THE pH SCALE

Research and Anticipate

Anticipate potential hurdles

Acidity and alkalinity are both measured on the pH scale, but whereas acidity increases with decreasing pH, alkalinity increases as you move further up the scale. This can confuse pupils, so spend time orientating them and reviewing this.

Language matters

Avoid talking about 'stronger acids' when pH and acidity are introduced. Saying 'more acidic' is a better foundation for later ideas.

Instead of saying:

"Acids have a pH of less than 7. The stronger an acid is, the lower its pH will be."

Say:

"Acidic solutions have pH values of less than 7. The more acidic a solution is, the lower its pH will be."

Using the term 'acidic solution' for common laboratory acids also introduces language underpinning the concept of solvated ions.

Diagnose and Address

Diagnostic question

Ask pupils to explain which of the following statements they agree with, and why.

Monica

The lower the pH, the more dangerous the solution.

Priyanka

pH tells you how acidic or alkaline a solution is.

Lucy

pH tells you how acidic a solution is.

Chantelle

pH tells you the strength of an acid or alkali.

Building on understanding

A pupil agreeing with Monica or Lucy may need reminding that the pH scale measures alkalinity and acidity. It works in two directions, with low and high pH representing extremes. Explain that both acids and alkalis can be dangerous.

If a pupil agrees with Priyanka, explain that, in chemistry, acid or alkali strength relates to the type of acid or alkali and not the solution.

Assess and Review

Revisit using further examples

Pupils can practise comparing acids and alkalis using pH values.

Later links

Adding water to an acid or alkali changes its pH. But the strength of an acid or alkali relates to the type of acid or alkali, not its concentration in solution. For a given concentration in aqueous solution, a stronger acid will have a lower pH.

The explanation for this in terms of dissociation of ions will be encountered later, so at this stage just focus on the language you use to describe acids and alkalis.

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