** LESSON – PLAN Learner Group: 7**

**Subject :Mathematics**

**Learning Aim**: Students will be able to understand about integers, four fundamental operations on integers and properties of integers.

**Learning Objective (s) addressed:** students would

1. Define integers.
2. Recall basic operations and concepts on integers.
3. List the characteristics of integers.
4. Locate integers on the number line.
5. Perform all the 4 arithmetic operations with integers
6. Find additive, multiplicative identity and additive inverse of integers
7. Understand Closure property, Commutative property, Associative property, Identity element and Distributive property.
8. Apply this knowledge to solve problems in daily life situations

**Chapter and pg no.(s)**: Integers (6 – 27)

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| **Term** : Term1 | **No. of teaching periods: 6** |
| **Topic:**  Properties of Integers under four fundamental operations. | **Sub-topics:**  Closure property, Commutative property, Associative property, Distributive property over addition and subtraction  Additive identity, Multiplicative Identity, Multiplication by zero. |

**Key vocabulary:** Closure, Commutative, Associative, identity, Distributive property.

**Reference Book:** Macmillan, Ncert textbook, Collins math Zone, Oxford Advantage mathematics

**Reference websites**:

**Resource materials**: Flash cards, color papers.

**Videos:** <https://www.youtube.com/watch?v=TPmiS5Z74tk>   
 <https://www.youtube.com/watch?v=INS_er63oBk>  
 <https://www.youtube.com/watch?v=jG9E2pev3bQ>

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| **The Six Es** | **Teacher activity** | **Learner activity** | **Assessment** | **Method /Approach** | **Alternate teaching strategies** | **Suggestions by HOD/ Coordinator** |
| **Period :1 ( 20min)**  **ENGAGE :** | Greetings of the day.  But before we formally start our lesson I will show you a video clip entitled Application of Integers in Real Life. While watching the video, you’re going to take note of what you have noticed in the video. Is that clear?  <https://www.youtube.com/watch?v=uopjGTZdj64>  If that so, here is the video. (The teacher will play the video) (after the video presentation) What can you say about the video the video? | Greetings of the day   * The video shows us how integers are being used in this world. * The video tells us that the mathematics is part of us, whether we like it or not, math is around us. | Observes / questions | Questioning | Video on introduction to integers |  |
| **Period:1 ( 15 min)**  **EXPLORE** | * Define integers. * How to represent integers on the number line?Image result for number line on integers. * Following number line shows the temperature in degree Celsius (°C) at different places on a particular day.      * (a) Observe this number line and write the temperature of the places marked on it. * (b) What is the temperature difference between the hottest and the coldest places among the above? * (c) What is the temperature difference between Lahulspiti and Srinagar? | * Combination of whole numbers and negative numbers are called integers.   Learners will note all the places and temperatures in the note book.   * Hottest= 22 coldest= -8   22-(-8) =30   * Lahulspiti= -8 Srinagar= -2   (-8) –( - 2) =6 | Flash card | Inductive method  Self learning | Peer discussion |  |
| **Period 2**  **EXPLORE** | **Addition and Subtraction of integers**   * Verify a – (– b) = a + b for the following values of a and b.  1. a = 21, b = 18   **Integrated with science** : Difference between melting ,freezing and boiling point. Acids and bases and neutralization.  **Integrated with social**  **Students should calculate the lengths of the civilization using integers. For example , if students are studying about roman civilization began from 509 B.C (-509) and ended in 476 A.D (+476). How long the civilization last ?**  Teacher will engage children to play a game using uno cards and to assume yellow color cards as negative and green color cards as positive and explore more on addition and subtraction of integers   * Teacher will be guiding the students to solve the sums from Exercise 1.1 | L.H.S = a – (– b) =  21- (-18) = 21 +18 =39  R.H.S = a +b =  21 + 18 = 39  (+476) –(- 509) = 985 years.  C:\Users\Pc\Desktop\Capture.PNGC:\Users\Pc\Desktop\Capture 1.PNG  Learners will play the game and understand addition and subtraction of integers  Learners will be able to solve sums in the class work. |  | Playing |  |  |
| **Period:3**  **EXPLAIN**  **Encourage**  **Period 4**  **Explore**  **&**  **Explain** | **Multiplication and Division of Integers**   * Greetings of the day * Oral Questioning   **Multiplication of Integers**  **Multiplication of two integers is the repeated addition**  **Example**   * 3 × (-2) = three times (-2) = (-2) + (-2) + (-2) = – 6 * 3 × 2 =  three times 2 = 2 + 2 + 2 = 6   **Rules of Multiplication:**   * If two integers have the same sign, their product is positive. * If two integers have opposite sign, their product is negative.   **Division of integers:**  Oral questioning  Inverse operation of multiplication is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  15 5 =  (-12) 4 =  10 (-2) =  (-18) (-3) =  **Rules of Division:**   * If two integers have same sign , their quotient is positive * If two integers have the opposite signs, their quotient is negative.   Encouraging the learners to create a snake and ladder game using four fundamental operations on integers.  Rules of the game the when we thrown the dice instead of taking the simple steps you need answer the given question on that number within 15 seconds, if you are not able answer you will lose your chance and other person will get the chance.  **Properties of integers :**   * **Closure under Addition**: We have learnt that sum of two whole numbers is again a whole number. For example, 17 + 24 = 41 which is again a whole number? * Can you give one more example? * Let us see whether this property is true for integers or not   12 + (-4) = 8,  (-4) + 0 = -4,  What do you observe? Is the sum of two integers always an integer?  Did you find a pair of integers whose sum is not an integer?  Integers are closed under addition. In general, for any two integers’ a’ and’ b’, a + b is an integer.  **Closure under Subtraction:**  **C:\Users\Pc\Desktop\closure property.JPG**  What do you observe? Is there any pair of integers whose difference is not an integer?  Can we say integers are closed under subtraction?  Thus, if ‘a’ and ‘b’ are two integers then a – b is also an integer.  Do the whole numbers satisfy this property?  **Integrated with art :**  **Commutative Property :**  If ‘a’ represents the 4 pictures and ‘b’ represents the 5 pictures, show the mathematical statement for the diagram below.    What operation is used in illustrating the diagram?  What happened to the terms in both sides of the equation?  • Based on the previous activity, what property is being applied?  Commutative property: For integers a, b, a + b = b + a.  Similarly explanation of all the properties like: Closure, Commutative, Associative, Additive identity, Multiplication by zero, Multiplicative Identity, Distributive property over addition and subtraction.  Notations and symbols pertaining to properties of real number applied in the operations of integers. | * Greetings of the day * Multiplication * 3 x 2 = 6 * 3 x (-2) = -6   C:\Users\Pc\Desktop\game 1.JPG  Explain  Learners will listen to the explanation and will understand the concept of multiplication and division.  8 is an integer.  -4 is an integer.   * Yes * No * 10+12=22   **5 is an integer.**  **2 is an integer.**  **No, all the integers have difference of integer.**  **Yes, integers are closed under subtraction.**  **No, because whole numbers does not have negative numbers.**  C:\Users\Pc\Desktop\commutative.JPG  Addition  The terms were interchanged.  Students will note down in the class work | Questioning | Deductive method  Play way method | Explicit teaching |  |
| **Period :**  **5,6 (20 min.)**  **ELABORATE** | **Ice breaker:** Let us have first a math trick. Do you want a math trick?? Are you ready? So get a paper and pen. Write your month number from you birthday. For example,  if your birthday is June then your month number is 6.  Then, multiply by 5.  Next, add 6.  Multiply the total by 4.  Add 9.  Multiply by 5 once again.  Then, add your birth date.  If you were born on the 14th, then add 14.  And last, subtract 165.  You will surprise cause you will have the month and day you were born. Are you done on computing? What have you notice in the trick?  C:\Users\Pc\Desktop\properties.JPG   * Teacher will explain the solution for the problems given in Exercise- 1.3 and 1.4 * **Integrated with music** <https://www.youtube.com/watch?v=jG9E2pev3bQ> | I have notice that in mathematics you just have to follow the instruction for you to get the correct answer.   * Learners will solve the sums in their class work. * Teacher will guide the learners to solve the problems from Exercise-1.3 and 1.4 | * Objective type | * Illustrate with example | Peer discussion |  |
| **Period :6**  **15 min.**  **EVALUATE** | MCQ’s Work sheet on INTEGERS | * Answer | Evaluate | Rating Scale | Questionnaire |  |

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| Real Life applications and cross curricular links  Samashti Core Value | Increment and decrement of the salaries, stock market gain and stock market loss etc.. |
| Differentiation | Students with a variety of learning preferences are taught based on their learning styles.  **Visual learners**- Video on properties of integers  **Kinesthetic learners**- activity by paper cutting and pasting  **Verbal Learners**-  **Oral/Listening Learners**-  **Cognitive / Logical Learners**-  **Social / peer learning Learners**– |
| Success Criteria | Learners will be able to solve most of the sums on their own which are related to the properties of integers and daily life situations. |
| Extension tasks | Classroom thinking and hots questions |
| Real Life applications and cross curricular links  Samashti Core Value | Integers in Body weight( over weight- positive, under weight- negative)  Floors in building (Above the ground- positive, cellar- negative) etc..  Life is a math equation. In order to gain, the most you have to know how to convert the negatives into positives. |