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| Q: How does pH indicate whether a substance is an acid or a base? | |
| C: A pH value below “7” indicates the substance is an acid, while a pH value above “7” indicates the substance is a base. Neutral substances will produce a pH value of “7”. The farther the pH value is from “neutral” on the 1-14 scale, the stronger the acid or base (*ie – lower numbers are strong acids while higher numbers are strong bases*). | |
| E: Results from testing solutions using red & blue litmus paper and pH paper:   |  |  |  |  | | --- | --- | --- | --- | | SOLUTION | pH | RED LITMUS | BLUE LITMUS | | Lemon Juice | 2 | red | red | | Vinegar (White Distilled) | 2 | red | red | | Soda (Coca-Cola) | 2.5 | red | red | | Apple Juice | 4 | red | red | | Orange Juice | 5 | red | red | | Shower Cleaner | 5.5 | red | red | | Rubbing Alcohol | 6.5 | red | blue | | Hydrogen Peroxide | 6.5 | red | blue | | Milk (Whole) | 7 | red | blue | | Water | 7 | red | blue | | Salt Water | 7 | red | blue | | Baking Soda Solution | 9 | blue | blue | | Soapy Water | 9 | blue | blue | | Laundry Detergent | 11 | blue | blue | | Ammonia | 12 | blue | blue |   Acidic substances indicated by litmus paper turning/staying red have a lower pH. Basic (alkaline) substances indicated by litmus paper turning/staying blue have a higher pH. Neutral substances indicated by neither litmus paper changing color have pH near 7. | J: Acidic substances produce hydronium ions (H3O+) in solution while bases produce hydroxide ions (OH-) in solution. Litmus paper can be used to classify substances as acidic or basic (alkaline) by detecting the presence of these ions. Blue litmus paper turns red in the presence of an acid and red litmus paper turns blue in the presence of a base. If neither litmus paper changes color, it indicates a neutral substance. The strength of the acid or base can be measured using pH paper, which turns a certain color to indicate a specific pH value on a scale from 1-14. |