New Countdown
Second Edition

2

Teaching Guide

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A Note to the Teacher from the Author

New Countdown 2 is the fourth book of a seven-book course specially designed for the young mathematician of today’s fast-changing world. Building on the foundations established in New Countdown Primer A, New Countdown Primer B and New Countdown 1, it leads children to the confident handling of more advanced operations and concepts: working with 3-digit numbers; the concept of one thousand; addition, subtraction and multiplication with changing; multiplication and division facts up to 100; time and its measurement; key geometrical concepts; and the idea of fractions.

New Countdown 2 covers all the concepts recommended for Class 2 learners by all major syllabuses; it also reaches beyond them in a systematic and carefully graded way. As in the preceding books of the course, worked examples are provided for every concept introduced, and a range of activities (including puzzles, crosswords and a coded message) seek to guarantee the interest and involvement of every child.

New Countdown 2 comprises three parts, each containing work which can be covered comfortably in the space of a term. We recommend that you follow the three parts in sequence. Review pages appear regularly in the text, and there’s a longer review section at the end of each part.

Here are my suggestions for practical work and simple teaching aids which you can incorporate in your lessons. They will reinforce learning and add interest, variety and a practical dimension to your classes.

PART ONE

New Countdown 2 opens with a seven-page review of some of the key concepts presented in New Countdown 1. It is essential to check that each child has mastered these concepts and is confident about handling them before you proceed to teach new concepts. Review activity relating to place value needs special emphasis. Make use of the matchsticks (or straws, pencils or lollipop sticks) for tens and ones recommended in New Countdown 1 as well as place-value cards. Your place-value cards should now cover the entire span of numbers from 1 to 999, and you may also want to prepare a longer card to show 1000.

Perhaps the most useful teaching aids for Class 2 learners are tens and ones tins. You will find that presenting the concept of changing is made much simpler through the use of these. Each child is given (or brings from home) two old tins or plastic tumblers. One tin is labelled as ‘tens’ and the other as ‘ones’. To use the tins, each child must have access to matchsticks or straws bundled into tens, and also to loose sticks. He must also have at least two/three sets of numeral cards from 0 to 9 readily available.

When you start working on addition converting ones (Page 8), ask the children to work in pairs. For example, the first child shows number 18 by putting one bundle of ten sticks in his/her tens tin and 8 loose sticks in his/her ones tin. He then places the correct numeral card against each.

The second child shows number 12 in the same way. The two children then find out how many sticks there are altogether by putting the bundles of ten into one of the tens tins, and the single sticks into one of the ones tins. They will discover that they have 10 sticks in the ones tin. Discuss
This carefully, making sure the children understand why they must tie the sticks together and place that bundle in the tens tin.

They now find they have three bundles of sticks in the tens tin and zero sticks in the ones tin. Now repeat the activity, at each stage noting on the board what the children are doing.

First, show the addition to be done:

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<tr>
<th>tens</th>
<th>ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
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<tr>
<td>+</td>
<td>1</td>
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<td></td>
<td>2</td>
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<td></td>
<td>10</td>
</tr>
</tbody>
</table>

Now add the ones (single sticks).

Use a dotted line or coloured chalk to show the ‘10’ in the ones column.

As the children tie their 10 sticks in the ones tin together and place them in the tens tin, explain that we show the transferred or changed ones by writing a ’1’ in the tens column:

This activity can be extended to cover the addition of ones where the sum is greater than 10 (refer page 9). By adding a third, ‘hundreds’ tin, you can utilize the activity also for 3-digit addition with changing.

When introducing subtraction with changing ask each child to place three bundles of sticks in the tens tin leaving the ones tin empty. Now ask him/her to remove five of the sticks and see how many are left. As he/she does the operation note the steps on the board:

First, the child discovers that he/she has to open one of the bundles in the tens tin in order to take out 5 sticks. Explain to the child how he/she can record exactly what he/she did:

First, he/she took out one of the tens bundles: Three bundles therefore became two. Next, the tens bundle was changed into 10 ones to be able to subtract the ones and get the right answer.

This activity can be repeated when you come to the concept of subtraction of TO from TO. For example, the sum on page 15 can be shown in tens and ones tins thus:

The children are asked to remove 27. They first remove one bundle of ten and untie it to get 10 single sticks. Note this on the board:

They add the 10 sticks to the 2 already in the ones tin, making 12. Now they can subtract the ones (12 – 7 = 5). After taking away the tens (4 – 2 = 2) they get the answer as 25 sticks.
Make sure your children understand the importance of neat and systematic work when converting from ones to tens and vice-versa. Explain that if they fail to write their conversions clearly and in the correct column, they will make mistakes.

**PART TWO**

Here, multiplication and division facts, begun in New Countdown 1, are completed. It is essential for children to master these facts and have them at their fingertips as they proceed to more advanced multiplication work. Games, puzzles, pattern-seeking and regular use of the multiplication square on page 64 will help. Make sure that every child grasps the fact that when a zero occurs in a multiplication the result is always zero (refer page 66).

Flashcards are a simple and practical way of helping children learn their multiplication and division facts and understand their interrelatedness. Cut a corner off each card so that its ‘front’ will be uppermost when it is placed in sets:

![Flashcards](image)

On the front, write an incomplete fact, supplying the completed fact on the reverse. You can use the cards for general class work (team games, quizzes, etc.) or ask the children to work in pairs: here, one child flashes the card at his/her partner, checking his answer by looking at the back. You can also prepare flashcards to reinforce the work presented on page 77.

Encourage your children to look for patterns in the number facts they are learning. For example, in multiples of 9 the sum of the digits is always 9 (18 = 1 + 8 = 9, 27 = 2 + 7 = 9, and so on). And in multiples of 5 the ones part of the answer is always either 0 or 5.

For multiplication using place value where multiplications outside the known facts are involved (refer page 70), make use of your tens and ones tins also. Ask three children to arrange 14 sticks each in their pairs of tins. What happens when all the sticks are put together in another pair of tins? Most children will say that there are 3 tens and 12 ones. Help them to see why they must change the 12 ones into one bundle of tens and two ones, transferring the newly made or changed bundle of ten to the tens tin. Repeat the operation noting down each stage on the board:

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<th>O</th>
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<tr>
<td>1</td>
<td>4</td>
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Now proceed to explain how we simplify the recording of the sum by writing our changed ones as one ten in the tens column:

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When discussing the geometrical terms introduced on pages 90–96, it is essential for you to have real-life examples of each solid shape ready in the classroom: suggestions are made in the text. Encourage your children to handle the shapes and discover through actual experience how many faces, edges and vertices they have, and whether their faces are curved or plane surfaces.
The same point applies to currency notes introduced on pages 100–103. Make sure you have a specimen of each note to show the children enabling them to compare sizes, colours and designs. The shopping exercise on page 106 is one you can easily develop in your classroom. Arrange a display of simple items with price labels attached. Select a group of children and allocate them money—simple currency notes made of paper or cardboard, or actual coins. Ask them to buy what they want and work out their spending sums. Extend your shop work to cover multiplication and division: for example, ask ‘if lollipops cost Rs 4 each, how much will six lollipops cost? If 4 children have Rs 20 to spend, how many lollipops can they buy?’

PART THREE

The concept of time is something all children enjoy discussing. You can talk about birthdays; holidays; grandparents and when they were born; last year and next year; last week and next week; or even being late for school (as Adil on page 110). As you proceed to clock work (introduced on Page 116) make your own classroom display clock, with adjustable hands. Make your clock out of thick cardboard attaching the hour hand and minute hands with a paper fastener or drawing pin so that the hands can be moved. Make sure there is a big difference in the length of the two hands. Organize team games around the problem of showing what o’clock it is. Develop the idea of thinking of one hour earlier or one hour later (refer page 120), asking the children to show the time on the clock face. Use your cardboard clock to demonstrate half past the hour (page 122). Ensure that the children understand that they must move the short hand as well as the long hand.

The sections on length, weight and capacity set out a number of key correlations involving 1000. After establishing that 1 km = 1000 m, these sections point out that other measures, too, can be divided into 1000 parts. Simple number facts relating to 1000 are then presented (pages 126–127; 134–138). You might like to devise your own flashcards to reinforce these useful number facts. Children are also introduced to the idea of working with two units of measurement simultaneously—for example, metres and centimeters, kg and g, and so on. Simple addition and subtraction exercises involving no carry over from the smaller unit to the bigger unit or vice-versa are included; make sure your children feel confident working with these more complicated-looking sums.

The concept of fractions (pages 149–155) offers you plenty of scope for practical activity. Make sure all the children fold sheets or strips of paper to make halves (page 149). Let them cut along the fold line, then hold up each piece in turn and tell the class ‘This is one half of my paper’. Then ask them to hold up both pieces together saying ‘Two halves make a whole’. Now introduce notation asking the children to write on each of the two halves of their sheet. Repeat this activity when you introduce the concept of quarters (Page 153). By holding up two quarters children will instantly see how $\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$.

Wishing you exciting and enjoyable teaching!

Shamlu Dudeja
Introduction

Children are born with a mind which is thinking, receptive and ready to try on new things. So they have a vast potential to grow unless circumstances throttle them. The two most essential aspects for this growth are the two R’s, i.e. reading and (w)riting and both of them are dependent on each other. The primary objective of the New Countdown series is to ensure that every child develops a strong affinity towards mathematics (as against a fear for it). And, for this, the following things are necessary:

- Concentration
- A sense of fun
- Retentive memory
- Asking questions and giving answers with confidence
- A sense of discovery and learning (rather than 'being taught')
- Understanding of the subject in a creative, logical and lateral manner
- Individual, easy pace of learning for each child
- A sense of confidence
- Affectionate bonding with the teacher

Teachers need to take the age group of the children into consideration and help them learn in a manner suitable to their age.

The first three years in school aided by Primer A, Primer B and Book 1 of New Countdown have been very useful in exposing these children to new things and new ideas in mathematics. At the end of these three years, their power of grasping new topics has improved, they are familiar with the beginnings of the two R’s and they are ready to accept a lot more.

BUILDING CONCENTRATION

As children grow older concentration becomes more imperative. This can start with the children shaking their arms and legs while standing at their individual positions and giving out a jolly good laugh. Look right, look left, raise your right hand and thump your left foot, .... It may sound crazy, but it does help to make a good beginning for the day.

This is followed by a round of meditation. All children sit down, close their eyes, and mentally focus on whatever they wish—be it a beautiful scene on a beach, a colorful flower or the face of his/her mother. They sit in this posture for a minute or two, to start with, and then go on to increase this duration up to five minutes.

The kind of concentration children are likely to develop through this focusing exercise will stay with them for many hours. In fact, this can be repeated after lunch break, once the children are back on their seats.

Note: It is essential to mention here that teachers do not mix this focusing exercise with religious meditation, as a matter of respect for the multi-religious societies we live in.

MEMORY RETENTION AND FUN

All learning needs to start with practical activities in a garden or in the classroom or on the board. This makes learning enjoyable and fun-filled (vis-à-vis rote learning).

Such an approach also goes a long way in making memory retentive. Rote learning, at the most, uses two senses—listening and seeing (reading), whereas activities involve touching (doing) all the
time, and smelling and tasting too, on a few occasions. The sense of joy or pleasure at discovering new things, which is missing in rote learning, is a great accelerator for learning.

The greater the number of senses used during a learning exercise the better will be the concentration and subsequent understanding, retention and application. The joy that children derive out of such a learning experience would be an added bonus.

Formal textbook learning leads to vertical learning, such as

\[ 2 + 1 = 3, \text{ therefore } 3 + 1 = 4 \text{ and so on} \]

Nowadays, it is important that children think, learn and apply their knowledge laterally, i.e. they are actually able to apply the concepts learnt by them to their environment throughout the day. Any aspect of learning done with concentration will lead to retentive memory and the use of retentive memory can never be undermined.

DISCOVERING, LEARNING AND UNDERSTANDING THE CONCEPT

Children learn something new every minute as they discover. Each discovery is a result of a practical activity and without practical activity proper grasp of the subject is not possible.

A child may recite poem-like \( 1 + 1 = 2, 1 + 2 = 3, \) and so on. But, unless these numbers are connected to the physical world by presenting the above sums as, say, ‘1 marble put together with 1 more marble gives 2 marbles’ and ‘2 marbles put together with 1 more marble gives 3 marbles’, the entire number sequence makes little sense.

After a start like this, the child’s sense of curiosity will be heightened and will remain with him/her throughout life lending it a dimension that many adults have never experienced.

LATERAL THINKING

In today’s time, more than ever before, it is important that children think, learn to think and apply their knowledge laterally, i.e. they apply what is actually learnt from the books in the classroom to their environment throughout the day in their every-day life. For example, number families, such as \( 1, 2 \) and \( 3, 2 + 1 = 3 \) and \( 3 – 1 = 2 \) or \( 3 – 2 = 1 \) are not only learnt for the classroom but to apply in their daily life as:

‘I need 3 books to give as gift to my friends. I have 2 books at home. So I need to buy 1 book \( (3 – 2) \) more.’

New Countdown series may teach the child only 1st, 2nd, 3rd, …, up to 10th, but if the lesson has been creatively handled when a situation arises involving 20 children in a line a child with a developed lateral power of thinking will apply 11th, 12th, 13th, and so on automatically. So, observation and vocabulary improve leading to a major jump in learning.

ASKING QUESTIONS AND GIVING ANSWERS

The mother of a well-known intellectual said that the reason for her son’s brilliant performance in life was that he always asked too many questions and gave answers, even when he was not asked. Can one say more? A good teacher is the one who encourages children to ask questions and give answers and also gives them a chance to find solutions to different situations whenever possible.
PACE OF LEARNING
In the ‘open’ method of learning suggested in New Countdown books, it is possible to include children with different learning abilities. Every child works at his/her own pace without being singled out. With greater exposure, he/she will eventually fall in line with the majority, and hence slow learners will not feel a sense of failure.

BUILDING SELF-CONFIDENCE
Being in a familiar and friendly environment itself is a confidence-building exercise. The more relaxed and confident a child is, the easier it is for him or her to absorb new concepts, as the year progresses.

BONDING WITH THE TEACHER
Children are born with a mind which is thinking, receptive, and ready to try on new things. So they have a vast potential to grow if handled properly by the teacher. A happy and fun-filled atmosphere, which the teacher creates, leads to a greater bonding between the children and the teacher. This is very important at the primary levels and should never be ignored. A comfortable, tension-free atmosphere leads to healthier mental growth. What else could be a better reward for a teacher than a class full of happy and confident children?
PART ONE

Revision of the Concepts (Pages 1–19)

Page 1 addition, subtraction, multiplication and division
Page 2 greater than and less than; before, after and between
Page 3 ascending order and descending order
Page 4–6 place value
Page 7 addition of 2-digit numbers

OBJECTIVES
These pages are a condensed revision of the concepts studied in the previous year. These reinforce and consolidate the lessons learnt and the concepts assimilated in the preceding year.

LEARNING AIDS
The teacher sets up an area for number work, as it was done in the previous class, to help children consolidate the concepts learnt.

Net bags, mobiles, number rods, number boxes, grouping on charts for recognition of numbers, and adding up to 10, all these are useful in Classes 1 and 2.

Three-Digit Numbers (Pages 20–26)

OBJECTIVES
Children are introduced to the three-digit number 100 as 100 ones or 10 tens, and also introduced to the place value of its digits.

LEARNING CURVE (10 MIN)
Till now children have been working with numbers up to 99. They know hundred rupees and have seen a hundred rupee note. Hundred has to be introduced as addition of 1 to 99 following the same pattern as in 10, addition of 1 to 9. Then, they learn to work with 3-digit numbers.

LEARNING AIDS
• Blocks arranged in stacks of 10
• Exercise books with squares
• Play money: Rs 100 notes and Re 1 coins
• Ones (O), Tens (T) and Hundreds (H) tabs
• Any of the materials used for counting from 10 to 99

LEARNING ACTIVITY (20 MIN)
Play money is the best aid here. Raza has nine Rs 10 notes and nine Re 1 coins; so in all he has Rs 99. He finds one more Re 1 coin in his money box; he takes it out. His mother gives him one Rs 10 note for the 10 single coins. Now Raza has ten Rs 10 notes. How much money does he have? The answer is Rs 100. He can exchange his ten 10-rupee notes for one Rs 100 note.
Explain the place value of three-digit numbers, and 100 in particular.
It is necessary to emphasize the fact that:

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10 Ones make 1 ten written as 10
10 Tens make 1 hundred written as 100

Each digit has a place and each place has a value associated with it.

In the O (ones) column (extremely right column) each numeral is One.
In the T (tens) column each numeral is Ten
In the H (hundreds) column each numeral is Hundred

Several charts of 100 squares on the board, with only 10, 20, 30, ..., 100 are put up. Each child goes up to the board and fills in a number or two in the blank squares.

**Three-Digit Numbers (Pages 27–35)**

These pages help recapitulate the concepts studied in Class 1. Children work with 3-digit numbers on the same basis as with the 2-digit numbers in Class 1—reinforce place value to teach ascending and descending orders so that children are able to use greater than (>) and smaller than (<) with ease (312 > 299) and consequently they can place a string of numbers in ascending or descending order.

ADDITIONAL WORK

A hopscotch-type pattern can be created on the board (and on sheets of paper) and children work with numbers from 1 to 100.

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<td>42 3 5 13</td>
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Crosses are cut out from stiff paper, with 5 small squares as shown. One cross can be filled in with 5 numbers on the number squares. Add the 3 vertical numbers and the 3 horizontal numbers.

What do you find? The answers are 84 and 90, vertically and horizontally, respectively. Children try with other sets of 5 numbers in the crosses.

**CLASSROOM ORGANIZATION (10 MIN)**

On the bulletin board, Humpty Dumpty is drawn sitting on a 100-brick wall. Not all numbers are written on the bricks. Children pick up paper bricks (cards shaped like bricks with numbers on them) and put them on the right place.

Later, they can think of a grasshopper climbing up (or down) the wall only through even numbers (or odd numbers). Which way can it travel? Start at any number (even or odd and move accordingly). They can mark the path of the grasshopper on the brick wall through even (or odd) numbers.

**Addition and Subtraction (Pages 36–49)**

**OBJECTIVES**

To review addition and subtraction of numbers up to 100 studied in Class 1. To learn addition and subtraction of 3-digit numbers with and without carry over and with and without borrowing, respectively.
LEARNING CURVE  (10 MIN)

Children know how to add and subtract Tens column and Ones column using the abacus and the number line. They now review addition and subtraction of one-digit numbers and later 2-digit numbers without carrying over and borrowing, respectively. Word problems are also given to make learning relevant and the students learn and apply in their everyday life situations. This makes the study fun and interesting.

Once this is clear, children add 3-digit numbers with 3-digit numbers without carrying over. Next, they learn addition with carry over—i.e., the children learn how to group ones into 10, then tens into 100s. Also the children first learn subtraction of 3-digit numbers without borrowing. Next, they learn how to convert Tens to Ones by ‘borrowing’ from the Tens place and finally from the Hundreds place to Tens place too.

LEARNING AIDS

- An abacus
- Bundles of straws and all other aids used in Class 1
- Counters
- House board

LEARNING ACTIVITY  (20 MIN)

Addition

Nawfal has 4 bundles of pencils of 10 pencils in each and 8 loose pencils. His friend Ahad has 3 bundles of pencils of 10 pencils in each and 4 pencils. How many pencils altogether?

\[
\begin{array}{c c c c}
T & O \\
4 & 8 + 3 & 4 \\
\hline
8 & 2 \\
\end{array}
\]

SIMILAR EXAMPLE IN SUBTRACTION

Nawfal has 4 bundles of pencils of 10 pencils in each and 8 loose pencils. He needs to give away 2 bundles of pencils of 10 pencils in each and 9 loose pencils to his friend Ahad. How many pencils does he have left over?
Start from single pencils; 9 pencils cannot be given away from 8. So, one bundle of 10 pencils needs to be opened and 8 pencils can easily be given away from 18 pencils.

Additions and subtractions can easily be understood using paper money also—use paper money of the following denominations: Rs 10 notes and Re 1 coins, etc.

Once the children understand the concept thoroughly, let them have enough practice of both concrete objects and numbers. Then they are given number (and word) problems to solve on their own. With time and practice, in an exactly identical manner, children are taught conversion of hundreds to tens as well.

ANOTHER EXAMPLE
Imsal has Rs 15 with her—one Rs 10 note and five Re 1 coins. The ice cream she wants to buy costs Rs 8. How does she pay the amount?

She asks her mother to give Re 1 coins in exchange of the Rs 10 note. Her mother gives ten Re 1 coins. Now she has 15 coins of Re 1 with her and she can easily pay Rs 8. She has Rs 7 left from Rs 15

In these pages the children hone their skills to add and subtract. For addition, they convert ones into tens and then tens into hundreds. For subtraction, they convert hundreds into tens and tens into ones.

ADDITIONAL WORK (10 MIN)
Children work with objects available in their every day life (keeping the theme in the mind), and the teacher works on the board with children giving answers before writing in their notebooks. More worksheets like this are necessary for more practice.

Review (Pages 50–51)
These pages are creative and fun pages where the following concepts have been revised.

- Addition
- Subtraction
- Place value
• Greater than and smaller than
• Ascending order and descending order

All these reinforce the concepts studied in Class 1 and prepare children for new concepts to be studied ahead.

PART TWO

Multiplication (Pages 52–75)

Objectives
Children learn multiplication of a 2-digit number by a 1-digit number and a 3-digit number by a 1-digit number.

LEARNING CURVE (10 MIN)
The children are familiar with addition and repeated addition. They learnt multiplication of 1-digit numbers. They also learnt that multiplication is a form of repeated addition. They learnt skip counting using the number line. Here they will learn multiplication of 2-digit and 3-digit numbers with 1-digit number.

LEARNING AIDS
• Strings with beads
• Small flags to make groups of two or three
• Sorting tray (with beads and buttons)

LEARNING ACTIVITY (20 MIN)
First, children recognise groups of objects but no calculations are asked for. Gradually, the concept of multiplication is introduced. As an introductory activity, the teacher asks Kashif to come up with two pens. The teacher then asks Shahid to come up with two more pens. The teacher then asks the children:
‘How many pens do I have altogether?’
‘How many children come to me with the pens?’
The activity continues.
As each child comes up with the pens, the rest of the students in the class add the numbers. The concept of multiplication becomes clear as:

REPEATED ADDITION
2 = 2
2 + 2 = 4
2 + 2 + 2 = 6
The language is translated into multiplication of numbers as follows:
WRITING IN NUMBERS | READ AS
---|---
1 × 2 = 2 | One 2 is 2
2 × 2 = 4 | Two 2s are four
3 × 2 = 6 | Three 2s are six

This is how the children learn to ‘build up’ multiplication tables:

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Please do remember that any number multiplied by 0 becomes 0 (for example, 0 × 3 = 0 or 0 × 5 = 0)

Practically:
First example: 3 sweets 0 times: 0
How many sweets? 0 × 3 = 0 sweets
Second example: 0 sweets 3 times: 0, 0, 0, …
How many sweets? 3 × 0 = 0 sweets

These pages help the children identify numbers in groups and then build up 6s, 7s, 8s and 9s tables. page 64 offers an interesting grid with the help of which children learn to multiply quickly and create multiplication tables up to 10.

Children move from horizontal multiplication to vertical multiplication, which paves the way to multiplying Tens and Ones without carrying over. Once the concept is clearly understood, children progress to calculating problems where Ones are converted into Tens.
Example:

\[
\begin{array}{ccc}
& 1 & 4 \\
\times & 3 \\
\end{array}
\]

Here, the earlier knowledge of place value is used along with practical examples with concrete objects.

For \(3 \times 4\): \(4 + 4 + 4 = 12\) (or \(4 \times 3 = 12\))
Do remember that 12 Ones = 1 Ten and 2 Ones.
Carry over 1 Ten to the Tens column.
Next, \(3 \times 10\): \(10 + 10 + 10 = 30\) (or \(3 \times 10 = 30\))
This gives 3 Tens. Add 1 Ten from 12 (carried over), to the Tens column. This gives 4 Tens. So, the answer is 4 Tens and 2 Ones = 42.
In a similar manner, more multiplications can be done, with carry over, with 2-digit and 3-digit numbers.

ADDITIONAL WORK
Number stories are fun. This is a tale of 2s. Look out for 2s.
‘I held up my hands when my mother asked me to.
I stood on my feet when my dad asked me to.
I looked at his feet with my little eyes and saw that they were bigger than mine.’
How many 2s? The answer is four 2s.
Memorizing multiplication facts (in the age of computers and calculators) is highly recommended. In addition to instant speed and accuracy in every-day calculations, it helps hone memory of the children.

CLASSROOM ORGANIZATION  (10 MIN)
With the help of the teacher, children build up tables with bigger numbers on the bulletin board as shown for 2 in the table above.

**Division (Pages 76–84)**

**OBJECTIVES**
Children learn division through sharing and repeated subtraction.

**LEARNING CURVE  (10 MIN)**
Children are familiar with multiplication. Division can only be understood if there is a sound knowledge of multiplication to build on, and if children have adequate practical experience in this area. Unknowingly, children have plenty of division activity in their everyday lives. Any process that involves sharing equally is, after all, a form of division.

**LEARNING AIDS**
- Concrete objects of different types (counters, buttons, etc.)
- Number line on the floor or on the board
- Sorting trays are also useful to group the same number of buttons/counters in each compartment
- Net bags and ribbons (to tie the bag into compartments)
LEARNING ACTIVITY  (20 MIN)

It is through conversation that the vocabulary of children will increase. They are made familiar with terms, such as share equally, subtract repeatedly, take away equally again and again and you are left with less.

Folding paper with dots is also an interesting activity. Here, a child is given a strip of paper with dots at regular intervals. First the child counts the dots (e.g. 15) and then folds the paper after every 3 dots. Finally, he counts the number of folds to see how many sets of 3 make 15.

After much practical experience the children are introduced to the symbol ‘÷’.

Many examples of division sums are then worked out so that children understand and grasp the link between everyday activity and the operation required. For example, there are 21 sweets and each child gets 3 sweets. How many children can share the sweets?

These pages help the children understand that division is the opposite (reverse) of multiplication. Then, children divide the numbers in groups so that there is 0 remainder, using Bobo jumping back from a certain number on the number line as on page 79. Bobo starts at 14, takes jumps of 2. How many jumps does he take before he reaches 0?

Terms, such as dividend, divisor, and quotient are to be taught with ease and have to be used to make the children comfortable with them. Here children solve problems with no remainder.

ADDITIONAL WORK

Other hand-made aids, such as number slides, are also useful. The teacher cuts a small strip of paper (with 3 equal sections) and sees how many times it will fit into 15 (they can try with 18 or 21 too). Here patience helps a lot.

Rhymes and jingles related to division can be written on the notice board.

Revision (Page 85)

Creative and fun pages, where the following concepts have been revised:

- Multiplication
- Division

All these reinforce the concepts studied earlier and prepare children for the challenges ahead.

CLASSROOM ORGANIZATION  (10 MIN)

Rhymes and jingles related to division could be written and illustrated on the soft boards in the classroom.
OBJECTIVES
Children recognize 2D objects and 3D objects as separate entities. Also, they distinguish between 2D shapes (circle, square, rectangle and triangle) and 3D shapes (ball or sphere, cube, cuboid, cylinder and cone).

LEARNING CURVE (10 MIN)
Children are familiar with 3D and 2D shapes from their daily life. They have seen and held objects, such as a ball (a sphere), a dice (a cube), a toothpaste box or a lunch box (a cuboid), an ice cream cone (a cone), etc.

They have also felt the flatness of shapes, such as a floor tile (a square) or a windowpane (a rectangular), a 50 p coin (a circle), a kite (a quadrilateral) and the 4 parts of a kite (triangles). They have a visual idea of what each looks like, but often get confused with names. At this level their knowledge of shapes takes a slightly more formal shape.

LEARNING AIDS
• Arrange a table with different 3D objects of daily use under a banner saying ‘3D objects’. For example, balls, talcum powder tin and other cylindrical objects, party hats, wooden blocks and icecream cones, pencil/crayon boxes, empty toothpaste boxes, large empty boxes of cereals, building blocks (with painted faces), 3D shapes made from plasticine, etc.

• Arrange another table with different 2D shapes with a banner saying ‘2D shapes’. For example, kites, floor tiles, biscuits, coins, boxes of plastic shapes, origami papers of different shapes, handkerchiefs, different cut-outs from printed fabrics, etc. (Please note: Use only the surfaces of 3D objects, like coins, biscuits, as 2D objects.)

LEARNING ACTIVITY
Children work in small groups of four. A group comes to the 3D table and each child holds up one object and tells the class the name of the object in his/her hands separately. Children from the class describe the object clearly. Teacher asks questions like ‘How many faces?, How many corners?, How many edges?, etc.’ Once the object is off the table, teacher draws the 3D shape on the board and marks the sides, the edges and the vertices of the shape.

The teacher cuts a very thin slice of a plasticine cylinder. ‘What is the shape?’ the teacher asks. Some children might answer, ‘circle’. The teacher cuts some more very thin slices and children see that each one is a circle. Then, the teacher makes slices of a cube or a cuboid. ‘What is the shape?’ the teacher asks. The answer is, ‘square’ or ‘rectangle’. Children count edges, faces and vertices, and tabulate them to arrange them as the original 3D object.

It is important that the children learn the difference between plane and curved surfaces at this stage. This should be taught so that the children are able to handle the terms at ease. The children can also be taught to differentiate between a hollow object and a solid object.

ADDITIONAL WORK
A visit with teacher to a park having a jungle gym (with some solid shapes made with edges alone) could be interesting. The pipes of the jungle gym (or monkey bars) make edges of many interesting
solids. The human tunnel is a hollow pipe, like the bars of a jungle gym. Children look for hollow and solid shapes of the same variety in their environment and make a table as follows.

<table>
<thead>
<tr>
<th>Name of solid</th>
<th>Hollow shape</th>
<th>Solid shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cone</td>
<td>cone for ice cream</td>
<td>ice cream inside</td>
</tr>
</tbody>
</table>

Money (Pages 97–109)

OBJECTIVES
The concept of money as an alternative of barter is reinforced. Formal introduction to Pakistani currency is taught.

LEARNING CURVE  (10 MIN)
Children get their first idea of money from their shopping expedition with their parents or elder brother or sisters. They realize that in exchange of notes and coins they are able to buy a whole lot of things. Later, they understand the meaning of getting ‘change’ back from a shopkeeper if they do not tender the exact amount.

LEARNING AIDS
- Real coins and notes of all denominations to show the children what real money feels and looks like
- Play money for children to work with
- Vegetable and fruit dummies, various stationery items and toys, etc., for setting up various play shops

LEARNING ACTIVITY  (20 MIN)
For various coins it is useful to have cardboard 1 p coins (if real ones are not available) for children to see that 100 p = Re 1. Make them understand that one net bag full of one hundred 1 p coins has the same value as that of one Re 1 coin.

Children play with various denominations and find different ways of making up Re 1 from coins. (This can take the H, T and O course.)

Ten 1 p coins = One 10 p coin
Ten 10 p coins = One 100 p coin = One Re 1 coin (or Re 1 note)

A one hundred rupee note quite clearly displays the value of the note: children realise that One Rs 100 note = Hundred Re 1 notes or coins. (It is useful to use net bags for comparison.)

Some time is spent on observation of the various features written on different notes. Children recognize Quaid-i-Azam’s photo, rupees one hundred written in two languages, the number of the note, a pattern and a water mark, colour of the note, etc.

Children carry out simple additions, subtractions, multiplications, divisions and conversions of money. Finally, the children are given simple word problems involving addition, subtraction, multiplication and division of money in their daily-life situations.
ADDITIONAL WORK
A play shop or market could be set up for the children where they buy various products, such as toys, fruits and vegetables, etc., from the shops using play money. This activity is very interesting and fun way of teaching money in a classroom.

CLASSROOM ORGANIZATION (10 MIN)
Different play shops or market could be set up by the children themselves with the help and guidance of the teacher.

- Card shop
- Shoe box shop
- Grocery store
- Flower shop
- Stationery shop
- Mall

PART THREE

Time (Pages 110–124)

OBJECTIVES
Students learn to measure time by hours, days, weeks, months and years and learn to read the clock face by the hour and half past the hour.

LEARNING CURVE (10 MIN)
They have a fair idea about time, long before they come to school—wake-up time, school time, lunch break time and meal time, etc. They have heard their parents or teachers speak about summer vacations, monsoon floods and winter clothes.

Children best understand time if it is taught to them in relation with their own experience. They know that there are seven days in a week and are familiar with the names of the days in a week. They also know that there are an average 30 days in a month and 12 months in a year. With the passage of time, they get familiar with dates of the month in association with the days of the week and the names of the months.

With greater exposure and practice, they are able to read the clock face and able to tell the time accurately.

LEARNING AIDS
- A large calendar of each month with days of the week written
- Daily timetable
- An actual clock
- Toy clock faces
- Rubber stamps for clocks for printing on paper
- Paper cut-outs showing summer, winter and rainy seasons

LEARNING ACTIVITY (20 MIN)
At this stage story-telling is the best method to start a lesson. It helps the children relate time to their own experience. Time was told in ancient times by the length of the shadow of a stick. That was not
accurate and what happened when days became shorter and nights longer and vice-versa or on a cloudy day? So, time was also measured by the flow of sand from one bottle into another bottle.

Next the children write down time as they know it in their daily life, i.e. time to get up, time to bathe, time to leave for school and study hour.

Names of the months, number of days in each month, weeks in a month, number of days in a week, and number of hours in a day are reinforced using the calendar and the clock. Then, the children are asked to tell time with toy clock faces, stamped clock faces and drawings with bangles, with the 12 numbers written around the rim.

The children are introduced to terms, like hour hand, minute hand and second hand.

Also they are introduced to terms, such as clockwise and anticlockwise. The teacher demonstrates on a clock that when the minute hand is on 12 the hour hand tells the time and when the minute hand is on 6 the time is half-past an hour. Toy clocks emulate movements of the minute hand and the hour hand and are a very useful aid.

Children enjoy working on the pages in the book, which have common everyday situations. This helps them make their daily routine. They measure time as indicated by the calendar, i.e. days, weeks and months and the number of days in each month. Solving word problems after a great deal of practical work is very important. Thereafter, with the help of real (or toy) clock faces accompanied by the clock faces in the book children tell time by the hour and by half-past an hour.

ADDITIONAL WORK (10 MIN)

There are several ways by which one can keep track of time:

- Sunrise and sunset (though these times change)
- Shadows (at noon shadows are the smallest; it can be seen in the garden)
- Blooming of flowers, such as morning glory
- Crescent of the moon

Real sundial, an hourglass and a pendulum create a great deal of interest; these can be shown along with pictures on the board.

In the art and craft class, children make their own clock faces using cardboard circles and spilt pins. They also look at the working of a toy pendulum.

Measurement—Length, Weight and Capacity (Pages 125–155)

Length (Pages 125–132)

OBJECTIVES

Children learn the concept of length (as a distance between two points either in a straight or in a curved line) and its measurement in the metric system.

LEARNING CURVE (10 MIN)

Children have worked with long, longer and longest; short, shorter and shortest in Class 1. Also, they are familiar with many words which mean the measurement of length, such as metres of cloth, height of a child, length of the road to school and the tallest building in the world.
LEARNING AIDS

There is a wide variety of learning aids that can be used from daily life:

- Pencils
- Lollipop sticks
- Short rulers
- Strings
- Metre rulers
- Strips of ribbons/ropes

LEARNING ACTIVITY (20 MIN)

In olden days man used handspan, cubit, foot or stride to measure lengths. Situations arose where men got into a fight because their handspans and cubits were of different sizes. Thus, it became necessary to use a standard measurement for length to avoid arguments.

From stories about how the caveman used his span, his cubit and his pace to measure length and distance, they come to the present standard unit of measurement—metre. Like a rupee has 100 paise, a metre is also divided into 100 parts called centimetres.

Additions and subtractions based on 2-digit and 3-digit numbers need to be worked out with cm and m in separate columns (not with a decimal point). Finally, the word kilometre is derived from the word kilo meaning 1000.

Abbreviations such as km, m and cm are important for use and recognition in their everyday life. The pages in the book help children revise the concepts studied in Class 1 followed by conversion from metres to centimetres and from kilometres to metres. Thereafter, they solve word problems involving addition and subtraction with length.

ADDITIONAL WORK

Children work in pairs or in groups. A height chart can be made for children of the class. Each child cuts out a piece of ribbon to match his height and writes his name on it. These ribbons can form a ribbon chart in the Maths Activity Corner. Ribbons, ropes and strings of various sizes are a part of the measurable items.

In an art and craft class, children make their own ruler from a strip of cardboard, following the teacher’s sample. On a chart paper, children make various shapes, such as circles, squares and triangles, of different lengths which lead to interesting questions and answers.

Children measure different parts of their school, using a ruler, or a trundle wheel. They guess various lengths and determine which instrument can be used for accuracy.

CLASSROOM ORGANIZATION (10 MIN)

The classroom needs to be set up in such a way that it provides a large number of objects for measurement in a corner, such as books, ribbons, charts and toys.
Weight (Pages 133–141)

OBJECTIVES
Children learn to measure weight correctly in the metric system with different types of measuring tools, such as beam balance, weighing scales and spring scales.

LEARNING CURVE (10 MIN)
Children are familiar with many words which indicate weight. They have heard in their daily-life experiences people talking about kilos of fruits and grams of chocolates, butter, etc. They are even familiar with words, such as heavy and light in Class 1. Slowly, children discover that the lighter object is not necessarily the smaller one.

LEARNING AIDS
- A wide variety of concrete objects with varying weights that can be lifted by the child
- Seesaw, beam balance, metric scale and spring balance
- A table with several sets each with 4 or 5 objects in plastics, stone and metal of varying weights

LEARNING ACTIVITY (20 MIN)
It is good to begin with the story of measurement. In the old days man compared the weights of objects by lifting them in their hands. Children try this and make a note of their findings—a lunch box is lighter than a bag of books.
Charts and a story about astronauts going to the moon make a good beginning. On the surface of moon everything weighs less than it does on our planet Earth.
An estimate card for weights is made for each group (in grams and kilograms) after the children have had experience of assessing weights by holding various objects in their hands.
Use of different weighing scales, such as a seesaw, a beam balance, grocer’s scales, a spring balance and a metric weighing (pan) scale is encouraged. Children put various objects from each set on the table in order of the heaviness, such as feather, pencil, pebble, geometry box, etc.
The pages in the book help children revise the concepts studied in Class 1 followed by matching the unit of measurement to the weight of different objects.
Based on the meaning of kilo children understand that
1 kilometre = 1000 metres
This is followed by everyday problems with addition and subtraction involving weight. It is important that children learn to use proper abbreviations, such as g for gram (not gm) and kg for kilogram.
Estimation exercises are very useful, such as ‘will 5 glasses be equal in weight to a fat book?’.

ADDITIONAL WORK
The children are taken to a park and they work in groups of 3 or 4. They sit on the seesaw to compare their weights. A comparative chart for each group is made saying 1st for the heaviest, 2nd for the next, and so on.
CLASSROOM ORGANIZATION  (10 MIN)
The bulletin board could be titled ‘Who is heavier?’ and paper cut-out of the images of boats could be stuck on the board tilted with the heavier side down. And similarly with ‘What is heavier?’.

Capacity (Pages 142–148)

OBJECTIVES
Children learn and estimate the concept of capacity of various containers and they learn standard measurements of capacity.

LEARNING CURVE   (10 MIN)
Children get a fair idea about capacity by playing with different containers, filling them with sand, clay or water. Vocabulary such as full, empty and half-full are applied to various containers.
A bucketful of water, a spoonful of medicine, a cupful of hot chocolate, etc.; children are familiar with these phrases in their daily life. Situations, such as the petrol tank of a car gets 20 litres of petrol in it at the petrol pump, the bathtub is filled with 50 buckets of water when there is water shortage and the bottle has 1 litre of soda, etc. are discussed. Also, comparative capacities like, Will a narrow, tall glass hold more water than a flat, wide plate?
With practical work children understand that the word capacity refers to the amount of liquid a container can hold.

LEARNING AIDS
• Empty bottles and containers of different shapes and sizes
• Water
• Sand (for sand play with different sizes of buckets)
• Containers of irregular shapes, like some curvy flower vases, water jugs and a fish bowl, etc.

LEARNING ACTIVITY   (20 MIN)
Children are given a lot of practical experience to transfer liquid from one container into another to compare capacities of the containers. They are then introduced to the standard measurement of capacity—litre (l).
Children are introduced to the term millilitre (ml), milli means 1000th part.
1000 millilitres (ml) = 1 litre (l)
\[
\frac{1}{1000} \text{ l} = 1 \text{ ml}
\]
After working with several containers of different shapes and sizes children try and guess the capacity of each one.
The teacher asks, ‘Would you use l or ml to measure the capacity of
(i) a medicine bottle,
(ii) a cola bottle
(iii) a bucket and
(iv) a bathtub?”
Now come to conversion of millilitre to litre and vice-versa. This is simple at this stage:

\[
\begin{align*}
1 \text{l} &= 1000 \text{ml} & 2000 \text{ml} &= 2 \text{l} \\
5 \text{l} &= 5000 \text{ml} & 9000 \text{ml} &= 9 \text{l}
\end{align*}
\]

Word problems based on capacity involving addition and subtraction in millilitres and litres become simple if enough sums are done in conversion at the very outset. It is important that children learn to use proper abbreviations, such as l (not L) for litre and ml for millilitre.

**ADDITIONAL WORK**

Children make a record of how much water each child drinks and how much water his older brother or sister drinks throughout the day. Questions like ‘who drinks more?, how much do you drink?, etc.’ should be asked to the children and to be noted.

Here, it is important to talk about the shortage of clean water in the world and to emphasise the need for conserving water. For example, Don’t take more water in a glass than you can drink; If there is a little water left in a glass or in a bottle don’t throw it in the sink, put it in a plant; Do you know how much water you waste by keeping the tap open while brushing your teeth?; etc.

**CLASSROOM ORGANIZATION (10 MIN)**

Estimate cards may be put in the Maths Activity Corner in front of different containers. The children guess the capacity of the container and write it down on the cards. Later, they fill the containers and write down the actual capacity of the containers.

**Fractions (Pages 149–155)**

**OBJECTIVES**

Children learn about equal parts of a whole object or a whole group.

**LEARNING CURVE (10 MIN)**

Children have a fair idea about fractions much before they come to school. They are asked time and again to share a chocolate slab equally with their siblings—if there is just one other child then each gets half. If there are 3 other children, each gets half of a half, i.e. a quarter.

Activities involving fractions (\(\frac{1}{2}\) and \(\frac{1}{4}\)) increase both their visual and analytical skills.

Children work with \(\frac{1}{2}\) and \(\frac{1}{4}\) of a variety of shapes and quantities, such as a net bag full of 10 marbles or 20 mints, etc.

**LEARNING AIDS**

- Strips of paper
- Net bags
- Plasticine solids, such as a long cylinder or a cake shape
- Three differently coloured circles each with a diameter of 8 units
- Different stories on fraction
LEARNING ACTIVITY  (20 MIN)

Story time, again!

Once upon a time there lived three bears in a jungle—Papa Bear, Mama Bear and Baby Bear. Baby Bear was very hungry so Mama Bear baked a whole pie for him. The aroma made Papa Bear’s stomach grumble. He asked Mama Bear to divide the pie in two equal parts—one half for Baby Bear and another half for Papa Bear. As soon as Mama Bear puts each half in two different plates for Baby Bear and Papa Bear, they heard a knock on the door. Guess who it was? No, not Goldilocks, but Grandpa Bear. He smelt the honey in the pie and came to have some. Mama Bear realized that she too was hungry. So, she cut both the halves into equal parts again. There were now four quarters of the whole pie. They all ate happily knowing that all four of them had got equal pieces.

A picture or demonstration (using a plasticine pie) makes it more enjoyable and real.

It is necessary to use a variety of shapes and quantities to explain the concept or else the children tend to associate fractions with particular shapes only.

The pages in the book help children understand that fraction is a name given to a part of the whole or a group of objects. It does not matter what the shape of the whole is or the number in the group of objects is.

The lesson begins with more practical examples by the teacher followed by pictorial examples in the book to learn about halves and quarters.

ADDITIONAL WORK

Children enjoy working with origami papers; they fold each sheet into halves, and make boats and aeroplanes.

Symmetrical painting of shapes is also a great idea to help them understand the concept of half.

Important Note: At this level, only halves and quarters are understood by children.

CLASSROOM ORGANIZATION  (10 MIN)

The bulletin board is covered with different coloured papers. Take two colours each covering half the board when teaching halves and take four colours covering quarters of the board when teaching quarters; this helps the children learn halves and quarters clearly. On each half or a quarter, a half or a quarter of a picture is placed so that all children can come up one by one and put them together as a whole.

Review (Pages 156–160)

Pages 156–158 help students to review the concepts studied throughout in the book itself. Pages 159–160 are fun pages.

Worksheets (Pages 161–168)

Worksheets are a condensed revision of the entire book and the same objectives and learning activities apply as has been done in the entire book.
Maths Lab Activities (Pages 169–172)

Activities are suggested which are carried on by the teacher to make the lessons fun and meaningful for the children. The activities cater to concepts, such as

- Place value
- Additions involving bigger numbers
- Subtraction skills
- Remembering multiplication tables easily
- Multiplication facts
- Division as equal sharing

Answers

PART ONE

- Review (pages 1–7)
  1. (b) 18  (c) 47  (d) 38  (e) 45
  2. (a) < (b) < (c) < (d) < (e) > (f) < (g) < (h) > (i) <
  3. (a) 53, 10, 69, 99, 40
     (b) 78, 30, 41, 17, 60, 13
     (c) 40, 99, 56, 49, 11, 68
  4. (b) 14, 19, 27, 78, 86, 87
     (c) 13, 44, 46, 51, 72, 99
     (d) 6, 8, 23, 47, 54, 98
  5. (b) 100, 99, 77, 58, 49, 2
     (c) 85, 82, 49, 32, 17, 6
     (d) 99, 98, 93, 92, 69, 39
  6. (b) 26  (c) 22  (d) 44  (e) 66  (f) 59
  7. (b) 06  (c) 53  (d) 27  (e) 80  (f) 99  (g) 68  (h) 11
  8. (b) 82  (c) 66  (d) 29  (e) 97
  9. 29, 53, 66, 82, 97
     97, 82, 66, 53, 29
 10. (a) 94  (b) 74  (c) 88  (d) 79  (e) 75  (f) 99  (g) 84  (h) 87
  12. (a) 94  (b) 86  (c) 27

- Addition (pages 8–13)
  2. (a) 12  (b) 15  (c) 13  (d) 14  (e) 14  (f) 11  (g) 16  (h) 11
  3. (b) 26  (c) 34  (d) 52
  4. 52
  5. 21
  6. (b) 42  (c) 63  (d) 71  (e) 43  (f) 95  (g) 55  (h) 79
  7. (b) 92  (c) 75  (d) 63  (e) 91  (f) 61  (g) 58  (h) 44  (i) 84
     (j) 90  (k) 39  (l) 80
8. (b) 78  (c) 91  (d) 82  (e) 95  (f) 70  (g) 85  (h) 89
9. (b) 41  (c) 42

- Subtraction (pages 14–17)
  1. (b) 46  (c) 13  (d) 52  (e) 12  (f) 22  (g) 37  (h) 02
  2. (a) 12  (b) 14  (c) 31
  3. (a) 18  (b) 47  (c) 23  (d) 14  (e) 64  (f) 17  (g) 35
       (h) 18  (i) 09  (j) 26  (k) 07  (l) 28

- Let’s practice (pages 18–19)
  1. (a) 41  (b) 99  (c) 47  (d) 17  (e) 70  (f) 58
       (g) 52  (h) 58  (i) 28  (j) 41  (k) 49  (l) 12
       (m) 83  (n) 47  (o) 90

- Hundreds, tens and ones (pages 21–26)
  1. (b) 137  (c) 212  (d) 241  (e) 318
  2. (b) 693  (c) 555  (d) 833  (e) 916  (f) 767
  4. (b) 854  (c) 297  (d) 640  (e) 209  (f) 961  (g) 737
  8. (a) 924  (b) 175  (c) 430  (d) 618  (e) 756  (f) 805
       (g) 398  (h) 519  (i) 247

- Numbers up to 999: ordering (pages 27–28)
  1. (b) 261, 263, 265, 267
       (c) 475, 476, 478, 479
       (d) 708, 709, 711, 712
       (e) 595, 596, 597, 598
       (f) 348, 350, 351, 352
       (g) 678, 679, 681, 682
       (h) 992, 993, 995, 996
  2. (a) 341, 860, 305, 527, 429, 609, 99, 995, 746, 200, 584, 113, 149, 332, 989
       (d) 130, 635, 549, 500, 218, 350, 110, 910, 847, 800, 199, 209, 555, 608, 200
       (c) 554, 800, 320, 607, 890, 449, 233, 122, 709, 200, 866, 998, 475, 400, 257

- Numbers up to 999: >, < (pages 29–31)
  1. (a) < (b) > (c) < (d) < (e) > (f) <
       (g) > (h) > (i) < (j) > (k) < (l) <
  2. (a) > (b) < (c) > (d) < (e) > (f) <
       (g) > (h) > (i) < (j) < (k) < (l) <
  3. (a) > (b) < (c) > (d) > (e) > (f) > (g) > (h) <
       (i) < (j) < (k) > (l) < (m) > (n) > (o) <

- Ascending and descending order (page 32–33)
  1. (b) 687, 692, 729, 748, 750, 901
       (c) 329, 338, 420, 571, 600, 710
       (d) 809, 890, 908, 980, 997, 998
       (e) 599, 621, 624, 629, 738, 783
       (f) 139, 146, 164, 193, 379, 397
• Greatest number 998; Smallest number 139
  2. (b) 864, 790, 684, 542, 531, 513
  (c) 281, 248, 232, 223, 218, 210
  (d) 969, 854, 796, 769, 754, 699
  (e) 914, 491, 482, 419, 399, 194
  (f) 849, 742, 740, 656, 407, 247

• Addition: Pick a Pair (page 34)
  (b) 75 (c) 80 (d) 20 (e) 31 (f) 12 (g) 30 (h) 70
  (i) 13 (j) 82 (k) 30 (l) 10 (m) 80 (n) 20 (o) 15 (p) 22

• Review (page 35)
  2. (b) 628 (b) 406 (c) 185
  3. (b) 791, 792, 793, 794, 795, 796, 797, 798, 799,
     (c) 548, 549, 550, 551, 552, 553
  4. (a) > (b) > (c) > (d) > (e) < (f)>

• Addition of 3-digit numbers: no conversion (page 36)
  1. (b) 796 (c) 699 (d) 719 (e) 888
     (f) 298 (g) 689 (h) 996 (i) 959

• Addition of 3-digit numbers: converting ones (page 37)
  1. (b) 565 (c) 876 (d) 980 (e) 617
     (f) 992 (g) 551 (h) 932 (i) 847
  2. (a) 260 samps (b) 370 pages (c) 174 grapes (d) 190 saplings
  3. (a) 421 (b) 685 (c) 480 (d) 982 (e) 559 (f) 279
     (g) 250 (h) 383 (i) 561 (j) 653 (k) 778 (l) 590
     (m) 376 (n) 362 (o) 895 (p) 994

• Think and solve (page 42)
  1. (a) Aamir (b) Majeed (c) Aliya's (d) 3 mark (e) 70 (f) 190
  2. (a) 11 (b) 63 (c) 37
  3. 24

• Addition: Converting tens and ones (page 43)
  1. (b) 122 (c) 102 (d) 146 (e) 154 (f) 120 (g) 143
     (h) 521 (i) — (j) 343 (k) 413 (l) 361 (m) 694
     (n) 521 (o) 464 (p) 750 (q) 990 (r) 916 (s) 886 (t) 944

Page 49
  (a) 190 (b) 19 (c) 5 (d) 120 (e) 370
  (f) 888 (g) 731 (h) 50 (j) 17

• Review (page 50–51)
  1. (a) 180 (b) 175
  2. (a) 264 (b) 430 (c) 701 (d) 999 (e) 508 (f) 352
  3. (a) 419 (b) 280 (c) 706 (d) 548
  4. (a) > (b) < (c) > (d) < (e) < (f)>
  5. (a) 307, 318, 322, 347, 354, 368, 381, 392
     (b) 392, 381, 368, 354, 347, 322, 318, 307
6. (a) 779 (b) 857 (c) 586 (d) 839
7. (a) 14 (b) 436 (c) 526 (d) 202

PART TWO

Page 54
1. a - w
   (a) 20 (b) 3 (c) 2 (d) 24 (e) 4 (f) 25
   (g) 24 (h) 5 (i) 30 (j) 28 (k) 7 (l) 0
   (m) 6 (n) 4 (o) 7 (p) 4 (q) 3 (r) 0

Page 55
1. b-p
   (b) 24 (c) 20 (d) 9 (e) 50 (f) 18 (g) 16
   (h) 30 (i) 24 (j) 21 (k) 32 (l) 25 (m) 27
   (n) 40 (o) 45 (p) 14

Page 56
1. a - c
   (a) 6, 12, 24, 30, 36, (b) 30, 36, 42, 54, 60
   (c) 18, 24, 30, 48, 54
4. (a) 14, 21, 35, 42, (b) 7, 14, 24, 28 (c) 35, 42, 49, 56
7. (a) 16, 24, 40, 48 (b) 8, 16, 32, 40, 56 (c) 24, 32, 40, 56, 64
10. (a) 9, 18, 36, 45, 63 (b) 18, 27, 36, 54, 63 (c) 27, 36, 45, 72, 81

Page 65
2. (b) 30 (c) 36 (d) 20 (e) 80 (f) 18 (g) 35
   (h) 32 (i) 45 (j) 21 (k) 32 (l) 49 (m) 42
   (n) 25 (o) 27 (p) 40 (q) 49 (r) 63
   (t) 54 (u) 72 (v) 24 (w) 64 (x) 14 (y) 56
5. (b) 56 (c) 42 (d) 32 (e) 28 (f) 36

Page 69
1. (b) 26 (c) 63 (d) 96 (e) 0 (f) 82 (g) 45 (h) 60
2. (b) 30 (c) 70 (d) 60 (e) 90 (f) 20 (g) 80 (h) 0

Pages 70–71
1. (c) 115 (d) 176 (f) 68 (g) 54 (h) 175 (i) 56 (j) 224
   (k) 171 (l) 208 (n) 190 (o) 276 (p) 558 (q) 275 (r) 147
   (s) 469 (t) 312 (u) 510 (v) 460 (w) 0 (x) 747

Pages 72–73
1. (b) 565 (c) 972 (d) 456 (e) 632 (f) 896 (g) 810 (h) 889
2. (b) 756 (c) 549 (d) 688 (e) 847 (f) 546 (g) 768 (h) 510
3. (b) 770 (c) 972 (d) 872 (e) 710 (f) 933 (g) 600 (h) 774
   (i) 995 (j) 810 (k) 0 (l) 875

Page 75
1. (a) 42 (b) 26 (c) 160 (d) 965 (e) 384 (f) 152 (g) 144
   (h) 375 (i) 511 (j) 640 (k) 756 (l) 22 (m) 268 (n) 213
   (o) 441

Page 79
1. (b) 9 (c) 2 (d) 4 (e) 3 (f) 10 (g) 2 (h) 2 (i) 7 (j) 6
   (l) 8 (m) 1 (n) 1 (o) 1 (p) 5 (q) 5 (r) 5 (s) 4 (t) 3
   (u) 9 (v) 10
2. (b) 2, 3 (d) 5, 3
Page 81
1. (b) 9  (c) 7  (d) 2  (e) 4  (f) 7  (g) 6  (h) 8  (i) 7  (j) 8  (k) 10  (l) 9  (m) 7  (n) 5
2. 5, 7, 9, 4, 3, 10, 6, 1

Page 83
1. (a) 3  (b) 2  (c) 4  (d) 2  (e) 4  (f) 8  (g) 5  (h) 3  (i) 6  (j) 7  (k) 4  (l) 8  (m) 6  (n) 10  (o) 6  (p) 5  (q) 4  (r) 9  (s) 5  (t) 6  (u) 6  (v) 6  (w) 9  (x) 5

Page 84
1. (b) 6 packet  (c) 6 teams  (d) 9 eggs  (e) 4 samosas

Page 85
1. (a) (b) 64  (c) 8  (d) 3  (e) 9  (f) 81  (g) 42  (h) 60  (i) 4  (j) 3  (k) 6  (l) 45  (m) 54  (n) 40  (o) 90  (p) 32  (q) 1  (r) 63  (s) 0  (t) 56  (u) 27  (v) 5  (w) 7  (x) 49

Page 97
1. (a) 2  (b) 8  (c) 7  (d) 10

Page 98
1. (b) Rs 2  (c) Rs 11  (d) Rs 6  (e) Rs 3
2. (a) 100  (b) Rs 30  (c) Rs 75
3. (a) 10 stamps  (b) 5 pastries  (c) 5 tickets

Page 104
2. (b) Rs 61  (c) Rs 63  (d) Rs 70  (e) Rs 39  (f) Rs 87
3. (b) Rs 62, Rs 3  (c) Rs 80, Rs 10  (d) No.

Page 106
1. (a) Rs 56  (b) Rs 9  (c) Rs 162  (d) Rs 180  (e) Rs 8

Page 107
1. (a) 42  (b) 32  (c) 6  (d) 63  (e) 7  (f) 48  (g) 50  (h) 7  (i) 18  (j) 10  (k) 10  (l) 0
3. (a) 96  (b) 82  (c) 132  (d) 150  (e) 469  (f) 448  (g) 615  (h) 254

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4. (a) 6  (b) 6  (c) 7  (d) 9  (e) 1  (f) 6  (g) 7  (h) 5
5. (a) –  (b) x  (c) –  (d) +  (e) x  (f) +

Page 115
1. (a) 59 days  (b) 42 days  (c) 23 years  (d) 730 days  (e) 70 days  (f) 92 days  (g) 8 weeks

Page 118
1. (a) 3 o’clock  (b) 12 o’clock  (c) 7 o’clock  (d) 5 o’clock  (e) 4 o’clock  (f) 8 o’clock

Page 120
3. (a) 4 o’clock  (b) 12 o’clock  (c) 9 o’clock  (d) 6 o’clock  (e) 8 o’clock  (f) 3 o’clock
4. (a) 1 o’clock  (b) 4 o’clock  (c) 10 o’clock  (d) 12 o’clock  (e) 2 o’clock  (f) 6 o’clock

Page 122
7. (b) half past 7  (c) half past 10  (d) half past 12  (e) half past 9  (f) half past 2  (g) half past 6  (h) half past 11  (i) half past 8

Page 123
8. (c) half past 12  (d) 6 o’clock  (e) half past 3  (f) half past 7  (g) 7 o’clock  (h) 3 o’clock  (i) half past 1  (j) 9 o’clock  (k) half past 4  (l) 5 o’clock
Page 124
1. (a) 24  (b) minute  (c) 30 days  (d) 12, 365  (e) February  (f) 12, (g) 5
2. (a) the hour  (b) hour  (c) Friday  (d) two weeks  (e) 24

Page 128
1. (a) 7m 85cm  (b) 7m 99cm  (c) 9m 86cm  (d) 16m 80cm  (e) 19m 46cm  
   (f) 26m 93cm  (g) 36m 84cm  (h) 39m 79cm  (i) 78m 95cm  (d)
2. (a) 1m 8cm  (b) 2m 11cm  (c) 1m 10cm  (d) 1m 6cm  (e) 3m 11cm  (f) 7m 17cm  
   (g) 11m 42cm  (h) 13m 14cm  (i) 10m 27cm
3. (b) 93m  (c) 41m  (d) 95cm  (e) 106cm  (f) 75cm
4. (b) 16m  (c) 35m  (e) 38m  (f) 6m
5. (b) 28m  (c) 37cm  (d) 92m  (e) 38m  (f) 24m

Page 133
1. (a) 7m 85cm  (b) 7m 99cm  (c) 9m 86cm  (d) 16m 80cm  (e) 19m 46cm  
   (f) 26m 93cm  (g) 36m 84cm  (h) 39m 79cm  (i) 78m 95cm  (d)
2. (a) 1m 8cm  (b) 2m 11cm  (c) 1m 10cm  (d) 1m 6cm  (e) 3m 11cm  (f) 7m 17cm  
   (g) 11m 42cm  (h) 13m 14cm  (i) 10m 27cm
3. (b) 93m  (c) 41m  (d) 95cm  (e) 106cm  (f) 75cm
4. (b) 16m  (c) 35m  (e) 38m  (f) 6m
5. (b) 28m  (c) 37cm  (d) 92m  (e) 38m  (f) 24m

Page 138
6. 5, 10, 20

Page 139
1. (b) 875g  (c) 650g  (d) 107kg  (e) 48kg  (f) 750kg
2. (b) x-55g  (c) 4kg  (d) 258g  (e) pan-60g  (f) 19kg
3. (a) 90kg 875g  (b) 12kg 110g  (c) 18kg 375g  (d) 16kg 58g  (e) 92kg 610g  
   (f) 81kg 773g  (g) 155kg 615g  (h) 283kg 150g  (i) 382kg 10g  (j) 234kg 12g  
   (k) 813kg 790g  (l) 800kg 947g

Page 144
50, 20, 10

Page 146
1. (a) 74 l  (b) 103 l  (c) 165 l  (d) 95 l  (e) 360ml  (f) 604ml  (g) 610ml  (h) 1000ml
2. (b) 856 l  (c) 63 l  (d) (a) 750ml (b) 775ml
3. (a) 21 l  (b) 65 l  (c) 62 l  (d) 304 l  (e) 43ml  (f) 40ml  (g) 75ml  (h) 181ml
4. (b) 27ml  (c) 522 l  (d) 165 ml
5. (a) 66 l 38ml  (b) 21 l 310ml  (c) 11 l 355ml  (d) 8 l 340ml  (e) 76 l 715ml  
   (f) 17 l 470ml  (g) 390 l 799ml  (h) 771 l 920ml  (i) 113 l 308ml  (j) 106 l 30ml  
   (k) 110 l 395ml  (l) 528 l 68ml

Page 156
1. (a) 163  (b) 41  (c) 122  (d) 37  (e) 349  (f) 579  (g) 812  (h) 305  (i) 542  
   (k) 127  (l) 687  (m)137  (n)533  (o) 972  (p)418
2. (a) 5 o'clock  (b) 8 o'clock  (c) half past 1  (d) half past 6  (e) half past 11  (f) 9 o'clock
3. (a) 88  (b) 93  (c) 208  (d) 375  (e) 504  (f) 177  (g) 500  (h) 655
5. (a) 5  (b) 6  (c) 3  (d) 10  (e) 8  (f) 9  (g) 10  (h) 7
6. (a) 8  (b) Rs 50
7. (a) 30, 31, 30, 31, February 29, 4
9. (a) 680m  (b) 820g  (c) 586g  (d) 370ml

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405, 521, 63, 800, 480, 521, 63, 100, 203, 480, 100, 900, 3

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41, 54, 75, 22, 111, 76, 95, 150, 126, 131, 555

Page 161
(a) 700  (b) 6409  (c) 763  (d) 890  (e) 999  (f) 29+4  (g) 85  (i) 970

Page 162
(a) 6  (b) 41  (c) 30  (d) 56in  (e) 0  (f) 36  (g) 48  (h) 54