Chapter: Integers **Lesson Module**
Name of Teacher: **Class: 6**

Lesson Objectives	Curricular Goals	Competency Codes and Descriptions
1. Explain how negative numbers are formed	CG-1: Understands numbers and sets of numbers (whole numbers, fractions, integers, rational numbers, and real numbers), looks for patterns, and appreciates relationships between numbers CG-7: Engages with puzzles and mathematical problems and develops own creative methods and strategies to solve them CG-10: Knows about and appreciates the interaction of Mathematics with each of their other school subjects	C-1.3: Learns about the inclusion of zero and negative quantities as numbers, and the arithmetic operations on them, as given by Brahmagupta C-7.1: Demonstrates creativity in discovering one's own solutions to puzzles and other problems, and appreciates the work of others in finding their own, possibly different, solutions C-10.1: Recognises interaction of Mathematics with multiple subjects across Science, Social Science, Visual Arts, Music, Vocational Education, and Sports
2. Represent negative numbers on a number line	CG-1 CG-7 CG-10	C-1.4 Explores and understands sets of numbers, such as whole numbers, fractions, integers, rational numbers, and real numbers, and their properties, and visualises them on the number line C-7.1 C-10.1
3. Compare and order integers	CG-1 CG-7 CG-10	C-1.3 C-7.1 C-10.1
4. Perform addition and subtraction of integers	CG-1 CG-7 CG-10	C-1.3 C-7.1 C-10.1

NCF/NEP FEATURES	Resources
21C Skills *21C: Communication, Collaboration, Critical Thinking* **Sustainable Development Goals** **Integration** *IL: Real-life, India Knowledge, EVS, Geography* **Multiple Intelligence** *MI: Bodily-Kinesthetic* **Financial Literacy** **Experiential Learning** **Game-based Learning** **Assessments**  Assessment for Learning  Assessment as Learning  Assessment of Learning	• Coursebook • Smartbook (https://teachers.orientblackswandigital.com/) **Scope** • Pre-requisite Knowledge • Differentiated Learning for Mixed Ability Classes • In-situ Learning Reminders • Interactive Activity, Animation, Photo Gallery, PowerPoint Presentations • Assessments (AFL; AAL; AOL)

Prerequisite knowledge

Before starting this chapter, students should ideally be able to:

- count positive numbers and recognise them on a number line.
- understand the concept of zero as a number representing nothing.
- perform addition and subtraction with whole numbers.
- recognise the difference between gains (positive) and losses (negative) in simple scenarios.
- identify real-life situations where opposite values occur (such as climbing up versus going down, saving money versus spending money).

Session Plan (9 sessions)

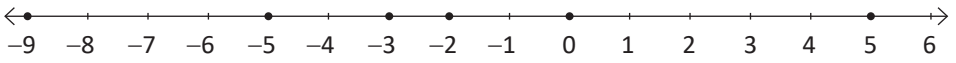
Session 1 – Introduction to Integers **LO-1**

NCF/NEP Features: IL: India Knowledge, Real-life *Key Concepts:* Integers, positive numbers, negative numbers, number line.	
Teaching Methodology • Begin by relating integers to students' daily lives. For instance: Temperature: 'If today the temperature is 25 °C, and yesterday it was 20 °C, is today hotter or colder? What if the temperature goes below 0 °C, like –5 °C? What does that mean?' • Introduce negative numbers using using the context of Dwarka below sea level. • Define integers. • Use real-life examples such as profit, saving, deposit, increase, moving forward and, loss, spending, withdrawal, decrease, moving backwards, to explain positive versus negative integers.	
Example	Example 1

Skill Focus	Practice 1 — Sum 2
Assessment (Formative)	Discuss the questions given in the coursebook. Give a set of integers. Ask students to identify each number as a positive or negative integer.
Differentiated Learning for Mixed Ability Classes	*Challenge Level 1*: Use images to show depth, height, and hot and cold temperatures. *Challenge Level 2*: Insert correct signs (+/–) in context-based situations.
In-situ Learning Reminder	Ask students to assign positive or negative signs to classroom temperature, explain why, and, if possible, show it using a thermometer.
Bloom's Taxonomy	Remembering, Understanding
Activity	Take the students to the playground and have them stand in a line. When you call out a positive integer, they should jump to their right. When you call out a negative integer, they should jump to their left. Students who jump in the wrong direction are out of the game.
End-of-Session test	Write Positive if the number is greater than 0, and Negative if it is less than 0 and Zero if it is neither positive nor negative. 1. +12 2. –8 3. 0 4. –15 5. 7 *Answers*: 1. Positive 2. Negative 3. Zero 4. Negative 5. Positive

Session 2 – Representing Integers on the Number Line **LO-2**

Key Concepts: Integers, positive numbers, negative numbers, number line.	
Teaching Methodology • Review the number line and integers. • Demonstrate how to represent integers on a number line. • Provide practice problems where students represent integers on a number line.	
Example	Example 2
Skill Focus	Ask students to circle integers on a number line drawn on the board.
Assessment (Formative)	Use GeoGebra or Desmos to draw arrows left or right on a number line; ask students to identify if the numbers increase or decrease.
Differentiated Learning for Mixed Ability Classes	*Challenge Level 1*: Provide number line diagrams. *Challenge Level 2*: Use GeoGebra, Desmos, or other online tools to show larger integers.
In-situ Learning Reminder	Ask students to pick three trees from the school, find their heights and root lengths online, and represent the heights with positive integers and the root lengths with negative integers.
Bloom's Taxonomy	Applying
Activity	Ask students to draw a number line on graph paper with zero, positive and negative integers.

End-of-Session Test	Represent the following on a number line: –2, –3, 0, –9, 5, –5 *Answers*: 

Session 3 – Comparing and Ordering Integers; Absolute Value **LO-3**

NCF/NEP Features: 21C: Critical Thinking, IL: Financial Literacy *Key Concepts*: Comparing integers, ordering integers, number line, absolute value.	
Teaching Methodology • Explain rules for comparing integers (for example, negative < positive; right side > left side on number line). • Define absolute value as distance from zero. Use a thread to measure the distance of positive and negative integers from zero on a number line to reinforce the concept of absolute value. Use real-life examples, such as measuring the distance between two points on a map, the depth below sea level, or the money owed in debts, to help them understand that absolute value shows how far a quantity is from zero without considering direction. Encourage students to identify and calculate absolute values in these contexts. • Practice ordering integers in ascending/descending order and finding absolute values. • Explain to students how a bank account can be represented on a number line: positive integers show savings, negative integers show debt, and zero means an empty account. Discuss overdrafts, spending limits, and fees to emphasise the importance of tracking money and making informed financial decisions. • Divide students into two groups and ask them to enact a play using positive and negative numbers from "Money Matters," showing savings, overdraft, spending, and debt situations.	
Examples	Examples 3, 4, 5, 6
Skill Focus	Practice 1 — Sums 1, 3, 4, 5, 6
Assessment (Formative)	• Quick Drill • Thinking Cap! Guide students to write the elevations of given cities as integers, plot them on a number line, and identify the highest and lowest points. Encourage them to compare pairs of numbers on the number line to reason which is greater or smaller, fostering critical thinking.
Differentiated Learning for Mixed Ability Classes	*Challenge Level 1*: Use number line for comparisons. *Challenge Level 2*: Compare both actual and absolute values; explain absolute value of 0 is 0.
In-situ Learning Reminder	Provide a mock record of a shop's gains and losses for a week using integers, and ask students to arrange the integers in increasing or decreasing order.
Bloom's Taxonomy	Applying
Activity	• Use integer cards to arrange integers in ascending/descending order. • Use number line on graph paper to measure distance of integers from zero.
Digital	IA: Comparing and ordering integers

End-of-Session Test	A. Compare the pairs of integers using <, >, or =. 1. −3 ___ 2 2. −10 ___ −5 3. 0 ___ −1 4. +7 ___ +7 B. Write in ascending and descending order: −4, 0, 3, −7, 2 C. Find the absolute values: 1. |−6| 2. |4| *Answers*: A. 1. < 2. < 3. > 4. = B. −7, −4, 0, 2, 3 C. 1. 6 2. 4

Session 4: Addition of Integers **LO-4**

NCF/NEP Features: 21C: Communication, Collaboration; EL; MI-Bodily Kinaesthetic *Key Concepts:* Addition of integers (Introduction)	
Teaching Methodology • Do the Explore! activity given in the coursebook. Use a number line to demonstrate the addition of integers. *NEP Compliance: This activity fosters communication as students discuss strategies and explain their moves, collaboration by working in groups to solve problems, experiential learning through physically moving on the number line to understand integer addition, and multiple intelligence – bodily-kinaesthetic by integrating movement with learning, helping students internalise mathematical concepts actively.*	
Digital	Animation – Addition of Integers

Session 5: Addition of Integers (Continued) **LO-4**

Key Concepts: Addition of integers with the same sign, addition of integers with different signs.	
Teaching Methodology • Explain the rules for adding integers with the same and different signs using number lines. • Provide practice problems, including word problems.	
Example	Example 7
Skill Focus	Practice 2—sums 1, 2, 3
Assessment (Formative)	Quick Drill
Differentiated Learning for Mixed Ability Classes	*Challenge Level 1*: Use visual aids and manipulatives. *Challenge Level 2*: Introduce addition of more than two integers.
In-situ Learning Reminder	Conduct a class quiz. Assign positive marks for correct answer and negative marks for incorrect answers. The students should add the values to find the marks for their groups. Then they could compare the totals to find who has won.

Bloom's Taxonomy	Applying
Activity	Conduct a quiz where the students have to find the rule to add a set of integers.
Digital	IA – Addition of Integers (Numerical sums)
End-of-Session Test	Add: 1. $6 + (-3)$ 2. $-8 + (-2)$ 3. $4 + (-7)$ 4. $-5 + 10 + (-3)$ 5. $-6 + (-4) + 2$ 6. $9 + (-5) + (-2)$ 7. $-10 + 3$ 8. $7 + (-3) + 5$ 9. $-2 + (-6) + (-1)$ *Answers*: 1. 3 2. −10 3. −3 4. 2 5. −8 6. 2 7. −7 8. 9 9. −9

Session 6: Properties of addition of integers **LO-4**

NCF/NEP Features: IL: EVS; 21C: Critical Thinking Key *Concepts:* Properties of addition of integers (closure, commutative, associative, identity, and additive inverse.	
Teaching Methodology • Use a number line to demonstrate the properties of addition of integers. • Use the rules for adding integers with the same and different signs to explain the properties. • Explain how the property of additive inverse is true only for integers and not for whole numbers.	
Example	Example 8
Skill Focus	Practice 2—sum 6
Assessment (Formative)	Thinking Cap!
Differentiated Learning for Mixed Ability Classes	*Challenge Level 1*: Use manipulatives like two-coloured counters to represent positive and negative integers. This can help students physically model the addition properties.
	Challenge Level 2: Presenting them with complex, multi-step problems that require applying several properties of integer addition to simplify and solve. Asking them to identify which properties are being used in each step of a given equation or problem. Providing scenarios where students must justify why a certain property of addition does or does not apply.
In-situ Learning Reminder	Divide the class into three groups. Consider pencils bought in a month as positive integers and pencils used as negative integers. Have the groups record these values and perform the addition activity on a number line using both positive and negative integers to explore the commutative and associative properties, and observe that adding zero does not change the total (additive identity).
Bloom's Taxonomy	Applying
Activity	Use 2 coloured counter (say, blue and red) to explain the properties of addition of integers. A red and a blue counter will cancel each other while adding.

End-of-Session Test	A. Find the answers. Write the addition property in each sum. 1. $-7 + 4 =$ _____; Is the answer an integer? 2. a) Find $-2 + 9$ b) $9 + (-2)$ c) Are the answers in a) and b) the same? 3. a) Find $(-1 + 3) + 5$ b) Find $-1 + (3 + 5)$ c) Are the answers in a) and b) the same 4. Find $-8 + 0$ 5. Find $(+11) + (-11)$ *Answers*: 1. -3; yes 2. a) 7 b) 7 c) yes 3. a) 7 b) 7 c) yes 4. -8 5. 0

Sessions 7, 8 and 9: Subtraction of Integers **LO-4**

NCF/NEP Features: IL: Real-life; IL: EVS, Geography; 21C: Critical Thinking; SDGs *Key Concepts:* Subtraction of integers, subtraction as the inverse of addition.	
Teaching Methodology • Explain subtraction as the inverse operation of addition. • Use a number line to demonstrate subtraction and the properties of subtraction. • Provide practice problems, including word problems. • Use the case study of Mount Everest and the Mariana Trench to have students represent heights and depths as integers, calculate differences, and analyse relative positions, connecting mathematics to real-world geography.	
Skill Focus	Practice 2—sums 4, 5
Assessment (Formative)	Thinking Cap! Ask students to solve the snake and temperature problems, relating integers to real-life environmental situations, fostering EVS understanding and 21C critical thinking skills; Case Study; Worksheet 1 and Worksheet 2 *Pen and Paper FA*
Differentiated Learning for Mixed Ability Classes	*Challenge Level 1*: Relate subtraction to real-life scenarios. *Challenge Level 2*: Introduce subtraction of integers in complex expressions.
In-situ Learning Reminder	Students simulate deposits (+) and withdrawals (−) from a virtual bank account and calculate the balance using integers.
Bloom's Taxonomy	Applying
Activity	Have students use a number line to subtract integers in pairs.
Digital	PPT – Addition and Subtraction of Integers; IA – About Integers, Subtraction of Integers
End-of-Session Test	1. $+8 - (+5)$ 2. $-7 - (-3)$ 3. $+4 - (-6)$ 4. $-10 - (+2)$ 5. $-3 - (-9)$ 6. A diver is 20 metres below sea level (-20 m). A bird is flying 30 metres above sea level ($+30$ m). What is the difference in height between the diver and the bird? *Answers*: 1. 3 2. -4 3. 10 4. -12 5. 6 6. 50 m

QUESTION BANK

A. Choose the correct answer.

1. Which of the following is an integer?

   a) 3.5 b) -4 c) $\frac{1}{2}$ d) -12.9

2. What is the additive inverse of -6?

   a) -12 b) 6 c) 0 d) -1

3. Where would you place -2 on a number line?

   a) To the right of 0 b) To the left of -3 c) Between -3 and -1 d) Between 0 and 1

4. What is $-3 + 5$?

   a) 8 b) -2 c) 2 d) -8

5. Which of these is in the correct order from smallest to greatest?

   a) 4, -1, 0, -5 b) -5, -1, 0, 4 c) -1, 0, 4, -5 d) 0, -5, 4, -1

B. Answer the following questions.

1. What are integers?
2. Give three examples of positive integers.
3. Give three examples of negative integers.
4. Is zero a positive or negative integer?
5. Draw a number line and represent the following integers: -3, 0, 4, -1, 6.
6. Explain how to represent -25 metres relative to sea level.
7. Can you subtract 84 from 37? If yes, write the answer. If no, explain why.
8. Write the absolute value of: a) -67 b) 12 c) -123 d) 0
9. Compare the following pairs of integers using $<$, $>$, or $=$:

   a) -5 and 2 b) -10 and -3 c) 0 and -7

10. Order the following integers in ascending order: -4, 6, -8, 0, 3, -1.
11. Order the following integers in descending order: 5, -2, 7, -5, 1, -10
12. Add the following integers:

    a) $-5 + (-3)$ b) $6 + (-2)$ c) $-4 + 9$

13. Subtract the following integers:

    a) $4 - 7$ b) $-3 - (-5)$ c) $-6 - 2$

14. Evaluate the following: $-5 + 8 - 3$
15. Evaluate the following: $10 - (-2) + (-7)$
16. The temperature in a city was 25 °C. It dropped by 7 °C. What is the new temperature?
17. A submarine is 200 metres below sea level (-200 m). It rises 50 metres. What is its new position?
18. A shopkeeper has a profit of ₹200 and a loss of ₹150. What is the net profit or loss?
19. In Srinagar, the temperature at 6 AM was −5 °C. By noon, it had risen to 8 °C. What was the change in temperature?
20. A submarine is at a depth of −80 metres. It ascends 25 metres. What is its new depth?
21. A shopkeeper has a profit of ₹750 and a loss of ₹320. What is the net profit or loss?

22. A well is 25 feet deep. During the rainy season, the water level rises by 15 feet. In summer, it drops by 12 feet. What is the final water level?
23. A bird flies 350 km north. After a few months it flies 500 km south. What is its final position relative to its starting point?
24. Riya deposits ₹5000 in her bank account. She withdraws ₹7500 overdraft and then deposits ₹3500. What is the final balance in her account?
25. A hiker starts at an elevation of 1200 metres. She climbs 500 metres and then descends 300 metres. What is her final elevation?
26. The price of a stock drops by 5 points on Monday, rises by 12 points on Tuesday, and drops by 3 points on Wednesday. What is the net change in the stock price?
27. In a game, a player loses 15 points, gains 25 points, and then loses 10 points. What is the player's final score?
28. A bird flies 20 feet above sea level, and a fish swims 30 feet below sea level. What is the vertical distance between the bird and the fish?

C. For each question, two statement are given, one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the options 1, 2, 3 and 4 given below.

1. Both A and R are true and R is the correct explanation of A.
2. Both A and reason R are true and R is not the correct explanation of A.
3. A is true but reason R is false.
4. A is false but reason R is true.

a) A: -7 is smaller than -2.
   R: On the number line, numbers to the right are greater than numbers to the left.
b) A: The absolute value of -5 is -5.
   R: Absolute value means the number without its sign.
c) A: Zero is a negative integer.
   R: Zero represents nothing and is placed between positive and negative numbers.
d) A: Addition of two negative integers gives a positive integer.
   R: Adding same sign integers increases their magnitude.
e) A: $-3 + 3 = 0$.
   Reason (R): A number added to its additive inverse results in zero.
f) A: When subtracting integers, the order does matter.
   R: Subtraction of integers is commutative.
g) A: The result of $-10 - (-3)$ is -13.
   Reason (R): Subtracting a negative number is the same as adding it.
h) A: The sum of 4 and -9 is a negative integer.
   R: When a smaller positive number is added to a larger negative number, the result is negative.

Answer key to the Question Bank

A. 1. b 2. b 3. c 4. c 5. b **B.** 1. Integers are positive, negative numbers, and zero.
2. Examples: 3, 5, 10. 3. Examples: -2, -7, -9. 4. Zero is neither positive nor negative.
5. [Number line with -3, 0, 4, -1, 6 marked] 6. -25 metres means 25 metres below sea level.
7. yes, we will get a negative integer as the difference. 8. a) 67 b) 12 c) 123 d) 0 9. a) $-5 < 2$
b) $-10 < -3$ c) $0 > -7$ 10. Ascending: -8, -4, -1, 0, 3, 6 11. Descending: 7, 5, 1, -2, -5, -10
12. a) -8 b) 4 c) 5 13. a) -3 b) 2 c) -8 14. 0 15. $10 + 2 - 7 = 5$ 16. 18 °C
17. -150 metres 18. ₹50 profit 19. 13 °C 20. -55 metres 21. ₹430 profit
22. -22 feet 23. -150 km south 24. ₹1000 25. 1400 metres 26. 4 points
27. 0 points 28. 50 feet **C.** a) 1 b) 4 c) 4 d) 4 e) 1 f) 3 g) 4 h) 1