Yan Kow Cheong
Yan Kow Cheong, based out of Singapore has been active on the Singapore’s mathematics educational scene for over two decades with teaching appointments at the ACS (Independent), NUS Extension, Institute of Technical Education, and Singapore Science Centre. He regularly conducts workshops and seminars for primary and secondary school students, teachers and parents.

Kow-Cheong is the author of Singapore’s best-selling Mathematical Quickies & Trickies series and the co-author of the MOE-approved Additional Maths 360. Besides editing primary and secondary MOE-approved textbooks, co-writing Teachers’ Guides, and ghost-writing assessment titles, he has also written contests questions and on-line assessment tests, and provided contents for maths apps.

A contributor to mathematics periodicals and journals, such as The Mathematics Educator, Mathematics Medley; he is also the author of The Stack Model Method: An Intuitive and Creative Approach to Solving Word Problems [Primary 3–4 & 5–6] and many other titles. His academic interests involve research in mathematics education, in particular, the psychology of learning and teaching mathematics, and creative problem solving.

Kow-Cheong writes about the good, the bad and the not-so-ugly of Singapore’s maths education and of the local educational publishing industry. Read his two maths blogs at www.singaporemathplus.com and www.singaporemathplus.net.

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Dr. Kevin Mahoney
Dr. Kevin Mahoney, based out of America has been a teacher of mathematics since 1989. A "math war" veteran, he has worked on wide variety of mathematics pedagogy and curricular materials in both public and private schools. In 2012, he became the first American to investigate Singapore’s elementary teaching methods at the doctoral level, publishing original academic research on the effects of Singaporean pedagogy on American math students.

Dr. Kevin worked as Math Curriculum Coordinator at an independent school outside Boston, Massachusetts. He consults with large numbers of schools and teacher training institutes in U.S., Canada, Europe and India, training the faculty and helping schools effectively implement mathematics curriculum and instruction.
Preface

WOW MATHS based on the Singapore model is a series of eight textbooks specially designed to meet the mathematical needs and wants of primary and middle school students in India, by incorporating the proven problem solving strategies and heuristics commonly used in the Singapore maths curriculum.

Besides promoting critical and creative thinking in mathematics, the WOW MATHS series introduces the Singapore Bar (or Model) Method—a powerful visualization and problem-solving heuristic used to solve word problems and to help students gain a better insight into mathematical concepts across all the eight grades.

Approach

The series infuses the Concrete-Pictorial-Abstract (CPA) approach of learning and teaching interwoven with the bar model method. This blend makes the teaching of mathematical concepts much simple and easier. The simpler and effective strategies will not only motivate the students to learn a new topic, concept or skill, but will also make the learning of mathematics more meaningful and relevant to their everyday life.

Venu has 3 cars.

Siya has 2 cars.

\[
\begin{array}{c}
\text{Concrete} \\
\uparrow \\
\text{Pictorial} \\
\uparrow \\
\text{Abstract} \\
\end{array}
\]

They have 5 cars in all.
The WOW series has 15 unique features.

**WOW KIDS**
They are your Maths buddies. They stimulate interest, explain concepts and create involvement in learning.

---

**I Have Learnt**
Quick recap of the concepts learnt in the previous class.

**Warm Up**
Encourages active student participation and creates opportunity for interaction and discussion.

**Everyday Maths**
Relates the concepts taught to every situation and shows how mathematical concepts are applied to everyday situations.

**Mental Maths**
Trains children to perform mental calculations quickly.

**Mind It**
Cautions/Alerts children of the common mistakes and errors.

**Exercise**
Graded exercises assess understanding of mathematical concepts.

**Think Smart**
Helps students enhance their critical and creative thinking skills, and to arouse mathematical curiosity.

**Fact Zone**
Mathematical facts about the topics.

**Practice Sheet**
Consists of graded questions that test understanding and application of concepts taught with an integrated approach.

**Maths Lab Activity**
Hands on activities to further consolidate the concepts taught.

**Topics Covered**
Show scaffolded introduction of concepts. Develop conceptual learning.

**I Can**
Consolidated check of the concepts learnt in the previous class.

---

### Example

**Venu** and **Siya** have 5 cars in all.

Venu has 3 cars.

Siya has 2 cars.

\[
\begin{align*}
\text{Venu} & : 3 \\
\text{Siya} & : 2 \\
\text{Total} & : 5
\end{align*}
\]
Singapore Maths Curriculum is recognized around the world for its innovative and effective teaching and learning practices. Singapore uses heuristics (problem solving strategies) and Bar Model Method (an effective pedagogical strategy recognized in over 30 countries and ranked the highest in TIMSS).

Bar or the Model drawing is a powerful visualization problems solving heuristic that is used to solve both arithmetic and algebraic problems. The Model method enables word problems that we traditionally set at higher grades (using algebra) to be set at lower grades.

**The Bar (or Model) method:**
- helps students to gain a better insight into mathematical concepts such as fraction, ratio and percentage
- helps students to plan for the solution steps for solving a maths problem
- is comparable to, but is less abstract than, the algebraic method
- empowers students to solve challenging problems

Let’s solve some problems by both the traditional and bar model methods.

Venu spent $\frac{1}{2}$ of his pocket money on a movie and $\frac{1}{4}$ on a new pen. What fraction of his pocket money was left?

**Traditional Method**

Money spent on movie $= \frac{1}{2}$
Money spent on pen $= \frac{1}{4}$
Total money spent $= \frac{1}{2} + \frac{1}{4}$
$\quad = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$
Money left $= 1 - \frac{3}{4}$
$\quad = \frac{4}{4} - \frac{3}{4} = \frac{1}{4}$
$\frac{1}{4}$ of his pocket money was left.

**Model Method**

Money left $= \frac{1}{4}$
$\frac{1}{4}$ of his pocket money was left.
Sahil earned a profit of ₹20.00 by selling a pair of shoes for ₹300.00. What was the cost of the pair of shoes?

**Traditional Method**

Selling price (S.P.) = ₹300.00  
Profit (P) = ₹20.00  
Cost price (C.P.) = ?  
C.P. = S.P. − Profit  
C.P. = ₹300.00 − ₹20.00  
C.P. = ₹280.00  
The cost price of the pair of shoes was ₹280.00.

**Model Method**

\[
\begin{array}{c|c|c}
\text{S.P.} & \text{C.P.} & \text{Profit} \\
\hline
₹300.00 & ₹20.00 & \\
\hline
\end{array}
\]

C.P. = ₹300.00 − ₹20.00  
C.P. = ₹280.00  
The cost price of the pair of shoes was ₹280.00.

Bar modeling is also helpful in solving mathematical problems of higher grades.

Tanya has two brothers. She gave \(\frac{1}{6}\) of her stamp collection to one of them and \(\frac{2}{5}\) of the remainder to the other. In the end, she was left with 12 stamps. How many stamps did Tanya have at first?

**Traditional Method**

Number of stamps = \(x\)  
Stamps given to one brother = \(\frac{1}{6}x\)  
Remaining stamp collection = \(\frac{5}{6}x\)  
Stamps given to other brother = \(\frac{2}{5} \times \frac{5}{6}x = \frac{1}{3}x\)  
Remaining stamps = 12  
According to the question,  
\(\frac{1}{6}x + \frac{1}{3}x + 12 = x\)  
\(\frac{x + 2x + 72}{6} = x\)  
\(\frac{3x + 72}{6} = x\)  
\(3x + 72 = 6x\)  
\(3x - 6x = -72\)  
\(-3x = -72\)  
\(x = 24\)  
Tanya had 24 stamps at first.

**Model Method**

\[
\begin{array}{c}
\text{Total Stamps} \\
\hline
? \\
\hline
\end{array}
\]

\[
\begin{array}{c}
\text{Remainder} \\
12 \\
\hline
\text{Second brother} \\
\text{First brother} \\
\hline
3 \text{ units} = 12 \\
1 \text{ unit} = 12 \div 3 = 4 \\
6 \text{ units} = 6 \times 4 = 24 \\
\text{Tanya had 24 stamps at first.}\end{array}
\]
Polya's four-step model, named after the Hungarian mathematician, George Polya (1887-1985), is commonly used in mathematical problem solving. The model consists of four steps:

1. **Step - 1** Understanding the problem
   - Identify wanted, Given & Needed information
   - Restate the problem

2. **Step - 2** Devising a Plan
   - Draw a model
   - Work backwards
   - Look for a pattern
   - Guess & Check
   - Simplify a problem

3. **Step - 3** Doing
   - Workout the solution
   - Tryout different strategies

4. **Step - 4** Checking
   - Check the solution
   - Seek alternatives solutions, if required
   - Extend the method to other problems
Contents

1. Numbers to 10,000 11
   Mental Maths, Maths Lab

2. Addition 31
   Part-Whole and Comparison Model

3. Subtraction 49
   Everyday Maths, Practice Sheet

4. Multiplication 73
   Worksheet, Maths Lab

5. Division 90
   Problem Solving, Practice Sheet

6. Whole and Parts: Fractions 113
   Maths Fun, Think Smart, Maths Lab

7. Measurement 130
   Word Problems, Practice Sheet

8. Geometry 154
   Practice Sheet, Maths Lab

9. Pattern and Symmetry 168
   Everyday Maths, Practice Sheet

10. Time 179
    Worksheet, Maths Lab

11. Money 190
    Everyday Maths, Practice Sheet

12. Data Handling 204
    Practice Sheet, Maths Lab

Answer Guide 214
I Have Learnt

1. $100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 = 1000$
   - 10 hundreds make 1 thousand.

2. $100 + 100 + 100 + 100 + 10 + 10 + 10 + 10 + 10 + 7 = 457$
   - 4 hundreds, 5 tens and 7 ones make

Place Value

- Ones place
- Tens place
- Hundreds place

Numbers to 10,000

1
Numbers to 1000

1. 

\[ 100 + 100 + 100 + 100 + 10 + 10 + 10 + 10 + 10 + 7 = 457 \]

Four hundreds, 5 tens and 7 ones make four hundred fifty-seven.

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>O</th>
<th>Place Value</th>
<th>Face Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>7</td>
<td>400 + 50 + 7</td>
<td>457</td>
</tr>
</tbody>
</table>

Expanded form = 400 + 50 + 7  Standard form = 457

2. 

\[ 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 = 1000 \]

10 hundreds make 1 thousand.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
<th>Place Value</th>
<th>Face Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0 + 0 + 0 + 0</td>
<td>0 + 0 + 0 + 0</td>
</tr>
</tbody>
</table>

Expanded form = 1000 + 0 + 0 + 0  Standard form = 1000
1. Write the place value of digit 9 in the given numbers.
   a) 935  
   b) 109  
   c) 296

2. Count and write the missing numbers. Also, write the number and its number name.
   a) 459 =  
      b) 136 = 100 + 
      c) 537 = 500 + 30 + 
      d) = 900 + 10 + 2

3. Fill in the missing numbers.
   a) 459 = + 50 + 9  
      b) 136 = 100 + + 6  
      c) 537 = 500 + 30 +  
      d) = 900 + 10 + 2

4. In the numbers given below, write the place value of each digit.
   a) 236  
      i) Ones place  
      ii) Tens place  
      iii) Hundreds place  
   b) 786  
      i) Ones place  
      ii) Tens place  
      iii) Hundreds place

5. Write the following numbers in figures.
   a) Nine hundred twenty-seven  
   b) Six hundred seventy  
   c) Three hundred five  
   d) Four hundred ninety-nine
Warm Up

1. Write the place value of digit 9 in the given numbers.
   a) 935
   b) 109
   c) 296

2. Count and write the missing numbers. Also, write the number and its number name.

3. Fill in the missing numbers.
   a) 459 = 4 + 50 + 9
   b) 136 = 100 + 30 + 6
   c) 537 = 500 + 30 + 7
   d) 900 + 10 + 2 = 912

4. In the numbers given below, write the place value of each digit.

<table>
<thead>
<tr>
<th>Number:</th>
<th>_________________________________</th>
<th>Number name:</th>
<th>_____________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Ones</td>
<td>10 Tens</td>
<td>10 Hundreds</td>
<td>10 Tenths</td>
</tr>
<tr>
<td>10 Ones</td>
<td>10 Tens</td>
<td>10 Hundreds</td>
<td>10 Tenths</td>
</tr>
</tbody>
</table>

   10 Ones → 1 Ten
   10 Tens → 1 Hundred
   10 Hundreds → 1 Thousand

   1000 cubes (_CUBE) make a thousands block.
   Counting by thousands, we have 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, 10000 cubes.
   So, 10 Thousands → 1 Ten Thousand
Count the blocks and complete the following.

- 1 block = 1000
- 2 blocks = 2000
- 3 blocks = 3000
- 4 blocks = ________
- 5 blocks = ________
- 6 blocks = ________
- 7 blocks = ________
- 8 blocks = ________
- 9 blocks = ________
- 10 blocks = ________

We write ‘Th’ for ‘thousands’ and ‘TTh’ for ‘ten thousands’.

1 block = 1000
2 blocks = 2000
3 blocks = 3000

10 thousands are written as 10,000 and read as ‘ten thousand.’
Reading and Writing Numbers

Example 1

Number: 2478
Number name: Two thousand four hundred seventy-eight

Example 2

Number: 4099
Number name: Four thousand ninety-nine

Fact Zone

999 + 1 = 1000
Greatest 3-digit number Smallest 4-digit number

9999 + 1 = 10000
Greatest 4-digit number Smallest 5-digit number

Help children understand that if a block is missing at any place, that value is represented by a zero.
Exercise 1.1

1. Complete the grids by counting forward.
   a) 1001 to 1020
      
      | 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 |
      |------|------|------|------|------|------|------|------|------|
      | 1011 | 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 |
      | 1020 |

   b) 5721 to 5750
      
      | 5721 | 5722 | 5723 | 5724 | 5725 |
      | 5730 |
      | 5735 |
      | 5741 | 5742 | 5743 | 5744 | 5745 |
      | 5750 |

   c) 9951 to 10000
      
      | 9951 | 9952 | 9953 | 9954 | 9955 |
      | 9956 | 9957 | 9958 | 9959 | 9960 |
      | 9961 | 9962 | 9963 | 9964 | 9965 |
      | 9966 | 9967 | 9968 | 9969 | 9970 |
      | 9971 | 9972 | 9973 | 9974 | 9975 |
      | 9976 | 9977 | 9978 | 9979 | 9980 |
      | 9981 | 9982 | 9983 | 9984 | 9985 |
      | 9986 | 9987 | 9988 | 9989 | 9990 |
      | 9991 | 9992 | 9993 | 9994 | 9995 |
      | 9996 | 9997 | 9998 | 9999 | 10000 |

2. Match the numerals with their correct number names.

   Five thousand one
   Four thousand thirty-one
   Six thousand nine hundred ninety-nine
   Nine thousand eighty-four
   Eight thousand seventy-five

3. Write the number names for the following.
   a) 4683
   b) 9807
   c) 8261
   d) 5617
Thousands, Hundreds, Tens and Ones

Example 1

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

**Face Value**  
3  
4  
2  
1

**Place Value**  
$3 \times 1 = 3$  
$4 \times 10 = 40$  
$2 \times 100 = 200$  
$1 \times 1000 = 1000$

1 Thousand + 2 Hundreds + 4 Tens + 3 Ones

In words, 1243 can be written as:

One thousand two hundred forty-three

**Expanded form:** $1000 + 200 + 40 + 3$

**Standard form:** 1243

Example 2

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

**Face Value**  
5  
0  
1  
7

**Place Value**  
$5 \times 1 = 5$  
$0 \times 10 = 0$  
$1 \times 100 = 100$  
$7 \times 1000 = 7000$

7 Thousands + 1 Hundred + 0 Tens + 5 Ones

In words, 7105 can be written as:

Seven thousand one hundred five

**Expanded form:** $7000 + 100 + 0 + 5$

**Standard form:** 7105

Think Smart

How many hundreds are there in the given numbers?

a) $1600 = \underline{\hspace{2cm}}$

b) $1800 = \underline{\hspace{2cm}}$

c) $2300 = \underline{\hspace{2cm}}$

d) $2000 = \underline{\hspace{2cm}}$
1. In 8796,
   a) which digit is in the tens place?  
   b) which digit is in the thousands place?  
   c) what is the place value of the digit 7?  
   d) what is the face value of the digit 6?  

2. Express each of the following numbers in expanded form.
   a) 4286 =  
   b) 1038 =  
   c) 7787 =  
   d) 9350 =  
   e) 6799 =  
   f) 8008 =  
   g) 10000 =  

3. Write the following numbers in standard form.
   a) 5000 + 30 + 9 =  
   b) 1000 + 7 =  
   c) 7000 + 300 + 40 + 9 =  
   d) 2000 + 600 + 8 =  
   e) 6000 + 500 + 40 =  

Mental Maths

What are the missing numbers?
   a) 3421 = 3000 +  + 20 + 1  
   b) 4305 = 4000 + 300 +  
   c) 5050 =  + 50  
   d) 6000 + 700 + 50 + 3 =  
   e) 7000 + 800 + 5 =  
   f) 2000 + 90 =  
Comparing and Ordering Numbers

Comparing Numbers

To compare the numbers, start from the digit on the left in the order of their place values.

Thousands → Hundreds → Tens → Ones

**Example 1**
Which number is smaller?

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>2</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

3 Th < 9 Th

So, 3156 is smaller than 9260.

**Example 2**
Which number is greater?

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>

6 Th = 6 Th 5 H > 3 H

So, 6569 is greater than 6342.

Ordering Numbers

We write the numbers in ascending or descending order as per the need.

Ascending order:
1, 2, 3, 4, 5

Descending order:
5, 4, 3, 2, 1

Amongst the two numbers, the number with more number of digits is the greater number.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Four digits

Two digits

4326 > 96
Example 3

Arrange the following numbers in ascending and descending order.
3456, 461, 6374, 3223

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

(Three digits)  Smallest number

6 > 3  Greatest number

6 Th > 3 Th  2 H < 4 H
3 Th = 3 Th

1. Write all the digits of the number in the place value table. Then compare the digits of the number.

2. There are three 4-digit numbers and one 3-digit number. So, the 3-digit number (461) is the smallest number of all.

3. 6 is the greatest digit in the thousands place among the 4-digit numbers. So, 6374 is the greatest number.

4. Now, 3 Th = 3 Th. So, compare the digit in the hundreds place. 2 H < 4 H
So, 3223 < 3456.

Numbers in ascending order are:
461 < 3223 < 3456 < 6374

Numbers in descending order are:
6374 > 3456 > 3223 > 461

Exercise 1.3

1. Look at the numbers. Fill in the blanks with >, < or =.

   a) 1295   1925
   b) 3654   3546
   c) 5515   5019
   d) 6295   6925
   e) 7001   7001
   f) 9999   9990

2. Arrange the following numbers in ascending order.

   a) 4568, 7984, 5200, 5206, 7354
       _______  _______  _______  _______  _______

   b) 5697, 3452, 5634, 9761, 5659
       _______  _______  _______  _______  _______

   c) 4268, 1300, 9190, 9192, 3030
       _______  _______  _______  _______  _______
3. Arrange the following numbers in descending order.

a) 3254, 2222, 9983, 3245, 4090

   ______ > ______ > ______ > ______ > ______

b) 5821, 5812, 7709, 4830, 8809

   ______ ______ ______ ______ ______

c) 4239, 4232, 9764, 3573, 8354

   ______ ______ ______ ______ ______

**Everyday Maths**

The following are the number plates of some vehicles.

- DL4S 6292
- HR2B 4980
- CG4K 9994
- MP9T 8889

a) Write the number names of the last four digits of each number plate.
b) Which is the greatest and the smallest number?
c) Arrange them in descending order.

**Forming Numbers**

**Forming the Smallest 4-digit Number**

*Example 1*

Make the smallest 4-digit number from the digits 7, 2, 9 and 0.

We write the digits in ascending order to form the smallest number.

So, the required number is 2079.

**Forming the Greatest 4-digit Number**

*Example 2*

Make the greatest 4-digit number from the digits 5, 1, 3 and 6.

We write the digits in descending order to form the greatest number.

So, the number formed is 6531.
Exercise 1.4

1. Form the greatest 4-digit number using the given digits.
   a) 4, 5, 2, 0
   b) 1, 3, 8, 2
   c) 1, 3, 9, 5
   d) 0, 1, 2, 3
   e) 5, 0, 3, 1
   f) 9, 7, 2, 6

2. Form the smallest 4-digit number using the given digits.
   a) 9, 1, 3, 7
   b) 0, 1, 5, 3
   c) 2, 4, 6, 8
   d) 4, 5, 3, 6
   e) 6, 7, 2, 4
   f) 2, 6, 9, 7

Think Smart

1. Form the smallest and the greatest 4-digit number using 7, 2 and 3 by repeating one digit two times.
2. How many 4-digit numbers can you form using the digits 5, 0, 2 and 8, without repeating?

More About Numbers

Odd and Even Numbers

Even numbers end in 0, 2, 4, 6 or 8.

Numbers which are divided by 2 exactly are called even numbers.
For example, 3452, 4526, 5788, 6450 and so on.

Odd numbers end in 1, 3, 5, 7 and 9

Numbers which are not divided by 2 exactly are called odd numbers.
For example, 1231, 2563, 3557, 7589 and so on.
**Successor and Predecessor**

1 more than any given number is the **successor** (just after) of the given number. For example, 1571 + 1 = 1572. So, successor of 1571 is 1572.

\[ \begin{array}{c}
1570 \quad 1571 \quad 1572 \quad 1573 \quad 1574 \quad 1575 \\
\end{array} \]

\[ +1 \]

1 less than any given number is the **predecessor** (just before) of the given number. For example, 3157 - 1 = 3156. So, predecessor of 3157 is 3156.

\[ \begin{array}{c}
3155 \quad 3156 \quad 3157 \quad 3158 \quad 3159 \quad 3160 \\
\end{array} \]

\[ -1 \]

**Number Patterns**

Numbers that are arranged in a proper sequence or in an order form a pattern.

- Each time 3 is added to the previous number:
  
  \[ 0, \quad 3, \quad 6, \quad 9, \quad 12, \quad 15, \ldots \ldots \]  

- Each time 5 is added to the previous number:
  
  \[ 0, \quad 5, \quad 10, \quad 15, \quad 20, \quad 25, \quad 30, \ldots \ldots \]  

**Example 1**

Count by 10 and complete the pattern.

\[ \begin{array}{c}
1380, \quad 1390, \quad 1400, \quad 1410, \quad ? \\
\end{array} \]

\[ 1410 + 10 = 1420 \]

\[ \begin{array}{c}
4286, \quad 4276, \quad 4266, \quad 4256, \quad ? \\
\end{array} \]

\[ 4256 - 10 = 4246 \]

**Example 2**

Count by 100 and complete the pattern.

\[ \begin{array}{c}
2281, \quad 2381, \quad 2481, \quad 2581, \quad ? \\
\end{array} \]

\[ 2581 + 100 = 2681 \]

\[ \begin{array}{c}
1786, \quad 1686, \quad 1586, \quad 1486, \quad ? \\
\end{array} \]

\[ 1486 - 100 = 1386 \]

**Example 3**

Count by 1000 and complete the pattern.

\[ \begin{array}{c}
1935, \quad 2935, \quad 3935, \quad 4935, \quad ? \\
\end{array} \]

\[ 4935 + 1000 = 5935 \]

\[ \begin{array}{c}
7530, \quad 6530, \quad 5530, \quad 4530, \quad ? \\
\end{array} \]

\[ 4530 - 1000 = 3530 \]
1. Write all the even numbers between the two given numbers.
   a) 1046 → 1050 → 1054 → 1058 → 1060
   b) 5356 → 5360 → 5364 → 5368 → 5370

2. Write all the odd numbers between the following numbers.
   a) 5237 → 5239 → 5241 → 5243 → 5245 → 5247 → 5249
   b) 4230 → 4231 → 4233 → 4235 → 4237 → 4239 → 4241

3. Write the predecessor (just before) and the successor (just after) of the following numbers.
   a) \[ \begin{array}{c}
   \text{Predecessor:} \\
   \text{Successor:} \\
   \end{array} \]
   b) \[ \begin{array}{c}
   \text{Predecessor:} \\
   \text{Successor:} \\
   \end{array} \]
   c) \[ \begin{array}{c}
   \text{Predecessor:} \\
   \text{Successor:} \\
   \end{array} \]
   d) \[ \begin{array}{c}
   \text{Predecessor:} \\
   \text{Successor:} \\
   \end{array} \]
   e) \[ \begin{array}{c}
   \text{Predecessor:} \\
   \text{Successor:} \\
   \end{array} \]
   f) \[ \begin{array}{c}
   \text{Predecessor:} \\
   \text{Successor:} \\
   \end{array} \]

4. **Rounding off Numbers**
   To the Nearest Tens
   - 12 is nearer to 10 than 20.
     So, it is rounded off to 10.
   - 17 is nearer to 20 than 10.
     So, it is rounded up to 20.
   Example 2
   To the Nearest Hundreds
   Example 3
   150
   144
   250
   350
   200
   300
   400
   Near Far
   144 is nearer to 100 than 200.
   So, it is rounded off to 100.

5. Write the missing numbers in each case.
   a) Count by tens
      4135, 4145, 4155, 4165, \[ \begin{array}{c}
      \text{Third place:} \\
      \text{Fourth place:} \\
      \text{Fifth place:} \\
      \end{array} \]
   b) Count by hundreds
      8700, 8800, 8900, 9000, \[ \begin{array}{c}
      \text{First place:} \\
      \text{Second place:} \\
      \text{Third place:} \\
      \end{array} \]
   c) Count by thousands
      1234, \[ \begin{array}{c}
      \text{First place:} \\
      \text{Second place:} \\
      \text{Third place:} \\
      \end{array} \], 3234, 4234, \[ \begin{array}{c}
      \text{First place:} \\
      \text{Second place:} \\
      \text{Third place:} \\
      \end{array} \], 5234, \[ \begin{array}{c}
      \text{First place:} \\
      \text{Second place:} \\
      \text{Third place:} \\
      \end{array} \]
Rounding off the numbers helps us to find an estimated value of a given amount.

**To the Nearest Tens**

**Example 1**
Round off 12 to the nearest 10s.

12 is nearer to 10 than 20.
So, it is rounded off to 10.

**Example 2**
Round off 17 to the nearest 10s.

17 is nearer to 20 than 10.
So, it is rounded up to 20.

**To the Nearest Hundreds**

**Example 3**
Round off 144 to the nearest 100s.

144 is nearer to 100 than 200.
So, it is rounded off to 100.

*Teaching Tip*

Give examples to students from daily life to associate rounding off to estimation. For example, price of clothes and electrical appliances are generally told after rounding off.
Example 4
Round off 256 to the nearest 100s.

256 is nearer to 300 than 200.
So, it is rounded up to 300.

To the Nearest Thousands
Example 5
Round off 1500 to the nearest 1000s.

1500 is exactly halfway between 1000 and 2000.
So, we round it up to 2000.

Example 6
Round off 4358 to the nearest 1000s.

4358 is nearer to 4000 than 5000.
So, it is rounded off to 4000.

Example 7
Round off 7620 to the nearest 1000s.

7620 is nearer to 8000 than 7000.
So, it is rounded up to 8000.
Exercise 1.6

1. Round off the following numbers to the nearest tens.
   a) 17  
   b) 59  
   c) 25  
   d) 99  
   e) 88  
   f) 43  
   g) 89  
   h) 46  
   i) 74  

2. Round off the following numbers to the nearest hundreds.
   a) 132  
   b) 391  
   c) 757  
   d) 257  
   e) 995  
   f) 467  
   g) 387  
   h) 726  
   i) 589  

3. Round off the following numbers to the nearest thousands.
   a) 5325  
   b) 6357  
   c) 2573  
   d) 4500  
   e) 5731  
   f) 9835  
   g) 1299  
   h) 3901  

Roman Numerals

The system of numeration invented by the Romans is called the Roman numeration. The numerals in the Roman system are written using the seven capital letters of the English alphabet.

Roman numeral system uses only seven symbols to write any number, based on some rules.

In Roman Numerals:
- there is no zero.
- there is no place value chart.
- numbers are obtained by addition and subtraction.

The values of the seven symbols are given below:

<table>
<thead>
<tr>
<th>Roman Numerals</th>
<th>I</th>
<th>V</th>
<th>X</th>
<th>L</th>
<th>C</th>
<th>D</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu-Arabic Numerals</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>50</td>
<td>100</td>
<td>500</td>
<td>1000</td>
</tr>
</tbody>
</table>
Rule 1: Repetition of a numeral means addition. No numeral can be repeated more than 3 times.

II = 1 + 1 = 2
III = 1 + 1 + 1 = 3
XX = 10 + 10 = 20
XXX = 10 + 10 + 10 = 30

Rule 2: A smaller numeral written to the right of a greater numeral means addition.

VI = 5 + 1 = 6
XV = 10 + 5 = 15
XXXV = 10 + 10 + 10 + 5 = 35

Rule 3: A smaller numeral written to the left of a greater numeral means subtraction.

IV = 5 \( - \) 1 = 4
IX = 10 \( - \) 1 = 9
XL = 50 \( - \) 10 = 40

Rule 4: When a smaller numeral is placed between two numerals of greater value, it is subtracted from the numeral on its right.

XIV = 10 + (5 \( - \) 1)
= 10 + 4 = 4
XXIX = 10 + 10 + (10 \( - \) 1)
= 10 + 10 + 9 = 29

Example

Write the Roman numerals for the following.

a) 9  b) 21  c) 37  d) 43

a) Roman numeral for 9 is IX.
b) Roman numeral for 21 is XXI.
c) Roman numeral for 37 is XXXVII.
d) Roman numeral for 43 is XLIII.

Exercise 1.7

1. Write the Roman numerals for the following.
   a) 6  b) 14  c) 23  d) 34

2. Write the Hindu-Arabic numerals for the following Roman numerals.
   a) VII  b) XII  c) XXXVII  d) XL

Fact Zone

- Repetition of a Roman numeral is not allowed more than thrice.
- ‘I’ can be subtracted from V and X only.
- ‘V’ is never subtracted from any number.
- ‘X’ can be subtracted from L and ‘C’ only.
- V, L and D are never repeated.
1. Fill in the missing numbers.

   a) 2641     b) 8644

   2649

2. Write the number name of each of the following.

   a) 2195  b) 6304  c) 9009

3. Tick (✓) the odd numbers and cross (✗) the even numbers.

<table>
<thead>
<tr>
<th>1092</th>
<th>1095</th>
<th>1147</th>
<th>1522</th>
<th>1693</th>
<th>1582</th>
<th>1400</th>
<th>1709</th>
<th>1923</th>
<th>1505</th>
</tr>
</thead>
<tbody>
<tr>
<td>1882</td>
<td>1853</td>
<td>1794</td>
<td>1831</td>
<td>1928</td>
<td>1473</td>
<td>1929</td>
<td>1850</td>
<td>1463</td>
<td>1972</td>
</tr>
<tr>
<td>2481</td>
<td>5962</td>
<td>3429</td>
<td>7954</td>
<td>5556</td>
<td>7709</td>
<td>3491</td>
<td>4956</td>
<td>7804</td>
<td>9908</td>
</tr>
</tbody>
</table>

4. Put the correct sign in the circle (<, > or =).

   a) 1010 1100  b) 29 XXXI  c) 9321 9811
   d) XIX 39  e) 30 XXX  f) 7001 6999

5. Arrange 7987, 7789, 7978, 7798 in both ascending and descending order.

   ____________________________

6. Using the given digits, form the greatest and the smallest 4-digit numbers.

<table>
<thead>
<tr>
<th>Digits</th>
<th>Greatest 4-digit number</th>
<th>Smallest 4-digit number</th>
</tr>
</thead>
<tbody>
<tr>
<td>9, 5, 0, 4</td>
<td>9540 5940</td>
<td>9045 5049</td>
</tr>
<tr>
<td>3, 4, 6, 1</td>
<td>6431 4361</td>
<td>1346 1634</td>
</tr>
</tbody>
</table>

7. Write the predecessor and successor of the following numbers.

   a) _______ 7999 _______  b) _______ 9999 _______

8. Round off the following numbers to the nearest tens and hundreds.

   a) 7809  ,  b) 5516  ,  c) 7443  ,  
**Aim:** To explore the formation of a 4-digit even and odd numbers.

**Requirements:** A bowl, two sets of numbers slips with 0 to 9 written on them

**Steps:**

1. Divide the class into two teams.
2. Make some slips of paper with the digits from 0 to 9 written on them. Fold them and keep them in a bowl.

3. Each team will take turns and pick 4 slips. They will then form all possible 4-digit even numbers using the digits on their slips.
4. The teams get 2 points for each correct number formed by them.
5. Repeat the activity till time permits. In the next round, ask them to form the odd numbers.
6. The team that gets the maximum points at the end is the winner.
I Have Learnt

1. Add 375 and 144.

   **Hundreds** | **Tens** | **Ones**
   --- | --- | ---
   3 | 7 | 5
   1 | 4 | 4
   5 | 1 | 9

   375 + 144 = 519

2. Add 132, 249 and 72.

   
   
   
   
   Part 375

   Part 144

   Whole 519

   132 + 249 + 72 = 453

3. Siya’s school took the children on a trip to the amusement park. There were 139 children in 2 small buses and 256 children in 2 big buses. How many children were there in all?

   
   139 + 256 = 395

   So, there were 395 children in all.
### I Can

<table>
<thead>
<tr>
<th></th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First day</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tickets sold</td>
<td>59</td>
<td>47</td>
</tr>
<tr>
<td>Money earned (in ₹)</td>
<td>472</td>
<td>376</td>
</tr>
<tr>
<td><strong>Second day</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tickets sold</td>
<td>65</td>
<td>36</td>
</tr>
<tr>
<td>Money earned (in ₹)</td>
<td>455</td>
<td>252</td>
</tr>
<tr>
<td><strong>Third day</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tickets sold</td>
<td>33</td>
<td>28</td>
</tr>
<tr>
<td>Money earned (in ₹)</td>
<td>297</td>
<td>252</td>
</tr>
</tbody>
</table>

1. **Calculate the number of tickets sold on each day.**

<table>
<thead>
<tr>
<th>First day</th>
<th>Second day</th>
<th>Third day</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
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<td>33</td>
</tr>
<tr>
<td>47</td>
<td>36</td>
<td>28</td>
</tr>
</tbody>
</table>

2. **Calculate the money earned (in rupees) on each day.**

<table>
<thead>
<tr>
<th>First day</th>
<th>Second day</th>
<th>Third day</th>
</tr>
</thead>
<tbody>
<tr>
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<td>455</td>
<td>297</td>
</tr>
<tr>
<td>376</td>
<td>252</td>
<td>252</td>
</tr>
</tbody>
</table>

3. **Calculate the total number of boys and the total number of girls who visited the park on all the three days.**

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>
Warm Up

Can you tell the sum of 4041 and 1234?

It would be around 5300.

How did you calculate the sum so quickly?

I know that! He rounded off the numbers and calculated the estimated sum.

Addition without Regrouping

Example 1
Add 4041 and 1234.

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>4041</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1234</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Add the ones first.

4 Thousands + 1 Thousand = 5 Thousands

1. Calculate the number of tickets sold on each day.

<table>
<thead>
<tr>
<th>Day</th>
<th>Boys</th>
<th>Girls</th>
<th>Money earned (in `)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>59</td>
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</tr>
<tr>
<td>Third</td>
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<td>28</td>
<td>297</td>
</tr>
</tbody>
</table>

2. Calculate the money earned (in rupees) on each day.

3. Calculate the total number of boys and the total number of girls who visited the park on all the three days.

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
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<tbody>
<tr>
<td>4041</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1234</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Add the ones first.

4 Thousands + 1 Thousand = 5 Thousands

1. Calculate the number of tickets sold on each day.

<table>
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<th>Girls</th>
<th>Money earned (in `)</th>
</tr>
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2. Calculate the money earned (in rupees) on each day.

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<td>9</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>
1. Add the ones.

\[
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
4 & 0 & 4 & 1 \\
1 & 2 & 3 & 4 \\
\hline
\end{array} \\
+ \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 2 & 3 & 4 \\
\hline
\end{array} \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
4 & 0 & 4 & 1 \\
\hline
\end{array} \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 2 & 3 & 4 \\
2 & 7 & 5 \\
\hline
\end{array} \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
4 & 0 & 4 & 1 \\
\hline
\end{array} \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 2 & 3 & 4 \\
5 & 2 & 7 & 5 \\
\hline
\end{array} \\
\end{array}
\]

Part 4041

Part 1234

Whole 5275

4041 + 1234 = 5275

Example 2
Add 1022, 321 and 5555.

Arrange the numbers vertically first.

1. Add the ones.

\[
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 0 & 2 & 2 \\
5 & 5 & 5 & 5 \\
\hline
\end{array} \\
+ \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 0 & 2 & 2 \\
5 & 5 & 5 & 5 \\
\hline
\end{array} \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 0 & 2 & 2 \\
5 & 5 & 5 & 5 \\
9 & 8 \\
\hline
\end{array} \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 0 & 2 & 2 \\
5 & 5 & 5 & 5 \\
\hline
\end{array} \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 0 & 2 & 2 \\
6 & 8 & 9 & 8 \\
\hline
\end{array} \\
\end{array}
\]

1022 + 321 + 5555 = 6898

Exercise 2.1

1. Add the following.

\[
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
2 & 4 & 3 & 2 \\
\hline
\end{array} \\
+ \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
5 & 9 & 7 & 0 \\
\hline
\end{array} \\
+ \\
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
9 & 3 & 0 & 2 \\
\hline
\end{array} \\
\end{array}
\]

Make students observe by giving examples that numbers can also be added by expanding them.
2. Find the sum of the given numbers.

a) 2452 and 14  
b) 6336 and 230  
c) 3759 and 5000  
d) 1722 and 6167  
e) 7682 and 1005  
f) 3591 and 4207  
g) 2125, 3420 and 1052  
h) 1021, 4370 and 4000  
i) 23, 312 and 6102  
j) 70, 500 and 7000

Mental Maths

1. Write the expanded form and add.

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Th</td>
<td>H</td>
<td>T</td>
<td>O</td>
<td>Th</td>
<td>H</td>
<td>T</td>
<td>O</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
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<td>2</td>
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<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tr>
<td>Th</td>
<td>H</td>
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<td>H</td>
<td>T</td>
<td>O</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>0</td>
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<td>3</td>
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2. Observe the pattern and add.

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</table>
Example 1
Add 4318 and 2235.

1. Add the ones.
   - 8 Ones + 5 Ones = 13 Ones
   - 1 Ten 3 Ones
2. Add the tens.
   - 1 Ten + 1 Ten + 3 Tens = 5 Tens
3. Add the hundreds.
   - 3 Hundreds + 2 Hundreds = 5 Hundreds
4. Add the thousands.
   - 4 Thousands + 2 Thousands = 6 Thousands

So, 4318 + 2235 = 6553

Encourage the students to form a habit of checking that the digits of the numbers are copied correctly, before solving the questions.
Addition with Regrouping

Add 4318 and 2235.

Thousands Hundreds Tens Ones

8 Ones + 5 Ones = 13 Ones
13 Ones = 1 Ten 3 Ones
1 Ten + 1 Ten + 3 Tens = 5 Tens
3 Hundreds + 2 Hundreds = 5 Hundreds
4 Thousands + 2 Thousands = 6 Thousands

So, 4318 + 2235 = 6553

Encourage the students to form a habit of checking that the digits of the numbers are copied correctly, before solving the questions.

Example 1

1. Add the following.

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Find the sum of the largest 3-digit number, 17 hundreds and three thousand twenty-two.

Exercise 2.2

1. Add the following.

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</tbody>
</table>

2. Find the sum of the given numbers.

a) 3632 and 5576
b) 5432 and 1375
c) 2375 and 3106
d) 6579 and 1105
e) 5106 and 3156
f) 1053 and 3564

Think Smart

Find the sum of the largest 3-digit number, 17 hundreds and three thousand twenty-two.
More Ways to Add

Example 1  2625 + 8

= 2625 + 5 + 3
= 2630 + 3
= 2633

Example 2  1274 + 20

= 1270 + 20 + 4
= 1290 + 4
= 1294

Example 3  9735 + 200

= 9700 + 200 + 35
= 9900 + 35
= 9935

Exercise 2.3

Add the following by breaking up the numbers.

1. 204 + 7
2. 312 + 9
3. 566 + 6
4. 663 + 10
5. 914 + 60
6. 1592 + 10
7. 4120 + 400
8. 3222 + 500
9. 5510 + 300
10. 6735 + 200

Break the numbers in such a way that they form groups of 10, 100 or 1000.
Order Property
Numbers can be added in any order. This does not affect the sum.

Example 1  Add 4142 and 3623.

\[
\begin{align*}
\text{Th} & \quad \text{H} \quad \text{T} \quad \text{O} \\
4 & \quad 1 \quad 4 \quad 2 & \text{Addend} \\
+ & \quad 3 \quad 6 \quad 2 \quad 3 & \text{Addend} \\
\hline
7 & \quad 7 \quad 6 \quad 5 & \text{Sum}
\end{align*}
\]

\[
\begin{align*}
\text{Th} & \quad \text{H} \quad \text{T} \quad \text{O} \\
3 & \quad 6 \quad 2 \quad 3 & \text{Addend} \\
+ & \quad 4 \quad 1 \quad 4 \quad 2 & \text{Addend} \\
\hline
7 & \quad 7 \quad 6 \quad 5 & \text{Sum}
\end{align*}
\]

\[
4142 + 3623 = 7765 \quad \text{The sum is the same.}
\]

\[
3623 + 4142 = 7765
\]

\[
4142 + 3623 = 3623 + 4142
\]

Grouping Property
The sum of three or more numbers does not change even when they are grouped and added in any order.

Example 2  Add 2936, 1478 and 1002.

\[
\begin{align*}
\text{Th} & \quad \text{H} \quad \text{T} \quad \text{O} \\
1 & \quad 4 & \quad 1 & \quad 4 \\
+ & \quad 1 & \quad 4 & \quad 7 & \quad 8 \\
\hline
4 & \quad 4 & \quad 1 & \quad 4
\end{align*}
\]

\[
\begin{align*}
\text{Th} & \quad \text{H} \quad \text{T} \quad \text{O} \\
1 & \quad 4 & \quad 7 & \quad 8 \\
+ & \quad 1 & \quad 0 & \quad 0 & \quad 2 \\
\hline
2 & \quad 4 & \quad 8 & \quad 0
\end{align*}
\]

\[
\begin{align*}
\text{Th} & \quad \text{H} \quad \text{T} \quad \text{O} \\
1 & \quad 4 & \quad 8 & \quad 0 \\
+ & \quad 2 & \quad 9 & \quad 3 & \quad 6 \\
\hline
5 & \quad 4 & \quad 1 & \quad 6
\end{align*}
\]

\[
(2936 + 1478) + 1002 \quad (1478 + 1002) + 2936
\]

\[
= 4414 + 1002 \quad = 2480 + 2936
\]

\[
= 5416 \quad = 5416
\]

\[
(2936 + 1478) + 1002 = 5416 \quad \text{The sum is the same.}
\]

\[
(1478 + 1002) + 2936 = 5416
\]

Addends are the numbers being added. The total is called the sum.
Property of Zero
The sum of a number and 0 is the number itself.

Example 3  Add 4658 and 0.

\[
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
\hline
4 & 6 & 5 & 8 \\
\hline
& & & \\
\hline
4 & 6 & 5 & 8 \\
\hline
\end{array}
\]

4658 + 0 = 4658
0 + 4658 = 4658

The sum is the same.

This is called the property of zero.

Exercise 2.4

1. Fill in the blanks using order property.
   a) 2349 + 5927 = 5927 + ________  b) 1573 + 7225 = _______ + 1573
   c) 4123 + ________ = 3510 + 4123  d) ________ + 5913 = 5913 + 3633

2. Fill in the blanks.
   a) \((5423 + 357) + 160 = 5423 + (357 + \underline{\phantom{0}})\)
   b) \(1111 + (2222 + 3333) = (\underline{\phantom{0}} + 2222) + 3333\)
   c) \((1252 + 1917) + \underline{\phantom{0}} = \underline{\phantom{0}} + (1917 + 2325)\)
   d) \((2533 + 4753) + 2915 = \underline{\phantom{0}} + (4753 + 2915)\)

3. Solve the following using property of zero.
   a) 3173 + ________ = 3173  b) ________ + 1573 = 1573
   c) 2148 + 0 = ________  d) ________ + 0 = 1739

4. Solve the following.
   a) \((2312 + 4592) + 133\)  b) \(2312 + (4592 + 133)\)
   c) \((2312 + 133) + 4592\)

What do you observe?
Estimation of Sum

We can estimate the sum of the given numbers by rounding them off to the nearest tens, hundreds and thousands place as required.

**To the nearest tens**

*Example 1*

Estimate the sum of 63 and 28 to the nearest tens.

<table>
<thead>
<tr>
<th>rounded off</th>
<th>Estimated sum</th>
<th>Actual sum</th>
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</thead>
<tbody>
<tr>
<td>to the nearest 10s</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>rounded up</td>
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<td>30</td>
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The estimated sum is close to the actual sum.

**To the nearest hundreds**

*Example 2*

Estimate the sum of 343 and 575 to the nearest hundreds.

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<th>Actual sum</th>
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</thead>
<tbody>
<tr>
<td>to the nearest 100s</td>
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<td>300</td>
</tr>
<tr>
<td>rounded up</td>
<td>300</td>
<td>600</td>
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</table>

The estimated sum is close to the actual sum.

**To the nearest thousands**

*Example 3*

Estimate the sum of 1293 and 6555 to the nearest thousands.

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<tr>
<th>rounded off</th>
<th>Estimated sum</th>
<th>Actual sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>to the nearest 1000s</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>rounded up</td>
<td>1000</td>
<td>7000</td>
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</tbody>
</table>

The estimated sum is close to the actual sum.
Exercise 2.5

1. Estimate each sum to the nearest tens. Also, find the actual sum.
   a) \(55 + 31\)
   b) \(247 + 375\)

2. Estimate each sum to the nearest hundreds. Also, find the actual sum.
   a) \(4215 + 2787\)
   b) \(2172 + 2461\)

3. Estimate each sum to the nearest thousands. Also, find the actual sum.
   a) \(7127 + 1654\)
   b) \(6217 + 1523\)

4. On a shopping trip, Mohit spent ₹1592 and his sister spent ₹5923. Round off the amounts to the nearest thousands to find the estimated sum of money they spent in all.

Maths Fun

1. Work in pairs.
2. Take a game board as shown below and slips of paper with 6 numbers written on them. (1241, 5079, 3128, 4091, 4700 and 2266)
3. Choose any two numbers from the slips of paper.
4. Find the sum of the two numbers.
5. Take turns marking your answers on the game board. For example, the first player crosses his answer, while the second partner circles his answer.
6. The first one to get three crosses or three circles on the game board wins.
Problem Solving using a Model

The model method is a form of problem representation that helps students gain a better understanding of the operations they need to use to solve word problems. Drawing bars help the students see the relationship among the given quantities and help decide the method to be used to solve the problem given.

Mainly, two types of models are used:

a) Part-whole model
b) Comparison model

Part-Whole Model

The rectangular bars are used to represent the quantities that shows the ‘part’. These rectangular bars are drawn proportionally to one another that helps students see and understand the relationships between the quantities.

Addition Model: Find the sum of 2 and 3.

Comparison Model

The comparison model is used to compare two quantities to show how much one quantity is greater (or smaller) than the other. Without the model, children may simply rely on the cue words "more than" and use addition to solve the problem without realising that it is incorrect.

We draw different rectangular bars for different quantities. The comparison models are generally drawn this way.
Addition Model: A has 5 coins. B has 2 coins more than A. How many coins does B have?

\[
\begin{array}{c}
\text{A} \\
5 \\
\text{B} \\
? \\
\end{array}
\quad \rightarrow \quad
\begin{array}{c}
\text{A} \\
5 \\
\text{B} \\
7 \\
\end{array}
\]

Smaller quantity + Difference = Larger quantity

Solving Word Problems

Example 1
On Saturday, 1232 people attended a concert. On Sunday, 2754 people attended the same concert. How many people attended the concert over two days?

Understanding
The number of people who attended the concert over two days is given. We have to find the total.

Planning
Here, we are given two parts and we need to find the whole. Let’s draw a part-whole model for it.

Doing

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</table>

We need to find the sum of 1232 and 2754.

3986 people attended the concert over two days.
Work backwards to check your answer.
Subtract any part from the whole.

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The answer is correct.

**Example 2**

1569 passengers are flying to Sri Lanka. The number of passengers flying to Maldives is 72 more than the passengers flying to Sri Lanka. How many passengers are flying to Maldives?

To find the answer, we add 72 to the number of passengers flying to Sri Lanka. Let’s draw a comparison model for it.

```
1569

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Work backwards to check your answer.
1641 – 72 = 1569
1641 – 1569 = 72

The number of passengers flying to Maldives is 1641.

**Everyday Maths**

You have ₹10,000 to buy 3 items. Which 3 items would you choose if you spend between ₹9000 and ₹10,000?

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<thead>
<tr>
<th>Item</th>
<th>Price</th>
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</tr>
<tr>
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</tr>
<tr>
<td>Sofa</td>
<td>₹7149</td>
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<tr>
<td>Cupboard</td>
<td>₹5129</td>
</tr>
<tr>
<td>Table</td>
<td>₹1995</td>
</tr>
</tbody>
</table>
1. Complete the given model, and then solve the addition sentence.

On Saturday, 1050 people went to a book fair. On Sunday, 1608 people went to the book fair. How many people went to the book fair over two days?

\[ ? \]

\[ \begin{array}{c}
\text{Saturday} \\
1050 \\
\text{Sunday} \\
\hline
\end{array} \]

\[ \square \quad \bigcirc \quad \square \quad \square = \square \]

2. Solve the following word problems. Draw a bar model to help yourself.

a) Rohit spent ₹1467 in January. He spent ₹2310 in February. How much did he spend in both the months altogether?

b) A fruit seller has 1312 mangoes and 149 apples. How many fruits does he have in all?

c) The sale of a flower shop was ₹1023 on Monday, ₹1294 on Tuesday and ₹3129 on Wednesday. What was the total sale of the shop on three days?

d) At a Christmas carnival, there are 1650 men, 1413 women, 1512 girls and 1119 boys.

   i) How many adults attended the carnival?

   ii) How many children were there in all?


e) A total of 2376 males and 3924 females visited the Kingdom of Dreams last Sunday. Find the estimated and the actual sum of people who visited the place on Sunday.
Cricket matches were held for a number of schools of a city for six days from Tuesday to Sunday. The number of viewers on each day is shown in the table given below.

<table>
<thead>
<tr>
<th>Day</th>
<th>Viewers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>1715</td>
</tr>
<tr>
<td>Wednesday</td>
<td>2141</td>
</tr>
<tr>
<td>Thursday</td>
<td>2004</td>
</tr>
<tr>
<td>Friday</td>
<td>2721</td>
</tr>
<tr>
<td>Saturday</td>
<td>3312</td>
</tr>
<tr>
<td>Sunday</td>
<td>3871</td>
</tr>
</tbody>
</table>

Add the number of viewers for the first two days, last two days, first three days and the last three days.

- On Tuesday and Wednesday, there were ____________ viewers.
- On Saturday and Sunday, there were ____________ viewers.
- On Tuesday, Wednesday and Thursday, there were ____________ viewers.
- On Friday, Saturday and Sunday, there were ____________ viewers.

**Find Out**

How many players are there in a cricket team? ____________

Who are the captains of India’s men’s and women’s cricket team?
________________________________ and ________________________________
**Aim:** To revise the concept of addition of 4-digit numbers.

**Requirements:** Set of cards numbered from 0 to 9, a bowl

**Steps:**
1. Divide the class into groups of 4 students.
2. Call out one student from each group and ask them to pick 4 cards from the bowl.
3. Instruct the groups to form two numbers such that their sum is the greatest sum.
   [Hint: They need to form the greatest possible and the second greatest possible number with these digits and fill in the record table.]
4. The group with the greatest sum wins the round.
5. Repeat steps 2 to 4, five times.

**Record Table**

<table>
<thead>
<tr>
<th>Number</th>
<th>Greatest number</th>
<th>Second greatest number</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 4, 0, 4, 1</td>
<td>4410</td>
<td>4140</td>
<td>8550</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[\text{Subtraction}\]

\[
\begin{array}{c|c}
\text{H} & \text{T} & \text{O} \\
174 & 35 & 139
\end{array}
\]

\[
\begin{array}{c|c|c|c}
\text{H} & \text{T} & \text{O} & \text{Regroup} \\
174 & 35 & & 6 \text{Tens} 14 \text{Ones} \\
139 & & & 9 \text{Ones} \\
& & & 3 \text{Tens} \\
\end{array}
\]

\[\text{Finally, subtract the hundreds.}\]

\[174 - 35 = 139\]

\[\begin{array}{c|c|c|c|c}
\text{H} & \text{T} & \text{O} & \text{Subtract the ones.} \\
125 & 64 & 61 & 0, 1 \\
\end{array}\]

\[125 - 64 = 61\]

So, there were 61 more children in the big buses than in the small buses.
1. Subtract 35 from 174.

\[
\begin{array}{c|c|c}
\text{Hundreds} & \text{Tens} & \text{Ones} \\
\hline
1 & 7 & 4 \\
1 & 4 & 1 \\
\end{array}
\]

Subtract the ones.

\[
\begin{array}{c|c|c}
\text{H} & \text{T} & \text{O} \\
1 & 6 & 7 \\
3 & 5 & \_ \\
\end{array}
\]

Regroup
7 Tens 4 Ones into
6 Tens 14 Ones
14 Ones – 5 Ones
= 9 Ones

\[
\begin{array}{c|c|c}
\text{H} & \text{T} & \text{O} \\
1 & 6 & 7 \\
3 & 5 & \_ \\
1 & 3 & 9 \\
\end{array}
\]

Finally, subtract the hundreds.

\[
\begin{array}{c|c|c}
\text{H} & \text{T} & \text{O} \\
1 & 7 & 4 \\
3 & 5 & \_ \\
6 & 1 & \_ \\
\end{array}
\]

174 – 35 = 139.

2. On a school trip to an amusement park, there were 64 children in 3 small buses and 125 children in 2 big buses. How many more children were there in the big buses than the small buses?

\[
\begin{array}{c|c|c}
\text{H} & \text{T} & \text{O} \\
0 & 1 & 2 \\
6 & 4 & \_ \\
6 & 1 & \_ \\
\end{array}
\]

125 – 64 = 61.

So, there were 61 more children in the big buses than in the small buses.
1. If there were 150 tickets in each booklet, then calculate the tickets left at the end of each day.

<table>
<thead>
<tr>
<th>Day</th>
<th>Tickets sold</th>
<th>Money earned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First day</strong></td>
<td>96</td>
<td>672</td>
</tr>
<tr>
<td><strong>Second day</strong></td>
<td>101</td>
<td>808</td>
</tr>
<tr>
<td><strong>Third day</strong></td>
<td>61</td>
<td>549</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day</th>
<th>Money earned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First day</strong></td>
<td>Difference 54</td>
</tr>
<tr>
<td><strong>Second day</strong></td>
<td>Difference 0</td>
</tr>
<tr>
<td><strong>Third day</strong></td>
<td>Difference 54</td>
</tr>
</tbody>
</table>

2. There was a target to earn ₹950 each day. Calculate the difference in the money earned and the targeted earning for each day.

<table>
<thead>
<tr>
<th>Day</th>
<th>Money earned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First day</strong></td>
<td>Difference</td>
</tr>
<tr>
<td><strong>Second day</strong></td>
<td>Difference</td>
</tr>
<tr>
<td><strong>Third day</strong></td>
<td>Difference</td>
</tr>
</tbody>
</table>

3. Find the difference in the earnings between the two given days.

<table>
<thead>
<tr>
<th>Day combination</th>
<th>Money earned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day 1 and Day 2</strong></td>
<td>Difference</td>
</tr>
<tr>
<td><strong>Day 2 and Day 3</strong></td>
<td>Difference</td>
</tr>
<tr>
<td><strong>Day 3 and Day 1</strong></td>
<td>Difference</td>
</tr>
</tbody>
</table>
Subtraction without Regrouping

Example 1
Subtract 1106 from 1368.

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1368</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1106</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. 8 Ones – 6 Ones = 2 Ones
2. 6 Tens – 0 Tens = 6 Tens
3. 3 Hundreds – 1 Hundred = 2 Hundreds
4. 1 Thousand – 1 Thousand = 0 Thousands
We always subtract the smaller number from the greater number.

Begin subtraction from the ones place.

1. Subtract the ones.

\[
\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 3 & 6 & 8 \\
- & 1 & 1 & 0 & 6 \\
\hline
& & 2 & 6 & 2 \\
\end{array}
\]

2. Subtract the tens.

\[
\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 3 & 6 & 8 \\
- & 1 & 1 & 0 & 6 \\
\hline
& & 2 & 6 & 2 \\
\end{array}
\]

3. Subtract the hundreds.

\[
\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 3 & 6 & 8 \\
- & 1 & 1 & 0 & 6 \\
\hline
& & 0 & 2 & 6 & 2 \\
\end{array}
\]

4. Subtract the thousands.

\[
\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 3 & 6 & 8 \\
- & 1 & 1 & 0 & 6 \\
\hline
& & & & \\
\end{array}
\]

1368 – 1106 = 262

Check:

1. To check the answer, add the difference to the smaller number.
2. If the sum obtained is equal to the greater number, the answer is correct.

Greater number →

\[
\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 3 & 6 & 8 \\
- & 1 & 1 & 0 & 6 \\
\hline
& & 2 & 6 & 2 \\
\end{array}
\]

Smaller number →

\[
\begin{array}{cccc}
\text{Difference} \\
& & 2 & 6 & 2 \\
\end{array}
\]

\[
\begin{array}{cccc}
\text{Greater number} \\
1 & 3 & 6 & 8 \\
1 & 1 & 0 & 6 \\
0 & 2 & 6 & 2 \\
\end{array}
\]

So, the answer is correct.

Exercise 3.1

1. Subtract the following.

\[
\begin{array}{cccc}
a) & \text{Th} & \text{H} & \text{T} & \text{O} \\
& 3 & 5 & 4 & 7 \\
- & & & & 3 \\
\hline
\end{array}
\]

\[
\begin{array}{cccc}
b) & \text{Th} & \text{H} & \text{T} & \text{O} \\
& 4 & 7 & 9 & 3 \\
- & & & & 7 & 3 \\
\hline
\end{array}
\]

\[
\begin{array}{cccc}
c) & \text{Th} & \text{H} & \text{T} & \text{O} \\
& 5 & 9 & 3 & 2 \\
- & 3 & 0 & 0 & 0 \\
\hline
\end{array}
\]
1. To check the answer, add the difference to the smaller number.
2. If the sum obtained is equal to the greater number, the answer is correct.

We always subtract the smaller number from the greater number.

Begin subtraction from the ones place.

\[ 1368 - 1106 = 262 \]

So, the answer is correct.

### Exercise 3.1

1. Subtract the following.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>b)</td>
<td>c)</td>
<td>d)</td>
<td>e)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f)</td>
<td>g)</td>
<td>h)</td>
<td>i)</td>
<td>j)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k)</td>
<td>l)</td>
<td>m)</td>
<td>n)</td>
<td>o)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p)</td>
<td>q)</td>
<td>r)</td>
<td>s)</td>
<td>t)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Subtract the smaller number from the greater number to find the difference. Also, check your answer.

a) 5638 and 4417
b) 4969 and 3333
c) 5671 and 6987
d) 3988 and 5999
e) 9999 and 9876
f) 5476 and 9887

**Fact Zone**

The difference of two numbers is always less than the greater number.
Subtraction with Regrouping

Example 1
Subtract 1509 from 2562.

\[ \begin{align*}
2562 \\
\hline
1509 \\
\hline
? \\
\end{align*} \]

I cannot subtract 9 ones from 2 ones. So, I regroup 6 tens as 5 tens and 10 ones.

\[ \begin{align*}
&\text{1. Subtract the ones.} \\
&\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
2 & 5 & 6 & 2 \\
- & 1 & 5 & 0 \end{array} \\
&\text{2. Subtract the tens.} \\
&\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
2 & 5 & 6 & 2 \\
- & 1 & 5 & 0 \\
\hline
& & 5 & 3 \\
\end{array} \\
&\text{3. Subtract the hundreds.} \\
&\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
2 & 5 & 6 & 2 \\
- & 1 & 5 & 0 \\
\hline
& & & 10 \\
\end{array} \\
&\text{4. Subtract the thousands.} \\
&\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
2 & 5 & 6 & 2 \\
- & 1 & 5 & 0 \\
\hline
& & & 10 \\
\end{array} \\
\end{align*} \]

\[ 2562 - 1509 = 1053 \]

Help students observe that regrouping the next higher unit means making 10 units of the smaller unit, through various examples. For example, regrouping 1 thousand means making 10 hundreds.
Subtraction with Regrouping

Help students observe that regrouping the next higher unit means making 10 units of the smaller unit, through various examples. For example, regrouping 1 thousand means making 10 hundreds.

**Teaching Tip**

Subtract 1509 from 2562.

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2562</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
</tr>
<tr>
<td>1509</td>
</tr>
</tbody>
</table>

1. Subtract the ones.
2. Subtract the tens.
3. Subtract the hundreds.
4. Subtract the thousands.

So, the answer is correct.

**Example 2**

Subtract 2500 from 3000.

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2500</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
</tr>
<tr>
<td>2500</td>
</tr>
</tbody>
</table>

1. Subtract the ones.
2. Subtract the tens.
3. Subtract the hundreds.
4. Subtract the thousands.

Check:

Greater number → 2
Smaller number → 5

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>0</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

Greater number

So, the answer is correct.

3000 – 2500 = 500.
Check:

<table>
<thead>
<tr>
<th>Greater number</th>
<th>Smaller number</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 0 0 0</td>
<td>2 5 0 0</td>
<td>1 5 0 0</td>
</tr>
</tbody>
</table>

So, the answer is correct.

Exercise 3.2

1. Subtract the following.

   a) \[
   \begin{array}{cccc}
   5 & 6 & 3 & 4 \\
   - &   &   & 9 \\
   \end{array}
   \]

   b) \[
   \begin{array}{cccc}
   4 & 9 & 9 & 6 \\
   - &   & 9 & 8 \\
   \end{array}
   \]

   c) \[
   \begin{array}{cccc}
   3 & 4 & 2 & 7 \\
   - &   & 5 & 1 \\
   \end{array}
   \]

   d) \[
   \begin{array}{cccc}
   1 & 0 & 0 & 0 \\
   - &   & 9 & 9 \\
   \end{array}
   \]

   e) \[
   \begin{array}{cccc}
   4 & 0 & 0 & 0 \\
   - & 3 & 9 & 8 \\
   \end{array}
   \]

   f) \[
   \begin{array}{cccc}
   7 & 4 & 3 & 1 \\
   - & 5 & 6 & 7 \\
   \end{array}
   \]

   g) \[
   \begin{array}{cccc}
   6 & 8 & 4 & 8 \\
   - & 2 & 9 & 0 \\
   \end{array}
   \]

   h) \[
   \begin{array}{cccc}
   8 & 9 & 1 & 8 \\
   - & 6 & 1 & 9 \\
   \end{array}
   \]

   i) \[
   \begin{array}{cccc}
   2 & 3 & 8 & 4 \\
   - & 1 & 5 & 7 \\
   \end{array}
   \]

2. Find the difference of the numbers and check your answer.

   a) 2543 and 4357   b) 5498 and 9176
   c) 1257 and 9100   d) 3577 and 8246
   e) 2769 and 4758   f) 2678 and 9000
   g) 3259 and 6043   h) 2765 and 5000

Mind It
More Ways to Subtract

Example 1  
3362 – 9

3362 - 9

= 3352 + 10 - 9

= 3352 + 1

= 3353

Example 2  
5562 – 50

5562 - 50

= 5502 + 60 - 50

= 5502 + 10

= 5512

Example 3  
1853 – 400

1853 - 400

= 1053 + 800 - 400

= 1053 + 400

= 1453

Exercise 3.3

Subtract the following by breaking down the bigger number.

1. 286 – 8
2. 463 – 7
3. 724 – 6
4. 483 – 30
5. 555 – 50
6. 1581 – 300
7. 2724 – 500
8. 3940 – 600
9. 5648 – 60
10. 6490 – 200
Subtraction Properties

Order Property
Unlike addition, in subtraction, we cannot change the order of numbers because we always subtract the smaller number from the greater number.

Example 1 Subtract 2132 from 4364.

\[
\begin{array}{c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
- & 4 & 3 & 6 & 4 \\
& 2 & 1 & 3 & 2 \\
& 2 & 2 & 3 & 2
\end{array}
\]

Not possible

Subtracting 0
When we subtract 0 from any number, the difference is the number itself.

Example 2 Subtract 0 from 1257.

\[
\begin{array}{c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
- & 1 & 2 & 5 & 7 \\
& & & 0 \\
& 1 & 2 & 5 & 7
\end{array}
\]

Subtracting Number from Itself
When we subtract a number from itself, the difference is 0.

Example 3 Subtract 5235 from 5235.

\[
\begin{array}{c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
- & 5 & 2 & 3 & 5 \\
& 5 & 2 & 3 & 5 \\
& 0 & 0 & 0 & 0
\end{array}
\]

Subtraction Facts
An addition sentence can have two subtraction sentences.

Example 4

Addition sentence
1423 + 2142 = 3565

\[
\begin{array}{c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
1 & 4 & 2 & 3 \\
2 & 1 & 4 & 2 \\
3 & 5 & 6 & 5
\end{array}
\]

Subtraction sentence
3565 – 1423 = 2142

\[
\begin{array}{c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
3 & 5 & 6 & 5 \\
1 & 4 & 2 & 3 \\
2 & 1 & 4 & 2
\end{array}
\]

Subtraction sentence
3565 – 2142 = 1423

\[
\begin{array}{c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
3 & 5 & 6 & 5 \\
2 & 1 & 4 & 2 \\
1 & 4 & 2 & 3
\end{array}
\]

Fact Zone
In general, we do not write zero on the left most position of a number.
1. **Subtract the following.**

   a) \[
   \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   9 & 6 & 8 & 9 \\
   \hline
   \end{array}
   \]
   \[
   - \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   6 & 9 & 7 & 1 \\
   \hline
   \end{array}
   \]

   b) \[
   \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   5 & 6 & 7 & 8 \\
   \hline
   \end{array}
   \]
   \[
   - \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   5 & 6 & 7 & 8 \\
   \hline
   \end{array}
   \]

   c) \[
   \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   6 & 3 & 4 & 8 \\
   \hline
   \end{array}
   \]
   \[
   - \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   6 & 3 & 4 & 8 \\
   \hline
   \end{array}
   \]

   d) \[
   \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   6 & 9 & 7 & 1 \\
   \hline
   \end{array}
   \]
   \[
   - \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   6 & 9 & 7 & 1 \\
   \hline
   \end{array}
   \]

   e) \[
   \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   4 & 8 & 3 & 8 \\
   \hline
   \end{array}
   \]
   \[
   - \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   3 & 8 & 0 \\
   \hline
   \end{array}
   \]

   f) \[
   \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   7 & 3 & 5 & 2 \\
   \hline
   \end{array}
   \]
   \[
   - \begin{array}{c|c|c|c|c}
   \text{Th} & \text{H} & \text{T} & \text{O} \\
   \hline
   7 & 3 & 5 & 2 \\
   \hline
   \end{array}
   \]

2. **Find the difference.**

   a) \[4629 - 0\]
   b) \[2429 - 2429\]
   c) \[2738 - 0\]
   d) \[4235 - 4235\]
   e) \[7999 - 0\]
   f) \[9999 - 9999\]
   g) \[5641 - 5641\]
   h) \[6543 - 0\]
   i) \[8468 - 0\]

3. **Is it possible to subtract 4973 from 1239?**

4. **Write two subtraction sentences for each of the following addition sentences.**

   a) \[2591 + 1235 = 3826\]
   b) \[7142 + 215 = 7357\]
   c) \[3333 + 2222 = 5555\]
   d) \[1723 + 2962 = 4685\]
   e) \[42 + 3213 = 3255\]
   f) \[5123 + 1671 = 6794\]
   g) \[1234 + 5678 = 6912\]
   h) \[4571 + 2587 = 7158\]

5. **Can you form two subtraction sentences for 1241 + 1241 = 2482?**

   - **Mental Maths**
   
   Fill in the empty blue squares in the given subtraction puzzle.
   The subtraction sentences across and down the puzzle must be correct.

   \[
   \begin{array}{c|c|c|c|c}
   4274 & - & - & = & 2742 \\
   - & - & - & - & \equiv \end{array}
   \]

   \[
   \begin{array}{c|c|c|c|c}
   2934 & - & - & = & 2416 \\
   \equiv & - & = & \equiv & -
   \end{array}
   \]
Estimating the Difference

For fast calculations, we generally use estimation. To estimate the difference, we round off the numbers to the nearest 10s, 100s or 1000s.

To the Nearest Tens

Example 1  Estimate the difference of 78 and 52.

<table>
<thead>
<tr>
<th></th>
<th>Estimated difference</th>
<th>Actual difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>rounded up to the nearest 10s</td>
<td>80</td>
</tr>
<tr>
<td>52</td>
<td>rounded off to the nearest 10s</td>
<td>50</td>
</tr>
</tbody>
</table>

The estimated difference is close to the actual difference.

To the Nearest Hundreds

Example 2  Estimate the difference of 892 and 721.

<table>
<thead>
<tr>
<th></th>
<th>Estimated difference</th>
<th>Actual difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>892</td>
<td>rounded up to the nearest 100s</td>
<td>900</td>
</tr>
<tr>
<td>721</td>
<td>rounded off to the nearest 100s</td>
<td>700</td>
</tr>
</tbody>
</table>

The estimated difference is close to the actual difference.

To the Nearest Thousands

Example 3  Estimate the difference of 7929 and 3449.

<table>
<thead>
<tr>
<th></th>
<th>Estimated sum</th>
<th>Actual sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>7929</td>
<td>rounded up to the nearest 1000s</td>
<td>8000</td>
</tr>
<tr>
<td>3449</td>
<td>rounded off to the nearest 1000s</td>
<td>3000</td>
</tr>
</tbody>
</table>

The estimated difference is close to the actual difference.
Exercise 3.5

1. Estimate each difference to the nearest tens. Also, find the actual difference.
   a) 92 – 47
   b) 72 – 21

2. Estimate each difference to the nearest hundreds. Also, find the actual difference.
   a) 439 – 302
   b) 710 – 592

3. Estimate each difference to the nearest thousands. Also, find the actual difference.
   a) 5499 – 4001
   b) 8625 – 8256

4. Estimate the difference between 5429 and 5907, by rounding off to the nearest thousands.

5. The cost of a table is ₹3529. Rekha has ₹2325. Estimate the amount to the nearest hundreds, to find the amount she needs more to buy the table.

6. Estimate the difference between 4576 and 4231 to the nearest tens, hundreds and thousands.

Maths Fun

Solve the puzzle.
1. Choose two numbers from the circles. Subtract the smaller number from the greater number.
2. Write the difference in the circle between the two numbers.
3. Repeat steps 1 and 2 to complete the puzzle.
**Problem Solving using a Model**

**Part-Whole Model**

**Subtraction Model:** Find the difference of 5 and 3.

Subtraction Model: A has 5 coins. B has 2 coins less than A. How many coins does B have?

Comparison Model

Subtraction Model: A has 5 coins. B has 2 coins less than A. How many coins does B have?

**Subtraction Model:** A has 5 coins. B has 3 coins. How many more coins does A have?

**Comparison Model**

Subtraction Model: A has 5 coins. B has 2 coins less than A. How many coins does B have?

**Solving Word Problems**

**Example 1**

There are 1896 people at a book fair. 983 of them are adults and the rest are children.

a) How many children are there?

b) How many more adults than children are there?

- a) Total number of people and adults are given. We have to find the number of children. Should we add or subtract?

- b) Use the four-step problem solving process to solve.
Subtraction Model:
A has 5 coins. B has 2 coins less than A. How many coins does B have?

Part-Whole Model

Subtraction Model:
A has 5 coins. B has 3 coins. How many more coins does A have?

Comparison Model

Solving Word Problems
There are 1896 people at a book fair. 983 of them are adults and the rest are children.

a) How many children are there?

b) How many more adults than children are there?

Example 1
Total number of people and adults are given.

Should we add or subtract?

Use the four-step problem solving process to solve.

Work backwards to check your answer.

There are 913 children.

Work backwards to check your answer.

There are 70 more adults than children.

Check!

Check!

Number of children
Number of adults more than children
Number of adults

So, the answer is correct.

Example 4
The greater of two numbers is 6031. The difference between the smaller number and the greater number is 3061.

a) What is the smaller number?

b) What is the sum of the two numbers?
a) \[6031 - 3061 = 2970\]
The smaller number is 2970.
b) \[2970 + 6031 = 9001\]
The sum of the two numbers is 9001.

**Exercise 3.6**

1. **Complete each model, and then solve the subtraction sentence.**

a) Ramya paid ₹4073 for her airfare. Raunak paid ₹2386 less than Ramya for his airfare. How much did Raunak pay for his airfare?

b) There were 4536 participants in the Republic day parade. 1657 of them were adults and the rest were children. How many children participated in the parade?

2. **Solve the following word problems. Draw a bar model to help yourself.**

a) The airfare to Goa is ₹5886. The airfare to Mumbai is ₹798 less than that to Goa. What is the airfare to Mumbai?
b) A total of 8346 visitors visited the zoo in March. 6780 were Indians and the rest were foreigners. How many foreigners visited the zoo?

c) The sum of two numbers is 6403. The smaller number is 2313. What is the greater number?

d) The prices for four Domestic Tour packages for three days are given below. What is the difference between the:

<table>
<thead>
<tr>
<th>Package</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manali</td>
<td>₹1500</td>
</tr>
<tr>
<td>Simla</td>
<td>₹1750</td>
</tr>
<tr>
<td>Nanital</td>
<td>₹1800</td>
</tr>
<tr>
<td>Darjeeling</td>
<td>₹1600</td>
</tr>
</tbody>
</table>

i) price of the cheapest and the most expensive packages?

ii) the price of package to Manali and Simla?

e) 890 people boarded a train at the first station. At the second station, another 238 people boarded the train, but 136 people got off. How many people are on the train at the second station now?

f) Jyoti baked 2380 cookies in September. She baked 565 fewer cookies in October. How many cookies did she bake in October?

Think Smart

Form the smallest and the greatest number of 4-digit numbers using 5, 9, 0 and 1. Find the estimated and the actual difference between the two numbers formed.

Framing Word Problems

Example

Frame a word problem using the following clues:

a) Siya, 1530, marbles, Tina, 1273, total

b) Siya, Tina, 1530, 1273, marbles, difference
a) Step 1: First, categorize the clues.

<table>
<thead>
<tr>
<th>Character 1</th>
<th>Character 2</th>
<th>Figure 1</th>
<th>Figure 2</th>
<th>Object</th>
<th>Operation to be performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siya</td>
<td>Tina</td>
<td>1530</td>
<td>1273</td>
<td>marbles</td>
<td>total</td>
</tr>
</tbody>
</table>

Step 2: Club the first character with a figure and an object.

Siya had 1530 marbles.

Step 3: Club the second character with the other figure and the other object.

Tina had 1273 marbles.

Step 4: Frame the question using the given operation.

How many total marbles did they have?

So, the word problem will be:

Siya had 1530 marbles. Tina had 1273 marbles. How many total marbles did they have?

Siya had 1530 marbles. Tina had 1273 marbles. Siya gave all the marbles to Tina. What is the total number of marbles Tina has?

Tina had 1530 marbles. Siya had 1273 more marbles than Tina. Find the total number of marbles Siya had.

b) Siya had 1530 marbles. Tina had 1273 marbles. Find the difference in the number of marbles.

Exercise 3.7

Frame word problems using the given clues.

1. town, men, women, 5043, 3927, total population
2. tanker, 1529 L, 1922 L, petrol, how much
3. school, student, 5423, 2927, boys, number of girls
4. fair, 5525, 7750, people left
Finding the Missing Numbers

**Example 1**

When the greater number and the difference are given.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>
-   |   |   |   |
| 1  | 2 | 1 | 4 |

→ Greater number
→ Smaller number
→ Difference

To get the smaller number, subtract the difference from the greater number.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>
-   |   |   |   |
| 1  | 2 | 1 | 4 |

→ Greater number
→ Difference
→ Smaller number

**Example 2**

When the smaller number and the difference are given.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
-   | 2 | 4 | 2 | 5 |
| 3  | 3 | 6 | 4 |

→ Greater number
→ Smaller number
→ Difference

To get the greater number, add the smaller number to the difference.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
-   | 2 | 4 | 2 | 5 |
| 3  | 3 | 6 | 4 |

→ Difference
→ Smaller number
→ Greater number

**Example 3**

When one addend and the sum are given.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

→ Addend

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
+   | 2 | 4 | 2 | 5 |
| 5  | 7 | 8 | 9 |

→ Missing addend
→ Sum

To find the missing addend, subtract the given addend from the sum.
Combining Addition and Subtraction

Follow these steps to solve questions involving both addition and subtraction.

**Example 1**

Solve $1423 + 5009 - 4722$.

1. Add $1423$ and $5009$.
   
<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>
   
   $1423 + 5009 = 6432$

2. Subtract $4722$ from the sum.
   
<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

   $6432 - 4722 = 1710$

$1423 + 5009 - 4722 = 1710$

**Teaching Tip**

Always arrange the numbers with ‘+’ sign together and add first.

Tell students to make it a habit to check their answers using addition or subtraction every time after solving a problem.
Example 2
Solve 5323 – 1213 + 2312.

1. Add 5323 and 2312.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

\[
\text{5323 + 2312 = 7635}
\]

2. Subtract 1213 from the sum.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>6</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

\[
\text{7635 – 1213 = 6422}
\]

Exercise 3.9
Solve the following.

1. 4513 + 2167 + 1259
2. 1523 + 4523 – 2351
3. 2493 – 3427 + 5234
4. 4573 + 1972 + 2423
5. 3214 + 1212 – 2313
6. 2532 + 3795 – 1725
7. 2935 + 6573 – 2576
8. 1000 – 4000 + 3000

Everyday Maths

Use the given menu to order. Calculate the amount you will have to pay. How much change will you get if you use one ₹2000 note to pay your bill?

<table>
<thead>
<tr>
<th>Our Order</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pizza</td>
<td>₹500</td>
</tr>
<tr>
<td>Ice Cream</td>
<td>₹250</td>
</tr>
<tr>
<td>Mix Veg</td>
<td>₹200</td>
</tr>
<tr>
<td>Rajma Chawal</td>
<td>₹200</td>
</tr>
<tr>
<td>Sandwich</td>
<td>₹150</td>
</tr>
<tr>
<td>Mango Shake</td>
<td>₹100</td>
</tr>
<tr>
<td>Soup</td>
<td>₹100</td>
</tr>
</tbody>
</table>

Change returned = ₹

Teaching Tip: Explain combining addition and subtraction through real-life examples. For example, when goods are exchanged, the shopkeeper subtracts the volume/cost of the goods returned and adds the volume/cost of the goods bought in its place.
1. Subtract the following.

<table>
<thead>
<tr>
<th></th>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>8</td>
<td>9</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>-</td>
<td>2</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>-</td>
<td>3</td>
<td>8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>-</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Arrange in columns and subtract.

- a) 5649 from 5649  
  b) 4853 from 9628  
- c) 1432 from 3656  
  d) 999 from 1000.

3. Write the subtraction sentences for each of the following addition sentences.

- a) $6429 + 382 = 6811$  
  b) $4960 + 6222 = 11182$  
- c) $999 + 999 = 1998$  
  d) $4856 + 9602 = 14458$

4. Fill in the missing numbers.

- a) + 3 2 5 3  
  
  4 6 7 6  
- b) − 5 4 7 5  
  
  3 3 4 3  
- c) − 5 2 6 5  
  
  0 0 0 0

5. Solve the following.

- a) $7285 – 6231 + 2242$  
  b) $6201 – 6223 + 1129$  
- c) $8657 – 4182 + 1111$  
  d) $6999 – 6343 + 250$  
- e) $450 + 3658 – 4108$  
  f) $5547 + 950 – 1800$

6. A carton has 3000 packets of biscuits. Out of these, 1998 packets are chocolate biscuits. The rest are jam biscuits. How many packets of jam biscuits are there?

7. 5030 people came to watch a match. Some people left early. 2691 people stayed until the end. How many people left early?
**Maths Lab Activity**

**Aim:** To find the smallest difference.

**Requirement:** Number cards from 0 to 9 (1 set per group).

**Steps:**
1. Divide the student into groups of 4.
2. Make four sets of cards numbered from 0 to 9, using sheets of paper.
3. Shuffle the cards. Each group draws four cards.
4. Make the greatest and the smallest 4-digit numbers.
5. Find the difference between the numbers and fill in the record table.

**Record Table**

<table>
<thead>
<tr>
<th>Greater number</th>
<th>Smaller number</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>9652</td>
<td>2569</td>
<td>9652 – 2569 = 7083</td>
</tr>
</tbody>
</table>

6. The group with the smallest difference wins the round. Repeat steps 3 to 5, five times.

7. The group which wins the maximum rounds wins the game.
Mishika has 1423 seashells. She has 345 more seashells than Varun. How many seashells does Varun have?

a) Who has fewer seashells—Mishika or Varun?
   __________

b) Look at the following problem. Who has the correct way of solving the problem?
   __________

Irfan

Tina

c) Which answer is more likely to be correct? Tick (✓) the correct box.
   i) Varun has 1768 seashells.  ❑
   ii) Varun has 1078 seashells.  ❑
1. Multiply 68 by 2.

\[ 8 \times 2 = 16 \]
\[ 60 \times 2 = 120 \]
\[ 16 + 120 = 136 \]


\[ 2 \times 2 = 4 \]
\[ 30 \times 2 = 60 \]
\[ 400 \times 2 = 800 \]
\[ 4 + 60 + 800 = 864 \]
1. Complete the multiplication sentences by observing the blocks.
   a)  
   b)  
   \[3 \times \square = \square\] 
   \[\square \times \square = \square\]

2. Look at the number line given below. Fill in the missing numbers.
   a) Count by 6 from 0 to 30.
   b) Count by 6 from 30 to 60.
   c) Count by 7 from 0 to 42.

3. Multiply the following.
   a)  
   b)  
   c)  
   d)  
   e)  
   f)  
   g)  
   h)  
   i)  
   \[2 \times 6 = \square\] 
   \[\square \times 2 = \square\] 
   \[\square \times \square = \square\] 
   \[\square \times \square = \square\] 
   \[\square \times \square = \square\] 
   \[\square \times \square = \square\] 
   \[\square \times \square = \square\] 
   \[\square \times \square = \square\] 
   \[\square \times \square = \square\]
### Warm Up

These are 6 groups of buttons. There are 11 buttons in each group.

How many total buttons are there?

6 × 11 = 66. There are 66 buttons.

### Multiplication Tables

#### Table of 11

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>11</td>
<td>22</td>
<td>33</td>
<td>44</td>
<td>55</td>
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### Count by 6 from 0 to 30

1. Complete the multiplication sentences by observing the blocks.
2. Look at the number line given below. Fill in the missing numbers.
3. Multiply the following.
   - a) Count by 6 from 0 to 30.
   - b) Count by 6 from 30 to 60.
   - c) Count by 7 from 0 to 42.
### Table of 12

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| 1 × 14 = 14 | 2 × 14 = 28 | 3 × 14 = 42 | 4 × 14 = 56 | 5 × 14 = 70 | 6 × 14 = 84 | 7 × 14 = 98 | 8 × 14 = 112 | 9 × 14 = 126 | 10 × 14 = 140 |

### Table of 15

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| 1 × 15 = 15 | 2 × 15 = 30 | 3 × 15 = 45 | 4 × 15 = 60 | 5 × 15 = 75 | 6 × 15 = 90 | 7 × 15 = 105 | 8 × 15 = 120 | 9 × 15 = 135 | 10 × 15 = 150 |
### Table of 16

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#### Teaching Tip

Make sure that the child knows multiplication tables of 6, 7, 8, 9 and 10. Stress on memorising the multiplication tables as they form the basic facts of multiplication.
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<td>3 × 18 = 54</td>
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<td>18 + 18 + 18 + 18</td>
<td>4 × 18 = 72</td>
</tr>
<tr>
<td>18 + 18 + 18 + 18 + 18</td>
<td>5 × 18 = 90</td>
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<td>18 + 18 + 18 + 18 + 18 + 18</td>
<td>6 × 18 = 108</td>
</tr>
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<td>18 + 18 + 18 + 18 + 18 + 18 + 18</td>
<td>7 × 18 = 126</td>
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<td>18 + 18 + 18 + 18 + 18 + 18 + 18 + 18</td>
<td>8 × 18 = 144</td>
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<td>9 × 18 = 162</td>
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<td>10 × 18 = 180</td>
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### Table of 19

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<td>3 × 19 = 57</td>
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<td>19 + 19 + 19 + 19</td>
<td>4 × 19 = 76</td>
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<td>19 + 19 + 19 + 19 + 19</td>
<td>5 × 19 = 95</td>
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<td>19 + 19 + 19 + 19 + 19 + 19</td>
<td>6 × 19 = 114</td>
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<td>7 × 19 = 133</td>
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<td>8 × 19 = 152</td>
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<td>9 × 19 = 171</td>
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<td>10 × 19 = 190</td>
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Make sure that the child knows multiplication tables of 6, 7, 8, 9 and 10. Stress on memorising the multiplication tables as they form the basic facts of multiplication.
Exercise 4.1

1. Match the following.
   a) 16 × 6
   b) 19 × 5
   c) 14 × 8
   d) 15 × 10
   i) 112
   ii) 150
   iii) 95
   iv) 96

2. Complete the following.
   a) 20 × ____ = 40  
   b) 11 × 6 = ______  
   c) ____ × 5 = 60  
   d) 13 × 4 = ______  
   e) ____ × 9 = 126  
   f) ____ × 7 = 105  
   g) 16 × ____ = 144  
   h) 17 × 7 = ______  
   i) 19 × ____ = 171

Try this with your friends.
1. Ask your friend to think of any number from 1 to 9 in his or her mind.
   Suppose, your friend chose the number 8.
2. Ask him or her to multiply the number by 2.  
   \[8 \times 2 = 16\]
3. Then, ask him or her to multiply the product by 5.  
   \[16 \times 5 = 80\]
4. Now, ask them to tell the answer.
5. From the answer, drop the number ‘0’. What do you get?
   You get the number 8, which is the number your friend started with.


**Multiplication by 10s**

When we multiply any number by 10, 20, 30, ... or 90; we multiply the number by 1, 2, 3, ... or 9, respectively and put a zero to the right of the product obtained.

\[
7 \times 10 = 7 \times 1 \text{ Ten} = 7 \text{ Tens} = 70; \quad 9 \times 10 = 9 \times 1 \text{ Ten} = 9 \text{ Tens} = 90
\]

**Example 1**

Multiply 7 by 20.
We know that, 20 = 2 \times 10
So, \(7 \times 20 = 7 \times 2 \times 10\)
\[= (7 \times 2) \times 10\]
\[= 14 \times 10 = 140\]

**Multiplication by 100s**

When we multiply any number by 100, 200, 300, ... or 900; we multiply the number by 1, 2, 3, ... or 9, respectively and put two zeros to the right of the product obtained.

\[
4 \times 100 = 4 \times 1 \text{ Hundred} = 4 \text{ Hundreds} = 400; \quad 8 \times 100 = 8 \times 1 \text{ Hundred} = 8 \text{ Hundreds} = 800
\]

**Example 2**

Multiply 4 by 200.
We know that, 200 = 2 \times 100
So, \(4 \times 200 = 4 \times 2 \times 100\)
\[= (4 \times 2) \times 100\]
\[= 8 \times 100 = 800\]

---

**Mental Maths**

What are the missing numbers?

a) \[\begin{array}{ccc}
7 & \times 10 & \times 10 \\
& \times 100 &
\end{array}\]

b) \[\begin{array}{ccc}
8 & \times 10 & \times 10 \\
& \times 100 &
\end{array}\]

c) \[\begin{array}{ccc}
4 & \times 10 & \times 10 \\
& \times &
\end{array}\]

d) \[\begin{array}{ccc}
9 & \times 10 & \times 10 \\
& \times &
\end{array}\]
Exercise 4.2

1. Fill in the missing numbers.
   a) \( 12 \times 30 = (12 \times \underline{\phantom{0}}) \times 10 = \underline{\phantom{0}} \)
   b) \( 36 \times 20 = (\underline{\phantom{0}} \times 2) \times 10 = \underline{\phantom{0}} \)
   c) \( 49 \times 90 = (49 \times \underline{\phantom{0}}) \times \underline{\phantom{0}} = \underline{\phantom{0}} \)
   d) \( 4 \times 300 = (4 \times \underline{\phantom{0}}) \times 100 = \underline{\phantom{0}} \)
   e) \( 2 \times 400 = (\underline{\phantom{0}} \times 4) \times 100 = \underline{\phantom{0}} \)

2. Find the product.
   a) \( 5 \times 10 = \underline{\phantom{0}} \)
   b) \( 11 \times 20 = \underline{\phantom{0}} \)
   c) \( 33 \times 30 = \underline{\phantom{0}} \)
   d) \( 5 \times 100 = \underline{\phantom{0}} \)
   e) \( 3 \times 300 = \underline{\phantom{0}} \)
   f) \( 9 \times 90 = \underline{\phantom{0}} \)

Properties of Multiplication

**Multiplication by 0**
When a number is multiplied by 0, the product is always 0.

- \( 16 \times 0 = 0 \)
- \( 413 \times 0 = 0 \)
- \( 6780 \times 0 = 0 \)

**Multiplication by 1**
When a number is multiplied by 1, the product is always the number itself.

- \( 27 \times 1 = 27 \)
- \( 692 \times 1 = 692 \)
- \( 7123 \times 1 = 7123 \)

**Order Property of Multiplication**
The product of two numbers, in any order, remains the same.

- \( 7 \times 2 = 14 \)
- \( 2 \times 7 = 14 \)
So, \( 7 \times 2 = 2 \times 7 \).

**Grouping Property of Multiplication**
The product of three numbers, in any order, remains the same.

- \( 14 \times 2 \times 3 = 28 \times 3 = 84 \)
- \( 14 \times 3 \times 2 = 14 \times 6 = 84 \)
So, \( (14 \times 2) \times 3 = 14 \times (3 \times 2) \).
**Exercise 4.2**

1. Fill in the missing numbers.
   - a) 12 × 30 = (12 × □) × 10 = □
   - b) 36 × 20 = □ × 2) × 10 = □
   - c) 49 × 90 = (49 × 9) × □ = □
   - d) 4 × 300 = (4 × □) × 100 = □
   - e) 2 × 400 = □ × 4) × 100 = □

**Exercise 4.3**

Fill in the missing numbers.

1. 167 × 0 = □
2. 382 × 1 = □
3. 4631 × □ = 4631
4. □ × 600 = 0
5. 6 × 4 = □ × 6
6. 10 × 13 = □ × 10
7. 162 × □ = 5 × 162
8. (10 × 40) × 0 = 10 × (40 × □)
9. (16 × 3) × 9 = □ × (3 × 9)
10. (81 × 6) × 5 = 81 × (□ × □)
11. (□ × 4) × 7 = 21 × (□ × □)
12. (73 × 0) × 5 = □ × (0 × □)

---

### Multiplication by a 1-digit Number

#### Without Regrouping

**Example 1**

Multiply 2123 by 3.

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Steps to multiply:

1. Multiply the ones.
2. Multiply the tens.
3. Multiply the hundreds.
4. Multiply the thousands.

- **Th H T O**
  - 2 1 2 3
  - 3 × 3
  - 9

- **Th H T O**
  - 2 1 2 3
  - 20 × 3
  - 60

- **Th H T O**
  - 2 1 2 3
  - 100 × 3
  - 300

- **Th H T O**
  - 2 1 2 3
  - 2000 × 3
  - 6000

- **Th H T O**
  - 2 1 2 3
  - 9 + 60 + 300 + 6000
  - 6 3 6 9

### Teaching Tip

Reiterate that the order property is used to read and remember tables.
With Regrouping

**Example 2**

Multiply 2261 by 4.

Steps to multiply:

1. Multiply the ones.
   - 1 Ones × 4 = 4 Ones

2. Multiply the tens and add.
   - 6 Tens × 4 = 24 Tens
   - 2 Hundreds × 4 = 8 Hundreds
   - 2 Thousands × 4 = 8 Thousands
   
3. Multiply the hundreds and add.
   - 2 Hundreds × 4 = 8 Hundreds
   - 2 Thousands × 4 = 8 Thousands
   
4. Multiply the thousands and add.
   - 1 Thousands × 4 = 4 Thousands
   
\[
2261 \times 4 = 9044
\]

Fact Zone

We multiply any two numbers beginning from the right to the left (starting with the digit in the ones place).

**Exercise 4.4**

1. **Multiply the following.**
   a) \[
   \begin{array}{c}
   \text{Th} \\
   1 \\
   \times \\
   2 \\
   \hline
   \text{H} \\
   2 \\
   \times \\
   2 \\
   \hline
   \text{T} \\
   2 \\
   \times \\
   4 \\
   \hline
   \text{O} \\
   1 \\
   \times \\
   4 \\
   \hline
   \end{array}
   \]

   b) \[
   \begin{array}{c}
   \text{Th} \\
   1 \\
   \times \\
   3 \\
   \hline
   \text{H} \\
   2 \\
   \times \\
   1 \\
   \hline
   \text{T} \\
   2 \\
   \times \\
   2 \\
   \hline
   \text{O} \\
   1 \\
   \times \\
   3 \\
   \hline
   \end{array}
   \]

   c) \[
   \begin{array}{c}
   \text{Th} \\
   1 \\
   \times \\
   8 \\
   \hline
   \text{H} \\
   1 \\
   \times \\
   0 \\
   \hline
   \text{T} \\
   8 \\
   \times \\
   2 \\
   \hline
   \text{O} \\
   3 \\
   \times \\
   3 \\
   \hline
   \end{array}
   \]

   **Teaching Tip:**
   Ask the children to use different coloured pens when doing regrouping to represent carry overs and the products of the given numbers. This would reduce the chances of all the possible errors, while adding carry overs to the product of the given numbers to get the final product.
Multiply 2261 by 4.

\[
\begin{array}{cccc}
\text{H} & \text{T} & \text{T} & \text{O} \\
2 & 2 & 6 & 1 \\
\times & 4 & & \\
\hline
4 & 2 & 4 & 0 \\
8 & 0 & 0 & \\
8 & 0 & 0 & 0 \\
9 & 0 & 4 & 4 \\
\end{array}
\]

Example 2

1. Multiply the ones. 2. Multiply the tens and add. 3. Multiply the hundreds and add. 4. Multiply the thousands and add.

\[
\begin{array}{cccc}
\text{Th} & \text{H} & \text{T} & \text{O} \\
2 & 2 & 6 & 1 \\
\times & 4 & & \\
\hline
1 \times 4 & & & \\
60 \times 4 & & & \\
200 \times 4 & & & \\
2000 \times 4 & & & \\
\hline
4 & 240 & 800 & 8000 \\
\end{array}
\]

Exercise 4.4

1. Multiply the following.
   a) 1224 and 5
   b) 1305 and 4
   c) 1513 and 3
   d) 2124 and 4
   e) 3213 and 2
   f) 4324 and 2

2. Find the product of the following numbers.
   a) 1246 and 5
   b) 1305 and 4
   c) 1513 and 3
   d) 2124 and 4
   e) 3213 and 2
   f) 4324 and 2

3. Has Siya done the multiplication correctly?
   Circle the incorrect digits. Show the correct multiplication in your notebook.

Multiplication by a 2-digit Number

2-digit Number by a 2-digit Number

Example 1

Multiply 35 by 23.

\[
\begin{array}{cccc}
\text{H} & \text{T} & \text{O} \\
3 & 5 & \times \\
2 & 3 & \times \\
\hline
20 + 3 & \times & 2 & 3 \\
35 \times 3 & 1 & 0 & 5 \\
35 \times 20 & 7 & 0 & 0 \\
105 + 700 & 8 & 0 & 5 \\
\end{array}
\]

Remember to multiply the multiplicand with the multiplier in order of the multiplier’s places, starting from the right.
1. Multiply 35 by 3.
   \[35 \times 3 = 105\]
   \[35 \times 20 = 700\]
3. Add the products obtained.
   \[105 + 700 = 805\]

**3-digit Number by a 2-digit Number**

**Example 2**
Multiply 212 by 33.

Steps to multiply:
1. Multiply 212 by 3.
   \[212 \times 3 = 636\]
   \[212 \times 30 = 6360\]
3. Add the products obtained.
   \[636 + 6360 = 6996\]

**Example 3**
Multiply 203 by 34.

Steps to multiply:
   \[203 \times 4 = 812\]
   \[203 \times 30 = 6090\]
3. Add the products obtained.
   \[812 + 6090 = 6902\]
Steps to multiply:


\[
\begin{array}{c|c c c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
\hline
2 & 0 & 3 \\
\times & 3 & 4 \\
\hline
& 8 & 1 & 2 \\
\end{array}
\]

\[203 \times 4 = 812\]


\[
\begin{array}{c|c c c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
\hline
2 & 0 & 3 \\
\times & 3 & 4 \\
\hline
& 8 & 1 & 2 \\
& 6 & 0 & 9 & 0 \\
\end{array}
\]

\[203 \times 30 = 6090\]

3. Add the products obtained.

\[812 + 6090 = 6902\]

Exercise 4.5

1. Multiply the following.

a) \[
\begin{array}{c|c c c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
\hline
& 3 & 4 \\
\times & 1 & 2 \\
\hline
& 8 & 1 & 2 \\
\hline
& 8 & 1 & 2 \\
\end{array}
\]

b) \[
\begin{array}{c|c c c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
\hline
2 & 3 & 0 \\
\times & 4 & 3 \\
\hline
& 8 & 1 & 2 \\
& 6 & 0 & 9 & 0 \\
\end{array}
\]


c) \[
\begin{array}{c|c c c}
\text{Th} & \text{H} & \text{T} & \text{O} \\
\hline
2 & 1 & 4 \\
\times & 3 & 5 \\
\hline
& 8 & 1 & 2 \\
& 6 & 0 & 9 & 0 \\
\end{array}
\]

2. Arrange the given numbers in columns and find the product.

a) \[42 \times 21\]
b) \[24 \times 12\]
c) \[33 \times 33\]
d) \[22 \times 13\]
e) \[134 \times 21\]
f) \[221 \times 43\]
g) \[215 \times 34\]
h) \[249 \times 37\]
i) \[381 \times 23\]
j) \[546 \times 13\]
k) \[695 \times 12\]
l) \[326 \times 24\]

Everyday Maths

A dozen is equal to 12. If you buy 13 dozen of bananas, then how many bananas did you buy?

\[12 \times 13 = \_\_\_\_\_\_\]
Puneet and his father went to a shop to do shopping for Diwali. The price for the items they bought are given below.

Based on the above information, answer the following questions.

1. What is the cost of 5 dry fruit packets?

2. What is the cost of 14 packets of rangoli colours?

3. If Puneet buys 11 diya plates, then how much will these cost?

4. If they buy 12 boxes of candles to decorate their home, then how much will these cost?
Aim: To find another way of multiplying numbers.

Requirements: paper, pair of scissors, pen, ruler

Steps:
1. Cut 10 strips of paper as shown below from the sheet attached at the end of the book.

```
    1  2  3  4  5  6  7  8  9  1
   2  3  4  5  6  7  8  9
   4  5  6  7  8
   5  6
   7
   8
   9
```

2. Arrange the strips as shown below and use them to multiply, say 729 x 6.

3. First place the strips with the headers 7, 2 and 9 next to the red strip as shown below.

4. Choose the boxes in the strips with the headers 7, 2 and 9, that are aligned with the number equal to the multiplier as shown below in the blue dotted box.

5. Add the numbers diagonally to find the product (answer). Check your answer.

```
9
1 8 7
2 8
3
4
5
6
7
8
```

Check

```
7 2 9
× 6
4 3 7 4
```

Try this: Using the above method, find the value of:

a) 134 × 3       b) 681 × 4       c) 479 × 5