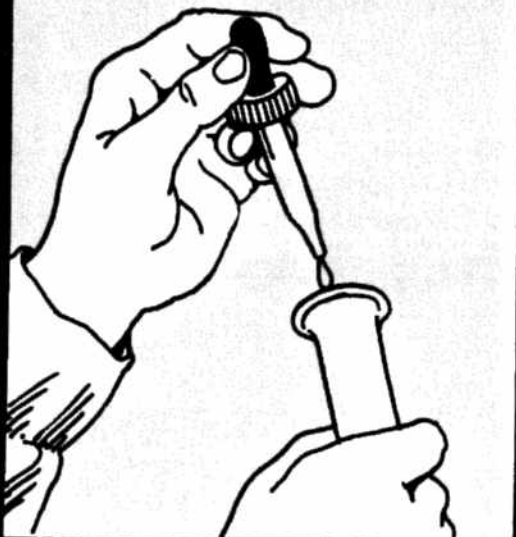


WHAT ARE BASES?

20c



base: bitter chemical that turns red litmus paper blue

phenolphthalein: an indicator that turns a deep pink color when a base is added

The batter runs to first. There are players on second and third. *Bases* are loaded! These are bases you know of. Now let us learn about some other kinds of bases.

Bases are a group of chemicals that have certain properties. Their properties are different from the properties of acids. Often they act *opposite* to the ways that acids act.

Let us see how bases act with the tests that we use to identify chemicals.

Bases that are not harmful have a *bitter taste*.

If you *touch* a harmless base it will *feel slippery*. (Acids do not have any special feel.)

Bases act the opposite way from acids with indicators.

Bases turn *red litmus paper blue*. They do not change blue litmus paper.

There is another indicator that helps us to identify bases. It is called *phenolphthalein* [fee nole THAL in]. This solution is clear in acids. But phenolphthalein turns deep pink in bases.

Unlike acids, bases do *not* wear away metals.

Only liquid bases show these properties. Dry bases do not.

Bases may be of different strengths. Some are very weak. Some are very strong. Some bases are dangerous to touch or taste.

PROPERTIES OF BASES

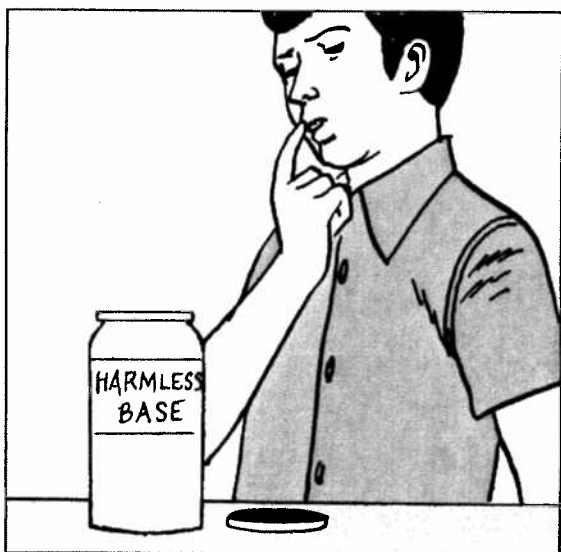


Figure A

Bases taste bitter. How do acids taste? _____



Figure B

Bases feel slippery or soapy. Would you do this test on *all* bases? _____

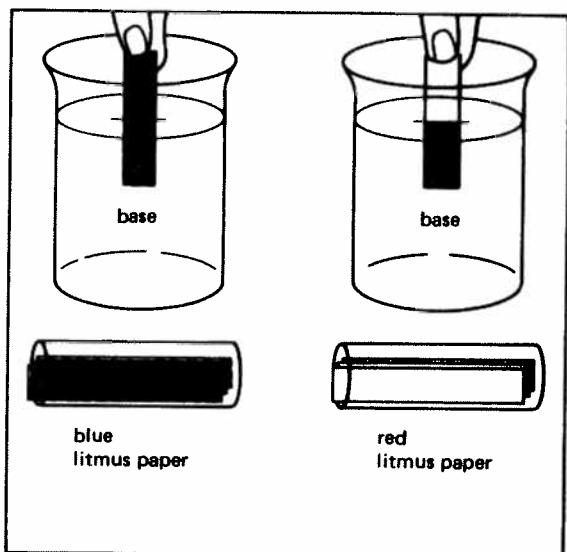


Figure C

Bases turn red litmus paper blue. Blue litmus paper does not change color.

What happens to blue litmus paper in acids? _____

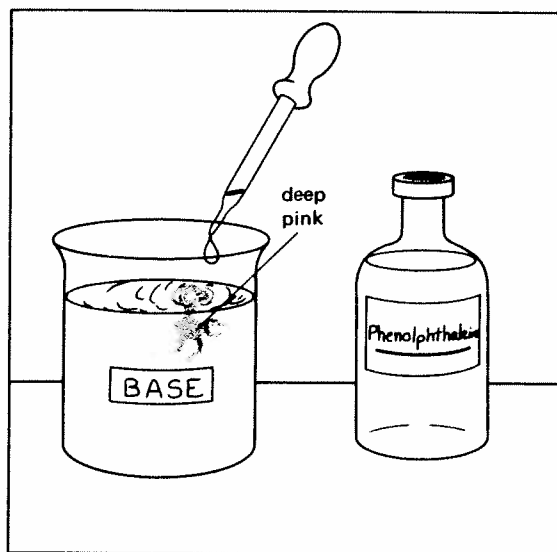


Figure D

Phenolphthalein turns deep pink in bases.

What happens to phenolphthalein in acids? _____

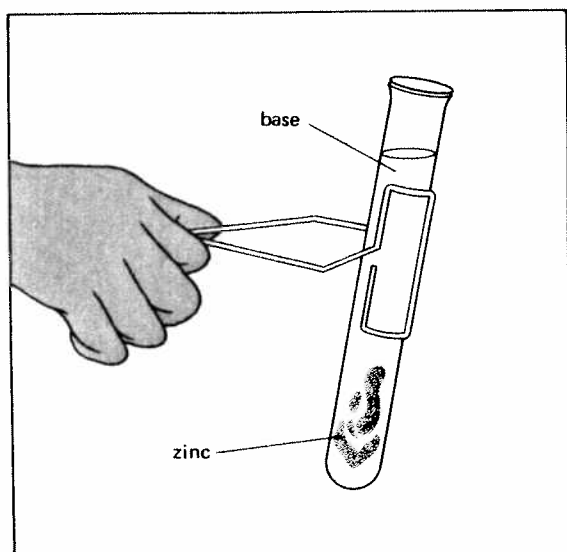


Figure E

Bases do not wear away metals.
No hydrogen gas is given off.

Do acids wear away metals?

SOME COMMON BASES

The chart lists some common bases and their chemical formulas. It shows you what all bases have in common.

Common Name	Chemical Name	Formula	All bases contain special groups of oxygen and hydrogen atoms called hydroxides. (OH ⁻)
Ammonia water	ammonium hydroxide	NH ₄ OH	
Limewater	calcium hydroxide	CaOH ₂	
Lye	sodium hydroxide	NaOH ₂	
Milk of Magnesia	magnesium hydroxide	MgOH ₂	

FILL IN THE CHART Use what you have learned about acids and bases to fill in this chart.

	Taste	Litmus Paper Test	Phenolphthalein Test	Metal Test	Contain H ⁺ or OH ⁻ (Which One?)
Acids					
Bases					

BASES IN EVERYDAY LIFE



Figure F

Ammonia water does many cleaning jobs.

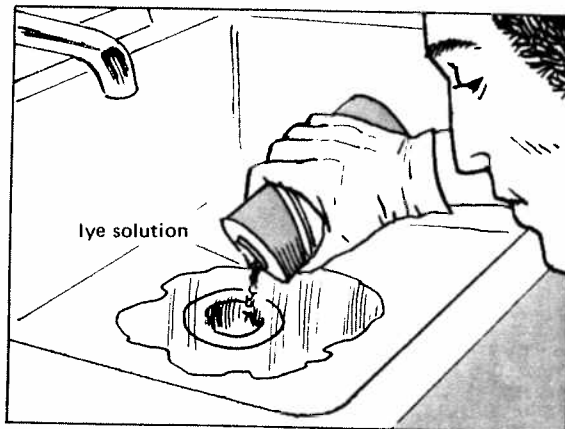


Figure G

Lye is used to open clogged drains.



Figure H

Lye is also used to make soap.



Figure I

Your doctor may tell you to take milk of magnesia to help empty your digestive tract.

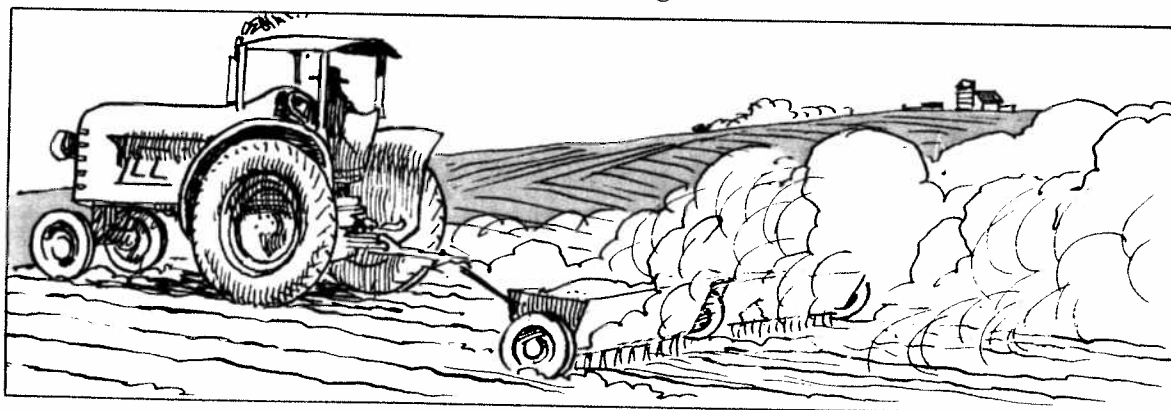


Figure J

Ammonium hydroxide is important in making fertilizers.

TRUE OR FALSE Write T on the line next to the number if the sentence is true.
Write F if the sentence is false.

1. _____ Bases taste sour.
2. _____ Bases feel slippery.
3. _____ Bases turn blue litmus paper red.
4. _____ Bases turn red litmus paper blue.
5. _____ Phenolphthalein turns deep pink in bases.
6. _____ Bases wear away metals.
7. _____ Only liquid bases can be tested with litmus paper.
8. _____ Acids contain the OH^- groups.
9. _____ Acids contain the H^+ groups.
10. _____ All bases are strong.

FIND THE HIDDEN WORDS *SLIPPERY* has a total of eight letters. If we take parts of this word or move some of the letters around, they make up other words. Some of the words you have learned in this book. How many of these hidden words in *SLIPPERY* can you find?

SLIPPERY

1. part of your face right under your nose (3 letters) _____
2. a common base used in soap (3 letters) _____
3. what the temperatures do when something is heated (4 letters) _____
4. an answer (5 letters) _____