05/ 05/ 2020

Ch - 3 ( Weather Study)

Answer sheet

**A) Answer the followins.**

1) and:- **Weather**

i) It refers to the condition of the atmosphere over a small area like a place or city.

ii) It stays over a short period of time, usually 24 hours.

iii) It is never static but ever changing.

**Climate**

i) It is the average of the atmospheric Conditions of a large area, such as a country.

ii) It stays over a long period of time of not less than 35 years.

iii) It is permanent in Nature and doesn't change from day to day.

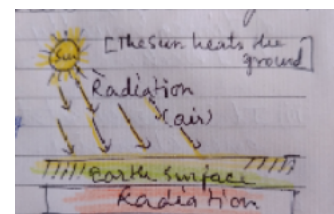
2) ans:- The elements of weather and climate are - temperature, atmospheric pressure,winds, humidity, precipitation, cloud cover and sun shine.

3) ans:- Temperature is determined by following factors -

- Latitude or distance from the Equator
- Altitude or height above sea level
- Distance from the sea
- Winds
- Slope of the land
- Ocean Currents
- Cloud cover

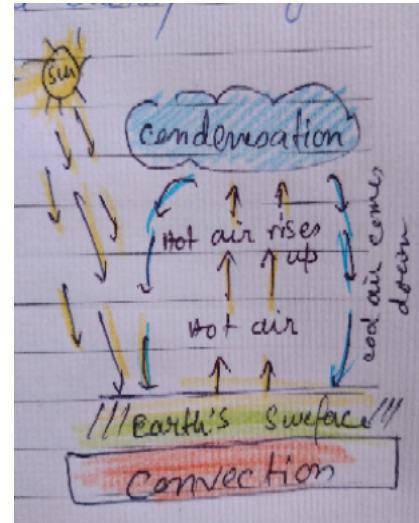
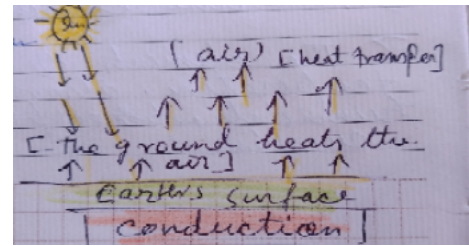
4) ans:- The three heating process are -

**i) Radiation** - Radiation is the mechanism by which solar energy reaches Earth and temperate Earth's surface and Air also.



**ii) Conduction** - It occurs when two objects at different temperatures are in contact with each other. Heat flows from the warmer to the cooler object until they are both at the same temperature.

**iii) Convection** - It describes vertical transport of heat and moisture in the atmosphere, usually from a warmer area (surface) to a cooler one (air).



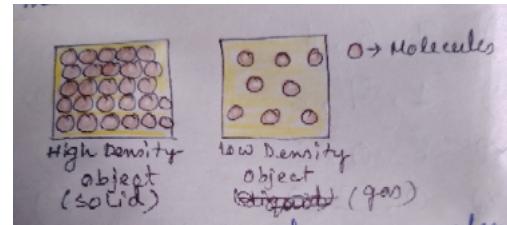
## CHAPTER - 3 ( WEATHER STUDY)

### Explanation-

#### ATMOSPHERIC PRESSURE

Air has weight and exerts pressure on everything on the Earth's surface. Atmospheric pressure is the force exerted by a column of air due to its weight over a unit area of 1sq.cm on the Earth's surface. The movement of air is related to atmospheric pressure.

Now how do we understand that air has weight? In this case we need to understand the density first. Density is a characteristic property of a substance. Means , the mass of atoms , their size and how they are arranged determine the density of a substance. So, density is degree of compactness. In solids molecules are closely packed and in gas molecules are in scattered form. That is why the same volume of solid is heavier than same volume of gas. So, high density have heavy weight. And heavy weight object have high pressure.

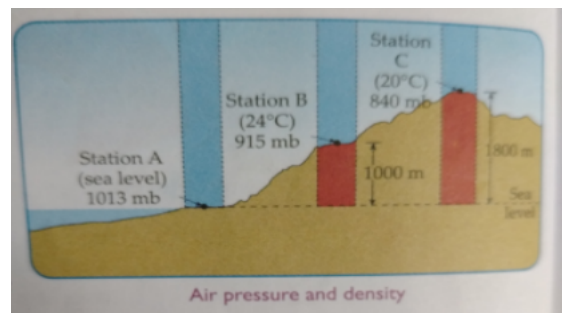


On Earth surface , air exerts pressure. The air around you has weight and it presses against everything it touches. That pressure is called atmospheric pressure or air pressure. It is the force exerted on a surface by the air above it as gravity pulls it to Earth. Apparently,we could feel the air pressure. But it is always there. Let take us one example. In the plain or bottom of a mountain we can inhale oxygen easily , but in the peak of mountains we can not inhale oxygen properly due to lack of oxygen. Because the density of oxygen in the mountain is lower than the plain. We already learned that low densed air has lower weight and exerts low pressure. In the plain air is dense and heavier ,so exerts high pressure. Atmospheric pressure or air pressure is measure in barometer. Temperature and pressure are inversely related. High temperature has low pressure and low temperature has high pressure. Whenever we heats any object or substance,the compactness of molecules has destroyed and placed dispersely. That is why , after giving heat solids change into liquids and gases as well.

The pressure difference results in the movement of the air. Moving air in horizontal direction is known as wind and in vertical direction is called air current. These movements of air together cause circulation of air in the atmosphere. Atmospheric pressure depends on the following factors-

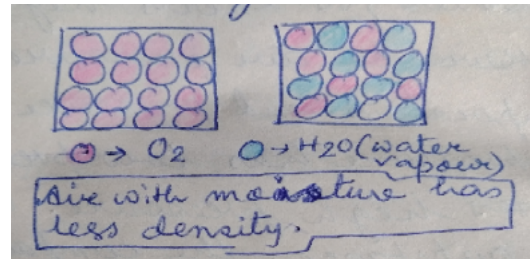
**Altitude** - places at greater heights above sea level experience low pressure due to lower density of air. Air pressure is the highest at the sea level and decreases with altitude.

**Temperature** - When temperature increases, the volume of air expands and its density decreases. The molecules move apart, as a result air becomes lighter and ascends. This leads to a decrease in the



air pressure of that area. On the other hand, when the temperature decreases, the air gets cooled, its volume contracts and becomes dense as the molecules in it are closely spaced. Therefore, cool air becomes heavy and descends. This leads to the formation of high pressure.

**Water vapour** - Air which contains moisture is lighter than dry air. Therefore, moist air exerts less pressure than dry air. Presence of water vapour in the air expands volume and decreases the density. Hence moist air always ascends.



**Rotation of the Earth** - Earth's rotation influenced atmospheric pressure. Earth's rotation produces a force on all bodies moving relative to the Earth. Due to Earth's approximately spherical shape, this force is greatest at the poles and least at the Equator. The force, called 'Coriolis effect'. Causes the direction of winds to be deflected.

Air deflected towards the poles from the Equator. Thus, in equatorial belt, due to the less air low pressure occurs. In the polar region, high pressure occurs. Rotation of Earth dynamically influenced pressure belts.

### PERMANENT PRESSURE BELTS OF THE EARTH ( World Wind System)

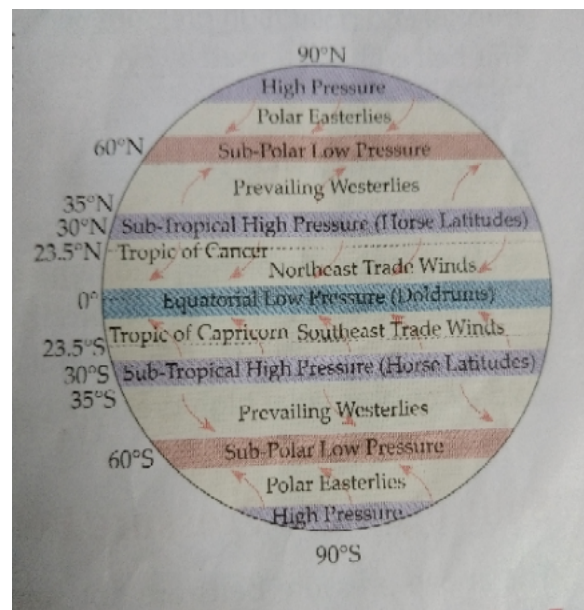
The atmospheric pressure is not the same throughout the Earth's surface. The variation in atmospheric pressure is mainly due to unequal heating of the Earth's surface. The pattern of pressure distribution generally corresponds with the heat zones of the Earth. Air always blows from high to low pressure.

#### Equatorial Low Pressure Belt

The equatorial low pressure belt extends from 5° North to 5° South latitudes. Due to the vertical rays of the Sun at the Equator, the temperature here is high throughout the year. The heated air being light, rises up and moves towards the tropics, forming an area of low pressure. This belt is also called the 'Doldrums' ( means ' dull') because there are no surface winds.

#### Sub-tropical High Pressure Belts

It lies between 30° North to 35° South and 30° South to 35° South latitudes. Where the ascending equatorial air currents descend. It moves horizontally at higher altitudes and as the air cools down, it becomes heavy, dense and starts to subside between these area. So, with the dense heavy air the high pressure formed.



### Sub- polar Low Pressure Belts

It is located between 60° and 70° in each hemisphere. This belt is also dynamically induced. In this region, the surface winds defect outwards due to rotation of Earth and low pressure is created. In this belt air coming from the Sub-tropical and polar high pressure belt converge and ascend , creating a region of low pressure. This belt is characterised by cyclonic storms in winters.

### Polar High Pressure Belts

At the North and South poles , between 70 ° to 90° North and South , the temperature are always extremely low. The cold descending air gives rise to high pressure over the Poles. These areas of Polar High Pressure are known as Polar Highs. These regions are characterised by permanent Ice Caps.

### SHIFTING OF THE PRESSURE BELTS

If the Earth had not been inclined towards the Sun, the pressure belts would have been as they are. But it is not so, because the Earth is inclined  $23\frac{1}{2}^{\circ}$  towards the Sun. That is why pressure belts are not static. When the Sun is over head on the Topic of Cancer ( 21st June) the pressure belts shifts 5° northward and when it shines vertically overhead on Topic of Capricorn ( 22nd December) ,they shift 5° southward from their original position. The shifting of the pressure belts cause seasonal changes in the climate, especially between latitudes 30° and 40° in both hemisphere. In this region the Mediterranean type of climate is experienced because of this shifting. During winters westerlies prevail and cause rain. During summers dry Trade Winds blow offshore and are unable to give rainfall in these regions. When the Sun shines vertically over the Equator on 21st March and 23rd September, the pressure belts remain balanced in both the hemisphere.

### HUMIDITY

Humidity refers to the amount of moisture or water vapour present in the air . The amount of water vapour in the atmosphere varies greatly from place to place and time to time. Most of the moisture in the air comes from the water bodies through process of evaporation. Temperature and evaporation have positive relationship. The actual amount of water vapour present in given volume of air at a given temperature is known as Absolute Humidity ( AH). It is measured in grams per cubic metre of air. The ratio between the actual amount of water vapour in the air at a given temperature and the maximum amount water vapour that the same air can hold at that particular temperature, is known percentage. Relative Humidity increases or decreases with variations in air temperature. When air can hold no more moisture , it is said to be saturated and its relative humidity is 100%. Cooling beyond this level wil condense the water vapour into clouds or rain. The temperature at which condensation sets in is called dew point.

### EVAPORATION

Evaporation is the process by which water changes from liquid into gaseous or vapour state through the process of heating. Evaporation is the primary path through which water moves from liquid state back into the water cycle as atmosphere water vapour. Scientific studies have shown that water bodies

provide nearly 90% of the moisture in the atmosphere through the process of evaporation and a tiny amount comes from sublimation. Sublimation is the process by which ice changes directly into water vapour without first becoming liquid. The rate of evaporation increases when the air is hot, dry and windy.

### **HOME WORK**

#### **A) Answer the followings**

- 1) Name the factors on which atmospheric pressure depends on.
- 2) What is absolute humidity?
- 3) What is relative humidity?
- 4) Name seven pressure belts on Earth.



## चित्र पर आधारित रचना (Picture Based Creation)

पत्र-लेखन की तरह चित्र-लेखन भी एक कला है। इसमें दो बातों की विशेष आवश्यकता होती है:

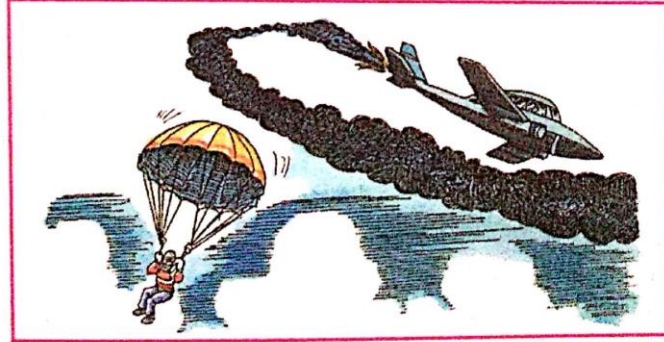
चित्र-अध्ययन और कल्पनाशीलता। चित्र-लेखन में चित्र के बारे में आपके विचार भी पूछे जा सकते हैं और चित्र पर आधारित कोई कहानी भी।

चित्र-लेखन के लिए निम्नलिखित बातों का ध्यान रखना चाहिए:

- चित्र को बारीकी से देखना कि उसका सूक्ष्म-से-सूक्ष्म बिंदु भी पकड़ में आ जाए।
- चित्र की घटनाओं को समझना और चित्र-लेखन करते हुए प्रत्येक का वर्णन करना।
- कल्पना-शक्ति का प्रयोग करना, परंतु कल्पना को इतना अधिक विस्तार देना भी उचित नहीं है कि मुख्य विषय से ध्यान हट जाए।
- चित्र-वर्णन रोचक और सजीव भाषा में होना चाहिए।
- चित्र-लेखन में दिए गए निर्देशों को ध्यान से पढ़ना चाहिए।

### कुछ उदाहरण

1. प्रस्तुत चित्र को आधार बनाकर एक कहानी लिखिए।



प्रस्तुत चित्र को देखकर मुझे एक कहानी याद आ रही है जिसमें वायुसेना के पायलट सुधीर की बहादुरी से एक गाँव के लोगों की जान बच पाई थी। पायलट सुधीर बचपन में एक शरारती बालक थे। उनके माता-पिता यह सोचकर परेशान रहते थे कि यह बच्चा अपने भावी जीवन में क्या करने वाला है? उनके माता-पिता उनके भविष्य के बारे में अत्यंत चिंतित थे। पढ़ाई में तो उनका मन ही नहीं लगता था। परंतु खेलों में उनका प्रदर्शन इतना अच्छा था कि शिक्षक भी उन्हें इस कारण से प्यार करते थे। विद्यालय से जैसे-तैसे उत्तीर्ण होने के बाद उनका अच्छे कॉलेज में दाखिला हो गया क्योंकि खेलों में उनका प्रदर्शन काफी अच्छा रहा था। बचपन से ही

हवाई जहाजों को उड़ते देखकर उनका मन उड़ने को लालायित रहता था अतः पढ़ाई पूरी होने के बाद उन्होंने पायलट की ट्रेनिंग की और पायलट बन गए। एक बार देश पर आतंकवादियों का हमला हुआ। उन्होंने एक पूरे गाँव को बंधक बना लिया। सरकारी महकमों में खलबली मच गई। पुलिस मजबूर थी क्योंकि आतंकवादियों ने धमकी दी थी कि अगर पुलिस ने कुछ भी गडबड़ किया तो वे ग्रामवासियों की हत्या कर देंगे। सरकार की ओर से वायु सेना को आतंकवादियों से निपटने को कहा गया। पायलट सुधीर एक योग्य पायलट थे। उन्हें वायु सेना की ओर से यह जिम्मेदारी दी गई। पायलट सुधीर उस गाँव के ऊपर अपनी जहाज़ लेकर गए। आतंकवादियों के पास अत्याधुनिक हथियार थे। उन्होंने जहाज़ पर हमला बोल दिया। जहाज़ में आग लग गई परंतु पायलट सुधीर जहाज़ को गाँव से दूर ले गए ताकि गाँव को कोई नुकसान न हो। आतंकवादियों ने सोचा कि पायलट सुधीर मारे गए लेकिन वे पैराशूट से नीचे कूद गए और छुपकर गाँव में पहुँचे। अपनी वीरता और बहादुरी से उन्होंने आतंकवादियों के मुखिया को पकड़ लिया और अपने साथियों की मदद से गाँववालों की जान बचाई। आज उनके माता-पिता को उनपर गर्व है।

### WORKSHEET

नीचे दिए गए चित्र को ध्यान से देखिये। इसे देखकर आपके मन में जो विचार उठते हैं, उनका वर्णन कीजिए। अपने विचार आप कहानी के रूप में भी लिख सकते हैं, पर आप जो कुछ भी लिखें उसका सीधा संबंध इस चित्र से होना चाहिए---



Ex-4.2 (H.W)

Q.7 Express each of the following rational numbers in the exponential form.

(i)  $\frac{25}{64}$

(ii)  $-\frac{125}{216}$

(iii)  $-\frac{343}{729}$

Q.8 Simplify the following: -

(i)  $\frac{(2^5)^2 \times 7^3}{8^3 \times 7}$

(ii)  $\frac{25 \times 5 \times t^8}{10^3 \times t^4}$

(iii)  $\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5}$

Q.9 Simplify the following: -

(i)  $(-\frac{1}{2})^5 \times 2^6 \times (\frac{3}{4})^3$

(ii)  $[(\frac{-3}{4})^3 - (\frac{-5}{2})^3] \times (\frac{-2}{3})^4$

Q.10

Simplify the following: -

(i)  $(\frac{3}{2})^{-1} \div (\frac{-2}{5})^{-1}$

(ii)  $[\{(\frac{-1}{4})^2\}^{-1}]^{-2}$

Q.11

Simplify: -  $(\frac{1}{3})^{-2} + (\frac{1}{4})^{-2} + (\frac{1}{5})^{-2} - (\frac{1}{6})^{-2}$

Q.12

Express each of the following as a product of prime factors in the exponential form.

(i)  $108 \times 192$

(ii)  $384 \times 147$

Q.13

Simplify and write the following in the exponential form.

(i)  $3^3 \times 2^2 + 2^2 \times 5^0$

(ii)  $9^2 \times 11^2 - 2^2 \times 3 \times 17^0$

H.W. Ex - 4.2

Q.1 Using laws of exponents, simplify and write the following in the exponential form.

(i)  $2^7 \times 2^4$

(ii)  $(-7)^5 \times (-7)^{11}$

(iii)  $\left(\frac{3}{5}\right)^6 \div \left(\frac{3}{5}\right)^2$

(iv)  $(-6)^7 \div (-6)^3$

Q.2 Simplify and write the following in the exponential form.

(i)  $5^3 \times 5^7 \times 5^{12}$

(ii)  $(7^{12} \times 7^3) \div 7^4$

Q.3 Simplify and write the following in the exponential form.

(i)  $(2^2)^{100}$

(ii)  $(3^2)^5 \times (3^4)^7$

Q.4 Simplify and write in exponential form.

(i)  $\frac{a^3 \times a^5}{(a^3)^2}$

(ii)  $(2^3)^4 \div 2^5$

(iii)  $[(6^2)^3 \div 6^3] \times 6^5$

Q.5 Simplify and write in the exponential form.

(i)  $5^4 \times 8^4$

(ii)  $(-3)^6 \times (-5)^4$

(iii)  $\left(\frac{8}{10}\right)^3$

$\left(\frac{3}{10}\right)^5 \times \left(\frac{2}{15}\right)^5$

Q.6 Simplify and express each of the following in the exponential form.

(i)  $\frac{2^4 \times 2 \times 7^3 \times 7}{2^3 \times 7^4}$

(ii)  $\frac{(3^2)^3 \times (-2)^5}{(-2)^3}$

(iii)  $\frac{3 \times 7^2 \times 11^8}{21 \times 11^3}$

(iv)  $3^0 \times 4^0 \times 5^0$

8.14  
(i) By what number should we multiply  $3^4$  so that the product is  $3^7$ ?

## Scientific Notation

Scientific notation is a way of expressing numbers that are too big or too small to be conveniently written in decimal form. It is commonly used by scientists, mathematicians, and engineers, in part because it can simplify certain arithmetic operations.

If you have a small number in decimal form (smaller than 1, in absolute value), then the power is negative for the scientific notation, if it is a large number in decimal (bigger than 1, in absolute value), then the exponent is positive for the scientific notation.

### How to write Numbers in Scientific Notation.

To write in scientific notation, follow the form.

$N \times 10^a$ , where  $N$  is a number between 1 and 10, but not 10 itself, and  $a$  is an integer (positive or negative number)

Write 312,000,000,000 in scientific notation.

① Move the decimal place to the left to create a new number from 1 up to 10, As, it is a whole number, the decimal point is understood to be at the end of the number, 312,000,000,000.

$$\text{So, } N = 3.12$$

② Determine the exponent, which is the number of times you moved the decimal.

In this example, you moved the decimal 11 times; also because you moved the decimal to the left, the exponent is positive. Therefore,  $a = 11$ ,  
 $\therefore 10^{11}$

$\therefore$  So, the number is  $3.12 \times 10^{11}$

To see an exponent that's negative.  
Write .00000031 in scientific notation.

① Move the decimal place to the right to create a new number from 1 up to 10.

$$\text{So, } N = 3.1$$

② Determine the exponent, which is the number of times you moved the decimal. In this example, you moved the decimal 7 times; also because you moved the decimal to the right, the exponent is negative. Therefore  $a = -7$ , so you get,  
 $10^{-7}$

$\therefore$  the number in scientific notation  
 $= 3.1 \times 10^{-7}$

Some more examples :-

$$4,900,000,000 = 4.9 \times 10^9$$

$$0.00000014 \text{ m} = 1.4 \times 10^{-7}$$

$$0.000275 \text{ m} = 2.75 \times 10^{-4}$$

On next assignment H.w.s regarding this, will be given.

CLASS-VII  
SUBJECT- HIGHER BENGALI  
PREVIOUS STUDY MATERIAL SOLUTION 2020-21( DATE- 30.04.2020 )  
CHAPTER – 4 KAROK (ANSWER SHEET )  
অধ্যায় ৪ – কারক ( উত্তরপত্র )

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DATE-05.05.2020  
TUESDAY

**HOMEWORK SOLUTION**

ক ) নিচের প্রশ্নগুলির উত্তর দাও:-

১) অধিকরণকারক কাকে বলে ? উদাহরণ দাও ।

উঃ- ক্রিয়ার আশ্রয়কে অধিকরণ কারক বলে অর্থাৎ যে স্থানে , যে সময়ে বা যে অবস্থায় ক্রিয়া সম্পন্ন হয় তাকে অধিকরণকারক বলে । যেমন – সকালে বৃষ্টি হয়েছে ।

২) কর্তৃকারক কাকে বলে ? উদাহরণ দাও ।

উঃ- যে বিশেষ্য বা সর্বনাম পদ বাক্যে ক্রিয়া সম্পাদন করে বা অন্য কোন ব্যক্তি বা বস্তুর সাহায্যে কাজ করায় তাকে কর্তৃকারক বলে । যেমন – আমি আজ কলকাতায় যাব।

৩) নিমিত্তকারক কাকে বলে ? উদাহরণ দাও ।

উঃ- কর্তা যার জন্য বা যার উদ্দেশ্যে ক্রিয়া সম্পাদন করে তাকে নিমিত্তকারক বলে । যেমন -  
দরিদ্রদের জন্য বস্ত্র বিতরণ করা হচ্ছে ।

খ ) চিহ্নিত পদগুলির কারক নির্ণয় করঃ-

১) পাগলে কী না বলে । \_\_\_\_\_ কর্তৃকারক

২) আমরা সবাই মিলে স্কুলে যাচ্ছি । \_\_\_\_\_ অধিকরণ কারক

৩) ছেলেরা ফুটবল খেলে । \_\_\_\_\_ কর্মকারক / করণকারক

৪) সরষে থেকে তেল হয় । \_\_\_\_\_ অপাদান কারক

৫) ছেলেটির দু চোখ দিয়ে জল পড়ছে । \_\_\_\_\_ অপাদান কারক

**CLASS-VII**  
**SUBJECT- HIGHER BENGALI**  
**STUDY MATERIAL 2020-21**  
**CHAPTER – 5 SHABDORUP**  
**( অধ্যায় ৫ – শব্দরূপ )**

DATE – 05.05.2020  
TUESDAY

আমাদের বাংলা ভাষায় যে সমস্ত শব্দ আছে তা বিভিন্ন সময়ে বিভিন্ন ভাবে পরিবর্তিত হয়। অর্থাৎ একই শব্দের নানা রকম রূপভেদ ঘটে। এই যে শব্দের রূপভেদ তা ঘটে কখনও শব্দের সঙ্গে বিভক্তি বা অনুসর্গ যুক্ত হয়ে, আবার কখনও শব্দের একবচন বা বহুবচনভেদে। আবার এই বিভক্তি বা অনুসর্গ যুক্ত হয় কারক সম্বন্ধের ওপর নির্ভর করে। বিভিন্ন কারণে শব্দের এই যে রূপভেদ ঘটে তাকে শব্দরূপ বলে। সুতরাং —————

- শব্দরূপ – বিশেষ্য ও সর্বনাম পদের পরে বিভিন্ন কারক সম্বন্ধ পদসূচক একবচন এবং বহুবচনের বিভক্তি ও অনুসর্গ যুক্ত করলে তার যে রূপভেদ ঘটে তাকেই বলা হয় শব্দরূপ।

- শব্দের এই রূপ পরিবর্তন মূলত নির্ভর করে তিনটি বিষয়ের ওপর। সেগুলি হল —————

১) কারক সম্বন্ধের ওপর

২) সম্বন্ধ পদের ওপর

৩) বচন ভেদের ওপর

- এই তিনটি বিষয়ের উপর ভিত্তি করে কীভাবে বিভক্তিচিহ্নের পরিবর্তন হয় তা নিম্নে ছকের আকারে দেখানো হল —————

**একবচনের বিভক্তিচিহ্ন**

কারক	বিভক্তি
কর্তৃকারক	অ ( শূন্য ), এ ( য,য়ে ), তে ( এতে )
কর্মকারক	শূন্য, এ ( য,য়ে ), কে, রে ( এরে )
করণকারক	শূন্য, এ ( য,য়ে ), তে ( এতে ) [ বিভক্তি ] দ্বারা, দিয়ে, কর্তৃক [ অনুসর্গ ]
অপাদানকারক	শূন্য, এ ( য,য়ে ), তে ( এতে ) [ বিভক্তি ] হতে, চেয়ে, থেকে [ অনুসর্গ ]
অধিকরণকারক	শূন্য, এ ( য,য়ে ), তে ( এতে )
সম্বন্ধপদ	র ( এর ), কার, কের

## বহুবচনের বিভক্তিচিহ্ন

( রা , এরা হল বিভক্তিচিহ্ন , বাকিগুলি হল বহুবচনাত্মক শব্দ , অনুসর্গ আর নির্দেশক )

কারক	বিভক্তি
কর্তৃকারক	রা , এরা , গুলি , গুলো , গণ , বৃন্দ
কর্মকারক	দের , গুলিকে , গুলোকে , গণকে , বৃন্দকে
করণকারক	দের দ্বারা , দের দিয়ে , গুলি দিয়ে
অপাদানকারক	দের হতে , দের থেকে , দের চেয়ে গুলি থেকে , গুলো থেকে
অধিকরণকারক	গুলিতে , গুলোতে , গুলোয়
সম্বন্ধপদ	গুলির , গুলোর , দের

- সুতরাং এই সমস্ত বিভক্তি , অনুসর্গ যুক্ত হয়ে এবং বচনভেদে শব্দের রূপভেদ ঘটে ।
- আবার বিশেষ্য পদের ক্ষেত্রে উপরোক্ত বিষয়গুলি ছাড়াও স্বরবর্ণ ও ব্যঞ্জনবর্ণের ওপর ভিত্তি করে শব্দের রূপভেদ ঘটে । অর্থাৎ যে সমস্ত বিশেষ্য পদের শেষে স্বরবর্ণ থাকে তাকে স্বরান্ত বিশেষ্য পদ বলে আর যে সমস্ত বিশেষ্য পদের শেষে ব্যঞ্জনবর্ণ থাকে তাকে ব্যঞ্জনান্ত বিশেষ্য পদ বলে ।
- নিম্নে উদাহরণস্বরূপ একটি শব্দের কারক ও বচনভেদে রূপভেদ দেখানো হল ———

### শব্দ — বই

কারক	একবচন	বহুবচন
কর্তৃকারক	বই , বইখানা , বইখানি	বইগুলো
কর্মকারক	বই , বইখানিকে	বইগুলো , বইগুলোকে
করণকারক	বইয়ের দ্বারা , বই দিয়ে	বইগুলো দিয়ে , বইগুলির দ্বারা
অপাদানকারক	বই থেকে , বইয়ের থেকে	বইগুলোর থেকে , বইগুলোর চেয়ে
অধিকরণকারক	বইয়ে , বইতে , বইয়েতে	বইগুলোতে , বইগুলোয়
সম্বন্ধপদ	বইয়ের , বইখানার , বইখানির	বইগুলোর

## CLASSWORK

### ১) শব্দরূপ কাকে বলে ?

উঃ- বিশেষ্য ও সর্বনাম পদের পরে বিভিন্ন কারক সম্বন্ধ পদসূচক একবচন এবং বহুবচনের বিভক্তি ও অনুসর্গ যুক্ত করলে তার যে রূপভেদ ঘটে তাকেই বলা হয় শব্দরূপ।

### ২) শব্দের রূপ পরিবর্তন কী কী বিষয়ের ওপর নির্ভর করে ?

উঃ- শব্দের এই রূপ পরিবর্তন মূলত নির্ভর করে তিনটি বিষয়ের ওপর। সেগুলি হল ———

১) কারক সম্বন্ধের ওপর

২) সম্বন্ধ পদের ওপর

৩) বচন ভেদের ওপর

### ৩) স্বরান্ত বিশেষ্য পদ কাকে বলে ? উদাহরণ দাও।

উঃ- যে সমস্ত বিশেষ্য পদের শেষে স্বরবর্ণ থাকে তাকে স্বরান্ত বিশেষ্য পদ বলে। যেমন – বাবা, মা ইত্যাদি।

### ৪) ব্যঞ্জনান্ত বিশেষ্য পদ কাকে বলে ? উদাহরণ দাও।

উঃ- যে সমস্ত বিশেষ্য পদের শেষে ব্যঞ্জনবর্ণ থাকে তাকে ব্যঞ্জনান্ত বিশেষ্য পদ বলে। যেমন – বালক, কৃষক ইত্যাদি।

## HOMEWORK

### ক) নিচের বিশেষ্য পদগুলি কোনটি স্বরান্ত এবং কোনটি ব্যঞ্জনান্ত

### বিশেষ্য পদ নির্ণয় করঃ-

১) শ্রমিক

২) দিদি

৩) শিক্ষিকা

৪) জল

৫) নদী

৬) অরণ্য

৭) চাঁদ

৮) গঙ্গা

৯) শিক্ষক

১০) হিমালয়

## Chemistry, Class-VII

### Chapter-3, Elements, Compounds, and Mixtures

#### Lesson continued for 05/05/2020 (Tuesday)

#### Solution of assignment dated-30/04/2020 (Thursday):

Q1.

- a) Mixture of naphthalene and chalk dust can be separated by sublimation process.  
Reason- This method is applicable to separate a solid-solid mixture where one of the component of the mixture is a sublime element.  
Here in the solid-solid mixture of naphthalene and chalk dust, naphthalene is a sublime element. So sublimation process is used.
- b) Mixture of stone dust and wood dust can be separated by gravitation method.  
Reason- This process is used to separate a solid-solid mixture where one of the solid is quite heavier with compare to other.  
Here in the mixture of stone dust and wood dust, both the substance are solid and stone dust is quite heavier than wood dust. So gravitation process is used.
- c) Mixture of iron dust and sulphur can be separated by magnetic separation method.  
Reason- This process is used to separate a solid-solid mixture where one of the component of the mixture is iron reach substance, which can be attracted by magnet.  
Here in this mixture of iron dust and sulphur iron can be attracted by magnet. So magnetic separation process is used.
- d) Mixture of common salt and chalk dust can be separated by using solvent extraction method.  
Reason- This method is used to separate a solid-solid mixture where one of the component of the mixture is soluble in water.  
Here in the solid-solid mixture of common salt and chalk dust common salt is soluble in water. So this solvent extraction method is used.

Q2. a) Difference between compound and mixture:

<i>Compound</i>	<i>Mixture</i>
1. A compound is a pure substance.	1. A mixture is an impure substance.
2. Compounds are always homogeneous	2. Mixtures may be homogeneous or heterogeneous.
3. A compound has a fixed composition, <i>i.e.</i> , it is formed when two or more pure substances chemically combine in a definite ratio by mass.	3. A mixture has no fixed composition, <i>i.e.</i> , it is formed by mixing two or more substances in any ratio without any chemical reaction.
4. Formation of a compound involves change in energy.	4. Formation of a mixture does not involve any change in energy.
5. Compounds have specific set of properties.	5. Mixtures do not have any specific set of properties.
6. Components of compounds can be separated only by complex chemical processes.	6. Components of mixtures can be separated by simple physical methods.

b) Difference between homogeneous and heterogeneous mixture:

Homogeneous	Heterogeneous
-------------	---------------

i) The components of this mixture is uniformly distributed throughout the mixture.	i) The components of this mixture is haphazardly or unequally distributed throughout the mixture.
ii) The components can be separated easily.	ii) The component cannot be separated easily.

c) Difference between gravitation method and solvent extraction method:

Gravitation method	Solvent extraction method
i) This method is used to separate such a mixture where one of the component of a mixture is quite heavier with compare to other.	i) This method is used to separate such a mixture where one of the component of the mixture is soluble in water.
ii) In this method both the component of the mixture are visible after separation.	ii) In this method one of the component is visible and the other one (the soluble one) is invisible after separation.

Q3. What do you mean by mixture separation? What is the need of it?

Ans: Mixture separation is the process to separate the components of a mixture by applying a particular process depending upon the type of the mixture and the physical and chemical properties of the mixture.

Need of separation of a mixture is to

- i. Remove undesirable and harmful substance and get useful substance.
- ii. Get completely pure substance for preparing other useful substance.

### **Lesson continued for 05/05/2020 (Tuesday)**

Till now we have learnt about the separation process of solid-solid mixture. now we will discuss about the separation process of solid-liquid mixture and liquid-liquid mixture.

The processes are as follows:

evaporation. In this way, they can be separated.

## (B) Separation of solid-liquid mixtures

Such mixtures can be homogeneous (a sugar solution) or heterogeneous (a mixture of sand and water). Different methods are used depending upon the type of mixture.

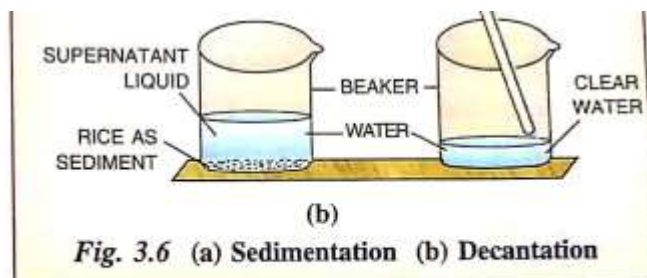
**Sedimentation and decantation :** *The settling down of suspended, insoluble, heavy solid particles in a solid-liquid mixture when left undisturbed is called **sedimentation**.*

*The solid which settles at the bottom is called **sediment** while the clear liquid above it is called **supernatant liquid**.*

*The process of pouring out the clear liquid, without disturbing the **sediment**, is called **decantation**.*

This method is used for a heterogeneous mixture of solid and liquid where the solid component is insoluble and heavier than the liquid component.

**Example :** A mixture of sand and water.



**Filtration :** *The process of separating insoluble solid particles from a liquid by allowing it to pass through a filter is called **filtration**.*

This process is used for separating the components of a heterogeneous solid-liquid mixture in which solids are lighter and insoluble in liquids.

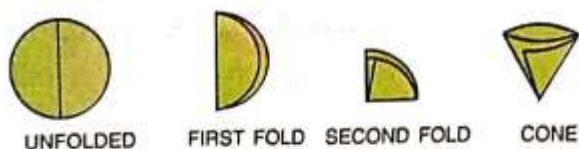
The substances that can be used as filters are a layer of sand, charcoal, cotton, glass, wool, unglazed porcelain, filter paper, a dice of muslin cloth *etc.* Even the strainer that we use to separate liquid tea from tea leaves is a filter.

These filters allow liquids to pass through them but not solids. The insoluble solid left on the filter is called the **residue**, while the liquid which passes through the filter is called

the *filtrate*. Mixtures like chalk and water, clay and water, tea and tea leaves, sawdust and water, etc., are separated by this method.

### Activity 10

- (i) Take some water in a beaker. Crush a chalk into powder and mix it well with water by stirring.
- (ii) Take a circular filter paper and fold it to make semicircular halves. Refold it to make a cone. Open the cone with three layers on one side and one layer on the other side.
- (iii) Fix the cone into a funnel in such a way that it is about one-fourth of an inch below the edge of the funnel. Hold the funnel over a beaker with the help of a stand.
- (iv) Now pour a mixture of chalk powder and water slowly into the funnel using a glass rod such that the liquid stands below the edge of the cone. You will observe that clear water drips into the beaker under the funnel.



Folding of a filter paper

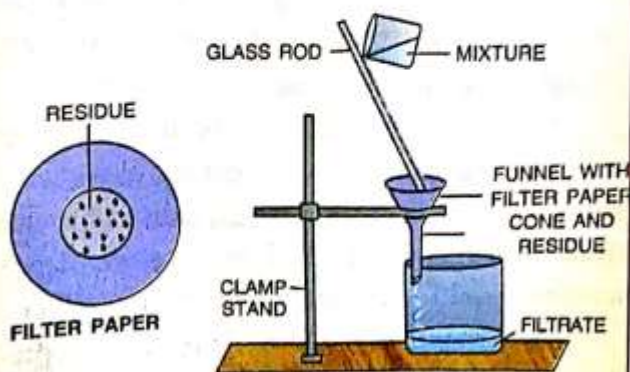


Fig. 3.7 Filtration using a funnel and filter paper (chalk powder remains on the filter paper as a residue and clear water collects as the filtrate).

Remove the filter paper and open it when all the mixture is poured in. The chalk powder left on the filter paper is the *residue* while the clear water in the beaker is the *filtrate*.

**Evaporation :** Evaporation is the process of converting a liquid into its vapour state, either by exposing it to air or by heating.

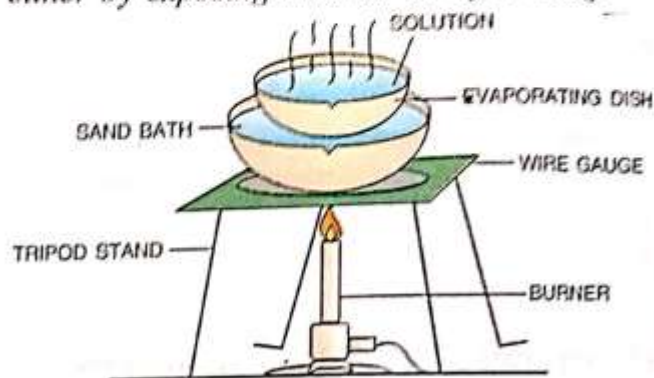


Fig. 3.8 Evaporation

This method is used to separate the components of a homogeneous solid-liquid mixture, like salt from sea water. Sea water is collected in shallow beds and allowed to evaporate in the sun. When all the water is evaporated, salt is left behind. By this method, we get only the solid, whereas the liquid escapes in the form of vapours. For separating a solid from its solution, we usually evaporate it until whole of the liquid escapes in its vapour form.

**Crystallisation :** It is a process in which slow evaporation of a solution containing more of the solid component is done.

Pure sugar is obtained from its solution in water by the process of crystallisation.

At first the sugar solution is heated to evaporate water at a faster speed. When very less of water is left the solution is cooled. On cooling sugar dissolved in it starts separating out in the form of **crystals**.

**Note :** Crystals are the solid particles with definite shape and size. They are lustrous too. *Example :* Sugar particles are cubical and they shine.

**Distillation :** Distillation is the method of getting a pure liquid from a solution by evaporating and then condensing the vapours.

When the solution is heated the liquid component of the mixture evaporates in the form of vapours. These vapours are then condensed back into the liquid form which is very pure and is called as **distillate**.

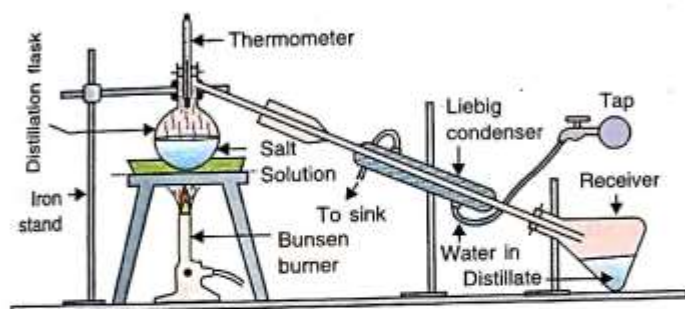


Fig. 3.9 Distillation

**Tap water**, which is a mixture containing dissolved salts, is purified by *distillation*. The pure water so obtained is called *distilled water*. It is used by doctors for preparing medicines, by chemists for making solutions and in industries for various purposes.

The advantage of this process is that both the components of the solid-liquid mixture are obtained.

**Centrifugation :** Centrifugation is the method of separating solids from liquids where the mixture is homogeneous. This is also called *churning*.

An apparatus called *centrifuge* is used for this purpose. The mixture is placed in the

centrifuge tube and rotated at a high speed, due to which the heavier solid particles (high density particles) move towards the bottom and the light solid particles (low density particles) float on the liquid. This results in the separation of substances of different densities.

*Cream is separated from milk* by this method. At home, we use mixers or traditional churners to separate cream from milk. This process is used even now in dairies. In washing machines, this principle is used to squeeze out water from wet clothes.

### (C) Separation of liquid-liquid mixtures

**By separating funnel :** It is a simple device used to separate the components of a liquid-liquid heterogeneous mixture.

*Example :* Kerosene oil and water. The mixture is placed in a separating funnel and allowed to stand for sometime. The components form two clear layers. Water being heavier forms the lower layer and oil being lighter forms the upper layer. When the stopper of the funnel is opened, the heavier liquid trickles out slowly and is collected in a vessel. The stopper is closed when the bottom layer is entirely removed from the funnel. In this way, the two liquids are separated.

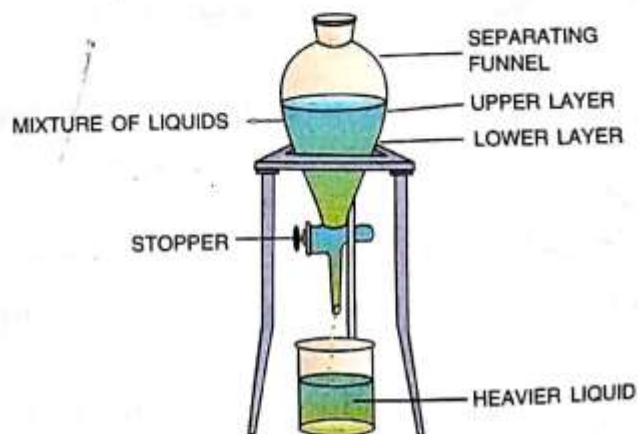


Fig. 3.10 Separation of immiscible liquids using separating funnel

## Fractional distillation :

**Separation of miscible liquids :** The process of distillation is used for separating the components of a homogeneous liquid-liquid mixture, like water and alcohol. This is based on the fact that alcohol boils at a lower temperature than water. The vapour of alcohol are collected and cooled while water is left behind in the original vessel. Thus, two liquids having different boiling points can be separated by distillation provided that difference in their boiling points must be  $25^{\circ}\text{C}$  or more.

Petrol, kerosene, diesel, etc., are obtained from crude petroleum oil in a similar way.

**Note :** Homogeneous liquid-liquid mixtures are called *miscible* liquids.

① Liquids which dissolve in each other completely in all proportions are called miscible liquids. Example - alcohol is miscible with water.

② Liquids which do not dissolve in each other are called immiscible liquids. Example - oils are immiscible with water.

**A gas - liquid mixture can be separated by the following method :**

A mixture of gas in liquid can be separated by heating. Dissolved gas escapes from the liquid on heating.

Drinking water contains air dissolved in it. When it is boiled, air escapes and so the boiled water becomes tasteless.

**Chromatography :** This is one of the latest techniques to separate the coloured components of a mixture when all the components are very similar in their properties.

**Example :** Components of ink are separated by this method. Ink is a mixture of different dyes, which are separated by chromatography because some of the dyes are less soluble and some are more soluble in a solvent.

The name "chromatography" means colour writing. It is named so, because earlier it was used to separate mixtures containing coloured components only but these days this technique is applied to colourless substances too.

The process of separating different dissolved constituents of a mixture by their absorption on an appropriate material is called chromatography.

The method is based on the difference in rates of absorption of different components on the surface of a suitable adsorbent.

Common adsorbents used are filter paper, silica gel etc.

Common solvents used are water, ethyl alcohol, acetic acid etc.

## Principle involved in chromatography

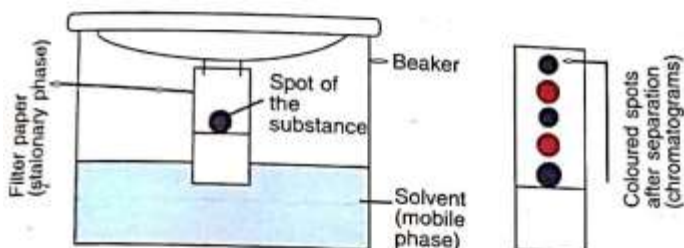
Chromatography separates the components of a mixture on the basis of differences between two phases, one of which is stationary while the other is mobile.

The simplest type of chromatography is "Paper chromatography".

In this method a special type of paper called chromatographic paper or ordinary filter paper is taken. A line is drawn with the pencil near the bottom edge of the paper. A drop of the mixture is placed on the filter paper above this line. The paper is then dipped in a solvent, taken in a beaker, so that the line drawn on the paper is above the level of the solvent.

The filter paper acts as “stationary phase” while the solvent act as “mobile phase”.

As the solvent rises on the paper it take alongwith it the drop of the substances. The component of the drop which is more soluble rises faster and we see various spots on the filter paper each indicating a component of the mixture. The paper is then removed from the solvent and dried.



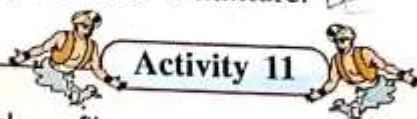
**Fig. 3.11 Paper chromatography**

### Advantages of chromatography

- A very small quantity of the substance can be separated.
- Components with very similar physical and chemical properties can be separated.

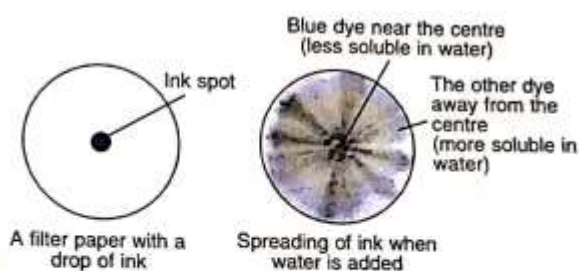


- It identifies the different constituents of a mixture.
- It also helps in quantitative estimation of components of a mixture.



### Activity 11

Take a filter paper. Put a drop of ink on the centre of the paper and then add some water into it. You will observe that the blot of ink spreads out into different coloured rings. Each ring corresponds to a dye. The more soluble dye moves farthest while less soluble remains near the centre.



**Fig. 3.12**

Chemists often use this technique for purity and doctors use it for pathological tests.

### Home assignment for 05/05/2020 (Tuesday):

- Q1. How will you separate a mixture of common salt, chalk powder and powdered camphor?
- Q2. What is chromatography? Why it is named so?
- Q3. On what principle is the method based?
- Q4. What do mean by stationary phase and mobile phase in chromatography?
- Q5. Describe by which process water can be squeeze out from wet clothes?