

Importance of pH in Everyday Life pdf

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Importance of pH in Everyday Life PDF: Explanation & Examples

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pH is very important in everyday life as the **pH of the soil** can lead to increased agricultural yield and the **pH of oceans** affects **aquatic life**. pH is also important in the **digestion of food**, stopping tooth decay, and acts as a remedy for the acidic effect of honeybee bite. **The pH value of a solution indicates whether it is acidic, neutral, or alkaline.** The common uses of pH in everyday life are –

- pH plays an important role in the healthy growth of **plants**.
- pH is important to activate the **pepsin** enzyme, which helps in the digestion of **protein** in food.
- With a change in the pH level of our blood, the human body gets affected.

It is very important to know the pH value of certain chemicals and other components that we use in our daily life. The common criteria under which chemical components are categorized into acidic, alkaline and natural in the pH scale are as follows:

- **Acid** → pH value of 1 to 6
- **Neutral** → pH value of 7
- **Alkaline** → pH value of 8 to 14

Also Read: [pH Formula](#)

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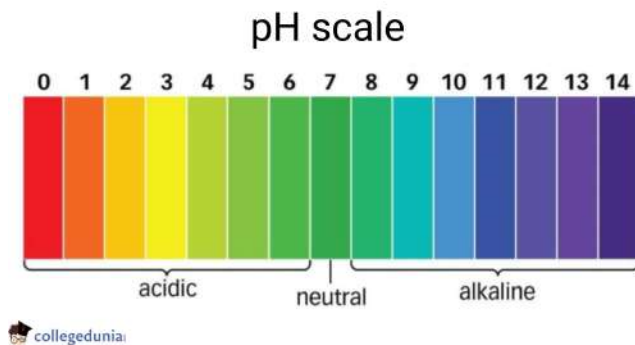
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Key Terms: pH, Acid, Base, Alkaline, pH scale, Importance of pH, Digestive System, Acidic, Plant Growth, Soil pH

pH Value [\[Click Here for Sample Questions\]](#)

The pH scale is a scale containing values from 0 to 14, where 0 indicates that the solution is very acidic, and 14 indicates it is very alkaline.

- A value less than 7 indicates that the solution is **acidic** in nature.
- 7 represents that the pH of the solution is **neutral**.
- As the value increases from 7 to 14, it represents that the **alkaline** nature of the solution is increased.



People Also Ask

Ques. What is pH and its importance?

Ans. The pH is a measure of the concentration of hydrogen ions in a solution. The pH scale is between 0 to 14. pH is important in everyday life as it affects agricultural yield, digestion system, aquatic life, etc.

Ques. Why is a pH of 7 important?

Ans. A pH of 14 at the end of the scale represents the basic level – that means the substance has more oxygen ions. To put things into perspective, a pH of 7 is neutral. This is the ideal pH for water in our bodies. A pH of 7 means that your solution is as pure as it can get.

Ques. What is pH full form?

Ans. The full form of pH is the “Potential of Hydrogen”. It is the negative logarithm of H^+ ion concentration. Therefore, pH is the strength of hydrogen or power of hydrogen.

Ques. What pH is water?

Ans. Water has a neutral pH of 7. Hence, it is neither acidic nor basic. The scale ranges from very acidic (0) to very basic (14). Water can also have pH in the range of 6.5 and 8.5 on the scale.

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List of Strong Acids	Formic Acid	Stearic Acid
Properties of Bases	Difference between Alkali and Base	Acid, Bases and Salt

Importance of pH in Everyday Life [\[Click Here for Sample Questions\]](#)

The importance of pH in daily life is as stated below-

- Plants and animals can survive only in a narrow range of pH changes. Usually, animal and human bodies work in a pH range of 7 to 7.5.
- When the pH value of rainwater is below 5.6, then it is called **acid rain**. It causes the pH value of the water to be dropped and this causes damage to aquatic life.
- Further, when the pH value of our stomach decreases we get acidity problems.
- When the pH value of our **mouth** reduces, our teeth start to decay.
- Changes in the pH value of the soil make it infertile.

This demonstrates how all living organisms and plants are sensitive to pH changes.

Plants and animals are sensitive to pH

Plants and animals have growth sensitive to pH. pH is the hydrogen ion **concentration of a solution**.

- Plants are growth sensitive to the pH of the soil as they need an optimum pH.
- In the case of animals, a certain pH level is maintained in the stomach for the activation of digestive acids for **digestion**.
- Low pH can cause acidic conditions in the stomach.

Therefore, it is observed that plants and animals are dependent on pH and are sensitive to variations in pH.

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pH Value Affects Existence of Living Beings [\[Click Here for Sample Questions\]](#)

The existence of living beings is also affected by the pH value in the following way –

- Organisms require a certain pH value in order to grow at an ideal pace.
- In the human body, all the physiological reactions take place in the pH range from 7 to 7.8.
- When acid rain gets mixed with natural water bodies, the existence of aquatic animals, plants, and **microbes** is at risk.

Read More: [NCERT Solutions for Class 10 Chapter 2 Acids, Bases and Salts](#)

pH Value in the Digestive System [\[Click Here for Sample Questions\]](#)

Our stomach generates **HCl (Hydrochloric Acid)** which helps in food digestion and kills germs. This acid balances the pH value of the **stomach**.

- Normally, the pH value of our stomach is around 1.2. However, this value may change when we consume more acidic or alkaline food.
- When the pH value of our stomach decreases we suffer from acidity.
- As a result, pH is important in everyday life as acidity can cause pain and irritation in the stomach.
- The acidity problems can be cured by consuming basic substances like **milk of magnesia** which neutralize the excess acid produced in our stomach.

Importance of pH Testing in Everyday Life.

There is immense importance of pH testing in everyday life. The pH test is a method to measure the acidic or basic level of a substance. Based on the conclusions, the usefulness of the substance can be further determined. By pH testing –

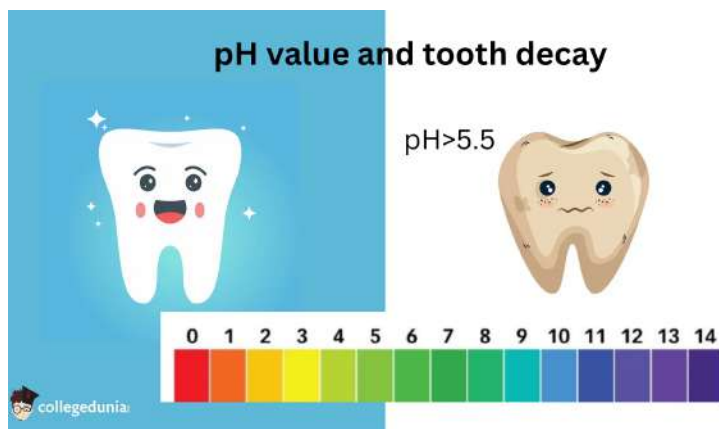
1. The changes in pH occur in elements that are necessary for the survival of plants, animals, and humans as they only survive narrow pH changes.
2. pH testing of soil is important as changes in soil pH value make it infertile.
3. A low pH value of our stomach indicates acidity problems in humans.
4. Testing the pH value of **rain** water allows us to check the occurrence of acid rain ($\text{pH} < 5.6$).
5. A low pH value in the mouth can lead to tooth decay.

Read More: [Explain the importance of pH Testing in Everyday Life.](#)

Changes in pH Value Cause Tooth Decay [\[Click Here for Sample Questions\]](#)

Normally, the pH value of our mouth is around 6. This value changes when we eat or drink food.

- A low pH value can lead to the decay of our **teeth**.
- The enamel of the teeth is made of Calcium Phosphate, which is insoluble in water. However, due to acid, it corrodes.
- Afterwards, the enamel teeth get sensitive and bad breath occurs.
- It might even result in tooth loss.



Read more:

Acids, Bases, and Salts – Important Notes		
Baking Soda and Baking Powder	Weak Base	Acid Strength
Acids, Bases, and Salts Formula	pH of Weak Acid Calculation	Base Meaning
Acids Bases and Salt Revision Notes	Difference Between Acid and Base	Acids, Bases, and Salt Important Questions
Difference between Baking Soda and Baking Powder	Ammonium bicarbonate	Ammonium chloride

pH of the Soil affects Plant Growth [\[Click Here for Sample Questions\]](#)

Plants grow properly only within a specific pH range. If the soil is neutral and not acidic or basic, it will result in healthy growth.

- Usually due to wrong harvesting or excessive use of **fertilizers** the pH balance of the soil may increase or decrease.
- This affects the plant's growth negatively, resulting in a lower yield.
- When the pH value of the soil goes below 7, the soil becomes acidic. So, it is treated with Calcium **Hydroxide**, **Calcium Oxide**, Chalk, etc. These products will neutralize the soil.
- Simultaneously, when the pH value gets more than 7, it becomes basic. In such cases, the soil is neutralized with **manure**, compost, or pyrite.

Importance of pH in Everyday Life

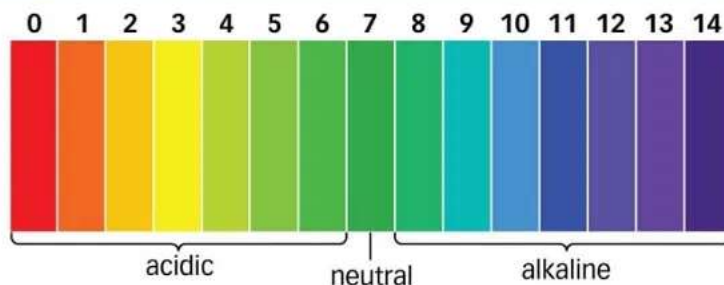
What is pH?

pH is a quantitative measure of the acidity or basicity of aqueous or other liquid solutions.

pH Value 1 – 6 → Acid

pH Value 7 → Neutral

pH Value 8 – 14 → Alkaline/Basic



Why is pH Important?

pH is important in the digestion of food, stopping tooth decay, and acts as a remedy for the acidic effect of honeybee bite.

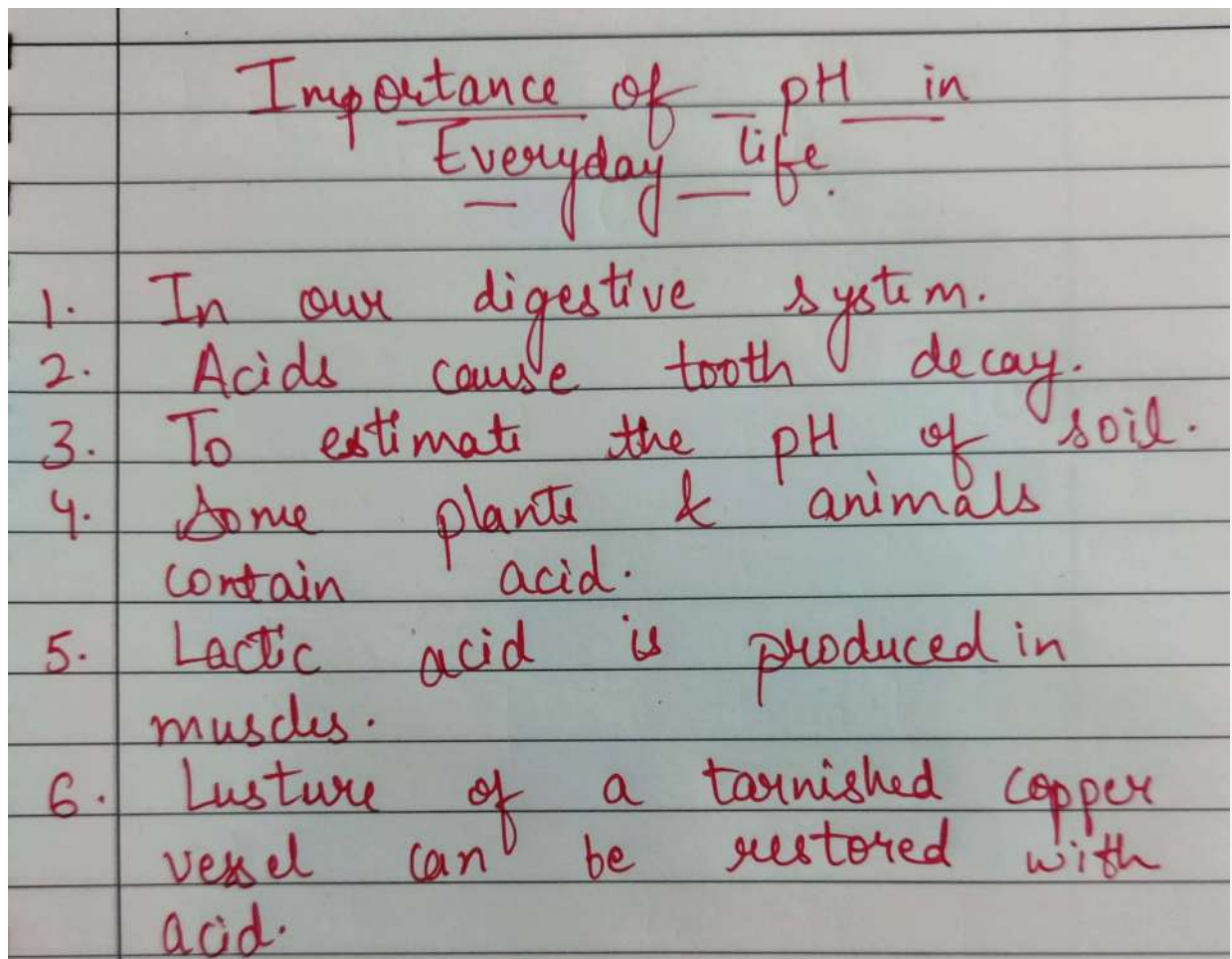
pH is very important in everyday life and has applications / lives.

Remedy for Acidic Effect of Honeybee Bite

All plants and animals have self-defense tools to protect themselves from attacks by their enemies.

1. Honey bees have a chemical sting as a defense tool. The bees have acid in their sting.
2. When the bee stings a human, the bee injects acid and pushes its sting into the skin. Due to that, the skin gets swollen.
3. To neutralize this acidic effect, you can rub baking soda, toothpaste, or a mild base.
4. Ants use their bites as a defense tool. Ant bites contain methanoic acid which can be neutralized by rubbing a mild base like baking soda.
5. Some plants like the nettle have a sting as a defense tool. When people try to Nettle it leaves a sting just like the honey bee.
6. This results in irritation and pain around the affected area. This acidic effect can also be neutralized by rubbing a mild base.

pH Importance in Daily Life Handwritten Notes



Things to Remember

- pH or 'power of hydrogen' is the log of the concentration of H^+ ions in a solution
- A neutral solution has a pH of 7.
- A pH of 1 to 7 indicates an acidic solution.
- A pH of 7 to 14 indicates a basic solution.
- pH is important to know the health of the soil, pH values of waterbodies, rain and aquatic life health.
- Plants depend on soil pH for nutrients.
- Aquatic life's survival depends on the correct pH of oceans.
- Our teeth also decay beyond a certain pH (i.e. more acidic teeth tend to decay)

Sample Questions on the Importance of pH in Everyday life

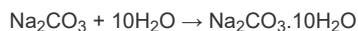
Ques 1: (a) State the chemical properties on which the following uses of baking soda are based:

- (i) as an antacid
 - (ii) as a soda acid fire extinguisher
 - (iii) to make bread and cake soft and spongy.
- (b) How is washing soda obtained from baking soda? Write a balanced chemical equation. (CBSE 2015, 5 Marks)**

Answer:

- (a) (i) It is weakly basic in nature and neutralizes hyperacidity.
 - (ii) It liberates CO_2 with H_2SO_4 , which extinguishes fire.
 - (iii) It liberates CO_2 on heating which makes bread and cake soft and spongy.
- (b) $2\text{NaHCO}_3 \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_3 + \text{CO}_2 + \text{H}_2\text{O}$

Baking soda on heating gives sodium carbonate which on crystallization forms hydrated washing soda



Ques 2: (a) Mention the pH range within which our body works. Explain how antacids give relief from acidity. Write the name of one such antacid.

- (b) Fresh milk has a pH of 6. How does the pH change as it turns to curd? Explain your answer.
- (c) A milkman adds a very small amount of baking soda to fresh milk. Why does this milk take a longer time to set as curd?
- (d) Mention the nature of toothpaste. How do they prevent tooth decay? (CBSE 2012, 5 Marks)

Answer: (a) Our stomach has a pH equal to 2. Antacids neutralize excess acid in our body and give relief from hyperacidity. Sodium hydrogen carbonate is one such antacid.

- (b) The pH value will decrease as the fresh milk turns into curd because curd is acidic due to the presence of lactic acid.
- (c) If baking soda is added to fresh milk then it takes a longer time to set as curd as bacteria do not work well in presence of sodium hydrogen carbonate, i.e. fermentation will take place slowly.
- (d) Toothpaste is basic in nature. They neutralize the acid formed in the mouth which causes tooth decay.

Ques 3: i) Explain why hydrochloric acid is a strong acid and acetic acid is a weak acid. How can it be verified?

- (ii) Explain why the aqueous solution of an acid conducts electricity.
- (iii) You have four solutions A, B, C and D. The pH of solution A is 6, B is 9, C is 12 and D is 7,
- (a) Identify the most acidic and most basic solutions.
- (b) Arrange the above four solutions in the increasing order of H^+ ion concentration.
- (c) State the change in colour of pH paper on dipping in solutions C and D. (CBSE 2012, 5 Marks)

Answer: (i) HCl is completely ionised in an aqueous solution whereas acetic acid is partially ionised in an aqueous solution. HCl gives a dark red colour with pH paper whereas CH_3COOH gives orange colour.

- (ii) The aqueous solution of an acid conducts electricity because acid ionises in an aqueous solution and these ions conduct the electricity.
- (iii) (a) 'A' is the most acidic and 'C' is the most basic.
- (b) $\text{C} (10-12) < \text{B} (10-9) < \text{D} (10-7) < \text{A} (10-6)$
- (c) pH paper will become blue in 'C' and green in 'D'.

Ques 4: (i) Give the constituents of baking powder

- (ii) Why does cake or bread swell on adding baking powder? Write a chemical equation. (CBSE 2013, 3 Marks)

Answer: (i) Baking powder contains sodium hydrogen carbonate and **tartaric acid**.

(ii) Cake and bread swell on adding baking soda because of the carbon dioxide.



Ques 5: (a) Write the name given to bases that are highly soluble in water. Give an example.

(b) How is tooth decay related to pH? How can it be prevented?

(c) Why does a bee sting cause pain and irritation? Rubbing baking soda on the sting area gives relief. How? (CBSE 2012, 3 Marks)

Answer: (a) The base that is highly soluble in water is Alkali, e.g. NaOH (Sodium hydroxide).

(b) Lower the pH, the more will be tooth decay. The acid reacts with $\text{Ca}_3(\text{PO}_4)_2$ and causes tooth decay.

Tooth decay can be prevented by brushing your teeth after every meal.

(c) Rubbing baking soda on the bee sting area gives relief because of the formic acid. Sodium hydrogen carbonate (Baking soda) neutralises formic acid and gives relief.

Ques 6: What is tooth enamel chemically? State the condition when it starts corroding. What happens when food particles left in the mouth after eating degrade? Why do doctors suggest the use of tooth powder/toothpaste to prevent tooth decay? (CBSE 2011, 3 Marks)

Answer. Tooth enamel is made up of calcium phosphate. It starts corroding due to the acid formed in the mouth.

- The food particles which are left in the mouth form acids which cause tooth decay.
- Toothpaste and tooth powder is basic in nature and they neutralise the acid formed in the mouth which prevents tooth decay.

Ques 7: Explain how antacids work. (CBSE 2015, 2 Marks)

Answer. Hyperacidity is caused by excess hydrochloric acid in the stomach. Antacids are basic in nature. It neutralizes excess acid and gives relief from pain caused by hyperacidity.

Ques 8: A student detected the pH of four unknown solutions A, B, C and D as follows 11, 5, 7 and 2. Predict the nature of the solution. (CBSE 2013, 2 Marks)

Answer. A is basic as it has a pH value of 11, 'B' is acidic as it has a pH value of 5, 'C' is neutral as it has a pH value of 7 and 'D' is strongly acidic as it has a pH value of 2.

Ques 9: Why do we use lemon juice to clean copper vessels? (2 marks)

Answer: Lemon juice is acidic in nature. When we use it to clean copper vessels, the copper oxide layer on the Copper vessel, which is basic in nature gets neutralized and forms Copper Citrate. The Copper Citrate then gets washed away with water. As a result, our Copper vessel is left shiny.

Ques 10: Why should a farmer treat the soil of his farm with quick lime (Calcium Oxide) Slaked lime (Calcium Hydroxide) or Chalk (Calcium Carbonate)? (2 marks)

Answer: For the healthy growth of plants, it is necessary to keep the soil's pH value of 7, i.e. neutral. But, if due to the use of fertilizers the pH value of the soil goes below 7 then the soil will become acidic. In this case, the farmer needs to treat his fields with alkaline components like quick lime (Calcium Oxide) or Slaked lime (Calcium Hydroxide) Chalk (Calcium Carbonate), etc. These substances will neutralize the soil and maintain a pH value of 7.

Ques 11: You have two solutions, A and B. The pH of solution A is 6 and the pH of solution B is 8. Which one of these has more hydrogen ion concentration? Which one is acidic and which one is basic? (2 marks)

Answer: Solution A has a pH value of 6 which is less than 7. This means it has a higher Hydrogen ion concentration than solution B.

So, solution A is more acidic and solution B is basic.

Ques 12: What happens if excessive acid is released into the Stomach? How can it be cured? (2 marks)

Answer: When we eat certain types of food, the amount of Hydrochloric acid in our stomach increases. This causes us to suffer from acidity which causes stomach pain and irritation. To cure this problem we need to consume alkaline substances like Milk of Magnesia, which will neutralize the acid.

Ques 13: What is a universal indicator? (1 mark)

Answer: A universal indicator is used to determine the strength of an acid and a base. It is a mix of different indicators

Ques 14: What is the pH range of the following substances? (5 marks)

- a) Gastric juice
- b) Vinegar
- c) Tears
- d) Human urine
- e) Blood plasma

Answer: a) Gastric juice – 1 to 3

b) Vinegar – 2.4 to 3.4

c) Tears – 7.4

d) Human urine – 4.8 to 8.4

e) Blood plasma – 7.3 to 7.4

Ques 15: What are the two common antacids? (2 marks)

Answer: The two most common antacids are Magnesium hydroxide and sodium hydrogen carbonate.

Ques 16: Explain how the change in pH of the lake water can endanger the lives of aquatic animals. How can we prevent it? (3 marks)

Answer: Due to a lot of acid rain, the pH of the lake water becomes lower. As the acidity of lake water increases, it can risk killing aquatic animals such as fish as they survive only within a narrow range of pH change.

To prevent fish from being killed, calcium carbonate can be added to the acidic lake water to neutralise it.

Ques 17: What colour will a universal indicator show if it is added to the following substances – (3 marks)

- a) potassium hydroxide, pH = 12
- b) soda water, pH = 5
- c) sulphuric acid, pH = 2

Answer: a) potassium hydroxide – Dark Purple

b) soda water – Orange Yellow

c) sulphuric acid – Red

Ques 18: The pH of soil A is 7.5 while that of soil B is 4.5. Which of the soil should be treated with powdered chalk and why? (3 marks)

Answer: Powdered chalk is limestone which is a basic salt. As Soil B is acidic in nature, therefore it should be treated with powdered chalk. This is done to reduce its acidity.

Ques 19: What is the pH of pure water? How it affects litmus paper or methyl orange? (2 marks)

Answer: Pure water is neutral in nature as it has a pH of 7. Therefore, as it is neutral, it will have no effect on litmus or methyl orange.

Ques 20: What colour will the universal indicator show in an aqueous sugar solution? (1 mark)

Answer: As the solution of sugar is neutral, the aqueous solution will turn the universal indicator green in color.

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