

*Comprehensive*

As Per New  
Continuous and  
Comprehensive  
Evaluation  
(CCE)  
Scheme

# PRACTICAL SCIENCE



**Dr. N.K. Sharma**

**CLASS X**

*Comprehensive*  
**PRACTICAL SCIENCE**  
CLASS X

*Comprehensive*  
**PRACTICAL SCIENCE**

FOR  
CLASS X

*Strictly according to new curriculum prescribed by*

Central Board of Secondary Education (CBSE)

and

State Boards of Chhattisgarh, Haryana, Bihar, Jharkhand, Kerala, Mizoram,  
Meghalaya, and other States following (CBSE) Curriculum

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## Comprehensive PRACTICAL SCIENCE CLASS X

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|                      |  |     |    |
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|  |  |     |            |
|--|--|-----|------------|
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## SECOND TERM

|  |   |     |             |
|--|---|-----|-------------|
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# LETTER TO THE STUDENTS

Dear students,

In this age of nail-biting competition, it really helps to be well equipped in subject knowledge in order to break the ice in the competitive area. So, while the market is flooded with numerous repetitions of books which mar your intellectuality and competency, we have endeavoured to reach out to your widen examination needs in this edition. Keeping in mind the broader comprehensive needs of subject knowledge we have put in our best efforts in this book.

Present book, **Academic Practical Science** for **class X** is strictly based on the new CBSE curriculum. An honest effort has been made in this book to attain underlying objectives of syllabus, such as developing *problem solving and decision making skills; understanding and appreciating the joint enterprise of science, technology and society; acquiring process skills which form part of the attitude for developing a scientific temper*; developing certain manipulative skills which are required in day to day life situations, etc. This practical book covers required practicals prescribed in the new syllabus in all the science disciplines *i.e.*, Physics, Chemistry and Biology. Viva Voce, Multiple Choice Questions and NCERT Lab Manual Questions are also added with each practical to attempt well in **Multiple Choice Written Test** for testing practical skills. Thus, this book fully covers the **Scheme of Evaluation**.

Some of the salient features of the book are :

## Formative Assessment

- ★ Experiments are *strictly according* to the **New CBSE Syllabus (CCE Based)**.
- ★ Experiments are *very methodically i.e.*, according to scientific method/process or/and pattern approved by the eminent experts. SI units are used where necessary.
- ★ Use of locally available required materials have been suggested, as far as possible, for conduction of experiments in the local laboratories.
- ★ Viva-Voce Question and **NCERT Lab Manual Question** are given at the end of the experiment.
- ★ Some important points for teacher are also given for experiments.

## Summative Assessment

- ★ Multiple Choice Questions related to experiment/theory of the practical/principles are given at the end of each practical to test practical skills.
- ★ **Sample Paper 1, 2, Termwise are include.**
- ★ Although we have taken care and laid down all efforts to remove any discrepancy which might have crept in, yet criticism or suggestions are always solicited from your end. Thanking you in anticipation for your co-operation.

Please do write to the authors or our publishers. Wishing for your success.

—Authors

# SYLLABUS

## PRACTICALS

### CLASS X

MARKS : 40 (20 + 20)

## LIST OF EXPERIMENTS

### FIRST TERM

Practical should be conducted alongside the concepts taught in theory classes.

- To find the pH of the following samples by using pH paper / universal indicator:
  - Dilute Hydrochloric Acid
  - Dilute NaOH solution
  - Dilute Ethanoic Acid solution
  - Lemon juice
  - Water
  - Dilute Sodium Bicarbonate solution.
- To study the properties of acids and bases (HCl and NaOH) by their reaction with:
  - Litmus solution (Blue/Red)
  - Zinc metal
  - Solid sodium carbonate
- To perform and observe the following reactions and classify them into :
  - Combination reaction
  - Decomposition reaction
  - Displacement reaction
  - Double displacement reaction
    - Action of water on quicklime
    - Action of heat on ferrous sulphate crystals
    - Iron nails kept in copper sulphate solution
    - Reaction between sodium sulphate and barium chloride solutions.
- (a) To observe the action of Zn, Fe, Cu and Al metals on the following salt solutions:
  - $\text{ZnSO}_4$  (aq.)
  - $\text{FeSO}_4$  (aq.)
  - $\text{CuSO}_4$  (aq.)
  - $\text{Al}_2(\text{SO}_4)_3$  (aq.)(b) Arrange Zn, Fe, Cu and Al (metals) in the decreasing order of reactivity based on the above result.
- To study the dependence of potential difference (V) across a resistor on their current (I) passing through it and determine its resistance. Also plot a graph between V and I.
- To determine the equivalent resistance of two resistors when connected in series.
- To determine the equivalent resistance of two resistors when connected in parallel.
- To prepare a temporary mount of a leaf peel to show stomata.
- To show experimentally that light is necessary for photosynthesis.
- To show experimentally that carbon dioxide is given out during respiration.

## SECOND TERM

**Practicals should be conducted alongside the concepts taught in theory classes.**

1. To study the following properties of acetic acid (ethanoic acid) :
  - (i) odour
  - (ii) solubility in water
  - (iii) effect on litmus
  - (iv) reaction with sodium bicarbonate.
2. To study saponification reaction for preparation of soap.
3. To study the comparative cleaning capacity of a sample of soap in soft and hard water.
4. To determine the focal length of:
  - (a) Concave mirror,
  - (b) Convex lens,by obtaining the image of a distant object.
5. To trace the path of a ray of light passing through a rectangular glass slab for different angles of incidence. Measure the angle of incidence, angle of refraction, angle of emergence and interpret the result.
6. To study (a) binary fission in Amoeba and (b) budding in yeast with the help of prepared slides.
7. To trace the path of the rays of light through a glass prism.
8. To find the image distance for varying object distances in case of a convex lens and draw corresponding ray diagrams to show the nature of image formed.
9. Aim is animal plants description only animal plants missing to study homology and analogy with the help of models/charts of animals and models/charts/specimens of plants.
10. To identify the different parts of an embryo of a dicot seed (Pea, gram, or red kidney bean).

# CATEGORIES OF PRACTICAL SKILLS

## A. Procedural and Manipulative Skills

To

- select appropriate apparatus/instruments for performing the experiment.
- know the limitations of the apparatus/instruments regarding their size, least count and accuracy.
- arrange/assemble/set and adjust the apparatus systematically.
- handle the apparatus, instruments, chemicals carefully to avoid any damage or injury.
- perform the experiment with reasonable efficiency and accuracy.
- separate and remove desired parts of a specimen for detailed study without damaging it.
- use appropriate methods and materials for specimen mounting.
- locate and rectify the errors in apparatus, instruments, etc.
- add chemicals in appropriate quantity.
- dismantle the experimental set-up carefully.
- handle the apparatus, instruments, chemicals carefully to avoid any damage or injury.
- perform the experiment with reasonable efficiency and accuracy.
- separate and remove desired parts of a specimen for detailed study without damaging it.
- use appropriate methods and materials for specimen mounting.
- locate and rectify the errors in apparatus, instruments, etc.
- add chemicals in appropriate quantity.
- dismantle the experimental set-up carefully.
- Practise the precautions in handling sensitive apparatus or chemicals or flame.

## B. Observational Skills

To

- find the least count of the instrument.
- read the instrument correctly.
- notice the colour change, evolution of gases, formation of precipitates, chemical reactions, etc. carefully.
- notice the relevant details in the given specimens minutely.
- locate the desired parts in a specimen accurately.
- take observations carefully and in a systematic manner.
- read graph correctly.

## C. Drawing Skills

To

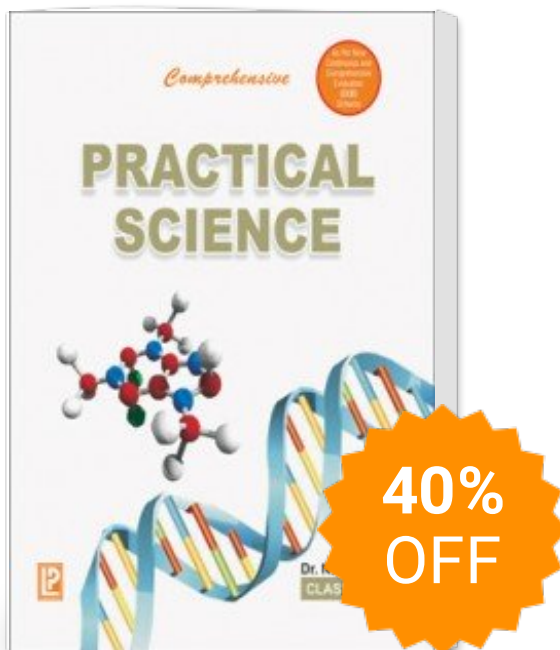
- make proper observation tables.
- draw circuit diagrams, ray diagram, experimental set-up, sketches, etc. correctly and proportionately.
- label sketches and diagrams correctly.
- draw graphs from observed data correctly based on observed data.

## D. Reporting and Interpretative Skills

To

- make a proper plan for recording the observations.
- record the observations/data/information correctly and systematically.
- classify and categorize organisms.
- make correct calculations/predictions.
- use proper formulae and mode of summarising and reporting the result.
- report the result using correct symbols, units, terms and chemical equations.
- interpret the observations and results correctly.

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