

SUBJECT – SCIENCE

CLASS – VII

CHAPTER – 4, HEAT

1. What is temperature?

Temperature is the reliable measure of the hotness of an object.

2. What is thermometer?

Thermometer is a device which is used to measure the temperature.

3. What is the use of clinical thermometer?

Clinical thermometer is used to measure the temperature of human body.

4. What is the temperature range of a clinical thermometer?

In a clinical thermometer, temperature ranges from 35°C to 42°C .

5. What is the temperature range of a laboratory thermometer?

In a laboratory thermometer, temperature ranges from -10°C to 110°C .

6. What is the normal temperature of human body?

The normal temperature of human body is 37°C or 98.4°F .

7. What is the use of kink in a clinical thermometer?

In a clinical thermometer, kink prevents the falling of the mercury level on its own.

8. Describe the structure of a clinical thermometer?

- A clinical thermometer consists of a long, narrow, uniform glass tube having a bulb at one end which contains mercury.
- It has a scale which ranges from 35°C to 42°C .

9. Name the different types of thermometer.

Different types of thermometer are –

- Clinical thermometer
- Laboratory thermometer
- Digital thermometer
- Maximum - minimum thermometer

10. What are the units used to measure the temperature?

Units used to measure temperature are

- Degree Celsius ($^{\circ}\text{C}$)
- Degree Fahrenheit ($^{\circ}\text{F}$)
- Kelvin.

11. What is the use of maximum – minimum thermometer?

Maximum – minimum thermometer gives information about maximum and minimum temperature of the day (weather report).

12. Name the methods of transfer of heat.

- Conduction
- Convection
- Radiation

13. What are the problems associated with the use of mercury in thermometer?

Mercury is a toxic substance and its disposal is very difficult if a thermometer breaks. This is the main problem which is associated with the use of mercury in thermometer.

14. Define conduction.

Conduction – The process by which heat is transferred from the hotter end to the colder end of an object is known as conduction. In solids, generally, the heat is transferred by the process of conduction.

15. Define convection.

Convection – the method of transfer of heat by the movement of the hotter particle into a colder region is called convection. In liquids and gases, generally, the heat is transferred by the process of convection.

16. Define radiation.

Radiation – the method of transfer of heat without any medium is called radiation.

Example – from the sun the heat reaches to Earth's surface by radiation.

17. Will the heat transfer if the temperature of two objects is same?

No, the heat will not transfer if the temperature of two objects is same. Heat always flows from a hotter object to a colder object.

18. Why does the hand kept above the flame feel hotter than the hand kept on the sides of the flame?

Towards the top, the air gets heated by convection. Therefore, the hand above the flame feels hot. On the sides, there is no convection and air does not feel as hot as at the top.

19. Why we feel comfortable with dark coloured clothes in winter?

We feel comfortable with dark coloured clothes in winter because dark surfaces absorb more heat.

20. Why we feel comfortable with light coloured clothes in summer?

We feel comfortable with light coloured clothes in summer because light coloured clothes reflect most of the heat that falls on them.

21. Differentiate between conductor and insulator of heat.

The materials which allow heat to pass through them easily are called conductors of heat.

Example – aluminium, iron and copper.

The materials which do not allow heat to pass through them easily are called insulators of heat. Example – plastic and wood

22. Write an activity to show the process of conduction.

- Take a rod of metal like iron or aluminium.
- Fix a few small wax pieces on the rod. These pieces should be at nearly equal distances.
- Clamp the rod to a stand.
- Now, heat one end of the rod.
- You will observe that the wax piece nearest to the flame will melt first.

This proves that heat is transferred from the end nearest to the flame to the other end. The process by which heat is transferred from the hotter end to the colder end of an object is known as conduction.

23. What are the precautions we should take while reading a clinical thermometer?

- Thermometer should be washed before and after use, with an antiseptic solution.
- Before use, mercury level should be below 35°C.
- Reading should be taken by keeping the level of mercury along the line of sight.
- Do not hold the thermometer by the bulb while reading.
- It should be handled with care.

24. What are the precautions we should take while reading a laboratory thermometer?

- Thermometer should be kept upright not tilted.
- Bulb should be surrounded from all sides by the substance of which the temperature is to be measured.
- The bulb should not touch the surface of the container.
- Thermometer should be washed before and after use.
- Before use, mercury level should be below -10°C.
- Reading should be taken by keeping the level of mercury along the line of sight.
- It should be handled with care.

25. Differentiate between sea breeze and land breeze with diagram.

Sea breeze – During the day, land gets heated up faster than the sea which in turn heats the air above the land. The warm air from the land rises above the land and cool air from the sea falls in to take its place. This movement of air from sea to land is called sea breeze.

Land breeze – at night, land cools down faster than the sea. Now the air above the sea is warmer than the air above the land. The warm air from the sea rises up and the cool air from the land flows into take its place. This movement of air from land to sea is called land breeze.

Diagram is on page number 43

SUBJECT – SCIENCE

CLASS – VII

CHAPTER – 5, ACIDS, BASES AND SALTS

1. What is an indicator?

An indicator is a substance that changes its colour in acidic and basic solutions.

2. What are salts?

Salts are substances formed due to neutralisation reaction between an acid and a base.

3. What is litmus?

Litmus is a dye extracted from lichens that changes its colour in acidic and basic solutions.

4. What are the products of a neutralisation reaction?

Salt and water are the products of a neutralisation reaction.

5. What is milk of magnesia?

Milk of magnesia is an antacid which contains magnesium hydroxide.

6. Name the most commonly used natural indicator.

Litmus is the most commonly used natural indicator.

7. Name the acid present in sting of an ant.

Formic acid is present in sting of an ant.

8. Why lemon juice and orange juice tastes sour?

Lemon juice and orange juice tastes sour because they contain acid.

9. Why baking soda tastes bitter?

Baking soda tastes bitter because it contains base.

10. Tina rubs a solution between fingers and feels soapy, what is the nature of that solution?

The solution is basic in nature.

11. Why care should be taken while handling laboratory acids and bases?

Care should be taken while handling laboratory acids and bases because they are corrosive in nature, irritating and harmful to skin.

12. Why we do not get the result when we use solid baking soda on dry litmus paper?

We do not get the result when we use solid baking soda on dry litmus paper because in solid state, ions are not free to move.

13. Give some examples of indicators.

- Litmus paper/solution
- China rose
- Phenolphthalein
- Turmeric

14. What is the colour of litmus indicator in acidic and basic solutions?

- In acidic solutions, blue litmus changes to red and red litmus remains red.
- In basic solutions, red litmus changes to blue and blue litmus remains blue.

15. What is the effect of China rose indicator on acidic and basic solutions?

- China rose indicator turns acidic solutions to dark pink and basic solutions to green.

16. What is the colour of turmeric indicator in acidic and basic solutions?

- In acidic solutions, the colour of turmeric indicator remains same (yellow).
- In basic solutions, the colour of turmeric indicator changes to red.

17. What is the colour of phenolphthalein indicator in acidic and basic solutions?

- In acidic solutions, the phenolphthalein indicator remains colourless.
- In basic solutions, the colour of phenolphthalein indicator changes to pink.

18. Why organic matter is added in basic soil?

Organic matter is added in basic soil because organic matter releases acid which neutralises the basic nature of the soil.

19. Why do we use indicators?

We cannot taste all the substances, so indicators are used to differentiate between acids, bases and salt.

20. What are neutral solutions?

The solutions which do not change the colour of red and blue litmus are known as neutral solutions. These solutions are neither acidic nor basic.

21. Give three examples of everyday materials which contain an acid.

- Curd contains lactic acid.
- Vinegar contains acetic acid.
- Orange contains citric acid.

22. Give three examples of everyday materials which contain a base.

- Lime water contains calcium hydroxide.
- Window cleaner contains ammonium hydroxide.
- Soap contains sodium hydroxide or potassium hydroxide.

23. Why does a turmeric stain on a white shirt turn red when washed with soap?

Turmeric is a natural indicator that changes to red colour in basic solutions. As soap contains sodium hydroxide or potassium hydroxide which is basic in nature, so turmeric stain turns red when washed with soap.

24. How does slaked lime helps in the treatment of acidic soil?

Slaked lime (calcium hydroxide) is basic in nature. When the acidic soil is treated with slaked lime then slaked lime being basic in nature neutralise the effect of acid present in soil and makes it neutral.

25. Will the reaction mixture become hot when dilute sulphuric acid is added to lime water?

Yes, the reaction mixture will become hot because when dilute sulphuric acid is added to lime water then neutralisation reaction takes place between them and heat is evolved. The evolved heat raises the temperature of the reaction mixture.

26. What is an acid rain? What is the cause of acid rain?

The rain containing excess of acids is called an acid rain. When carbon dioxide, sulphur dioxide and nitrogen dioxide which are released into the air as pollutants dissolve in rain drops and form carbonic acid, sulphuric acid and nitric acid then acid rain occurs.