

East Point School
Study Notes
Topic: A Truly Beautiful Mind

Class: - IX (2021-22)

Subject: English

Date: 20/08/2021

INTRODUCTION

Albert Einstein was one of the greatest scientists in the world. This lesson throws a light on his life and his works in the field of science and world politics. He was born on March 14, 1879, in the German city of Ulm. He was a normal looking child. But he had some deficiencies as a child. He began to speak very late and when he spoke, he repeated every word twice. His playmates made fun of him. His parents were not even so careful about him. But from his childhood, he had a big interest in science. He was good at studies. He always got good marks but he did not like the strict discipline of the school. So, he left the school for good. He agreed to study in Switzerland which has a liberal atmosphere. There he got interested in a fellow student Mileva Mark. Later he married her. He worked on different scientific theories. He was awarded the Nobel Prize for Physics in 1921. He was showered with honours and invitations from all over the world. When America dropped a bomb over Hiroshima and Nagasaki, he was deeply shaken. He proposed for the formation of the world government. He worked for the development of peace and democracy in the world until he died in 1955. He is remembered even today as a 'world citizen'.

THEME

This brief sketch of the life and achievements of the great genius Albert Einstein, reveals that extraordinary personalities with exceptional intellectual capabilities are not necessarily noticed during the early years. The author focuses on two aspects of Einstein's personality – as a scientist and as a human being. As a scientist, his marvellous discoveries created a revolution and as a human being, he worked towards peace and democracy in the world.

TITLE

The title of this biographical feature "A Truly Beautiful Mind" is very appropriate as it encompasses both the intelligence of Einstein and his humanistic tendencies. As a genius, he made an immense contribution to the world of science by presenting startling theories and as a human being, he preached for peace and democracy. Thus, his mind was really beautiful and teeming with new ideas and human concerns.

MESSAGE

This account of the life and personality of the famous scientist Einstein gives us the message that a beautiful mind possesses not only innovative ideas but also makes sincere efforts to use these ideas for the well being of mankind. Science should be solely devoted to the promotion of worldwide peace and prosperity. If used for destructive purposes, the scientific inventions and discoveries can wreak havoc on the earth.

CHARACTER

Albert Einstein

Albert Einstein has been portrayed as a great intellectual genius and a peace-loving human being with liberal ideas. As an intellectual, he created a revolution in the field of science, particularly physics. As a human being, he spread the message of love, liberty and peace. During his childhood, Einstein did not show any traces of intelligence. He was a slow child who started speaking very late. Even his mother considered him to be a freak and the headmaster of his school had such a negative opinion about him that he stated that Einstein would never achieve success in any career that he chose. However, Einstein proved to be a good student as he had a keen interest and skills in mathematics and physics and he also scored in all other subjects.

Einstein's love for freedom dated back to his school days. He felt suffocated in his school in a

liberal environment. He left Germany for America when the dictatorial Nazis took over because he was averse to every type of authority.

Though a great scientist, Einstein was a lover of arts and literature. He was against philistinism (ignorance of or hostility towards art and culture). He fell in love with a Serbian girl Mileva Maric because she held similar ideas about art. As a scientist, his theories of relativity and gravity created a stir in the world of science. He was awarded the Nobel Prize and got numerous other honours.

Einstein was a great lover of mankind. He wanted a world government. He was perturbed by the destructive use of science when the atom bomb was dropped over Hiroshima and Nagasaki. He spent the rest of his life spreading the message of peace and democracy. Thus, Einstein's traits as a scientific genius and a peace-loving human being with a deep love for freedom are amply highlighted in this biographical account.

SUMMARY

Albert Einstein was born on March 14, 1879, in the German city of Ulm. He was a normal looking child. His mother thought him an abnormal child. He began to speak very late. And when he spoke he repeated each word twice. The other children made fun of him. So he used to play all alone. He loved to play with mechanical toys. When he was six years old, he learnt to play the violin.

Albert Einstein went to high school in Munich. He was a good student. He scored good marks in all subjects. But he did not like the strict discipline of the school. He often got clashed with his teachers. So he left the school for good.

After long discussions, he agreed to continue his study in Switzerland. He was highly gifted in mathematics and interested in physics. After passing high school, he joined Zurich University. There he got interested in a fellow student Mileva Marie. He found an ally in her. She was a young Serb. She was very intelligent. They fell in love and later they got married in 1903.

Albert graduated in 1900, at the age of 21. He was unemployed. He worked as a teaching assistant. In 1902, he got the job of a technical expert in a patent office in Bern. His job was to assess other people's discoveries. He was secretly developing his own ideas. He published his famous paper in 1905 on 'Special Theory of Relativity', according to which time and distance are not absolute. Einstein's new personal chapter coincided with his rise to world fame. In 1915, he had published his 'General Theory of Relativity', which provided a new interpretation of gravity. Einstein has correctly calculated in advance the extent to which the light from fixed stars would be deflected through the sun's gravitational field. Einstein received the Nobel Prize for Physics in 1921. He was showered with honours and invitations from all over the world and lauded by the press.

When the Nazis came to power in Germany in 1933, Einstein emigrated to the United States. Five years later, the discovery of nuclear fission in Berlin had American physicists in an uproar. At the urging of a colleague, Einstein wrote a letter to the American president Franklin D. Roosevelt, on August 2, 1939, in which he warned against the danger of atom bombs. His words influenced Roosevelt. The Americans developed the atomic bomb in a secret project of their own and dropped it on the Japanese cities of Hiroshima and Nagasaki in August 1945.

Einstein was deeply shaken by the extent of the destruction. This time he wrote a long letter to the United Nations. In it, he proposed the formation of a world government. Einstein got ever more involved in politics using his popularity to campaign for peace and democracy. When Einstein died in 1955 at the age of 76, he was celebrated as a visionary and world citizen as much as a scientific genius.

ईस्ट पॉइंट स्कूल
कक्षा - 9/ पाठ्य सामाग्री -13
विषय: अर्थ के आधार पर वाक्य भेद
(अध्यापिका: सुजाता परमार)

अर्थ के आधार पर वाक्य भेद

अर्थ के आधार पर वाक्य आठ प्रकार के होते हैं

1. विधानवाचक वाक्य 2. निषेधवाचक वाक्य 3. प्रश्नवाचक वाक्य 4. आज्ञावाचक वाक्य
5. संदेहवाचक वाक्य 6. संकेतवाचक वाक्य 7. इच्छावाचक वाक्य 8. विस्मयादिवाचक वाक्य।

1. विधानवाचक वाक्य- जिस वाक्य से किसी काम के होने या करने का सामान्य रूप से बोध होता है, उसे विधानवाचक वाक्य कहते हैं; जैसे-

- विद्यार्थी पढ़ रहा है।
- सूरज चमक रहा है।
- बादल गरज रहे हैं।
- अध्यापिका पढ़ा रही हैं।
- लोग घूम रहे हैं।

* विधानवाचक वाक्य को विधिवाचक, विधानार्थक अथवा विधिबोधक वाक्य भी कहा जाता है।

2. निषेधवाचक वाक्य- जिस वाक्य से कार्य के न होने का बोध होता है, उसे निषेधवाचक वाक्य कहते हैं; जैसे- वाक्य कहते हैं; जैसे-

- मैं कल विद्यालय नहीं जाऊँगा।
- यहाँ मत बैठो।
- आज बाजार नहीं खुलेगा।
- गाड़ी यहाँ नहीं लगेगी।
- बच्चे परीक्षा नहीं देंगे।

3. प्रश्नवाचक वाक्य- जिस वाक्य से किसी प्रकार के प्रश्न पूछने का बोध होता है, उसे प्रश्नवाचक वाक्य कहते हैं; जैसे-

- स्वाति तुम कहीं जा रही हो?
- यह किसकी पुस्तक है?
- क्या आज बैंक खुला है?
- भोजन किसने नहीं किया?
- यह बच्चा किसका है?

4. आज्ञावाचक वाक्य- जिस वाक्य से आज्ञा, उपदेश, प्रार्थना, अनुमति आदि का बोध होता है, उसे आज्ञावाचक वाक्य कहते हैं; जैसे-

- विद्यालय समय पर पहुँचना चाहिए। (उपदेश)
- एक गिलास पानी लाओ। (आज्ञा)
- मुझे अब चलना चाहिए। (अनुमति)
- मुझे एक दिन का अवकाश दे दीजिए। (प्रार्थना)
- चलो, सब अपनी-अपनी पुस्तक खोलो। (आज्ञा)

5. **संदेहवाचक वाक्य**-जिस वाक्य से किसी कार्य के होने में संदेह का बोध होता है, उसे संदेहवाचक वाक्य कहते हैं; जैसे-

- शायद कल मैं न आऊँ।
- वर्षा होने की संभावना है।
- हो सकता है, मैं घूमने चला जाऊँ।
- शायद मेरी लॉटरी निकल आए।
- पल्लवी संभवतः लौट आए।

6. **संकेतवाचक वाक्य**- जिस वाक्य में एक बात या काम का होना दूसरी बात या काम के होने पर निर्भर करता है, उसे संकेतवाचक वाक्य कहते हैं; जैसे-

- यदि सावधानी बरती जाए, तो दुर्घटना रोकी जा सकती है।
- परिश्रम किया होता, तो सफलता अवश्य मिलती।
- यदि खान-पान पर ध्यान दोगे, तो स्वस्थ रहोगे।
- यदि वर्षा होगी, तो फसल अच्छी होगी।

7. **इच्छावाचक वाक्य**- जिस वाक्य से इच्छा, आशीर्वाद, शुभकामना आदि का बोध होता है, उसे इच्छावाचक वाक्य कहते हैं; जैसे-

- विजयी भव!
- काश! मैं एवरेस्ट छू पाता।
- ईश्वर तुम्हें प्रसन्न रखे।
- नववर्ष की हार्दिक शुभकामनाएँ।
- ईश्वर तुम्हें सद्बुद्धि प्रदान करे।

8. **विस्मयादिवाचक वाक्य**- जिस वाक्य से विस्मय, हर्ष, शोक, घृणा, प्रशंसा आदि का बोध होता है, उसे विस्मयादिवाचक वाक्य कहते हैं; जैसे-

- वाह! कितना सुंदर दृश्य है।
- ओह! बहुत बुरा हुआ।
- छि! कितनी बढ़बू आ रही है।
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अभ्यास कार्य

1. निम्नलिखित वाक्यों का अर्थ के आधार पर वाक्य-भेद लिखिए;

1. काश! मैं अक्ल आ पाता।
2. ईश्वर तुम्हें दीर्घायु करे।
3. कल तुम कहाँ गए थे?
4. आज मैं विद्यालय नहीं गया।
5. आज गाँधी जयंती की छुट्टी है।

2. निम्नलिखित वाक्यों का अर्थ के आधार पर निर्देशानुसार वाक्य परिवर्तित कीजिए;

1. राधा ने भोजन नहीं किया है। (प्रश्नवाचक)
2. वह कक्षा में अक्ल आया है। (विस्मयादिवाचक)
3. बादल गरज रहे हैं। (निषेधवाचक)
4. वर्षा होने पर फसल अच्छी होती है। (संकेतवाचक)

3। निम्नलिखित वाक्यों में से प्रधान उपवाक्य छाँटिए:

1. यह सभी जानते हैं कि गाँधी जी राष्ट्रपिता थे।

(क) सभी जानते हैं

(ग) यह सभी जानते हैं

(ख) गाँधी जी राष्ट्रपिता थे

(घ) राष्ट्रपिता थे

2. जब मैं होस्टल में रहती थी, तो अपने कपड़े स्वयं धोती थी।

(क) तो अपने कपड़े स्वयं धोती थी

(ग) जब मैं होस्टल में रहती थी

(ख) अपने कपड़े स्वयं धोती थी

(घ) जब मैं होस्टल में रहती थी तो

3. जब मुझे मदद की ज़रूरत पड़ी, तो रोहन ने मेरी मदद की।

(क) मुझे मदद की ज़रूरत पड़ी

(ग) जब मुझे मदद की ज़रूरत पड़ी तो

(ख) जब मुझे मदद की ज़रूरत पड़ी

(घ) तो रोहन ने मेरी मदद की

4. जो धन- मैंने मेहनत से कमाया था, वह सब चोरी हो गया।

(क) जो धन मैंने मेहनत से कमाया

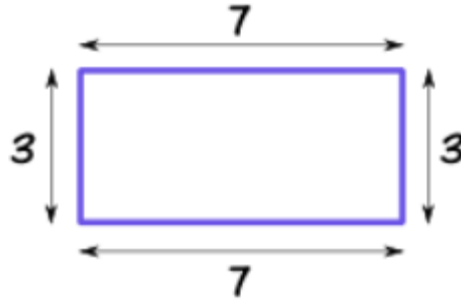
(ग) धन मैंने मेहनत से कमाया था

(ख) वह सब चोरी हो गया

(घ) सब चोरी हो गया

- **Notes on Heron's Formula**
Perimeter

It is the outside boundary of any closed shape. To find the perimeter we need to add all the sides of the given shape.



The perimeter of a rectangle is the sum of its all sides. Its unit is same as of its length.

$$\text{Perimeter} = 3 + 7 + 3 + 7 \text{ cm}$$

$$\text{Perimeter of rectangle} = 20 \text{ cm}$$

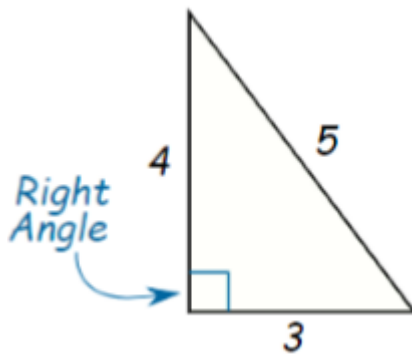
Area

Area of any closed figure is the surface enclosed by the perimeter. Its unit is square of the unit of the length.

Area of a triangle

The general formula to find the area of a triangle, if the height is given, is

$$\text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{height}$$

Area of a Right Angled Triangle

If we have to find the area of a right-angled triangle then we can use the above formula directly by taking the two sides having the right angle one as the base and one as height.

$$\text{Here base} = 3 \text{ cm and height} = 4 \text{ cm}$$

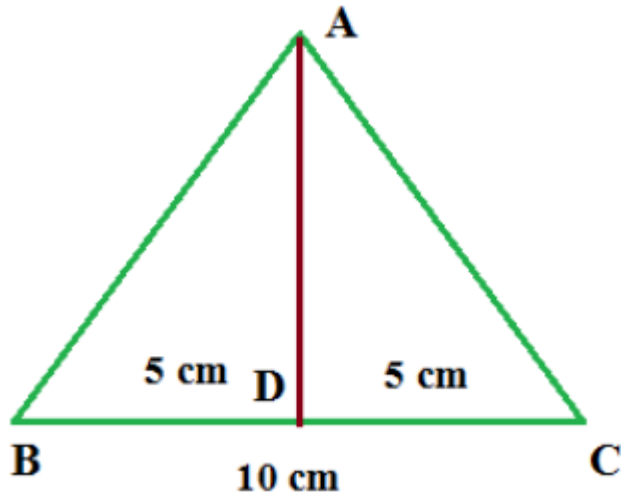
$$\begin{aligned} \text{Area of triangle} &= \frac{1}{2} \times 3 \times 4 \\ &= 6 \text{ cm}^2 \end{aligned}$$

Remark: If you take base as 4 cm and height as 3 cm then also the area of the triangle will remain the same.

Area of Equilateral Triangle

If all the three sides are equal then it is said to be an equilateral triangle.

In the equilateral triangle, first, we need to find the height by making the median of the triangle.



Here the equilateral triangle has three equal

sides i.e. 10 cm.

If we take the midpoint of BC then it will divide the triangle into two right angle triangle.

Now we can use the Pythagoras theorem to find the height of the triangle.

$$AB^2 = AD^2 + BD^2$$

$$(10)^2 = AD^2 + (5)^2$$

$$AD^2 = (10)^2 - (5)^2$$

$$AD^2 = 100 - 25 = 75$$

$$AD = 5\sqrt{3}$$

Now we can find the area of triangle by

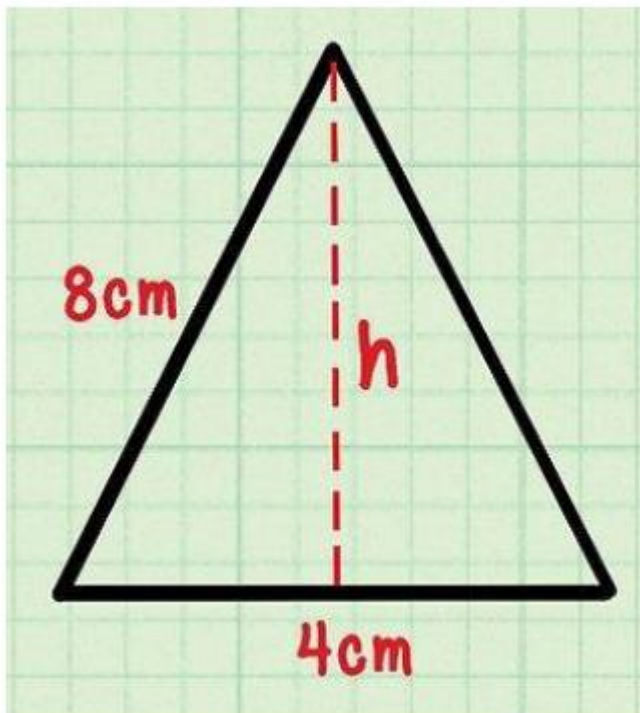
$$\text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$= \frac{1}{2} \times 10 \times 5\sqrt{3}$$

$$25\sqrt{3} \text{ cm}^2$$

Area of Isosceles Triangle

In the isosceles triangle also we need to find the height of the triangle then calculate the area of the triangle.



Here,

$$\begin{aligned}\text{Height} &= \sqrt{8^2 - 2^2} \\ &= \sqrt{64 - 4} \\ &= \sqrt{60} = 2\sqrt{15}\end{aligned}$$

$$\begin{aligned}\text{Area of triangle} &= \frac{1}{2} \times \text{base} \times \text{height} \\ &= \frac{1}{2} \times 4 \times 2\sqrt{15} \\ &= 4\sqrt{15} \text{ cm}^2\end{aligned}$$

Area of a Triangle — by Heron's Formula

The formula of area of a triangle is given by heron and it is also called **Hero's Formula**.

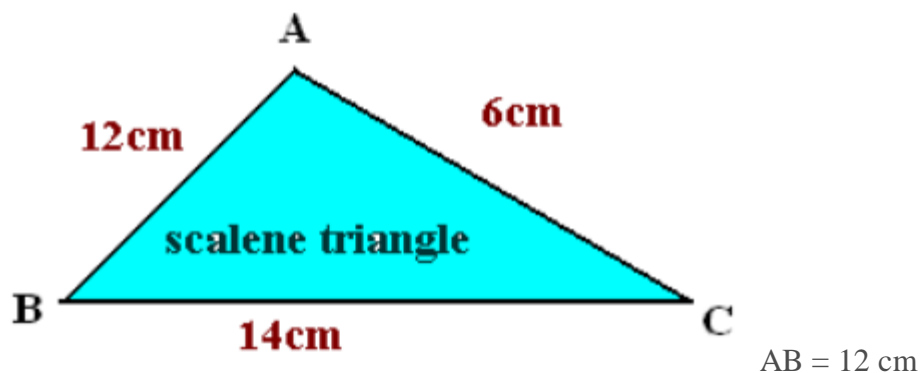
$$\text{Area of triangle} = \sqrt{s(s - a)(s - b)(s - c)}$$

where a, b and c are the sides of the triangle and s is the semiperimeter

$$s = \frac{a + b + c}{2}$$

Generally, this formula is used when the height of the triangle is not possible to find or you can say if the triangle is a scalene triangle.

Here the sides of triangle are



BC = 14 cm

AC = 6 cm

$$s = \frac{14 + 12 + 6}{2} = \frac{32}{2} = 16 \text{ cm}$$

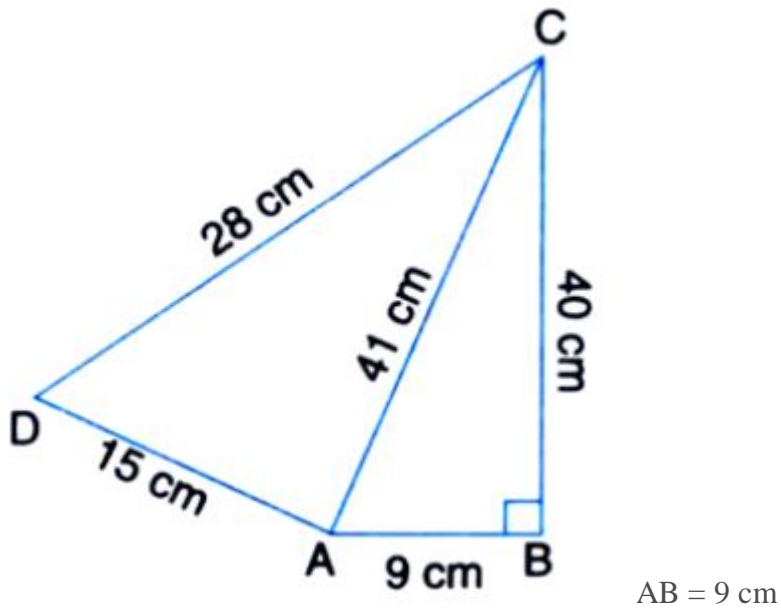
$$\begin{aligned}\text{Area of triangle} &= \sqrt{16(16 - 12)(16 - 14)(16 - 6)} \\ &= \sqrt{16(4)(2)(10)} \\ &= \sqrt{1280} \\ &= 35.77 \text{ cm}^2.\end{aligned}$$

Application of Heron's Formula in Finding Areas of Quadrilaterals

If we know the sides and one diagonal of the quadrilateral then we can find its area by using the Heron's formula.

Find the area of the quadrilateral if its sides and the diagonal are given as follows.

Given, the sides of the quadrilateral



$$BC = 40 \text{ cm}$$

$$DC = 28 \text{ cm}$$

$$AD = 15 \text{ cm}$$

$$\text{Diagonal is } AC = 41 \text{ cm}$$

Here, $\triangle ABC$ is a right angle triangle, so its area will be

$$\begin{aligned}\text{Area of triangle} &= \frac{1}{2} \times \text{base} \times \text{height} \\ &= \frac{1}{2} \times 9 \times 40 \\ &= 180 \text{ cm}^2\end{aligned}$$

$$\text{Area of } \Delta ADC = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\begin{aligned}s &= \frac{a+b+c}{2} \\ &= \frac{15+28+41}{2} = \frac{84}{2} = 42\end{aligned}$$

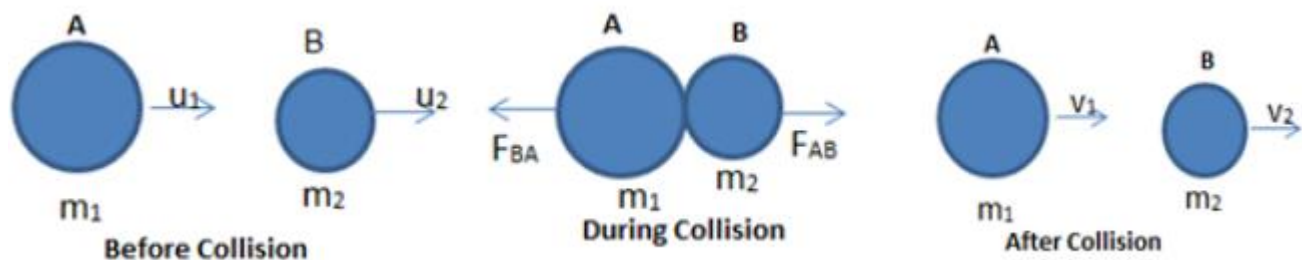
$$\begin{aligned}\text{Area of } \Delta ADC &= \sqrt{42(42-15)(42-28)(42-41)} \\ &= \sqrt{42(27)(14)(1)} \\ &= 126 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{Area of Quadrilateral ABCD} &= \text{Area of } \Delta ABC + \text{Area of } \Delta ADC \\ &= 180 \text{ cm}^2 + 126 \text{ cm}^2 \\ &= 306 \text{ cm}^2\end{aligned}$$

PHYSICS

Conservation of Momentum

As per the law of conservation of momentum, the sum of momenta of two objects before the collision and after collision remains the same given that no external unbalanced force acts upon them. In another way, collision conserves the total momentum of two objects.



Consider the figure given above. Two balls A and B having a certain initial velocities collide with each other. Conditions before the collision-

- There is no unbalanced force acting upon them
- The initial velocity of A is greater than initial velocity of B

The figure below explains how the momentum of the balls is conserved after the collision.

Fig.18 – Conservation of Momentum

Facts about Conservation Laws

- They are considered as the fundamental laws in physics.
- They are based on observations and experiments.

The momentum of ball A before collision = $m_A u_A$	According to third law of motion
The momentum of ball A after collision = $m_A v_A$	$F_{AB} = - F_{BA}$ [-ve sign shows opposite force]
The momentum of ball B before collision = $m_B u_B$	$m_A(v_A - u_A)/t = - m_B(v_B - u_B)/t$
The momentum of ball B after collision = $m_B v_B$	$m_A v_A - m_A u_A = - m_B v_B + m_B u_B$
Rate of change of momentum of ball A = $m_A(v_A - u_A)/t$	$m_A v_A + m_B v_B = m_A u_A + m_B u_B$
= Force of action F_{AB}	or
Rate of change of momentum of ball B = $m_B(v_B - u_B)/t$	$m_A u_A + m_B u_B = m_A v_A + m_B v_B$
= Force of reaction F_{BA}	Momentum before collision = Momentum after collision

- They cannot be proved but can be verified or disproved with the help of experiments.
- A single experiment is enough to disprove a law, while a single experiment is not enough to prove the same.
- It requires a large number of experiments to prove the law.
- The law of conservation of momentum was formulated 300 years ago.
- There is no single situation present until now that disproves this law.
- Other laws of conservation are – law of conservation of energy, the law of conservation of angular momentum, the law of conservation of charge.

CHEMISTRY

ATOMS AND MOLECULES

NOTES

CLASS IX

20/08/2021

Atom

Atoms are the smallest particles of an element which can take part in a chemical reaction.
Size of an atom: Atomic radius is measured in nanometres.

$$1 \text{ nm} = \frac{1}{10^9} \text{ m}$$

$$\therefore 1 \text{ m} = 10^9 \text{ nm}$$

Atomic radii of hydrogen atom = $1 \times 10^{-10} \text{ m}$.

Symbols of atoms:

(a) Symbols for some elements were proposed by Dalton but they were rejected later.

(b) Symbols of some common elements:

Name of the element	Latin name	Symbol
Hydrogen	-	H
Helium	-	He
Carbon	-	C
Copper	Cuprum	Cu
Cobalt		Co
Chlorine		Cl
Cadmium		Cd
Boron		B
Barium		Ba
Bromine		Br
Bismuth		Bi
Sodium	Natrium	Na
Potassium	Kalium	K
Iron	Ferrum	Fe
Gold	Aurum	Au
Silver	Argentum	Ag
Mercury	Hydragyrum	Hg

Molecule

It is the smallest particle of an element or a compound which can exist independently.

- Molecules of an element constitute the same type of atoms.
- Molecules may be monoatomic, diatomic or polyatomic.
- Molecules of compounds join together in definite proportions and constitute a different type of atoms.

Atomicity

The number of atoms constituting a Molecule is known as its atomicity.

Name of the element	Atomicity	Molecules formula
Helium	Monoatomic	He
Neon	”	Ne
Argon	”	Ar
Sodium	”	Na
Iron	”	Fe
Aluminium	”	Al
Hydrogen	Di-atomic	H ₂
Oxygen	”	O ₂
Chlorine	”	Cl ₂
Nitrogen	”	N ₂
Phosphorus	Polyatomic (Tetra)	P ₄
Sulphur	Polyatomic (Octa)	S ₈

BIOLOGY

Cell - The Fundamental Unit of Life : Chapter Notes

The body of all organisms is made up of very small units called cell.

A cell is capable of independent existence and can carry out all the functions which are necessary for a living being. Unicellular organisms are capable of independent existence which shows a

cell's capability to exist independently like in amoeba. Due to this, a cell is called the fundamental, structural and functional unit of living organisms and basic unit of life.

Discovery of Cell and Cell Theory

Cell was first discovered by Robert Hooke in 1665. He observed that just like honeycomb, organisms are also composed of small compartments. He named these compartments as Cells.

Cell theory state that:

- All living organisms are composed of cells.
- Cell is the fundamental unit of life.
- All new cells come from pre-existing cells.

Shape and Size of Cells

Cells vary in shape and size. They may be oval, spherical, rectangular, spindle shaped, or totally irregular like the nerve cell. The Size of cell also varies in different animals and plants. Most of the cells are microscopic in size like red blood cells (RBC) while some cells are fairly large like nerve cells. Average size of cells varies from 0.5 to 20 μ .

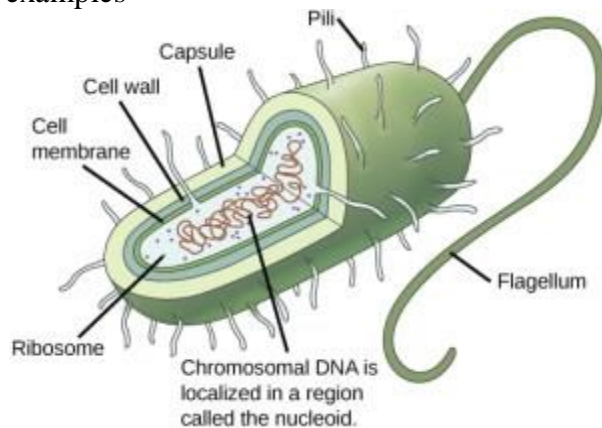
Types of Cells:

The cells can be categorized in two types :

1. Prokaryotic Cell
2. Eukaryotic Cell

Prokaryotic cell

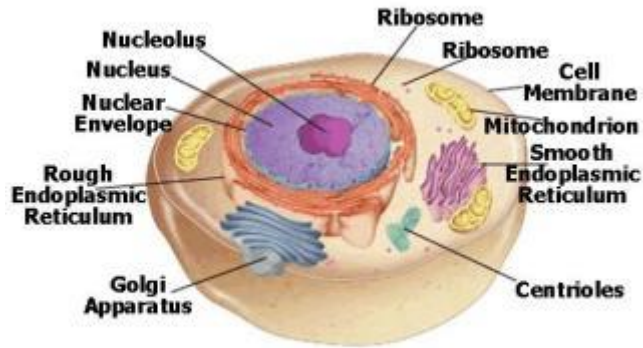
In some organisms, DNA and RNA (genetic substances) are bound by a membrane; this is termed as true nucleus. Prokaryotic cells are cells in which true nucleus is absent. They are primitive and incomplete cells. Prokaryotes are always unicellular organisms. Bacteria, blue green algae are the examples of prokaryotes.



Eukaryotic Cell

Eukaryotic cells are cells in which true nucleus is present. They are advanced and complete cells. Eukaryotes include all living organisms (both unicellular and multi-cellular organisms) except

bacteria and blue green algae.



Cell Structures

Cell is composed of some basic structures:

Plasma Membrane: Plasma membrane is the covering of the cell that separates the contents of the cell from its external environment. It is a living part of the cell. It is very thin, delicate, elastic and selectively permeable membrane. Plasma membrane is composed of lipid and protein.

Function:

As it is selectively permeable membrane, it allows the flow of limited substances in and out of the cell.

Cell wall: Cell wall is non-living, thick and freely permeable covering made up of cellulose. Cell wall is available in eukaryotic plant cells and in prokaryotic cells.

Functions:

- It determines the shape of the cell.
- It protects the plasma membrane.
- It prevents desiccation or dryness in cells.
- It helps in the transport of various substances in and out of the cell.

Protoplasm: It is a jelly-like, viscous, colourless semi-fluid substance in various cell organelles present in colloidal form.

Protoplasm consists two parts: **cytoplasm** and **nucleoplasm**.

Cytoplasm is that part of protoplasm which surrounds the nucleus.

Nucleoplasm is that part of protoplasm which is located inside the nucleus.

Functions:

- Protoplasm acts as a store of vital chemicals like amino acids, proteins, sugars etc.
- It is the site of some metabolic reactions.

Golgi Body: Golgi body are also called Golgi Complex/ Golgi Apparatus. It is first discovered by Camillo Golgi. It consists of membrane bound structures arranged parallel to each other.

Functions:

- Golgi bodies store, modify, package and dispatch the substances.
- They help in the formation of lysosomes.

Ribosomes : These are extremely small, dense and round bodies interspersed in the cytoplasm. Ribosomes are made up of ribonucleic acid(RNA) and proteins. In prokaryotic cell, ribosomes are of 70 types. In eukaryotic cells, ribosomes are of 80 types. Ribosome is responsible for protein synthesis.

Mitochondria: Mitochondria are small rod-shaped organelles. It is a double membrane structure. Outer membrane is smooth whereas inner membrane is projected into numerous finger-like structures; called cristae. Mitochondria contain their own DNA and ribosomes.

Functions:

- They provide energy for the vital activities of living cells.
- They store energy releases during reactions, in the form of ATP (Energy currency of the cell). Therefore it is also called **power house of the cell**.

Centrosome and Centrioles:

Centrosome is found only in eukaryotic animal cells. It is not bounded by any membrane but consists of centrioles. Centrioles are hollow cylindrical structures arranged at right angle to each other and made up of microtubules.

Centrioles help in cell division and also help in the formation of cilia and flagella.

Plastids : Plastids are present in most of the plant cells and absent in animals cells. They are usually spherical or discoidal in shaped. These are double membrane bound organelles. Plastids also have its own DNA and ribosomes.

Plastids are of three types:

1. **Chloroplasts:** Green coloured plastids containing chlorophyll. Chloroplasts manufacture food by the process of photosynthesis.
2. **Chromoplasts:** Colourful plastids. They provide colour to flowers and fruits.
3. **Leucoplasts:** Colourless plastids. They help in the storage of various substances like starch, proteins and fats.

Lysosomes : Lysosomes are formed by golgi bodies. They are small, spherical, sac like structures which contain several digestive enzymes enclosed in a membrane. They are found in eukaryotic cells mostly in animals.

Functions:

- Lysosomes help in digestion of foreign substances and worn-out cell organelles.
- They provide protection against bacteria and virus.
- They help to keep the cell clean.
- During the disturbance in cellular metabolism, for eg; when the gets damaged, lysosomes may burst and the enzymes digest their own cell. Therefore, lysosomes are also known as **suicide bags of a cell**.

Vacuoles : Vacuoles are liquid / solid filled in a membrane. In plant cells, vacuoles are large and permanent. In animal cells, vacuoles are small in size and temporary. In mature plant cell, it occupies 90% space of cell volume. Due to its size, other organelles including nucleus shift towards plasma membrane.

Endoplasmic Reticulum : It is a network of tube like structures from nuclear membrane to plasma membrane. It is absent in prokaryotic cells and matured RBCs of mammals.

There are two types of endoplasmic reticulum:

1. **Rough ER :** In rough endoplasmic reticulum, ribosomes are present on the surface.
2. **Smooth ER :** Ribosomes are absent.

Functions :

- It gives internal support to cell.
- It helps in transport of various substances from nuclear membrane to plasma membrane or vice versa.
- It helps in the formation of plasma membrane and golgi bodies.
- Rough ER helps in synthesis and transportation of proteins.
- Smooth ER helps in synthesis and transport of lipids.

Nucleus : Nucleus is dense and spherical organelle. Nucleus is bounded by two membranes, both forming nuclear envelope. Nuclear envelope contains many pores known as nuclear pores. The fluid which is inside the nucleus is called nucleoplasm. Nucleus contains chromosomes and chromosomes contain genes which are the carriers of genetic information.

Functions:

- Nucleus controls all the metabolic activities of cell.
- Nucleus is the storehouse of genes. Without nucleus, cell can neither survive nor shows specialized activities.

Transport of Substances through Plasma Membrane

Substance can pass through plasma membrane by two processes: **Diffusion** and **Osmosis**.

Diffusion: It is the process of movement of substances from its high concentration to low concentration.

During the respiration, carbon dioxide is given out a waste product and accumulates in higher concentration inside the cell compared to outside. Due to the difference in concentration inside and outside the cell, CO₂ start moving out of the cell.

Osmosis : It is the process of movement of water from its high concentration to its low concentration through semi-permeable membrane.

- If the medium surrounding the cell has higher water concentration than in cell, cell will gain water by osmosis. Such dilute solution is called **Hypotonic solution**. Though water molecules pass across plasma membrane in both sides but more water will enter inside the cell. The cell is therefore, swell up and increase in volume. This process is called **Endosmosis**.
- If the medium surrounding the cell is exactly the same water concentration as inside the cell, there will no net movement of water across membrane resulting in no change in size of cell. Such solution is called **Isotonic solution**.
- If the medium surrounding the cell has lower water concentration than inside the cell, the cell will lose water through osmosis. Such concentrated solution is called **Hypertonic solution**. The cell will therefore, shrink and reduce in volume. This process is known as **Exosmosis**.

HISTORY

Chapter 3 Nazism and Rise of Hitler

Competency based Questions

- 1) Go through the photos /pictures and prepare a theme-based story.

Stage 3: **Annihilation** 1941 onwards:

YOU HAVE NO RIGHT TO LIVE



Fig. 18 – Killed while trying to escape. The concentration camps were enclosed with live wires.



Fig. 19 – Piles of clothes outside the gas chamber.

Jews from Jewish houses, concentration camps and ghettos from different parts of Europe were brought to death factories by goods trains. In Poland and elsewhere in the east, most notably Belzec, Auschwitz, Sobibor, Treblinka, Chelmno and Majdanek, they were charred in gas chambers. Mass killings took place within minutes with scientific precision.



Fig. 20 – A Concentration Camp.



Fig. 21 – A concentration camp. A camera can make a death camp look beautiful.



Fig. 22 – Shoes taken away from prisoners before the 'Final Solution'.

2) Explain your emotional feelings after studying these photos.

Q-3-How far can the German military aggression during the interwar period be held responsible for the outbreak of the world war-2? Critically examine.

Q-4-The "Treaty of Versailles" signed as a treaty of peace, ironically, set the stage for another great war. Examine.

Q-5-One of the primary causes of World War II was the rise of Adolph Hitler in Germany. Examine the factors that led to his rise to prominence in Germany.

Q-6-Critically examine the main features of the Foreign Policy of the Nazi Germany.

Q-7-Enumerate the conditions conducive to rising of Nazism in Germany. Discuss the rise of Nazism and Hitler.

East Point School

Class-IX (2021-2022)

Social Science- Geography

Study Notes

Chapter- Climate

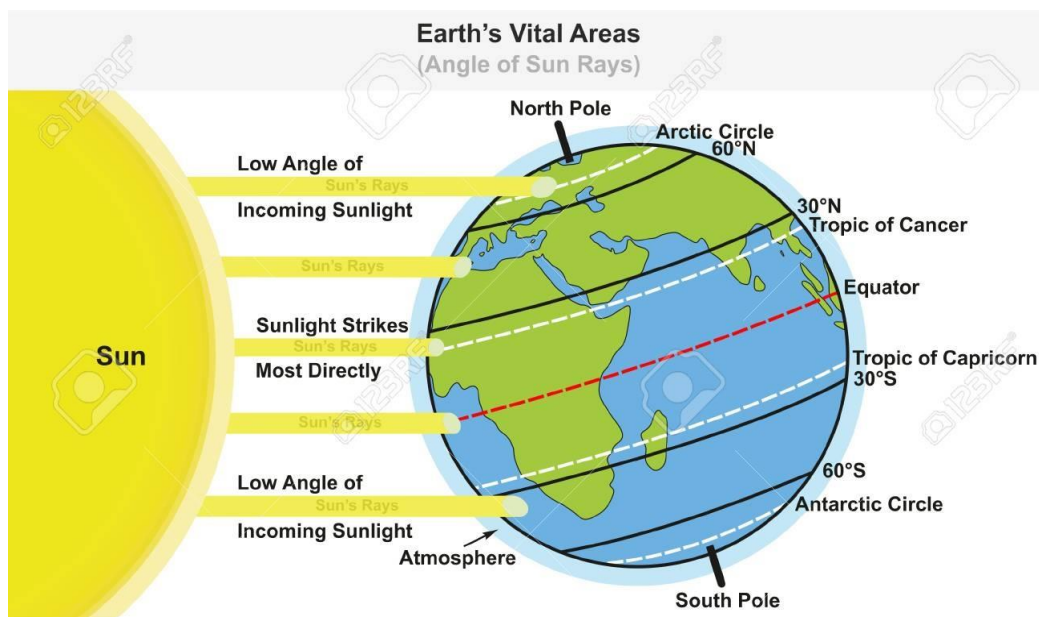
► **Climate** refers to the sum total of weather conditions and variations over a large area for a long period of time.

► **Weather** refers to the state of atmosphere over an area at any point of time.

► **‘Monsoon’** refers to seasonal reversal in the wind direction during a year.

There are various factors affecting climate of any place. They are :- Latitude, Altitude, Pressure and wind system, Distance from the sea , Ocean currents and Relief.

1. LATITUDE - Due to the curvature of the earth, the amount of solar energy received varies according to latitude. Lower latitudes receive more amount of solar insolation, higher latitudes receive low incidence of sunlight.

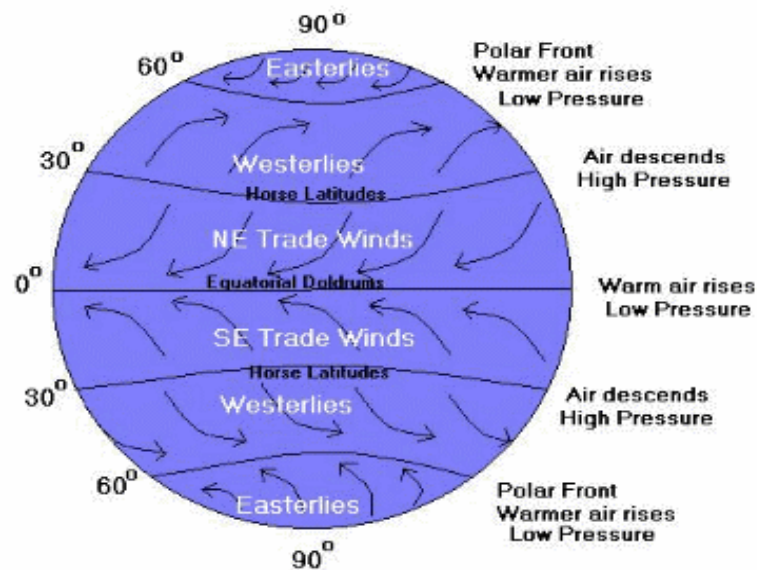


Half of country lying below Tropic of Cancer experiences tropical climate. All the area north of Tropic of Cancer lies in Sub-tropics. Thus, India experiences tropical as well as subtropical type of climate.

2. ALTITUDE – Altitude is distance above sea level. As one goes from the surface of the earth to higher altitudes, the atmosphere becomes less dense and temperature decreases. Therefore, places at higher altitudes have lower temperature than the places at lower altitude.

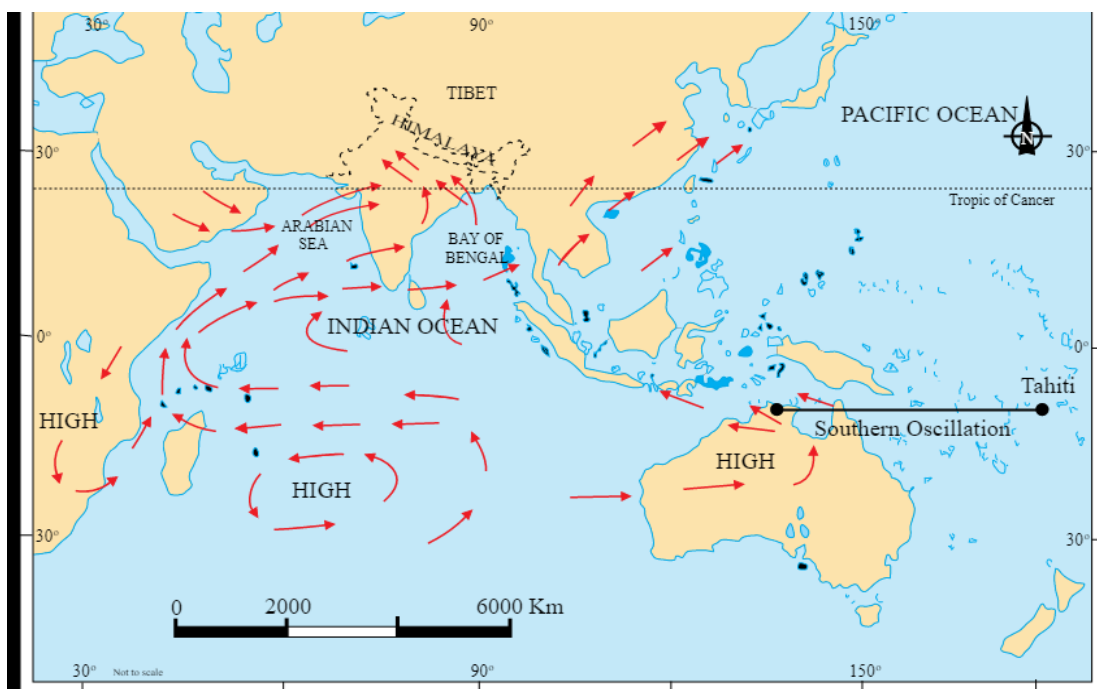
India has mountains to north which have an average height of about 6000 metres. Himalayas prevent cold winds from Central Asia from entering into subcontinent.

3. PRESSURE and WIND SYSTEM - The pressure and wind system of any area depend on the latitude and altitude of the place. As we all know that there exists an inverse relationship between temperature and pressure.



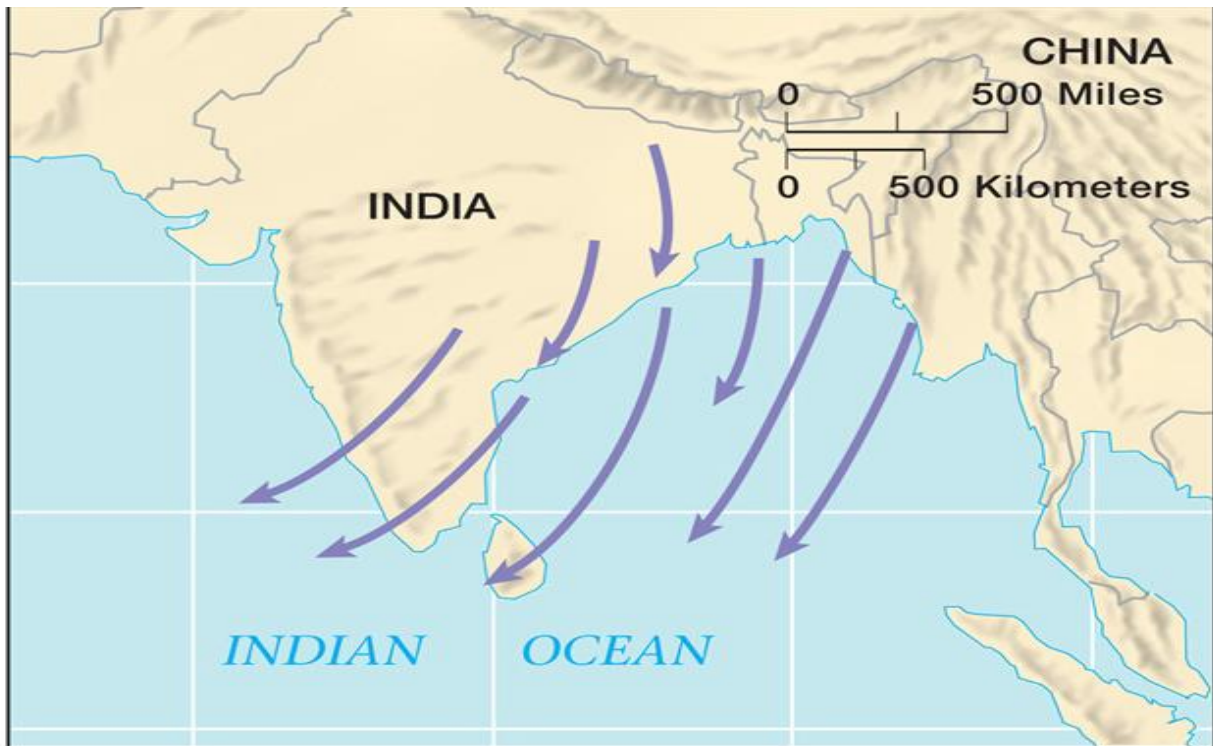
India lies in the region of north easterly winds. These winds originate from the subtropical high-pressure belt of the northern hemisphere. They blow southwards, get deflected to the right due to the **Coriolis Force**, and move towards the equatorial low-pressure area. Generally, these winds carry little moisture as they originate and blow over land.

► **In India during summer season a low-pressure area develops over interior Asia, as well as, over north-western India.** Air moves from the high-pressure area over the southern Indian Ocean. Low pressure cells attracts southeast trades across the equator & turns right towards the low-pressure areas over the Indian subcontinent. **These are known as the Southwest Monsoon winds.** These winds blow over the warm oceans, gather moisture and bring widespread rainfall over the mainland of India.



Summer Monsoon Winds

► During winter season there is a complete reversal in the direction of winds. **During winter, there is a high-pressure area north of the Himalayas.** Cold dry winds blow from this region to the low-pressure areas over the oceans to the south.



Winter

4. DISTANCE FROM SEA – Landmasses heat up more quickly than water bodies and also loses heat more quickly than water. So, in hot seasons, most especially at daytime, the sea or ocean remains cooler than the continent and therefore reduces the temperatures of adjacent lands.

As the distance from the sea increases, its moderating influence decreases and the people experience extreme weather conditions (continentality).

5. OCEAN CURRENTS - Ocean currents along with onshore winds affect the climate of the coastal areas. If onshore wind with cold current flows past any coastal area it will lead to cooling in that area.

6. RELIEF - It also plays a major role in determining the climate of a place. High mountains act as barriers for cold or hot winds; they may also cause precipitation if they are high enough and lie in the path of rain-bearing winds. The leeward side of mountains remains relatively dry.

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