

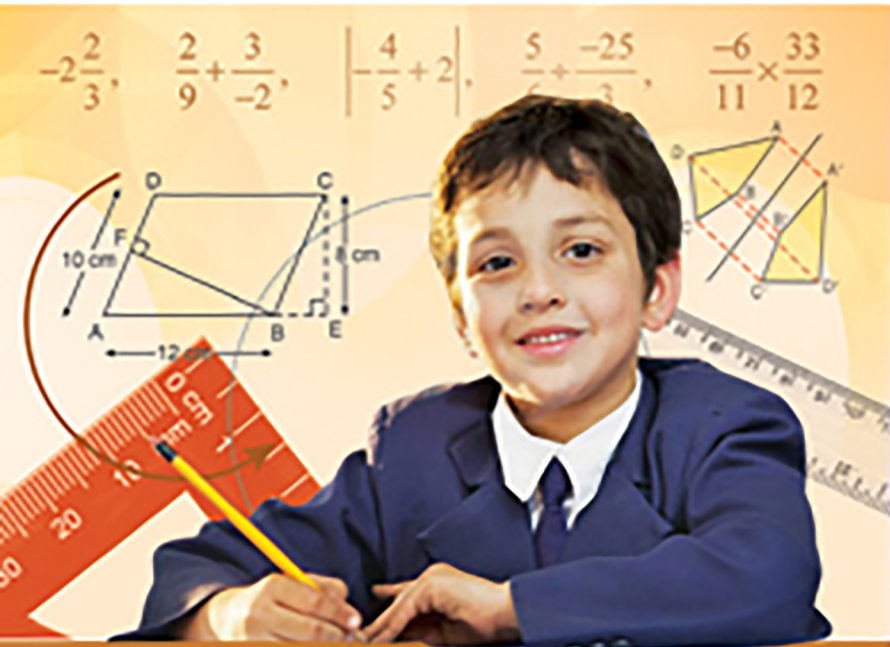
As per CBSE Guidelines and CCE Pattern

New
Revised
Edition

Composite

Mathematics

for Class **VII**



INCLUDING

- Mental Maths
- Multiple Choice Questions
- HOTS
- Activities and Worksheets
- Chapter Assessments
- Formative/Summative Assessments
- Lab Activities

S.K. GUPTA
ANUBHUTI GANGAL



Strictly conforming to the NCERT Syllabus and guidelines laid down by CBSE
and Other Educational Boards

Composite Mathematics

FOR CLASS VII

Revised Edition 2015
Teacher's Handbook also Available

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PREFACE TO THE REVISED EDITION

- The new model of teaching methodologies, content and *Continuous and Comprehensive Evaluation (CCE)* introduced by CBSE has been religiously followed and adhered to in the revised edition.
- *Test Your Understanding* exercises for immediate practice have been given almost after every topic.
- Exercises have been re-designed to include all types of questions, especially the *Multiple Choice Questions (MCQs)* and *High Order Thinking Skills (HOTS)*.
- *Chapter Assessment* based on CCE Pattern is provided at the end of each chapter to assess the child's understanding of the concepts given therein.
- *Lab Activities as per CBSE guidelines* have been incorporated at the end of the book.
- *Formative Assessment* is a part of the on-going scholastic evaluation of the child (as per CCE). It is a kind of Unit Test – A *Self-assessment* of the concepts taught in the class.
- *Mental Maths* exercises have been given to develop skills in rapid calculations.
- It also incorporates *Maths Alert* to warn against likely mistakes and misconceptions.
- *Summative Assessment* at the end of each term has been skillfully prepared incorporating all types of questions such as :
 - (i) Very Short Answer Type Questions (Concept Review, True-False, Matching Questions).
 - (ii) Short Answer Type Questions.
 - (iii) Multiple Choice Questions (MCQs).
 - (iv) High Order Thinking Skills (HOTS).

AUTHORS

A NOTE ON THE NEW REVISED EDITION

The present edition is a thoroughly revised version of the last edition. The content has been thoroughly revised, reorganised and re-written at a number of places making the treatment simpler and easier to understand. In deference to feedback and suggestions received from learned faculty in schools, a sincere effort has been made to **prune the exercises** and reduce the number of problems without of course compromising the quality which remains the hallmark of this series.

AUTHORS

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Further, the appearance of the personal name, location, place and incidence, if any; in the illustrations used herein is purely coincidental and work of imagination. Thus the same should in no manner be termed as defamatory to any individual.

PREFACE

It gives us great satisfaction to be able to bring out this series in **Composite Mathematics for Classes VI to VIII**. It has been designed to incorporate the current global trends and International practices and the latest philosophy and policy of providing stress-free education.

The **salient features** of this series are :

1. **It follows strictly the latest syllabus presented and released by the NCERT and its guidelines.**
2. All the mathematical concepts have been presented in a very simple and lucid form and loading the course content with unnecessary and irrelevant details has been avoided. The approach and orientation is to lay a strong foundation for the students through adequate emphasis on the fundamentals.
3. It aims at **complete involvement of the pupils in the learning process**. The emphasis throughout the text is on a student-centred performance, and in keeping with the spirit of the new Curriculum, **activity approach** is freely used relating the mathematical concepts to real-life situations.
4. Every unit is introduced by a motivating paragraph or story.
5. To facilitate easy and better understanding, each unit is divided into a number of subunits with short and separate practice exercises on each subunit.
6. **An attempt has been made to expose the children more fully to the 'Why' of various operations and made abundant use of diagrams, illustrations, cartoons, tables and charts to stimulate the student's interest in the subject and to clarify more difficult concepts.**
7. Colour panels are used throughout as a teaching aid to emphasize important terms and relationships and present useful tips.
8. The problems given in the books avoid tedious calculations and help in strengthening the understanding of basic principles honing the faculties of thinking and reasoning.
9. Each chapter contains a **unit summary of key points** at the end. It reviews the main points covered and helps the students in remembering them.
10. **Mental maths** exercises have been given to help the students acquire speed and sharpen their intellect.

It is hoped that this series of books will meet more than adequately the needs of the students they are meant for. Any suggestions for the improvement of the books would be most welcome and gratefully acknowledged.

AUTHORS

A NOTE FOR THE TEACHERS

Dear friends,

We feel happy to be able to present for your perusal and consideration the new and thoroughly revised and updated edition of our Composite Mathematics Series for Classes VI, VII and VIII. It has no doubt been possible as a result of the motivation and feedback received in the form of valuable comments, suggestions and criticism from the learned teachers. We strongly feel that a textbook howsoever good it may be is only a tool to help teachers to teach effectively. It is the teacher and only the teacher who is competent to decide his/her teaching strategies in the classroom and is the best judge of how to use the textbook to meet the special needs of his/her class. It is earnestly hoped that this series will be able to supplement your efforts effectively to create interest of your pupils in the subject and make the study of mathematics interesting and enjoyable and gain mastery over the subject.

Howsoever best one performs or creates there is always scope for improvement.

We would be very happy rather grateful to receive your comments, appreciation/criticism and suggestions for further improvement of the books.

With regards
Yours sincerely
Authors

A NOTE FOR THE STUDENTS

Dear students,

Wishing you the best in life. You are the best judge to evaluate whether the book you are studying fulfils your needs and satisfies your thirst for knowledge or not. Please do not hesitate to write individually through the publishers or directly to the authors at the following address, if you come across any discrepancies or if you have some suggestions to make.

Email: anubhutigangal@hotmail.com

Authors

NEW SYLLABUS

UNIT I : NUMBER SYSTEM (Periods 50)

(i) Knowing Our Numbers :

Integers

- Multiplication and division of integers (through patterns). Division by zero is meaningless
- Properties of integers (including identities for addition and multiplication, *commutative, associative, distributive*) (through patterns). These would include examples from whole numbers as well. Involve expressing commutative and associative properties in a general form. Construction of counter-examples, including some by children. Counter example like subtraction is not commutative.
- Word problems including integers (all operations)

(ii) Fractions and Rational numbers :

- Multiplication of fractions
- Fraction as an operator
- Reciprocal of a fraction
- Division of fractions
- Word problems involving mixed fractions
- Introduction to rational numbers (with representation on number line)
- Operations on rational numbers (all operations)
- Representation of rational number as a decimal
- Word problems on rational numbers (all operations)
- Multiplication and division of decimal fractions
- Conversion of units (lengths and mass)
- Word problems (including all operations)

(iii) Powers :

- Exponents only natural numbers.
- Laws of exponents (through observing patterns to arrive at generalization.)

$$(i) a^m \cdot a^n = a^{m+n}$$

$$(ii) (a^m)^n = a^{mn}$$

$$(iii) \frac{a^m}{a^n} = a^{m-n}, \text{ where } m - n \in N$$

$$(iv) a^m \cdot b^m = (ab)^m$$

UNIT II : ALGEBRA (Periods 20)

Algebraic Expressions :

- Generate algebraic expression (simple) involving one or two variables
- Identifying constants, coefficient, powers
- Like and unlike terms, degree of expression, e.g., x^2y etc. (exponent ≤ 3 number of variables ≤ 2)
- Addition, subtraction of algebraic expressions (coefficients should be integers).
- Simple linear equations in one variable (in contextual problems) with two operations (avoid complicated coefficients).

UNIT III : COMMERCIAL ARITHMETIC (Periods 20)

- Ratio and proportion (revision)
- Unitary method continued consolidation, general expression.
- Percentage-an introduction.

- Understanding percentage as a fraction with denominator 100.
- Converting fractions and decimals into percentage and vice-versa.
- Application to profit and loss (single transaction only)
- Application to simple interest (time period in complete years)

UNIT IV : GEOMETRY (Periods 60)
--

(i) Understanding Shapes :

- Pairs of angles (linear, supplementary, complementary, adjacent vertically opposite) (verification and simple proof of vertically opposite angles)
- Properties of parallel lines with transversal (alternate, corresponding, interior, exterior angles).

(ii) Properties of Triangles :

- Angles sum property (with notions of proof and verification through paper folding, proofs using property of parallel lines, difference between proof and verification.)
- Exterior angle property
- Sum of two sides of a $\Delta >$ it's third side
- Pythagoras' Theorem (Verification only)

(iii) Symmetry :

- Recalling reflection symmetry
- Idea of rotational symmetry, observations of rotational symmetry of 2-D objects, (90° , 120° , 180°)
- Operation of rotation through 90° and 180° of simple figures
- Examples of figures with both rotation and reflection symmetry (both operations)
- Examples of figures that have reflection and rotation symmetry and vice-versa

(iv) Representing 3-D in 2-D :

- Drawing 3-D figures in 2-D showing hidden faces.
- Identification and counting of vertices edges, faces, nets (for cubes cuboids, and cylinders, cones).
- Matching pictures with objects (identifying names)
- Mapping the space around approximately through visual estimation.

(v) Congruence :

- Congruence through superposition (examples-blades, stamps, etc.)
- Extend congruence to simple geometrical shapes, e.g., triangles, circles.
- Criteria of congruence (by verification) SSS, SAS, ASA, RHS.

(vi) Construction (Using Scale, Protractor, Compasses) :

- Construction of a line parallel to a given line from a point outside it. (Simple proof as remark with the reasoning of alternate angles)
- Construction of simple triangles. Like given three sides, given a side and two angles on it, given two sides and the angle between them.

UNIT V : MENSURATION (Periods 15)
--

- Revision of perimeter, Idea of π , Circumference of circle

Area :

Concept of measurement using a basic unit area of a square, rectangle, triangle, parallelogram and circle, area between two rectangles and two concentric circles.

UNIT VI : STATISTICS (Periods 15)
--

Data Handling :

- Collection and organisation of data – choosing the data to collect for a hypothesis testing.
- Mean, median and mode of ungrouped data, understanding what they represent.
- Constructing bar graphs
- Feel of probability using data through experiments. Notion of chance in events like tossing coins, dice etc. Tabulating and counting occurrences of 1 through 6 in a number of throws. Comparing the observation with that for a coin. Observing strings of throws, notion of randomness.

CONTENTS

UNIT 1 : NUMBER SYSTEM

- | | |
|-------------------------|---------|
| 1. Integers | 1 – 19 |
| 2. Fractions | 20 – 37 |
| 3. Decimals | 38 – 52 |
| 4. Rational Numbers | 53 – 77 |
| 5. Exponents and Powers | 78 – 92 |

Formative Assessment–1

UNIT 2 : ALGEBRA

- | | |
|-------------------------------------|-----------|
| 6. Algebraic Expressions | 93 – 104 |
| 7. Linear Equations in One Variable | 105 – 116 |

UNIT 3 : COMMERCIAL ARITHMETIC

- | | |
|--|-----------|
| 8. Ratio and Proportion and Unitary Method | 117 – 131 |
| 9. Percentage and Its Applications | 132 – 157 |

Formative Assessment–2

Summative Assessment–1

UNIT 4 : GEOMETRY

- | | |
|-------------------------------------|-----------|
| 10. Lines and Angles | 158 – 178 |
| 11. The Triangle and Its Properties | 179 – 202 |
| 12. Practical Geometry | 203 – 207 |
| 13. Congruence of Triangles | 208 – 226 |

Formative Assessment–3

UNIT 5 : MENSURATION

- | | |
|------------------------|-----------|
| 14. Perimeter and Area | 227 – 251 |
|------------------------|-----------|

UNIT 6 : STATISTICS

- | | |
|----------------------------|-----------|
| 15. Data Handling | 252 – 267 |
| 16. Chance and Probability | 268 – 277 |

UNIT 4 : GEOMETRY (Contd.)

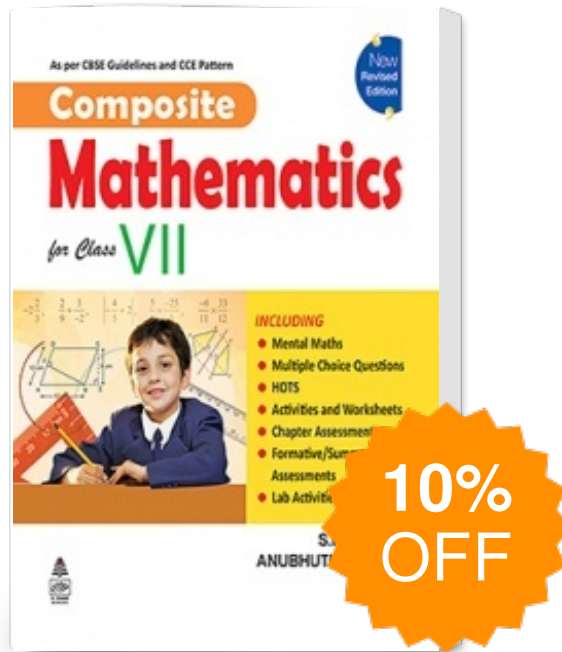
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|--|-----------|
| 17. Symmetry | 278 – 295 |
| 18. Visualising Solid Shapes (Representing 3-D in 2-D) | 296 – 313 |

Summative Assessment–2

Answers 314 – 338

Lab Activities 339 – 349

Composite Mathematics Book-7



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