

Overview

In this chapter, students will learn how to recognise, count, write and compare numbers up to 10 000.

Key Concepts

- Counting relates to finding how many
- Manipulatives with tens as the base are used to model numbers
- The relative value of a number can be known through comparing it with other numbers

Thinking Skills

- Sequencing
- Identifying patterns

Maths Vocabulary







- thousand
- increasing
- decreasing
- number line

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1 Numbers to 10 000

The leather sofa is more expensive than the teak sofa.

 Fabric sofa bed \$1690	 2-seat fabric sofa \$524
 3-seat fabric sofa \$870	 3-seat leather sofa \$3595
 3-seat teak sofa \$2100	 teak armchair \$750

Which items cost more than \$1000?

2

Teaching Note

Show a video of the picture. Get students to study the picture. Discuss an overview of it.

- Draw on students' experiences with respect to visiting shops selling furnitures
- Talk about the furniture they have come across in such shops.
- Talk about the furniture their parents or they have bought.
- Refer students to the price tags of the furniture shown in the picture. Ask them to read out the prices (if they are able to).

Ask: What are some of the items you see in this picture?
How much do they cost?
Do you have some of these items in your home?
Which ones do you have?
Which item is the most expensive? How much does it cost?
Which item is the cheapest? How much does it cost?



Key SIOs

- Recall: To read and write 3-digit numbers in numerals and in words
- Recall: To interpret 3-digit numbers in terms of hundreds, tens and ones
- To read and write 4-digit numbers in numerals and in words

Teaching Note

For **(1)**, start off by asking students to count by hundreds, tens and ones. Then help students recall the links between the pictures and the numerals (Pictorial-Abstract) to find the total number of beans. Emphasise the addition equation. If necessary, use place value cards to show the addition that results in 342.

For **(2)** and **(3)**, ask students to count the base-10 cubes to identify the number of hundreds, tens and ones (recap place values), to then use the addition equation to find the sum.

Counting to 10 000



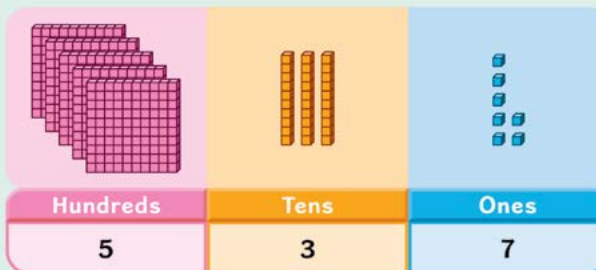
Recall

- 1 Count by hundreds, tens and ones.



$$300 + 40 + 2 = 342$$

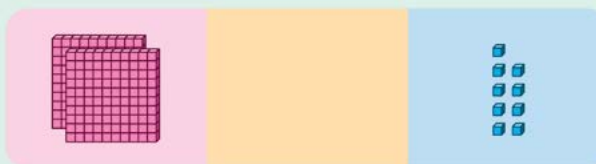
2



$$5 \text{ hundreds } 3 \text{ tens } 7 \text{ ones} = 537$$

$$500 + 30 + 7 = 537$$

3



$$2 \text{ hundreds } 0 \text{ tens } 9 \text{ ones} = 209$$

$$200 + 0 + 9 = 209$$



Go to PB 3A Practice 1

Recall

1. 342

2. 5, 3, 7
30, 7

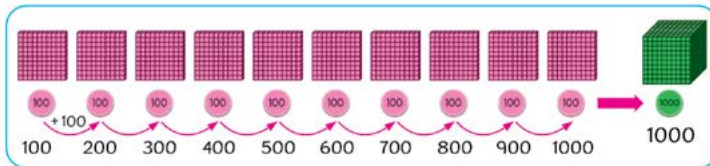
3. 2, 0, 9, 209
 $200 + 0 + 9 = 209$

Let's Learn

- 1 How many cubes are there?
We can use number discs to represent the number of cubes.

(a) Count by hundreds.

Let  be represented by .

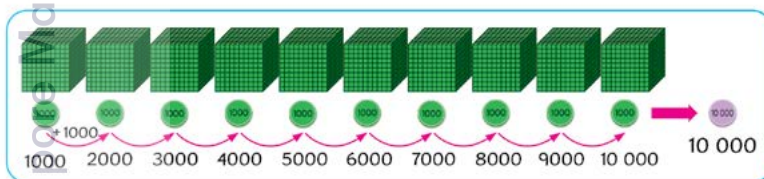


10 hundreds = 1 thousand

There are 1000 cubes.
We write **1000** in words as **one thousand**.

(b) Count by thousands.

Let  be represented by .



10 thousands = 1 ten thousand

There are 10 000 cubes.
We write **10 000** in words as **ten thousand**.

Teaching Note

Show the various representations of the base-10 blocks to students (one, ten, hundred, thousand). Next, use number discs to relate to the respective values as represented by the base-10 blocks. Inform students that number discs will be used in place of base-10 blocks in the lessons that follows.

For (a), have students pupils count in 100s. In particular, note that number discs are used to help them in the counting up to 1000. Count in 100s together with them up to 1000 while flashing the actual number discs to coincide with the counting.

Repeat the instruction as in (b) using number discs to represent 1000 and count up to 10 000. Write the following on the whiteboard naming equations on the board and have students read them aloud.

10 hundreds = 1 thousand
10 thousands = 1 ten thousand

Ask: How many hundreds equal 1 thousand?
How many thousands equal one 10 thousands?
How many ones equal one 10 thousands?

Teaching Note

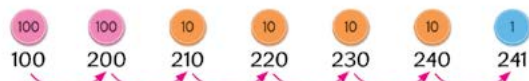
For **(2)**, use the count on method, in hundreds, tens and ones, to find the value of the sum of the number disks. Read aloud while counting. Note to students that only 1 place digit changes as we count on, in hundreds, tens and ones.

For **(3)**, we first identify the value of the number disk (e.g., 1000), we then count the number of disks of that value. E.g., 4 thousand-disks, 4000, 3 hundred-disks, 300, etc. We are then able to write down the number represented by the number discs in numerals first, then in words.

Extension

Provide students with a list of numerals, to be written in words. Provide certain numerals which are unique, such as having multiple zeros. (e.g. 9009, 770).

2 Let us count by hundreds, tens and ones.



Two hundred and forty-one.

Let us count by thousands, hundreds, tens and ones.



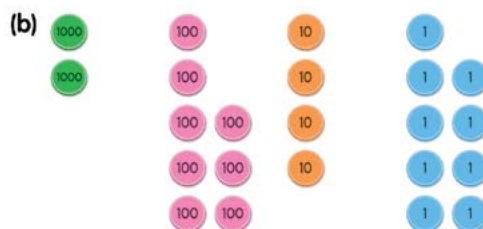
Three thousand, two hundred and forty-one.

3 What numbers are represented by the number discs?



In numerals: 4375

In words: Four thousand, three hundred and seventy-five



In numerals: 2849

In words: Two thousand, eight hundred and forty-nine

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Hands-on Activity

Look at the chapter opener.
In groups, use number discs to represent the prices of the items.
Take turns to say how much each item cost.



I need 7 hundreds and 6 tens to represent the price of the wall cabinet.


Let's Practise

1 Count on and find out what number you get.

(a)  7204

(b)  1036

2 What numbers are represented by the number discs?
Write each number in words and in numerals.

(a)  5682
Five thousand six hundred and eighty-two

(b)  4204
Four thousand two hundred and four

Go to PB 3A Practice 2

Teaching Note

Have students read aloud the prices of the items in different ways. They may start by reading the digits out loud, and then read the prices in thousands, hundreds, tens and ones, and then in words.

Teachers should avoid using play money to represent the prices, as this activity focuses on place value and read aloud numbers which are greater than 1000.

Let's Practise

- (a) 7204
(b) 1036
- (a) 5682 Five thousand six hundred and eighty-two
(b) 4204 Four thousand two hundred and four

Key SIOs

- To interpret 4-digit numbers in terms of thousands, hundreds, tens and ones

Teaching Note

Show number discs representing 2354 (i.e., 2 x 1000, 3 x 100, 5 x 10, 4 x 1) on the whiteboard or with a visualiser. Ask students to say aloud the number represented by the number discs.

Count and write the total value for each set of number discs below the number discs. Have students read each total value together with you.

Write the number obtained in a place value chart on the whiteboard. Write the addition equation and the number obtained in words. Have students read the addition equation aloud. Next, use place value cards to make sense of the equation and explain the value and place value of each digit.

Place Values

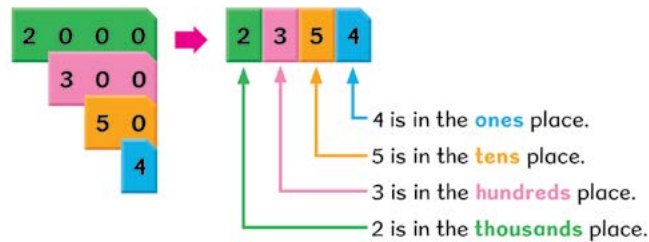
Let's Learn

What is the number shown by the number discs?



Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
2	3	5	4

$$2000 + 300 + 50 + 4 = 2354$$

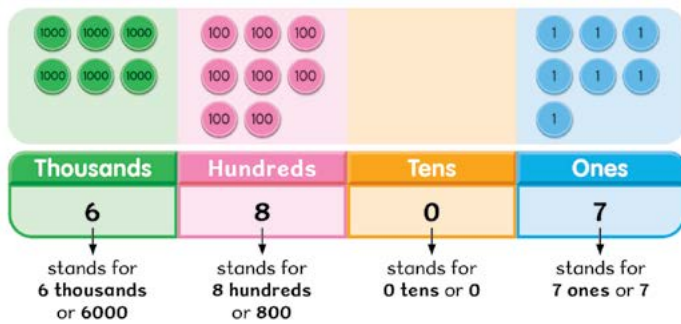


2 thousands 3 hundreds 5 tens 4 ones = 2354

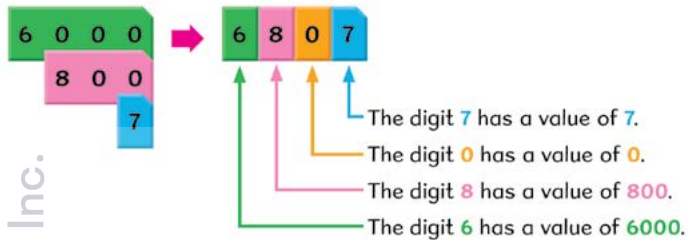


We read **2354** as **two thousand, three hundred and fifty-four**.

2



$$6000 + 800 + 0 + 7 = 6807$$



We read **6807** as **six thousand, eight hundred and seven**.

Hands-on Activity

Work in pairs.

Student A will write a 4-digit number on his or her whiteboard.

Student B will use place-value cards to represent the number and write the addition of the values.



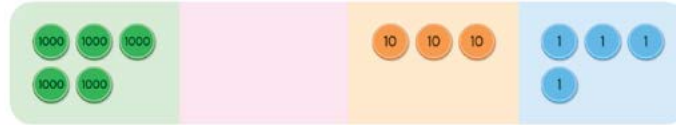
Teaching Note

Repeat the steps in (1) for (2). Show a few more examples if necessary.

Explain to students that they can use the words 'stands for' to show what value a digit represents.

Let's Practise

- 1 What is the number shown by the number discs?



5 thousands 0 hundreds 3 tens 4 ones = 5034

$$5000 + 0 + 30 + 4 = 5034$$

- 2 What are the missing numbers?

(a) $4526 = 4$ thousands 5 hundreds 2 tens 6 ones

(b) $6000 + 800 + 50 + 2 = 6852$

(c) $4 + 80 + 300 + 7000 = 7384$

- 3 In 9043,

(a) the value of the digit 4 is 40.

(b) the value of the digit 0 is 0.

(c) the digit 9 stands for 9000.

(d) the digit 3 stands for 3.

(e) the digit 4 is in the tens place.

(f) the digit 9 is in the thousands place.

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Go to PB 3A Practice 3

Let's Practise

1. $5, 0, 3, 4 = 5034$
 $5000 + 0 + 30 + 4 = 5034$

2. (a) 5
 (b) 800
 (c) 4837

3. (a) 40
 (b) 0
 (c) 9000
 (d) 3
 (e) tens
 (f) thousands

Comparing and Ordering Numbers



Recall

- 1 Compare and order 256, 526 and 265.

Hundreds	Tens	Ones
2	5	6
5	2	6
2	6	5

Compare the hundreds.
5 hundreds > 2 hundreds
526 is the greatest.

Arrange these numbers in order.
Begin with the greatest.

526 , 265 , 256
greatest

Hundreds	Tens	Ones
2	5	6
2	6	5

Both have 2 hundreds.
Compare the tens.
5 tens < 6 tens
256 is the smallest.

> means greater than,
< means less than



- 2 Compare and order 833, 718 and 730.

Hundreds	Tens	Ones
8	3	3
7	1	8
7	3	0

(a) 833 is the greatest number.

(b) 718 is the smallest number.

(c) Arrange these numbers in order.
Begin with the smallest.

718 , 730 , 833
smallest

Go to PB 3A Practice 4

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Key SIOs

- Recall: To compare numbers (up to 3 digits) using place values
- Recall: To place numbers (up to 3 digits) in increasing/decreasing order
- To compare numbers (up to 4 digits) using place values
- To place numbers (up to 4 digits) in increasing/decreasing order
- To compare numbers on a number line

Teaching Note

Since all three numbers given are 3-digit numbers, the largest place value is the hundreds. We hence compare the hundreds first, followed by the tens, and ones.

Where necessary, write the numbers on the board, or using a visualizer, and cover the columns of the place values which we are not comparing, so that the focus is on comparing a particular place value.

Have students use “greater than” and “less than” to compare the numbers accordingly.

Recall

- 526, 265, 256
- (a) 833
(b) 718
(c) 718, 730, 833

Teaching Note


Note to students that we are now comparing 4-digit numbers, where the thousands has the greatest place value. Thus for (a), we compare the thousands first. We can use the number disks to compare, where it is evident that 3250 has 1 more thousand disk, compared to 2500.

Read aloud with students “3000 is greater than 2000” in comparing, so that students are able to articulate the inequality. Note to students that in comparing, we can compare using both ‘<’ and ‘>’ notations. At the same time, once the greater or smaller is determined, there is no need to go through the rest of the digits.

For (b), we first compare the thousands using the place value cards, which have the same value 1000. We then move on to the hundreds.

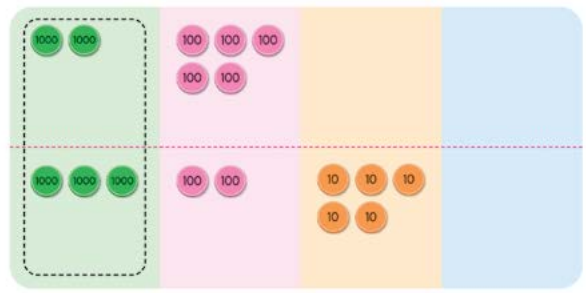
Ask: What do we do if the hundreds are also the same?

Ask the above question to have students establish a set of steps in comparing numbers.

**Let's Learn**

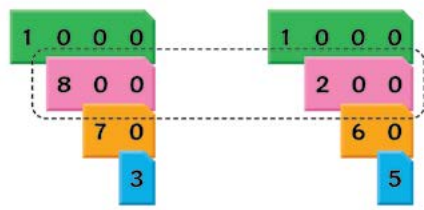
1 Let us compare some numbers.

(a) Compare 2500 and 3250.




Compare the thousands: $3000 > 2000$
 $3250 > 2500$
 $2500 < 3250$


(b) Compare 1873 and 1265. Which number is smaller?



Compare the thousands. Both numbers have 1000.
Compare the hundreds: $200 < 800$
 $1265 < 1873$
1265 is smaller than 1837.

When the thousands are the same, compare the hundreds.







- 2 Compare 2631 and 2613.
Which number is smaller?

Th	H	T	O
2	6	3	1
2	6	1	3

Step 1

Compare the thousands.
They are the same.

↓

Th	H	T	O
2	6	3	1
2	6	1	3

Step 2

Compare the hundreds.
They are the same.

↓

Th	H	T	O
2	6	3	1
2	6	1	3

Step 3

Compare the tens.
1 ten < 3 tens

2613 < 2631
2613 is smaller than 2631.

- 3 Compare 4183, 3700 and 4438.

Th	H	T	O
4	1	8	3
3	7	0	0
4	4	3	8

Step 1

Compare the thousands.
3 thousands < 4 thousands
3700 is the smallest.

↓

Th	H	T	O
4	1	8	3
4	4	3	8

Step 2

Both have 4000.
Compare the hundreds.
4 hundreds > 1 hundred
4438 is the greatest.

Arrange these numbers in **increasing order**
(smallest to greatest).

3700, 4183, 4438

“Increasing order” means starting with the smallest number and moving to the greatest.



Teaching Note

Explain to students that they need to learn to compare numbers without the aid of number discs or place value cards. They will compare numbers by starting with the digit that has the greatest place value.

For (2), on the whiteboard (or A4 paper using a visualizer), draw a place value chart. Write the two numbers in the chart. Get students to compare the numbers in these few steps.

Step 1. We compare the digits in the greatest place value column first, in this case, the thousands. Cover the digits in the hundreds, tens and ones column so that the focus is on comparing the thousands. Since the numbers have the same value for thousands, move on to Step 2.

Step 2. We compare the hundreds. Cover the tens and ones. Since the numbers have the same value for hundreds, move on to Step 3.

Step 3. We compare the tens. Cover the ones. Since 3 tens is greater than 1 ten, 2613 is smaller than 2631.

Use the same steps from (2) to compare the numbers in (3). Introduce the phrase “increasing order”, which is to arrange numbers from the smallest to the greatest.

Teaching Note

Use the same steps from (1) to compare the numbers in (4). Introduce the phrase “decreasing order”, which is to arrange numbers from the greatest to the smallest.

4 Compare 5912, 5487 and 5921.

Th	H	T	O
5	9	1	2
5	4	8	7
5	9	2	1

Step 1

Compare the thousands.
They are the same.



Th	H	T	O
5	9	1	2
5	4	8	7
5	9	2	1

Step 2

Compare the hundreds.
4 hundreds < 9 hundreds
5487 is the smallest.



Th	H	T	O
5	9	1	2
5	9	2	1

Step 3

Compare the tens.
2 tens > 1 ten
5921 is the greatest.

Arrange these numbers in **decreasing order** (greatest to smallest).

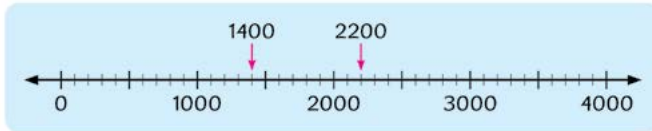
5921 , 5912 , 5487

“Decreasing order”
means starting with the
greatest number and
moving to the smallest.



5 We can use the **number line** to help us compare numbers.

(a) Compare 1400 and 2200.
Which number is greater?

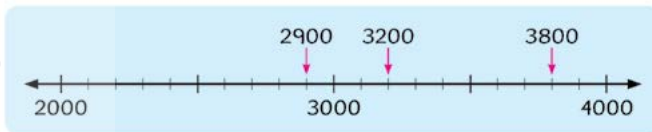


The numbers on the number line increase from left to right, with smaller numbers on the left and greater numbers on the right.



$2200 > 1400$
 $1400 < 2200$
2200 is greater than 1400.

(b) Compare 3800, 2900 and 3200.
Arrange the numbers from the smallest to the greatest.



3200 and 3800 are greater than 3000.
 $2900 < 3000$
2900 is the smallest number.

$3800 > 3200$
3800 is the greatest number.

2900, 3200, 3800
smallest

Teaching Note

Introduce students the idea of a number line by drawing one on the whiteboard, labelling the markings from 0 to 10 first. Note to students that the number line can continue indefinitely to very large numbers. We thus draw arrows on both ends on the number line to indicate that the numbers do not stop there.

Refer students to the number line shown in (5)(a), where each small marking represents an interval of 100, and each large marking represents an interval of 500. Teach students how to find the positions of 1400 and 2200 by counting on using the markings.

Have students observe the markings of the values 1000, 2000, 3000, 4000. They are from left to right, thus greater numbers are on the right and smaller numbers are on the left. We can then compare 1400 and 2200 using this concept.



Teaching Note

Teachers should use 4-digit numbers with common place-value digits, such that the comparisons do not immediately end upon comparing the thousands digit.
(e.g., 1425 and 4932)

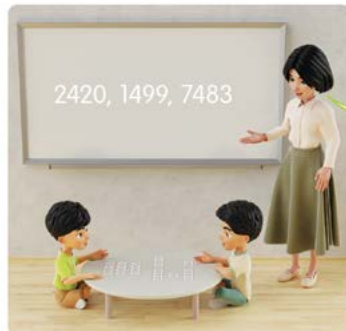
Maths Talk



Work in pairs.

Your teacher will write some numbers on the board.

Write the numbers in a place-value chart and arrange them in order.



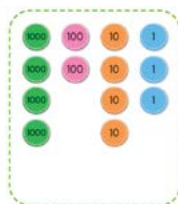
Arrange these numbers from the smallest to the greatest.

Th	H	T	O
1	4	9	9
2	4	2	0
7	4	8	3

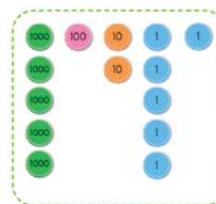
Let's Practise



- (a) What are the numbers represented by the number discs?
(b) Which is the greater number?



4243



5126

5126 > 4243

- Compare 5826 and 5862.
Which is smaller?

5826 < 5862

Th	H	T	O
5	8	2	6
5	8	6	2

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Let's Practise

- (a) 4243, 5126
(b) 5126 > 4243
- 5826 < 5862

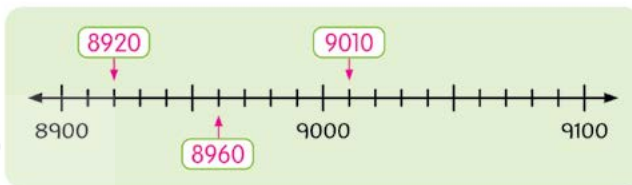
- 3 (a) Arrange the numbers 4290, 4240 and 4270 in increasing order.



The numbers in increasing order are:

4240, 4270, 4290

- (b) Arrange the numbers 8960, 8920 and 9010 in decreasing order.



The numbers in decreasing order are:

9010, 8960, 8920

- 4 Arrange these numbers from the greatest to the smallest.

3563, 3536, 3653, 3635
3536, 3563, 3635, 3653
greatest

Go to PB 3A Practice 5 17

Teaching Note

For (3), students should easily arrange the numbers in increasing or decreasing order once they have identified the positions of the numbers on the number line. For (4), students should be encouraged to use a place value chart, or a number line, to compare the given numbers.

Let's Practise

3. (a) 4240, 4270, 4290
(b) 9010, 8960, 8920,
4. 3536, 3563, 3635, 3653

Key SIOs

- To give the number that is $1/5$ / $10/100$ / 1000 more than a given number within 10 000
- To give the number that is $1/5$ / $10/100$ / 1000 less than a given number within 10 000

Teaching Note

For number patterns, we want to identify the next number in the pattern, while also generalise the pattern with a rule. We can define the rule as a guide which we can use to find the next number.

Show students the number pattern in (a) by writing the numbers on the whiteboard, or using a visualiser. Next, draw arrows linking one number to the next, and writing the rule down in numerical form (or in a short statement as shown). It is important to use the arrows, which show the relation between one number and the next.

We can also check if a rule is correct by reversing what was done. This highlights the relation between addition and subtraction.

Number Patterns Within 10 000

Let's Learn

What number patterns do you see?
Use a rule to describe the pattern.

(a) Rule: Add 1 to find the next number.

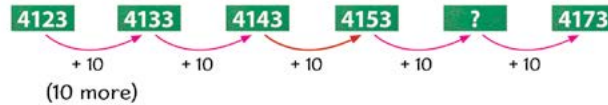


1 more than 2503 is 2504.
The next number in the pattern is 2504.

Check: 1 less than 2504 is 2503.



(b) Rule: Add 10 to find the missing number.

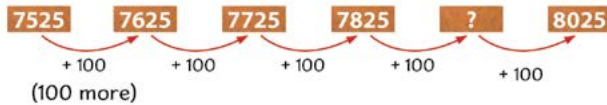


10 more than 4153 is 4163.
The missing number in the pattern is 4163.

Check: 10 less than 4173 is 4163.



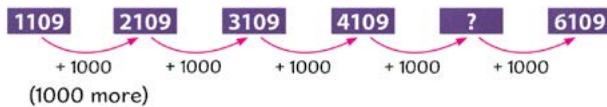
(c) **Rule:** Add 100 to find the next number.



100 more than 7825 is 7925.
The missing number is 7925.

Check: 100 less than 8025 is 7925.

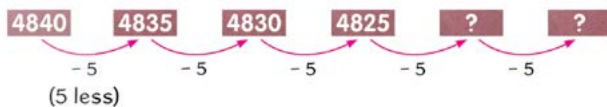
(d) **Rule:** Add 1000 to find the next number.



1000 more than 4109 is 5109.
The missing number is 5109.

Check: 1000 less than 6109 is 5109.

(e) **Rule:** Subtract 5 to find the next number.



$$4825 - 5 = 4820$$
$$4820 - 5 = 4815$$

5 less than 4825 is 4820.
5 less than 4820 is 4815.
The next two numbers are 4820 and 4815.

Check: 5 more than 4815 is 4820.
5 more than 4820 is 4825.



Teaching Note

For students who face difficulties in identifying the rule for the pattern. Write out the pattern on the whiteboard, or using a visualiser, and have students first read aloud the numbers that they see.

Next, have them observe two adjacent numbers at a time, if they can observe a relationship between the numbers. Suggest to students to use “more than” and “less than” to describe any two adjacent numbers. They can then use another pair of adjacent numbers to check if their rule is correct.

Maths Talk



What is the rule for each number pattern?
Identify the rule for the pattern. Then, write the next two numbers based on the rule you found.

- (a) 9127, 9126, 9125, 9124, 9123, 9122
- (b) 1467, 1567, 1667, 1767, 1867, 1967
- (c) 8024, 7024, 6024, 5024, 4024, 3024

Let's Practise



What are the missing numbers?

- (a) 5670, 5671, 5672, 5673, 5674, 5675, 5676, 5677
- (b) 4016, 4006, 3996, 3986, 3976, 3966, 3956, 3946
- (c) 802, 902, 4243, 1102, 1202, 1302, 4243, 1502
- (d) 9200, 8200, 4243, 6200, 4243, 4200, 3200, 2200, 1200

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Go to PB 3A Practice 6

Maths Talk

- (a) 9123, 9122
- (b) 1867, 1967
- (c) 4024, 3024

Let's Practise

- (a) 5672, 5674
- (b) 4006, 3986
- (c) 1002, 1402
- (d) 7200, 5200

How many people do you think each venue can hold?



school hall



sports stadium



Thinking Aloud

Look at the cruise packages. Which one offers a better deal?

SEATRAVEL

10 NIGHTS PACKAGE

- Cruise to Japan with a shopping stopover in Hong Kong
- Mini-suites with personal attached balconies
- Indoor and outdoor movie theatre
- Wide spread of international cuisines available
- All day entertainment
- Free cooking and dance classes
- Free unlimited Wi-Fi

\$3080
per person

CRUISE
Tour

7 NIGHTS PACKAGE

- Cruise to Australia and New Zealand
- Cruise cabins with ocean view
- Best cuisines for food lovers
- Endless engaging entertainment
- 24-hour gym facility
- Free unlimited Wi-Fi

\$3080
per person

Teaching Note

The objective of this activity is for students to have a sense of large numbers, as well as capacity of different venues. Use the capacity of the current classroom, as well as other different rooms in the school to provide students a sense of venue space and capacity.

Students may also do a small research to find the capacities of local landmarks and venues which can hold large number of people.

Teaching Note

Use the video provided in the Teacher's ebook to provide students an idea of what each package includes. Note that there is no correct answer to this activity, and the intention is for students to rationalise which package offers a better deal.

For example, some students may feel that the shopping stopover in Hong Kong for Seatravel may be a better deal, while some students may feel the cabins of Cruise Tour may feel more luxurious.

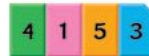




What Have I Learnt?

1 Place values.

A 4-digit number is made up of thousands, hundreds, tens and ones.



4153 is written as four thousand, one hundred and fifty-three.

$$4153 = 4000 + 100 + 50 + 3$$

The digit **4** is in the **thousands** place and it stands for **4000**.

The digit **1** is in the **hundreds** place and it stands for **100**.

The digit **5** is in the **tens** place and it has a value of **50**.

The digit **3** is in the **ones** place and it has a value of **3**.

2 Comparing and ordering numbers.

Compare and order the numbers 7492, 1215 and 1239.

Thousands	Hundreds	Tens	Ones
7	4	9	2
1	2	1	5
1	2	3	9

STEP 1

Compare the thousands.
7 thousands > 1 thousand
7492 is the greatest.

STEP 2

Compare the hundreds.
Both have 200.

STEP 3

Compare the tens.
1 ten < 3 tens
1215 is the smallest.

The numbers in **increasing order** are:

1215 , 1239 , 7492

The numbers in **decreasing order** are:

7492 , 1239 , 1215

8 Number patterns.

These are some examples of number patterns:

- 3841, 4841, 5841, 6841, 7841, 8841, 9841
+ 1000 + 1000

- 1410, 1405, 1400, 1395, 1390, 1385, 1380
- 5 - 5

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