BISHOP SCOTT BOYS' SCHOOL

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ONLINE STUDY MATERIAL
SUBJECT-Maths
SESSION-2020-21
CLASS- 6

CHAPTER No- 4
TOPIC: Integers

DAY-1

- ❖ **NCERT MATERIAL**

Chapter 6 from NCERT book exercise 6.1

- ❖ **NOTES**

Let us understand the Integers from figure first .

From this figure (vein diagram) we can say that all natural numbers, whole numbers are part of the Integers.
 Now we can define Integers as:-
All positive numbers, negative numbers together with zero (0) is called an Integers. E.g ………-5,-4,-3,-2,-1,0,1,2,3,4……
From above example we can say -1,-2,-3,-4,-5 are negative integers
1, 2,3,4,5 are positive Integers and 0 (zero).
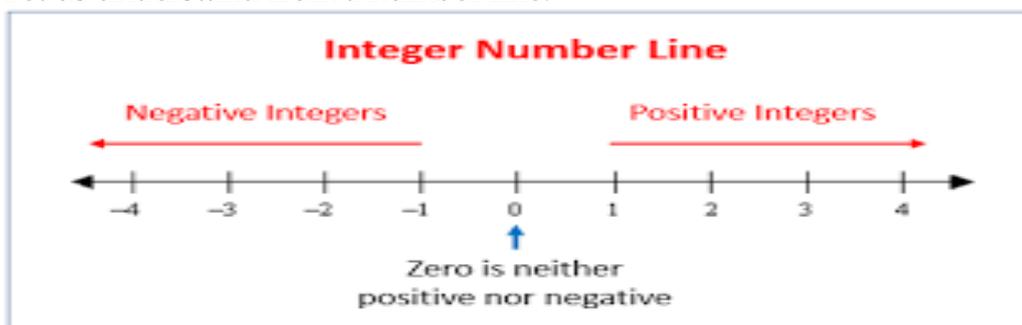Zero is neither negative Integer nor positive Integer.
Negative numbers are the opposite of positive numbers.
For example:- 5km above sea level as +5 km or simply 5km;
             5km below sea level as -5 km.

Representation of Integers on the number line:-
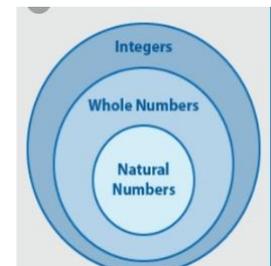Let us understand from a number line.

Points to remember:- Intercept between two consecutive values must be same.
Absolute value of an Integer:- The absolute value of an Integer is the numerical value of the Integer regardless of its sign. For example:-
The absolute value of -2, written as |-2|, is 2.
The absolute value of -5, written as |-5|, is 5.

The absolute value of 2, written as |2|, is 2.
The absolute value of 0, written as |0|, is 0.

DAY-2

❖ **NCERT MATERIAL**

Chapter 6 from NCERT book exercise 6.2.

❖ **NOTES**

Operations on Integers

Addition of Integers :- If two positive Integers or two negative Integers are added, we add their values regardless of their signs and give the sum their common sign. Eg. (+5) + (+5)=+10 or 10. (-5)+(-5)=(-10).

To add a positive and a negative Integer, we find the difference between their numerical values regardless of their signs and give the sign of the Integer with the greater value to it.

For example (-8)+ (5)= (-3) and 5 + (-8)= (-3).

Properties of addition

1) Closure property:- If a and b are any two integers , then (a+b) is also an Integer.
   E.g 5 + 6 = 11 all the three numbers 5 , 6 and 11 are Integers .
2) Commutative law:- If a and b are any two integers, then (a+b)=(b+a).
   E.g 5 +6 = 6+5 both will give the same result 11, which also an Integers.
3) Associative law:- For any Integers a, b, c we always have (a+b)+c = a+(b+c).
   E.g (9+10)+11 = 9 +(10+11)
      Adding the sequence we will get
      =》 (19)+11 = 9+ (21)
      =》 30 = 30
   Here, all the numbers are Integers 9,10,11,19,21 and 30.
4) Additive property of zero:- If **a** is any Integer , then **a+0 = 0+a= a**
   Eg. 5+0 = 0+5 = 5.
5) Additive inverse:- The sum of an Integer and its opposite is 0. If **a** is an Integer then **a+(-a)=0. E.g 3+(-3)=0** thus the additive inverse of 3 is -3. And the additive inverse of -3 is 3.

Successor and predecessor of an Integer:-

Let **a** be an Integer. Then, (a+1) is called the successor of **a**. And ,(a-1) is called the predecessor of **a.**

DAY-3

Chapter 6 from NCERT book exercise 6.3

❖ **NOTES**

Subtraction of Integers

The operation of subtraction is an inverse of addition. **a-b = c then b+c = a.**

Properties of subtraction

No property is follow in integers which we had studies in last class of integers. But if **a** and **b** are Integers then (**a-b**) is also an Integer.

Important point :- Subtracting smaller number from larger number is called its difference.

Multiplication of integers

If we write like 3+3+3+3=12 in short we can write it as 4 ×3=12.

So we can say that multiplication is repeated addition.

Properties of multiplication of numbers

1. Closure property :- If **a** and **b** are Integers, then (**a×b**) is also an Integer.
   E.g 5×6 = 30 Here 5 , 6 and 30 all are Integers.
2. Commutative law :- If **a** and **b** are any two Integers then (**a×b**) = (**b×a**).
   E.g 5×6 = 6×5
   =》 30 = 30. Here 5 , 6 and 30 all are Integers.
3. Associative law:- If **a, b, c** are any Integers then (**a ×b) ×c = a× (b×c).**
   E.g (9×7)×10 = 9× (7×10)
   =》 63 ×10 = 9 × 70
   =》 630 = 630.
   Here 9, 7, 10, 63 , 70 and 630 all are Integers.
4. Distributive law of multiplication over addition:- For any integers **a, b , c** we have
   a× (b+c) = (a× b) + (a×c).
   E.g Consider the integers 16, 9 and 8.
   16 ×(9+8) = (16×17) = 272.
   (16×9)+(16×8)= 144 + 128 = 272.
   Therefore 16×(9+8)= (16×9)+(16×8).
5. Distributive law of multiplication over subtraction :- For any whole number **a , b, c** we have **a× (b-c) = (a× b) - (a×c).**
   E.g Consider the integers 16, 9 and 8.
   16 ×(9-8) = (16×1) = 16
   (16×9)-(16×8)= 144 - 128 = 16
   Therefore 16×(9-8)= (16×9)-(16×8).
6. Multiplicative property of zero :- For every Integers **a** , we have (**a×0)=(0×a)=0.**
   E.g 9×0=0×9=0.
7. Multiplicative property of 1 :- For every Integers **a** , we have (**a×1)=(1×a)=a.**
   E.g 9×1 = 1×9 = 9

❖ **VIDEO-LINKS**

LINK- Integers_vedio_6
       Integers_vedio_7

❖ **PPT LINKS**

LINK- For additional information on the topic and power point presentation Click here

❖ **NOTES**

Division on Integers:-
- If **a** and **b** are Integers then (**a÷b**) is not necessarily an Integers.
- If **a** is an Integer and **a not equal to 0** then **a÷a =1.**
- If **a** is an Integer then (**a÷1)=a.**
- If **a** is a non zero interger then (**0÷a)=0,** but (**a÷0)** is not meaningful.
- If **a, b, c** are Integers then (**a÷b)÷c is not equal to a÷(b÷c),** unless c=1.

Few examples to understand the Integers and its operation.
Additional of -5+7=2.

$$-5 + 7 = 2$$
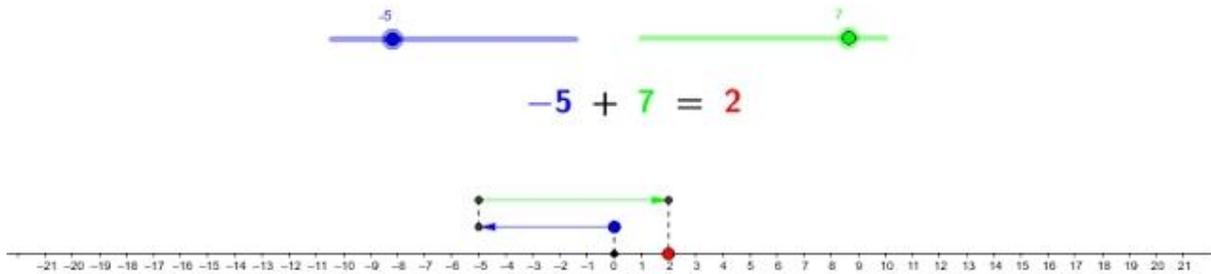
Addition of (-5)+(-2)=(-7)
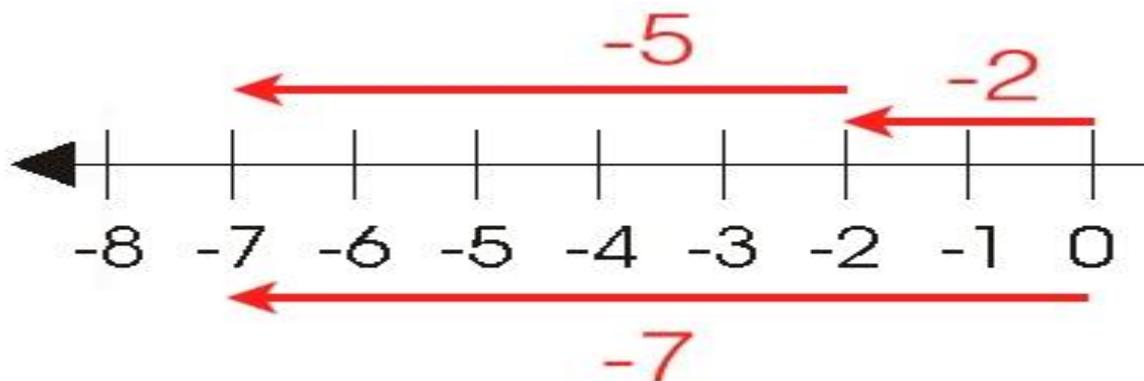
TITLE: MULTIPLICATION OF INTEGERS

1. **What we have to do?**
   To apply the multiplication of integers by playing a game.

2. **What is required?**
   Chart paper, a pair of scissors, geometry box, adhesive, colours, 2 white colour dice for positive integers and 2 red colour dice for negative integers.

3. **How much time is required?**
   30 - 40 minutes

4. **What do you need to know?**
   Knowledge about basic operations and concept of integers

5. **How will you proceed?**
   a. Draw 11 × 7 grid on a chart paper.
   b. Write the integers from (- 36) to (+36) in each box, leaving the first two and last two boxes blank and colour the boxes pink which contain negative integers. as shown in the Fig.1.

		+36	+35	+34	+33	+32	+31	+30	+29	+28
+17	+18	+19	+20	+21	+22	+23	+24	+25	+26	+27
+16	+15	+14	+13	+12	+11	+10	+9	+8	+7	+6
-5	-4	-3	-2	-1	⓪	+1	+2	+3	+4	+5
-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16
-27	-26	-25	-24	-23	-22	-21	-20	-19	-18	-17
-28	-29	-30	-31	-32	-33	-34	-35	-36		

Fig.1

c. Three chances will be given to each player:
   - For two positive integers (use 2 white dice)
   - For one negative and one positive integer (use 1 red dice and 1 white dice)
   - For two negative integers (use 2 red dice)

d. Two dice will be thrown simultaneously by each player and after every throw the player has to multiply the numbers (keeping in mind their signs) reflected on the top of the dice.

e. If the product is negative, the player will move his counter towards (-36), starting from the digit 0 and if the product is positive the player will move his counter towards (+36).

f. The player who reaches (+36) first will be the winner.

6. **What have you observed?**

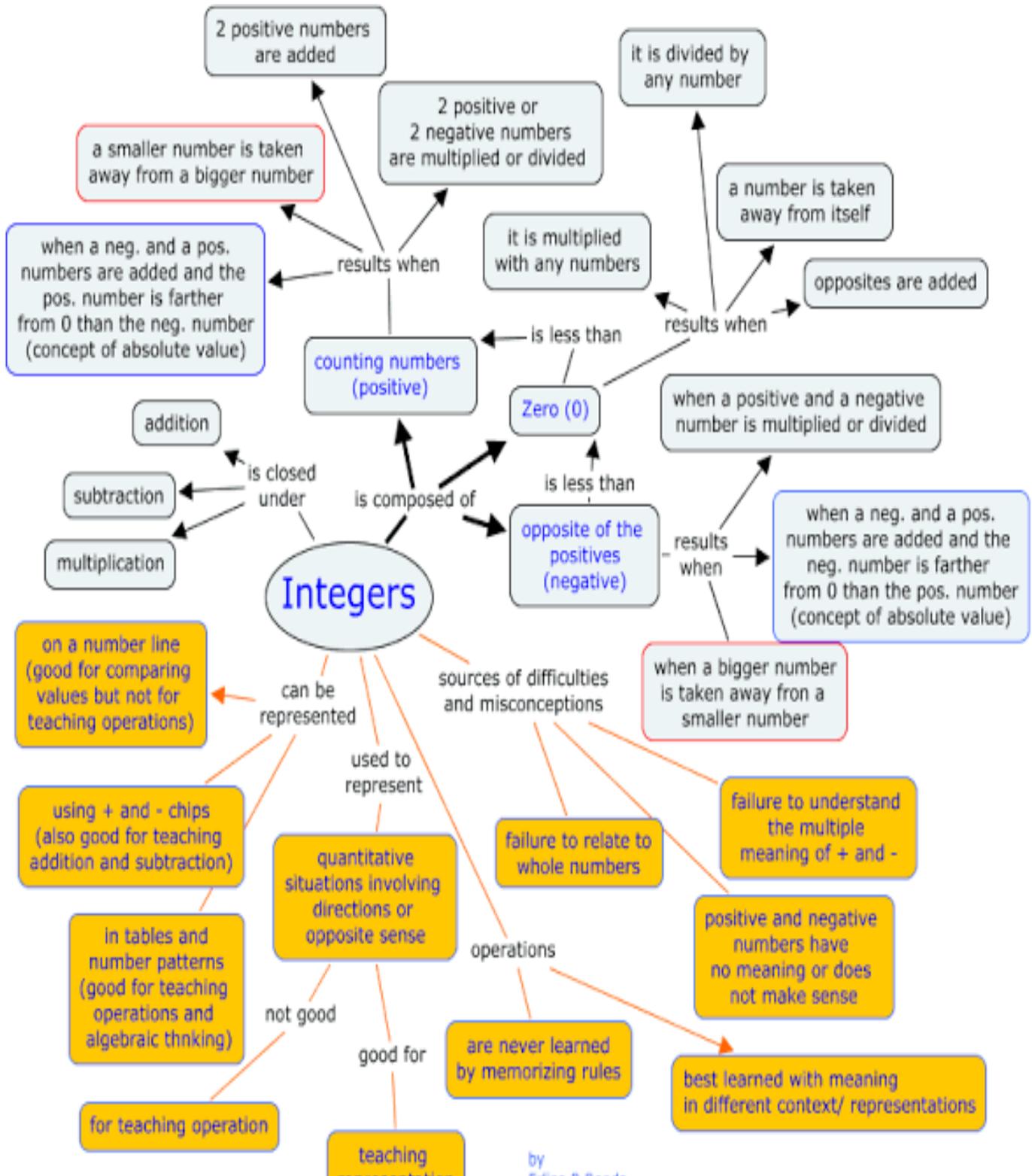|	Player1 Integer reflected on both the dice		a× b	Player2 Integer reflected on both the dice		a× b
Chance 1	a = _____	b=_____	_____	a = _____	b=_____	_____
Chance 2	a = _____	b=_____	_____	a = _____	b=_____	_____
Chance 3	a = _____	b=_____	_____	a = _____	b=_____	_____

7. **What have you learnt?**

8. **Extended Activity**

What will be the sign of the product you get, if you multiply 15 negative integers and 7 positive integers?

Real life Applications:

The above concept is used in our day-to-day life incidents viz. measuring temperature, in banking operations, sports, market place, games etc....

CONCEPT MAP

Integers

- 2 positive numbers are added
- a smaller number is taken away from a bigger number
- when a neg. and a pos. numbers are added and the pos. number is farther from 0 than the neg. number (concept of absolute value)
- 2 positive or 2 negative numbers are multiplied or divided
- results when
- it is multiplied with any numbers
- it is divided by any number
- a number is taken away from itself
- opposites are added
- results when
- counting numbers (positive)
- is less than
- Zero (0)
- when a positive and a negative number is multiplied or divided
- addition
- subtraction
- is closed under
- multiplication
- is composed of
- is less than
- opposite of the positives (negative)
- results when
- when a neg. and a pos. numbers are added and the neg. number is farther from 0 than the pos. number (concept of absolute value)
- when a bigger number is taken away from a smaller number
- on a number line (good for comparing values but not for teaching operations)
- can be represented
- sources of difficulties and misconceptions
- using + and - chips (also good for teaching addition and subtraction)
- used to represent
- failure to relate to whole numbers
- failure to understand the multiple meaning of + and -
- in tables and number patterns (good for teaching operations and algebraic thnking)
- quantitative situations involving directions or opposite sense
- operations
- positive and negative numbers have no meaning or does not make sense
- not good
- are never learned by memorizing rules
- for teaching operation
- good for
- best learned with meaning in different context/ representations
- teaching representation

by
Edino P Basda

Exercise to be done and send to email

Email id:- classvibsbs@gmail.com

EXERCISE:-

1)Represent the following integers on number line

  a) -6   b) -8   c) 25

2)Write true or false for the following statements

  a) The smallest integer is 0.

  b) -10 is greater than -6.

  c) Zero is larger than every negative integer.

3)Evaluate

  a) $15 + (-8)$

  b) $(-7) + (-23)$

  c) $(-32) + 88$

4) If a = -8 , b = -7 and C = 6, show that (a+ b) + c = a + (b+ c)

5) Find the additive inverse of the following

  a) -83   b) 256   c) -2001

6)Write a pair of integers whose sum gives

        a) zero

        b) a negative integer

        c) an integer smaller than both the integers.

7)Subtract

  a) 28 from -42   b) 318 from 0   c) -153 from -240

8)The sum of two integers is -16. If one of them is 53, find the other.

9) Find 36 - (-64) and (-64) -36. Are they equal.

10) Multiply

        a) 16×9 b) -67×4

11) Find each of the following products:-

        a) $3 \times 4 \times (-5)$ b) $2 \times (-5) \times (-6)$

12)What will be the sign of the product, if we multiply 90 negative integers and 9 positive integers.

13)What will be the sign of the product, if we multiply 103 negative integers and 65 positive integers.