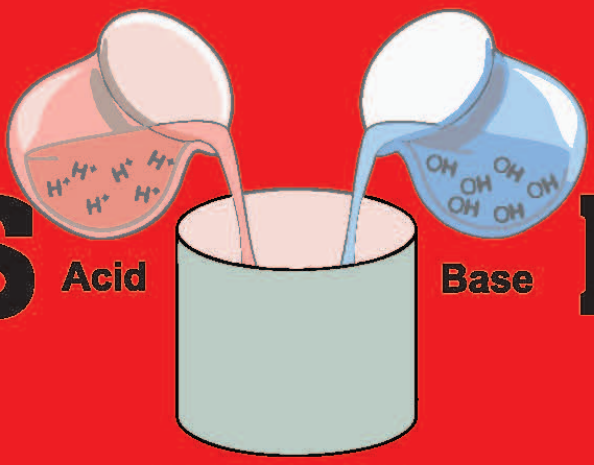
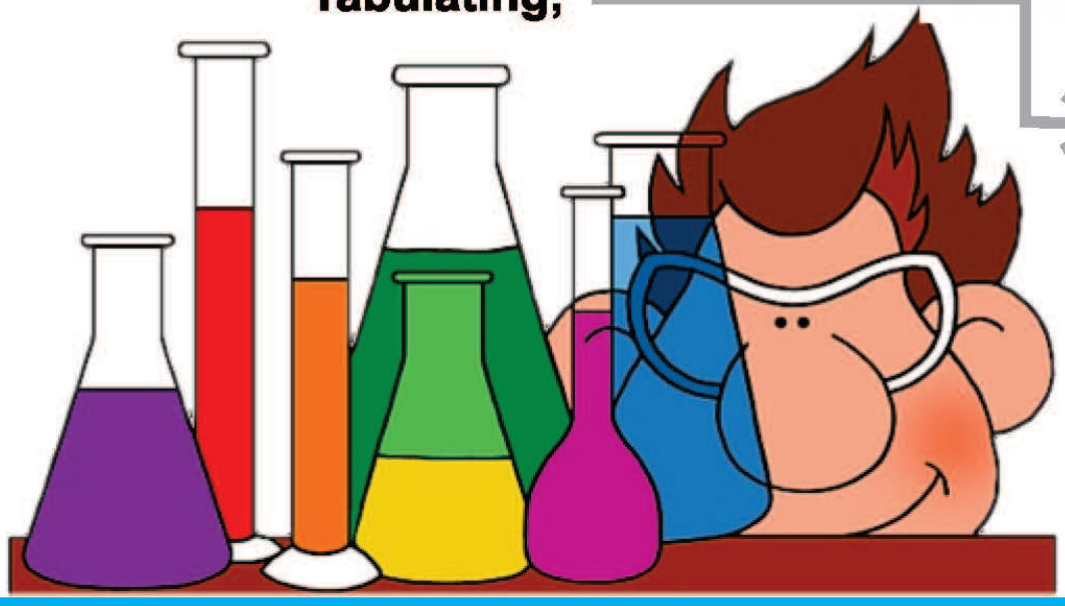
Natural Science



Grade 7 CAPS Syllabus

A COMPLETE LESSON SET on ACIDS and BASES

INCLUDES:
Teacher's Lessons;
Evaluation sheets;
Experiments;
Observation Sheets;
Tabulating;



Crossword;
Core Notes;
Revision Exercise;
Assessment-Tests and Answers.

CONTENTS

Acids, [illegible] alkalies.

[illegible] work. It is exciting, colourful and an
ic

Ensu[illegible]micals well in advance.
Have [illegible]o that you can divide the
chemica[illegible]nts.

Your chemi[illegible]

1. Phenol[illegible] Take carefl
2. Univers[illegible]
3. Bromoth[illegible]
4. Litmus red[illegible]
5. Litmus blue[illegible]

Other items needed:
A variety of household su[illegible]

(I usually give each child a s[illegible] fill with a
specified substance - this ide[illegible]

1. Bicarbonate of soda
2. Colgate Toothpaste
3. Coke
4. Rennies tablets
5. Paper
6. Thin paint brushes
8. [illegible]nlight soap
9. T[illegible]water
10. S[illegible]ice
11. Vin[illegible]
12. Was[illegible]

Class organisation:

Divide your class into groups of 4 to 6 children.
Ensure that each group has at least: One respons[illegible]
One good clea[illegible]
An enthusiastic

Each group needs a[illegible] with the following:

1. Te[illegible]t tubes.
[illegible] the listed household substances.
[illegible]ottle of strong black tea.
[illegible]given a small amount of the indicators.

The [illegible]uld be packed and ready for use.
The [illegible] cardboard. Using a paint brush
she/he [illegible]ohenolphthalien. eg. "Acids and
bases" o[illegible]
Allow the [illegible] the card is clear.
(Remember [illegible]
Stick the car[illegible].
As you introdu[illegible] the secret message, with
a mixture of wa[illegible]market near the washing
powder section) a[illegible]

As you spray the mes[illegible]alien message will
appear in bright pink.

You can explain how you a[illegible]: indicator; base;
alkali, etc. Or you can keep [illegible]

Development:

The first hour/lesson:

1. After the magic introduction:
I have found that experiment 1 an[illegible]ke the
terminology and the experiment pro[illegible]
Allow the learners to fill in answers a[illegible]

The second hour/lesson:

1. Explain the third experiment and supervi[illegible]
Discuss the results and give the learners a [illegible]
2. Over the years I have learnt that learner's [illegible] this
of neutralisation. So to prevent the learners f[illegible]
phenomenon do experiment 4 together as a clas[illegible] group's
results.

The third ... lesson: During these lessons, practical science skills ... Evaluation Form.

... your experiment results."
... paper to each group.
... lemon juice), using the red and then
... a class. Then allow each group to
... olving the 10 other household substances.
4. C... ...h the litmus paper then allow them
to ... ...thymol blue. WASH OUT ALL TEST
TUB... ...dicator: Phenolphthalien.
5. Once ... ...its of phenolphthalien wash out
all test ... ...g universal indicator.
6. Once all t... ...led the group must decide if
the househ...

The fifth lesson:
Discuss and mark ...
Hand out the homew... ...w each person must
complete the exercis...

Conclusion:

The sixth lesson:
Paste in and read through the ... ...es.
Hand in books for marking.

The seventh lesson:
Return books (Mark crossword /10: ...
OPTIONAL: Bonus marks out of 10)
Record the marks.
Homework: learn for test.

How to use the practical evaluation ...

Each learner has their own evaluation form.
There are 8 skills to be evaluated, on a five point ...

During e… t about 10 learners to evaluate.
Lo… on the level of mastery of each learner.
… the key.

…ting the level of mastery of each skill,

Y… learners have a good idea of areas
of …

You c… …s concentrating on the skills
you are …

Assessmen…
Practical/ C… _/25

Written/Homew… + Bonus = ____/40
Convert to a mar…

Test: ____/30 = ___

Practical work + writte…

ACIDS, B… ALKALIES: PRACTICAL EVALUATION

Name: _____ Date: _____

_____

K… …standing or ability; remedial help needed.
…ovement.
…nt.
…op a sound understanding.
5 … …ently showing a sound understanding
… science skills.

Practical …	1	2	3	4	5
1. Follows inst… continue with e… independently.					
2. Works safely: *lids on; clean work … no food/ eating, etc.					
3. Group co-operation: *Waiting for a turn, helpin… others; asking peers for he…					
4. Individual behaviour: *Attitude; independent ability, self-control.					
5. Scientific insight: Use of science terms & lang.					
6. Scientific application: Relating experiments to everyday experiences.					
7. Quality of written work: The detail and quality of written observations.					
8. Other: Diagrams: packing up time management					

Marks: _____ / 40 = _____ %

Comment: _____

SPOOKY SCIENCE!




...fully, before starting any of the

2. ...
3. Re... ...e observation sheet.
4. Cle...

CHECK THAT ...NG:

- A bottle
- A couple o
- Test tube r...
- Straw.
- A bottle of tea

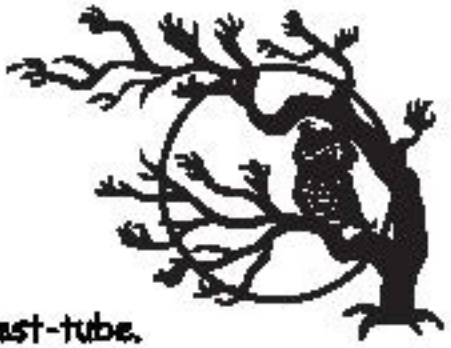
METHOD:

EXPERIMENT 1

1. Dip your finger into the lemon ju...
2. Touch this substance. Rub betwe...
3. Record your observations.
4. Dip your finger into the bicarb and t...
5. Rub some bicarb solution between you...
6. Record your answers on your observatio...
7. Discuss and record any problems you can ... out if a chemical is an acid or a base.

* bicarb. = bicarbonate of soda.

METHO



es (1/3 full)
to the first test-tube.
to the second test-tube.

Test-tub
Tea and lemon

Test-tube 1
Tea and lemon juice

1. Record your
Compare your
test-tube.

WASH

METHOD:

EXPERIMENT 3

1. Put a little of a substance into
eg. In test-tube 1, put a little le
test-tube 3 put a little soap; tea
test-tube 5 add some Coke. Add a l

negar;

2. Add a small amount of water to the tab
Mix with a clean straw.

3. Add a few drops of UNIVERSAL INDICAT
es.

4. Mix each test-tube, using a clean straw.

'niversal Indicator=

1. 3. 4. 5. 6.

Tablet Coke Toothpaste

Len

5. r guide on page 2 of your observation

6. Re on page 3 of your observation
shee

METHL

EXPERIMENT 4

Making acids

A strong acid (Indi vill give you a
NEUTRAL SOLUTIC

1. Try this: Add a little ongest acid.
See what happens?

A weak acid (Indicator Ye ou a
NEUTRAL SOLUTION (Inc

2. Try this: Add a weak acid (or
See what happens?

3. We make acids disappear every day se
examples:

For example: Coke +
a strong acid

OKY SCIENCE!

sheet:

Date:_____

W

Experim

SUBSTANC	PERY	ACID OR BASE

An acid, like_____ __taste
and feels _____

A base, like _____ e
and feels _____

A base is a solid.
A base, dissolved in water, is called a

Problems with this method of finding out
a base:

_____ __
_____ _____
_____ _____

Experiment



1. W… …a with lemon juice in it?

_____

…with washing soda in it?

_____

Column B

…urns tea darker.
…rns tea lighter.
… remains the same.

4. Tea i…
It ind… …line (base).
(sho…

5. Problems …

_____ _____

_____ _____

Let's take a closer …



Experiment 3: Univ…

Red ph4	Orange	Yellow ph6		Purple ph11

strong … weak acid … neu… …ng base
neith…
an acid…
nor base…

If universal indicator turns yellow in the so…

_____

If universal indicator turns purple in the solutio…

_____

3. A … neutral will turn _____
… an acid nor base.

	… indicator	Acid or Base?
1. …	_____	_____
2. Vin…	_____	_____
3. Soap	_____	_____
4. Rennie's …		_____
5. Coke		_____
6. Toothpaste		_____

Which is the strongest a…

_____

Which is the strongest base …

_____

Which substance is neutral? _____ _____

Experiment 4: Universal ind…

Complete:

1. Indigestion in stomach (acid) + …

2. Bee-sting (acid) + _____

3. Wasp sting (base) + _____ …ral (a…

TABULATE

YOUR EXPERIMENT

SUBSTANCE	EFFECT ON RED LITMUS PAPER	EFFECT ON BLUE LITMUS PAPER	EFFE...			
TAP WATER	STAYS RED					
LEMON JUICE		TU...				...RESENT
VINEGAR						
BICARBONATE OF SODA	TU...					
WASHING LIQUID						
TO...					TURNS BLUE-GREEN	
						BASE PRESENT
		...RNS RED				
					YELLOWISH	
						ACID PRESENT

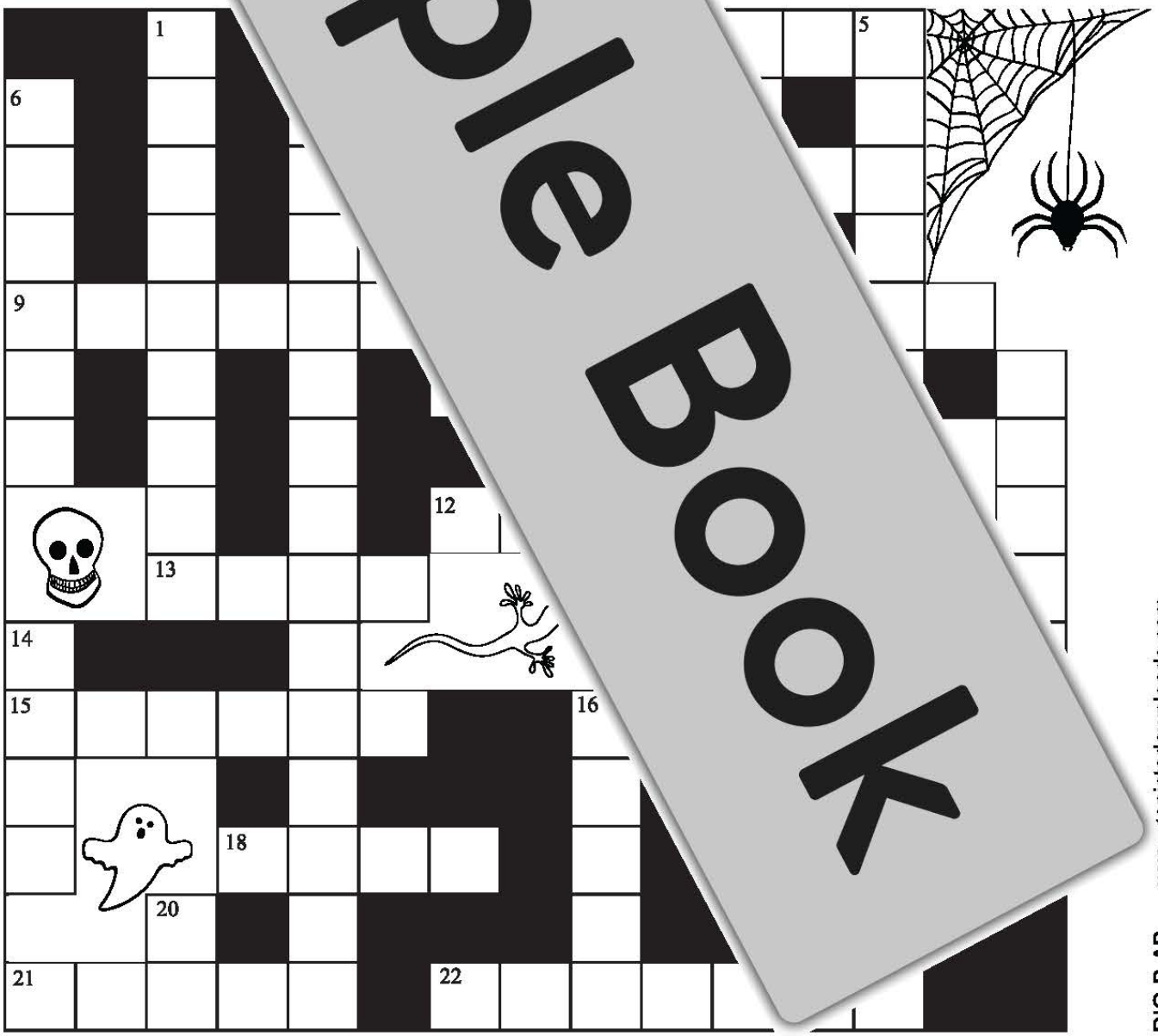
SCIENCE!

ASES

INS

1. Use yo he following crosswo
2. Work nea

A. CROSSWO



CLUE

1. l tests" not

2. This lution and blu

4. A househo

5. The substanc

6. The colour which ndy.

8. Dyes, which have on ifferent colour in an alkali.

10. On this scale, acidic sol ter is neutral at 7. Alkalies have values gr

11. The type of blue paper which changed in a base.

14. The term describing solid alkalies

16. The colour of universal indicator in n

17. A homemade indicator, which turns ligh

20. A wasp sting is / isn't neutralized by lemon

bstances are _____.
ot taste sour or bitter. They do not have a
ng.

7. A plu acid (aids digestion).

9. This indi gn. When a base, like
washing s sign, a bright pink
message ap

12. Universal indi ____, which gives a whole
range of colour

Colour in the range:

strong acid strong base

13. Both lemon juice and vinegar r change
to blue litmus paper.

15. A soluble base.

18. The colour of bromothymol blue in b

19. Bee stings, lemon juice, vinegar and col

21. A dangerous way to find out whether a par
or not.

22. When you add vinegar to litmus paper which is

23. The solution of bases _____ water are called ons.

LONGER QUESTIONS

to black tea, which is the indicator and

2. bstance is an acid or a base?

3. Is Unive tor to use?
Give an ex

4. Briefly explain ho g alkalies
and indicators.

OPTIONAL QUESTIONS

A. Write out the rec
acid-based indicat
B. Create your own mag g
an indicator and an alk
C. Explain what the PH sca

OOKY SCIENCE!
S AND BASES

All

Most ac
They ma
Strong ac
clothes.
All acids are
solutions.
Vinegar is a go
Other examples

y form acidic

s; milk; tea.

What colour do the
acidic solution?

d into an

a. Black tea _____
b. Bromothymol blue _____
c. Phenolphthalein _____
d. Universal indicator _____
e. Red litmus paper _____
f. Blue litmus paper _____

List a few household acidic solution

_____
_____
_____

All about Bases and Alkalies

Bases feel **soapy** or **slippery** when they are m
Soap contains a base called **sodium hydroxide.**
a bitter taste. Strong bases can burn the skin.
Some bases will **dissolve in water.** Bases which d
water are called **alkalies.** When an alkali dissolves in
forms an **alkaline solution.**



...e are bases.
...vashing powder; Handy Andy; shampoo.

R... ...ng indicators in a
ba...

a. Bl...
b. Brom...
c. Phen...
d. Univers...
e. Red litmu...
f. Blue litmus ...

Indicators:

In science, we ofte... ...d or a base.

We use **indicators** to ...
substance is an **acid** o...
The indicator changes ...
It is mixed with an acid or ...
alkaline solution.
An indicator will change to or...
in an acid and another colour i...

Indicators which we use most oft...
the laboratory, are **litmus paper**; bi...
blue; and universal indicator.
Acids change blue litmus paper red, ...
paper blue.

Bromothymol blue is yellow in an acid s...
Universal indicator turns red-yellow in ac... ...se)
solution.

We may use **black tea** as a neutral indicator.
Acids cause the tea to turn lighter and bases
cause it to turn darker.

Another ... red cabbage juice, ... solutions and ...

...litmus paper. It is not an acid nor ... no effect on an indicator.

Blue ... ...er.
Red ... ...o blue.
We sa...
Red litm... And....
Blue litm... ...d.
We say th...

...of acids.

Neutralisat...

We all have hydr... ...acid helps with digestion. Sometim... ...each which needs to be "neutrali... ...an **alkaline medicine** such as: Mi...

Most food is acidic. The ... ...contains an alkaline solution to neu...

Farmers always test the soil ... ...crops need sour soils to do well. Mo... ...a **sweet or natural soil** to do we... ...for a good crop. If there is too much ... hydroxide (slaked lime) to reduce ...

Bee stings burn and thus are acidic... an alkali - which will **neutralise** the ac...

The **sting of a wasp** contains an alkali... neutralise the sting and ease the pain.

ACIDS AND BASES

REVISION EXERCISE

...u know?

...he following words:
c. Alkali

...on feel like?
...e home.
...e home.
...r?
...e laboratory.
...the colour code
...tion is an acid

9. W...
   a.
   b. I...
   c. Br...
   d. Bro...
   e. Univ...
   f. Univer...

10. What happ...
    following?
    a. Vinegar b. ...

11. Give one examp...
12. What is a neutral ...
13. What is neutralisati...
14. Give one example o...
15. How do you treat a be...
    ease the pain?

ENRICHMENT

What is litmus paper made from ...

TEST

BASES

IN.

1. Car ions before answ
2. Write ur answer sheet.
3. For sec leting the table recorded on the An
4. For section r representing the correct answ
5. Check your wo

1. C eet by fil
2. The ether the substance is an acid or base. A he colour change which occurred when th nce.

SECTION B

Instructions:

1. Read the questions CAREFULLY.
2. Use an H.B. pencil to cross the letter repre.
3. Record all your answers on the correct answe.

1. T… correct statement:
… bitter.
… d alkalies.
… dangerous as some acids.
… 's teeth feel blunt/rough.

… xture of:
… tor.
… ids are dissolved in water.
… liquid, such as water.

3. … nd in the home?
A …dy; Bicarbonate of soda.
B. …v; Soap; Bee stings.
C. Fi… …uice.
D. So… …nate of Soda.

4. Name 2 h…
A. Bicarbo…
B. Lemon jui…
C. Lux soap; S…
D. Toothpaste;

5. What do we use in… …s.
A. Colour changes a…
B. To find out if a sub…
C. To determine if a su…
D. To change from one c…

6. Name two indicators used in …
A. Tea and Universal indicator.
B. Bromothymol blue and Univer…
C. Tea and Lemon juice.
D. Bromothymol blue and Washing …

7. What col… paper in acids?
A. P…
B. Blue.
D. Impossible to say.

…Universal Indicator purple?
…ndy Andy.
…h A and B.

9. …us paper in fruit juice?
A.
B.
C. S… is red.
D. No…

10. One exa…
A. Tea.
B. Spring wa…
C. Soil and ca…
D. Eno's and wa…

11. What is a neutral …
A. A solution which …
B. A solution with a s…
C. A solution with a wea…
D. None of these answer…

12. To make soil sweet, in orde… add a certain amount of:
A. Bicarbonate of soda.
C. Neutral or more acid.

13. To take old paint off a door, we use … soda. When all the paint is off, it is … soda otherwise it would burn the wood… the caustic soda?
A. A strong base.
B. A strong …
C. A weak acid.
D. A neutral …

14. [illegible] wasp sting to ease the pain? Rub in:
B. Toothpaste.
D. Both A and B.

[illegible] is caused by:
B. Too much alkali.
D. Too little alkali.

16. [illegible] "Acids"?
[illegible]h feel blunt.
B. [illegible]y feeling.
C. [illegible] feel rough.
D. Al[illegible] feeling.

17. Which s[illegible]?
A. Liquid [illegible]e; soapy.
B. Only liqu[illegible]te; soapy.
C. Only liquid[illegible]ous.
D, Liquid or so[illegible]e dangerous.

18. Sour soil contains
A. Calcium hydroxid[illegible]ds.
C. Slaked lime.[illegible]e.

19. What do we use to clea[illegible]
A. A strong base.
C. A strong acid.

20. Which statement is incorrect[illegible]
A. A bee sting is eased by rubbin[illegible]da.
B. A neutral solution causes no cha[illegible]
C. Strong bases are just as dangero[illegible]
D. Universal is always the best indica[illegible]

TEST

Bases

AN

NAM
GRADE

30

A. Complete the

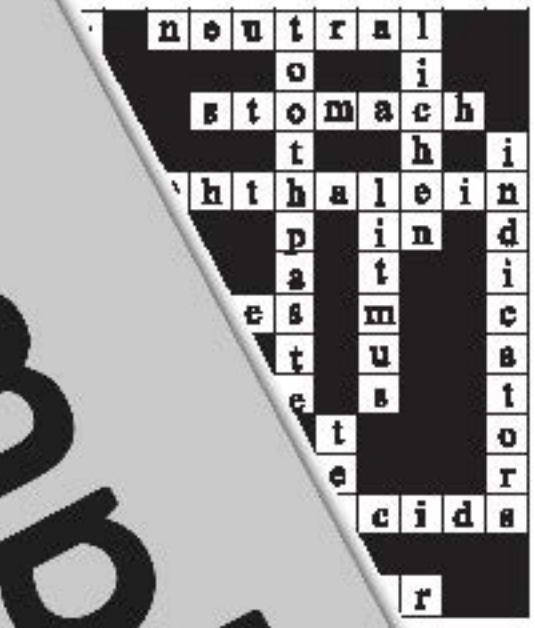
Substance	Name o	Inference
A	litm	A is
B	Universal I	is
C		an alkali/
D	Bromothymol B	
E	Phenolphthalein	base
F	Universal Indicator	
G		

B. Multiple Choice:

1	2	3	4	5	6	7	8	9	10	1									20
A	A	A	A	A	A	A	A	A	A	A									
B	B	B	B	B	B	B	B	B	B	B	B								
C	C	C	C	C	C	C	C	C	C	C	C							C	C
D	D	D	D	D	D	D	D	D	D	D	D	D				D	D	D	D

NSWER SHEET

The answ… …d and the test are provided.
Mos… …e evident by doing the experiments.



TEST ANSWERS:

A. Complete the tab…

Substance	Name of i…		Inference
A	_____litmus		…is an acid
B	Universal Ind…		…a weak acid
C	Universal Indic…		…n alkali/base
D	Bromothymol Blu…		…base
E	Phenolphthalein		…e
F	Universal Indicator		…l
G	Universal Indicator		…cid

B. Multiple Choice:

1	2	3	4	5	6	7	8	9	10	…	20
A	A	A	(A)	A	A	(A)	A	(A)	A	(A)	…
B	B	B	B	(B)	(B)	B	B	B	(B)	B	B	…
(C)	(C)	(C)	C	C	C	C	C	C	C	C	C	…	C
D	D	D	D	D	D	D	D	D	D	D	(D)	D	…	D	D	(D)