Master Lesson Plan

For

Integers

Board	Standard	Subject	Chapter	Language	Reference Link	Creation date
CBSE	STD VI	Mathematics	Integers	English	Integers	2019-07-31 23:11:13

Integers

1. MS_Objectives_Integers

Notes to the teacher:

This asset lays down the proposed plan for transacting this chapter

It states the asset objectives of the MLP. This asset is for teacher's reference and need not be taught to the students

Students will be able to

- differentiate negative integers from positive integers
- describe integers, as collection of natural numbers, whole numbers and negative integers
- to recognize use of positive and negative integers in our daily life
- imagine the temperature at the coldest place in India
- explain representation of integers on the number line
- show positive integers, negative integers and 0 on the number line
- compare integers
- solve problems on comparison of integers, writing integers in ascending and descending order
- explain addition of integers using number line
- apply their knowledge of addition of integers to solve problems
- define additive identity and additive inverses
- describe subtraction of integers using number line
- demonstrate addition and subtraction of integers in an activity
- practice problems related to addition, subtraction, and the additive inverses of integers by representing them on the number line
- appreciate the need to discriminate between the company of positive and negative people in real life

Time to teach	Asset Type	Theme	SubTheme
3 Minutes	Main Script	Integers	

2. IQ_Find the Opposite of Positive

Think and Answer.

Have you all come across the symbol '-'?

Like, -1, -2 and so on?

If yes, can you share with the class where and when this was observed?

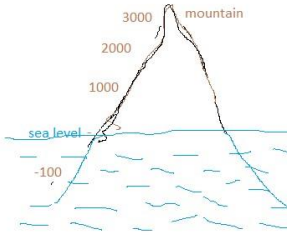
(Expected answers are: Lift, graph, temperature etc.)

1. The thermometer is a "two way" scale. On it we can read temperature above zero as well as below zero.

2. If you are on the top of a mountain which is 3000 feet above sea level, and you have to go down to a valley which is 100 feet below sea level, what is the distance you have traveled?

How to represent this diagrammatically?

Ans: Above Sea level is 3,000 feet. Below sea level is 100 feet which is represented as -100 (since it is below sea level). Total distance traveled =3,000 - (-100) = 3,100 feet.



(The teacher draws it on the board, using '+' to represent distance above sea level and

'–' to represent distance below sea level.

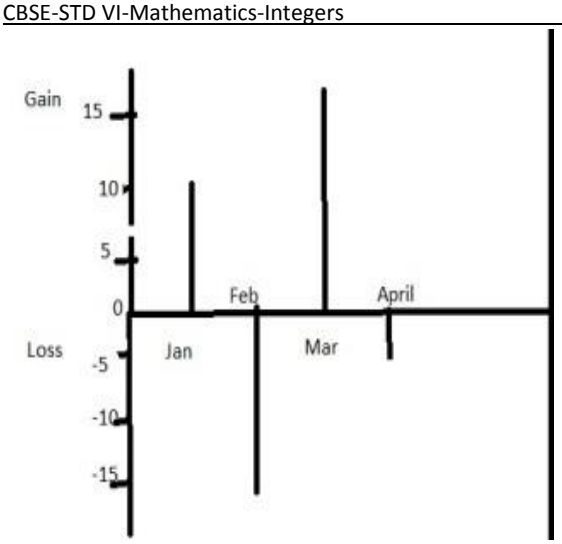
The teacher can then go on to give the solution using integers.

Above and below the ground level of a tree.

In fig 2, Trunk and Root seem to be the opposites. (exactly they are not)

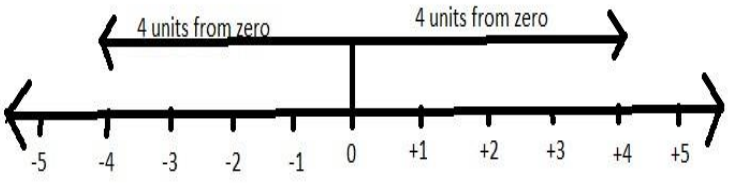
Fig 2.

When maintaining the accounts, a businessman also has a two – way scale in mind. He may have losses as well as gains.



Note: Teacher can give some more situations where the positive and negative integers are used.

Teacher can show how to represent and measure the distance using integers. To the right of “Zero" it is marked as positive values and to the left of "Zero" it is taken as negative values.



Images Sources:

Thermometer:https://pixabay.com/photos/thermometer-wooden-thermometer-2686020/

Tree: SSSVV Gallery-Keyword-Andaman

Mountain and sea level, Gain and Loss, Number line: Original image (girijashankeran@gmail.com)

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Inquisitive Questions	Integers	Introducing negative integers, Introducing negative integers

3. MS_Introduction to Integers

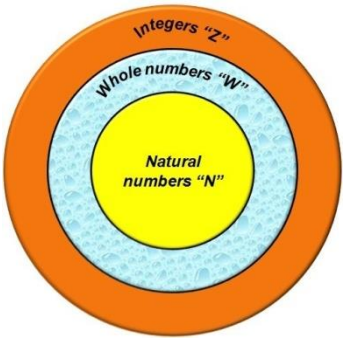
Integers:

The following collection of numbers are called “Integers”

……**..-3,-2,-1, 0, 1, 2, 3,……**

Integers are a collection of Natural Numbers, Whole Numbers and Negative numbers.

Integers are represented as **Z**



There is no starting number and ending number for this collection, i.e. We cannot find the smallest and biggest integers. ……..-3,-2,-1 are called negative integers and 1, 2, 3….. are called positive integers.

Example:

Five friends planned to buy a particular product and sell it later. At the end of the transaction two of them had profit and two suffered losses.

Rohit had a loss of Rs. 5.

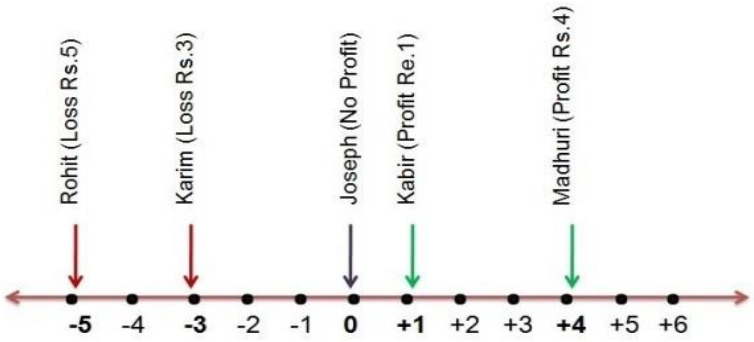
Madhuri had a profit of Rs. 4.

Kabir had a profit of Re. 1.

Joseph had neither profit nor loss.

Karim had a loss of Rs.3.

Let us incorporate this on the number line.



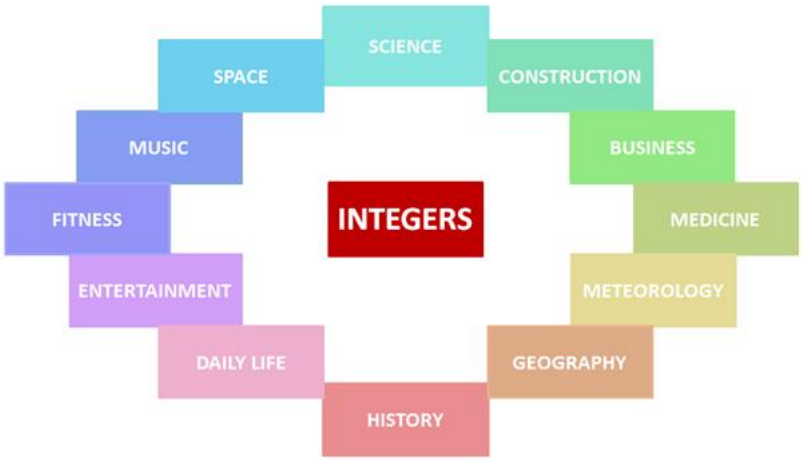
Note: Teacher can give some more examples.

All images are original (girijashankeran@gmail.com).

Time to teach	Asset Type	Theme	SubTheme
10 Minutes	Main Script	Integers	Integers on number line, Integers on number line

4. DD_Applications of Integers

Let us see how we can relate integers to our day to day life and the subjects we learn!

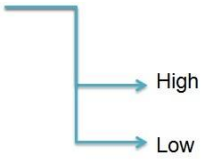


The table given below shows how integers are applied for the some fields mentioned above.

Field	Positive integer	Negative integer
Science	Boiling Point	Freezing Point
Space	High Temperature	Low Temperature
Business	Gain	Loss
Music	Increase volume	Decrease volume
Geography	Latitude	Longitude
History	AD	BC

Examples:

1. Space (Temperature) high is denoted by positive integer and Low is denoted by negative



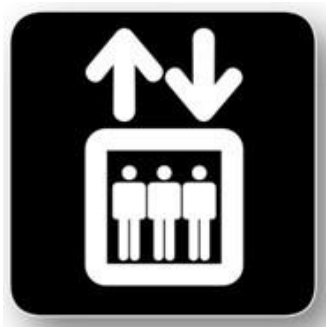
2. Science (Boiling Point, Freezing Point)

BOILING POINT

FREEZING POINT

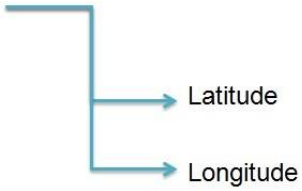
3. Business- Profit is denoted by positive integer and Loss is denoted by negative integer.

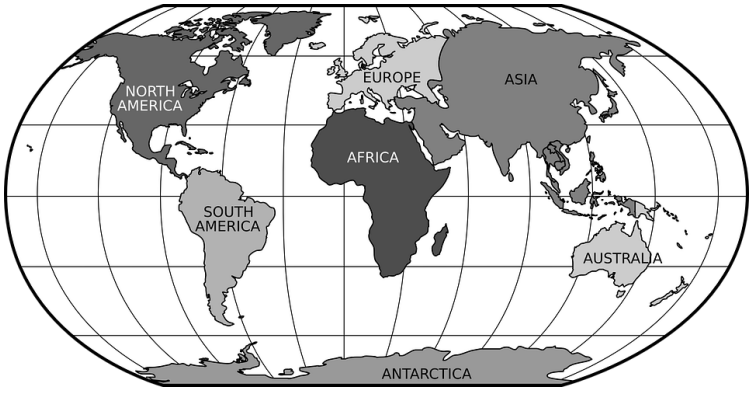
4. Daily Life (Elevator)



In daily life while using elevators, the floors below the ground level are marked as negative integers and above the ground level are marked as positive integers.

5. Geography



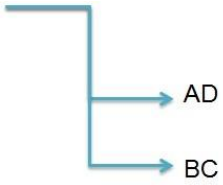


The plane through the centre of the earth, and perpendicular to the axis is known as equator. Planes parallel to the equator intersects the surface in circles.

The equator has latitude of 0^{o}, the North Pole has latitude of 90^{o} north (written as 90^{o} N or $+90^{o}$), the South Pole has latitude of 90^{o} south (written as 90^{o} S or -90^{o}).

The prime meridian, which passes near the Royal Observatory, Greenwich, England, is defined as 0° longitude by convention. Positive longitudes are east of the prime meridian, and negative ones are west.

6. History



This calendar era is based on the traditionally reckoned year of the conception of birth of Jesus, with AD counting positive years from the start of this reference point from which time is maintained and BC denoting negative years before the start of the era.

(Teacher can have an interactive session about the applications of integers like in Business, Medicine, Sports, and Music and so on)

Boiling water:

https://www.flickr.com/photos/sterlic/2835198444/in/photolist-5jx8HN-7C6tzn-bV9SfR-i82p53-2a522eo-

Y53oNK-6GpyQF-eJReLx-6nzbQ2-24w9r8-dPG1vH-Rm2Dqs-24j4xEH-4ZFtsD-a4bnmD-5VKAWe-3t4aDg-

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5qwuPe-fc3b5b-2j2jXn1-ewAzc-QaaCZn-fEFJjq-MEWLG6-WxvGfY-2dcxQg2-24LU3ba-2jeUXMj-7t2YNb-

3tquqZ-2ja41Ym-2jagETs-zThny-2cvZBFp-2hNqkcT-Vq2uoU-uB6aVo-XefL3h (By Scott Akerman)

Freezing Point: https://pxhere.com/en/photo/70925Image of Gold coin https://pixabay.com/vectors/money-bag-profit-gold-coins-40603/

Image of Elevator https://pixabay.com/vectors/elevator-people-silhouette-down-44013/

https://pixabay.com/vectors/world-map-robinson-projection-globe-42641/

Time to teach	Asset Type	Theme	SubTheme
10 Minutes	Day-to-day Relevance	Integers	Introducing negative integers, Introducing negative integers

5. IA_Temperature at the coldest place in India

Question:

What is the temperature of the coldest place in India?

Answer:

It is a place called Drass in Ladakh in the state of Jammu and Kashmir where the temperature can go down up to -40^{o} C

Why is it represented with a minus sign?

Because it shows that the place has a temperature that is below zero degrees.

So, when the temperature is below zero, we assign a negative symbol to it and if it is above zero, we say it is positive.

Image Source:

https://pixabay.com/photos/kashmir-landscape-scenic-sky-91218/

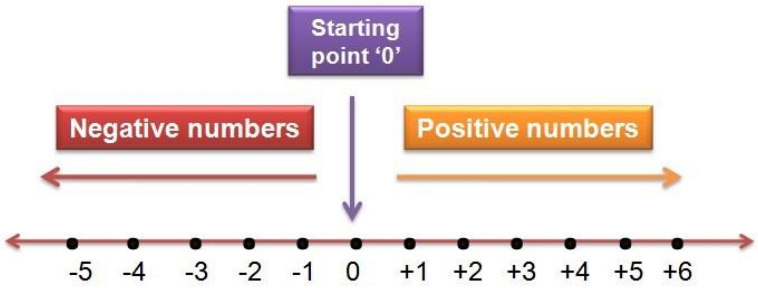
Time to teach	Asset Type	Theme	SubTheme
3 Minutes	Interesting Asides	Integers	Introducing negative integers, Introducing negative integers

6. MS_Representation of Integers-Number Line

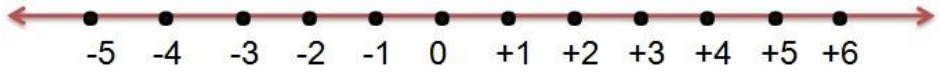
Let us now try to represent the integers on a line considering 'zero' as the base or middle (ensure that you use the word middle for a line segment and centre for circle.)

While drawing the number line, remember these points:

- The numbers on the left side of the '0' are called *'Negative numbers'* which are denoted by the symbol '-'.
- The numbers on the right side of the '0' are called *'Positive numbers'* which are denoted by the symbol '+'.
- All the numbers to its left are smaller and the numbers to its right are bigger.
- The number which is just before (previous) a given number is called its predecessor.
- The number which is just after (next) the number is its successor.



- Draw a line with the help of a ruler.
- Mark a Point Zero in the middle of the line.
- Then mark the numbers 1, 2,3 ... to the right at an equal distance of (say) every 1 cm.
- Similarly mark the numbers of -1, -2, -3,... to the left of Zero at an equal of distance of 1 cm.



Hence,

The number line goes on forever in both directions.

The integer zero is neutral. It is neither positive nor negative.

The sign of an integer is either positive (+) or negative (-)

Example:

Write all integers between -3 and +1

Solution:

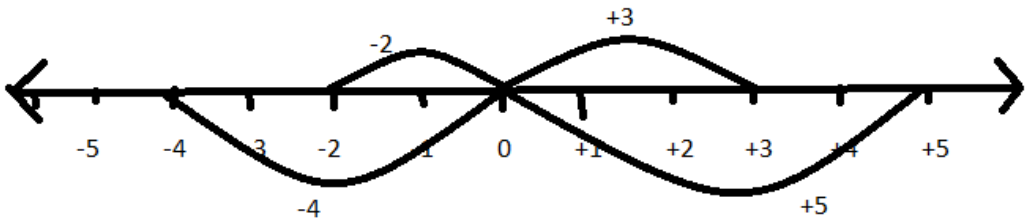
-2,-1, 0 (Teacher can ask more questions to make the children understand the concept)

Example:

Mention these numbers on the number line.

-4, +3, -2, +5

Solution:



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Time to teach	Asset Type	Theme	SubTheme
15 Minutes	Main Script	Integers	Integers on number line, Integers on number line

7. QA_Practice Questions

1. How do you represent the following in integers?

a. Hari got Rs. 15 as pocket money this month.

b. The temperature in Bangalore reduced to minus 13^0 C on Monday.

c. Gowri spent Rs. 20 on buying pencils.

d. Rohit put on 5 kgs during the last month.

Solutions:

a) (+15)

b) (-13)

c) (-20)

d) (+5)

2. Mark the following on a number line.

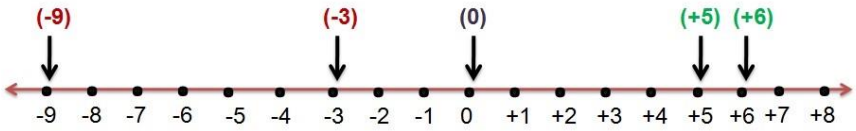
a) i) (-9) ii) (+6) iii) (0) iv) (-3) v)(+5)

b) From (-2) to (+4)

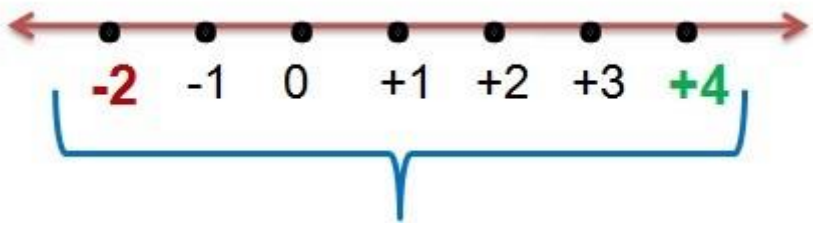
c) From (-6) to (+1)

Solutions:

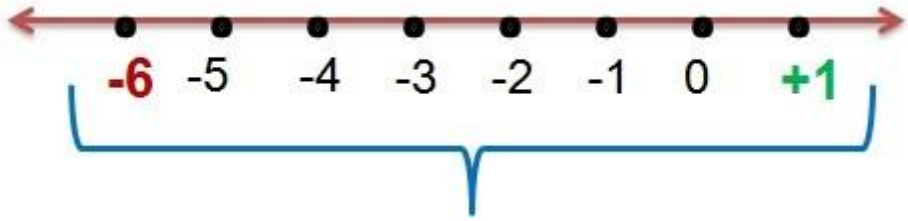
2. a)



b)



c)



3. The following is the list of temperatures of some cities in India on a particular day during winter. Write these temperatures using appropriate signs '+' or '-'(The teacher can change the cities of India or cities of different countries also).

SL. No	City	Min temp℃	Answer
1	Mount Abu(Rajasthan)	1 below 0	-1°C
2	Amritsar(Punjab)	2 below 0	
3	Gurgaon(Haryana)	5 above 0	
4	Delhi(Delhi)	3 above 0	
5	Chandigarh(Chandigarh)	4 above 0	

Solutions:

1) $-1^{O}C$ (2) $-2^{O}C$ (3) $+5^{O}C$ (4) $+3^{O}C$ (5) $+4^{O}C$

4. Write all the integers between:

(a) -3 and 4 (b) 2 and 7 (c) -4 and 6

Solutions:

(a) -2,-1, 0, 1, 2, 3

(b) 3,4,5,6

(c) -3,-2,-1, 0, 1, 2, 3, 4, 5

All images are original by girijashankeran@yahoo.com

Time to teach	Asset Type	Theme	SubTheme
15 Minutes	Assessments	Integers	Introducing negative integers, Introducing negative integers

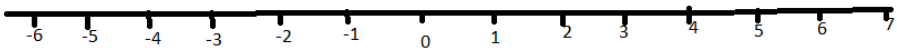
8. MS_Ordering and Comparison of Integers

(Teacher will revise predecessor and successor of numbers before teaching this concept)

The successor of a number = Number + 1

The Predecessor of a number = Number - 1

Number Line



Predecessor=Number -1

Successor = Number +1

From the Number Line answer the questions:

1. Find the predecessor of the following:

a) -1 b)-4 c) 3 d) 6

Solution:

a) -2 b)-5 c) 2 d) 5

2. Find the successor of

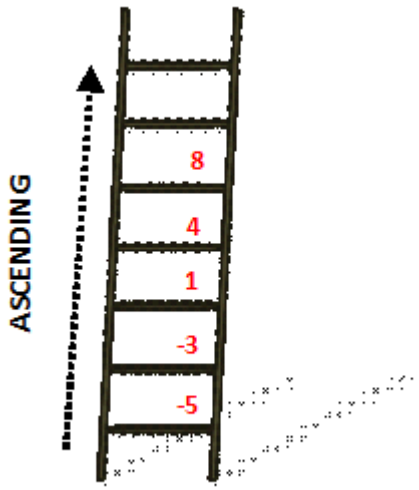
a) 0 b) -3 c) 4 d) -5

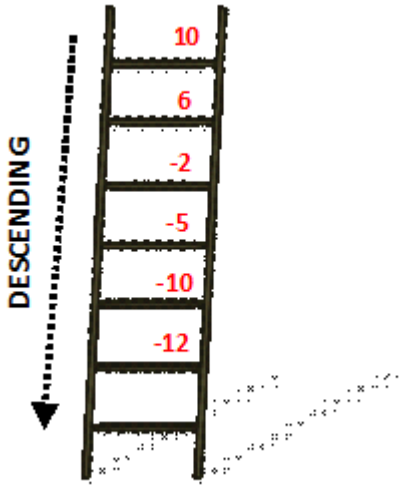
Solution:

a) 1 b) -2 c) 5 d) -4

Ascending and Descending Order

We are going to arrange the given integers in either ascending or descending order.



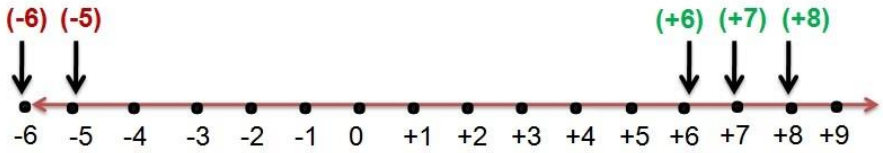


Example 1:

Arrange these integers in ascending order +7, +6, +8, -5, -6.

Solution:

Let us arrange these integers on the number line.



Value of Integers increases as they move from left to right of the number line.

Therefore, the ascending order will be -6, -5, +6, +7, +8.

Hence, arranging of integers from smallest to biggest is ascending order.

Example 2:

Arrange the following in descending order +10, +19, -9, -6, -11.

Solution:

The greatest integer among this is +19.

The smallest integer among this is -11.

Hence, arranging the integers from the biggest to the smallest is called descending order.

Therefore, the descending order is +19, +10, -6, -9, -11.

Examples:

Arrange in ascending order:

-7,-10,-20, 34, 45, 20, 9

Solution: -20,-10,-7, 9, 20, 34, 45

Arrange in descending order:

15, 9, 36, -2, 0, 12, -5

Solution:

36, 15, 12, 9, 0, -2, -5

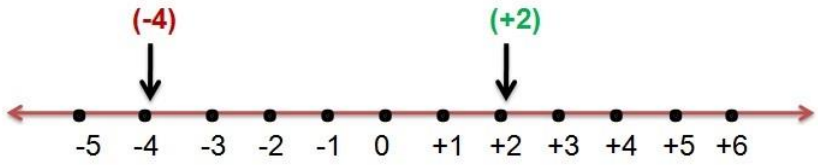
Ordering of integers

We use the '< 'and '> 'symbols to compare two integers.

Example 1:

Which one of the following is greater: (-4) or (+2)?

Let us plot the points on the number line.



(-4) is 4 points to the left of zero.

(+2) is 2 points to the right of zero.

The value increases as we move from the left side to the right on the number line.

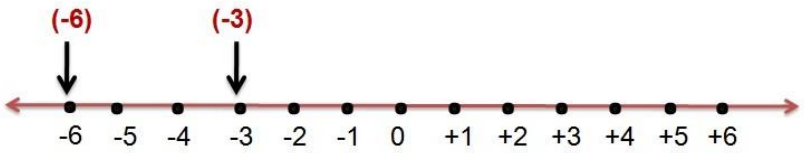
Therefore, (+2) is greater than (-4).

+2 > -4

Example 2:

Compare (-6) and (–3)

Let us draw the number line and mark the points.



(-3) is on the right of (-6). Therefore -6 < -3

For Example;

$2 < 6 means\ 2\ is\ less\ than\ 6$

$-7 < -5 means\ -7\ is\ less\ than\ -5$

$+9 > -6 means\ +9\ is\ greater\ than\ -6$

$-2 > -4 means\ -2\ is\ greater\ than\ -4$

Example 3:

1) Which one of the following is smaller?

(a) (-1) or (-5)?

(b) +6 or -6

Solution:

a) -5 < -1

b) -6 < +6

2) Which one of the following is greater?

(a) +10 or -20?

(b) -25 or +5

Solution:

a) +10 > -20

b) +5 > -25

(Teacher will summarize these points given below.)

(a) Every positive integer is larger than every negative integer.

(b) Zero is less than every positive integer.

(c) Zero is larger than every negative integer.

(d) Farther a number from zero on the right, larger is its value.

(e) Farther a number from zero on the left, smaller is its value.

Image Source: All images are original : girijashankeran@yahoo.com

Time to teach	Asset Type	Theme	SubTheme
20Minutes	Main Script	Integers	

9. QA_Test Your Aptitude

1. Complete the following table.

Number	Predecessor	Successor
7	6	8
21	?	?
?	25	?
?	?	14
-9	?	?
?	?	-1

Solution:

(20, 22)

(26, 27)

(13, 12)

(-10, -8)

(-2, -3)

2. Fill in the blanks:

a) On the number line ---------- integers lie on the left side of '0'.

b) The only integer which is neither positive nor negative is ----------.

c) The number ---------- is greater than all negative integers and -------- than all positive integers.

d) The biggest negative integer is ----------.

e) The smallest positive integer is ----------.

Solution:

a) Negative (b) Zero (c) Zero, smaller (d) -1 (e) +1

3. Fill up the blanks with ' <' or ' >' :

a) (- 3) ----- (+12)

b) (- 4) ----- (- 44)

c) (- 32) ----- 0

d) (+34) ----- (- 34)

e) (-12) ----- (+26)

Solution:

(a) <

(b) >

(c) <

(d) >

(e) <

4 (i) Arrange in ascending order:

a) -2, +4, +9, 0, -7, +1, -3, +10, -9.

b) -12, +14, -10, -20, +4, 0, -1.

(ii). Arrange in descending order:

a) -7, +43, +37, 0, +22, -14, +25, -36.

b) +13, +1, -2, -4, -1, 0, +7, +6, -9.

Solution:

(i) a) -9, -7, -3, -2, 0 +1, +4, +9, +10.

b) -20, -12, -10, -1, 0 +4, +14.

(ii) a) +43, +37, +25, +22, 0, -7, -14, -36.

b) +13, +7, +6, +1, 0 -1, -2, -4, -9.

5) Answer the multiple choice questions.

(i) Identify the smallest integer

– 21, -2, - 5, +7, +8, +23, -15

(a) 23 (b) -2 (c) -21 (d) None

(ii) Identify the biggest integer:

-3, +4, -7, +8, 0, -11, -21, +46

(a) -21 (b) +8 (c) -3 (d)+46

(iii) Write an integer to represent a loss of 19 Rupees

(a) +19 (b) -19 (c) less than 19 (d) None

Solution:

(i) c) -21

(ii) d) 46

(iii) b) -19

Time to teach	Asset Type	Theme	SubTheme
15 Minutes	Assessments	Integers	

10. MS_Integers -Addition

In Addition of Integers we shall see these 3 types and summarize the rules at the end.

1. Addition of two positive Integers

2. Addition of two Negative Integers

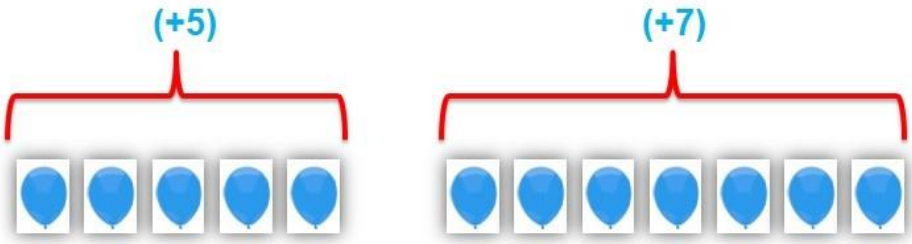
3. Addition of one Positive Integer and one Negative Integer

1. Addition of two Positive Integers.

Let us add (+5) and (+7).

Pick up 5 cards of positive integers and place them on one side in a row.

Pick up 7 cards of same colour and place them adjacently as shown below.



Total number of cards is (+12).

Therefore, (+5) + (+7) = (+12).

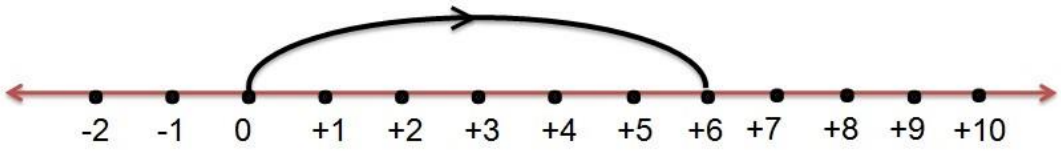
We can take different combinations of positive integers and do the same activity.

Adding two positive integers using Number line:

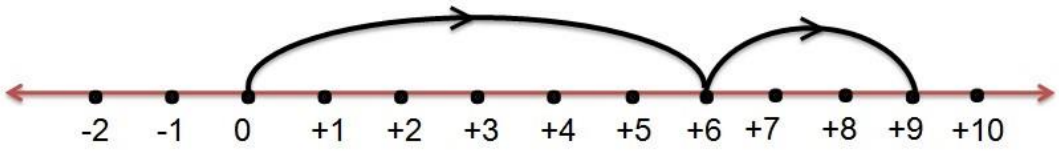
Let us add (+6) and (+3).

Draw a number line.

Since it is + 6, move to the right of Zero by 6 units.



Again, move to the right after 6 by 3 units. Therefore, (+6) + (+3) = +9



Hence, addition of two positive integers is always a positive integer.

Examples: a) (+11) + (+ 25) = +36

b) (+105) + (+ 1008) = + 1113

2. Addition of two negative Integers

Let us add (-4) and (-6)

Pick up 4 cards of negative integers and place them in a row.

Pick up 6 cards of same colour and place them as shown below.

Total number of cards is (-10)

Therefore, (-4) + (-6) = (-10)

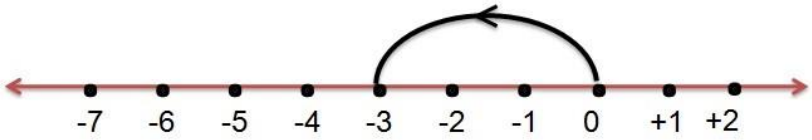
We can take different combinations of negative integers and do the same activity.

Adding two negative integers using Number line:

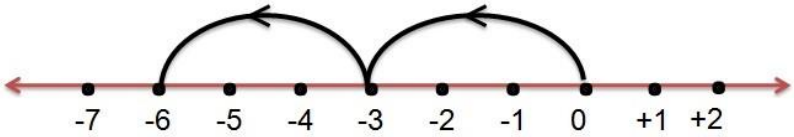
Let us add (-3) and (-3)

Draw a number line.

Since it is -3, move towards left of zero by 3 units.



Again, move towards left by 3 more units after -3. Therefore (-3) + (-3) = -6



Hence, Addition of two negative integers is always a negative integer.

Examples: a) (-65) + (-81) = -146

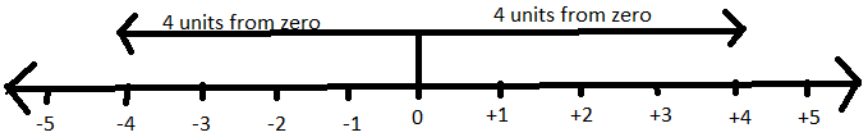
b) (-92) + (-29) = -121

3) Addition of a Positive integer and a negative integer.

(Teacher should explain the absolute value of a number)

Absolute value of a number is how far a number is from Zero.

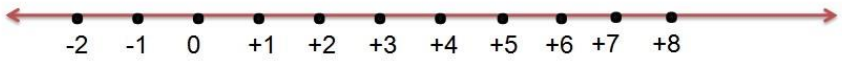
For example:



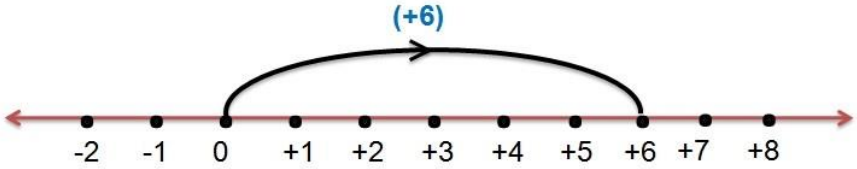
+4 means moving right 4 units from zero and -4 is moving left 4 units from zero. On either side, the distance is the same from zero. Hence, Absolute value of +4 is 4 and Absolute value of -4 is also 4.

Let us add (+6) and (-2).

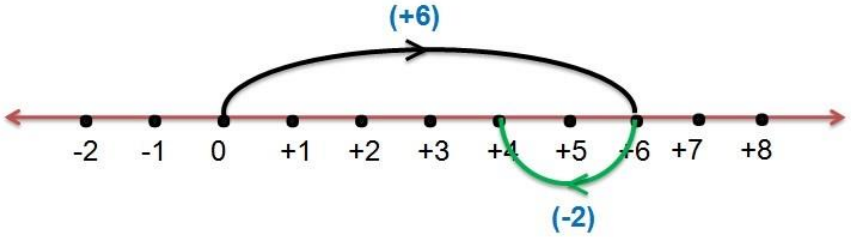
Draw a number line and mark the units in it.



Move 6 units to the right of Zero.



Since the next integer is -2, move 2 units from +6 towards left.



Hence (+6) + (-2) = +4

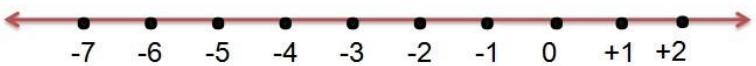
Algorithm:

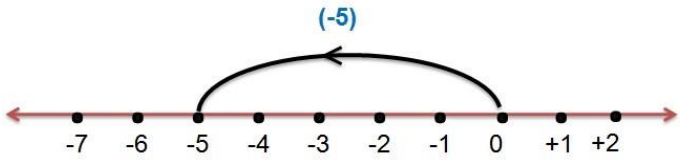
To add one positive integer and one negative integer, we subtract the absolute value of the smaller integer from the absolute value of the bigger integer and retain the sign of bigger number.

Examples :

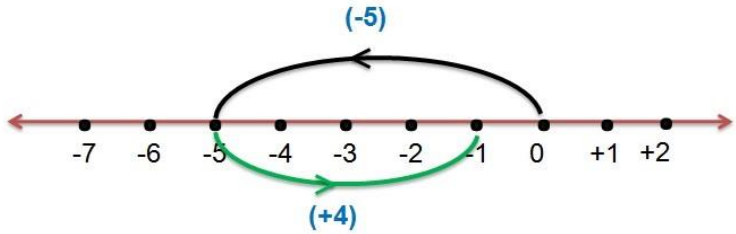
Add (-5) and (+4).

Draw a number line.





Move 4 to the right of (-5) since (+4) is a positive integer.

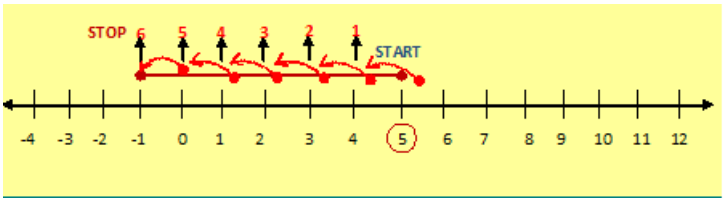


We get (-1).

Therefore, (-5) + (+4) = (-1). Hence, the sum of a positive and a negative integer will have the same sign as that of the greater number.

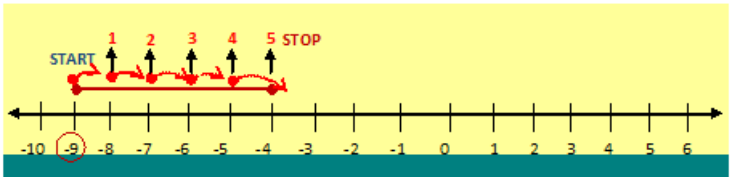
For example,

a) 5 + (-6) means you start at 5, and you move 6 units to the left.



Hence, the answer is -1

b) -9 + 5 means you start at -9, and move 5 units to the right.



Hence, the answer is **– 4**

Here is another way to learn this with each plus-minus symbol pair getting cancelled!!

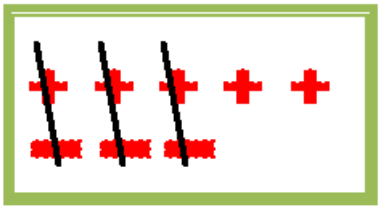
When you move one step right and one step left, you are back to your position

Your displacement is zero (you have not moved).

So + and - gets cancelled as they are opposite to each other.

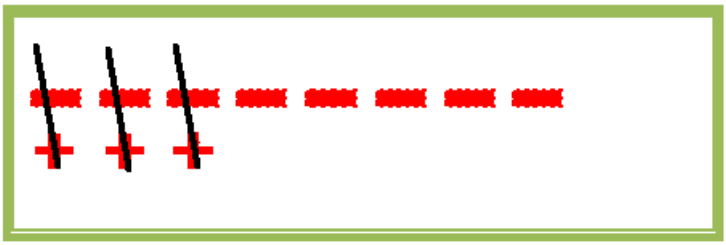
Hence, +1 - 1 = o

a. This represents (+5) + (-3).



Hence, the answer is **+2 or 2**

b. This represents (-8) + 3.



Hence, the answer is **– 5**

Summary of the Rules

1. When two positive integers are added, we get another positive integer.

2. When two negative integers are added, we get a negative integer.

3. When one positive integer and one negative integer, are added, we subtract the absolute value of the smaller integer from the absolute value of the bigger integer and retain the sign of bigger number.

Example :

1. 6 + 4 = 10

2. 6 + (-4) = 2

3. (-6) + (-4) = -10

4. (-6) + 4 = -2

All images are original. (girijashankeran@gmail.com)

Time to teach	Asset Type	Theme	SubTheme
20 Minutes	Main Script	Integers	Addition & Subtraction of integers on number line, Addition & Subtraction of integers on number line

11. QA_Questions to Assess

1. Fill in the blanks with appropriate answers:

a) 26 + 34 = _____

b) 35 + (-4) = _____

c) -67 + 56 = _____

d) -45 + (27) = _____

Solution:

a) 60 (b) 31 (c) -11 (d) -18

2) Find the number which is, 49 more than 36

Solution:

36 + 49 = 85

3) Find the number which is 21 more than -89

Solution:

-89+21 = -68

4) Answer the Multiple choice questions

(i)The sum of 42 and -68 is

a) -110 (b) -26 (c) 110 (d) 26

(ii) (-47) + (-13) is equal to

a) 60 (b) 34 (c) -60 (d) -34

(iii)What is 5 more than 2?

a) 7 (b)-7 (c) 3 (d) -3

(iv) What is 7 less than -3?

a) 10 (b) -10 (c) 4 (d) -4

(v) Find the number which is 5 less than 5

a) 10 (b) -10 (c) 0 (d) None

Solution:

(i) b) -26

(ii) c) -60

(iii) a) 7

(iv) b) -10

(v)C 0

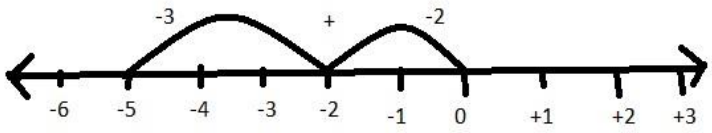
5. Using Number Line, find the sum of following integers:

a) -2 + (-3)

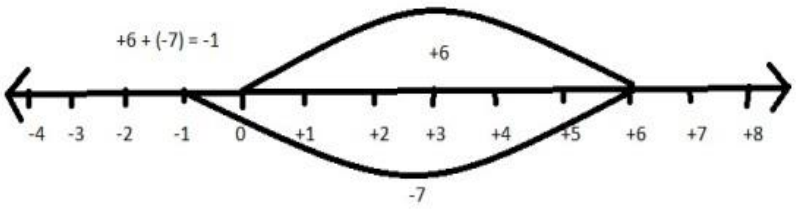
(b) +6 + (-7)

Solution:

a) (-2) + (-3) = -5



b) +6 + (-7) = -1



6. Complete the table

+	-3	-2	-1	+1	+2	+3
-3						
-2						
-1						
+1						
+2						
+3						

From the above table list 2 pair of integers whose sum is zero.

Solution:

+	-3	-2	-1	+1	+2	+3
-3	-6	-5	-4	-2	-1	0
-2	-5	-4	-3	-1	0	+1
-1	-4	-3	-2	0	+1	+2
+1	-2	-1	0	+2	+3	+4
+2	-1	0	+1	+3	+4	+5
+3	0	+1	+2	+4	+5	+6

Pair of Integers (-3, +3) ,(-2, +2)...

Image Source: All images are original : girijashankeran@yahoo.com

Time to teach	Asset Type	Theme	SubTheme
20 Minutes	Assessments	Integers	Integers on number line, Integers on number line

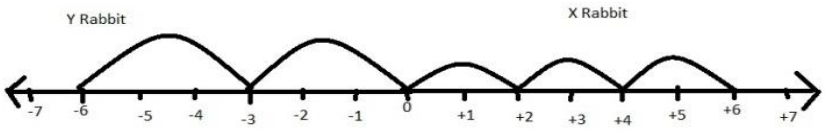
12. MS_Additive Opposites

Additive Opposites

Suppose two rabbits X and Y jump along a number line (like) on the opposite sides of 0. Rabbit X jumps 2 steps 3 times to the right of 0 and Rabbit Y jumps 3 steps 2 times to the left of 0 as shown in the figure below. Where will both of them stand on the number line? Are they at equal distance from 0?

RABBIT Y

RABBIT X



Clearly, the rabbit X stands at 6 and the rabbit Y stands at −6 on the number line. The distance from 0 to 6 on the number line is 6 units and the distance from 0 to −6 on the number line is also 6 units. The numbers 6 and −6 are at the same distance from 0 of the number line. That is, the rabbits X and Y stand at the same distance from 0, but in opposite directions.

Here, 6 and −6 are ***opposite*** to each other. That is, two numbers that are at the same distance from 0 on the number line, but are on the opposite sides of it, are ***opposite*** to each other. For every positive integer, there is a corresponding negative integer and vice versa.

Hence the opposite of every integer is called **Additive inverse**. Since Zero is neutral it does not have opposite.

Additive Identity

Here, we learn about a special property satisfied by the number “zero”

Observe the following:

a) 2 + 3 = 5

b) 3 + 4 = 7

c) 2 + (-3) = -1

d) 2 + (-9) = - 7

Here, we observe that when a number (any) is added to the number two, the number two loses its identity and we get a new number.

Whereas, 2 + 0 = 2

This shows that the number "zero" when '**added'** to any number does not change the identity of the number, i.e., the number retains its identity.
Therefore, the number "zero" is referred to as "additive identity".

When two numbers are added to each other and the resulting number is "0" then each number is called the "additive inverse" of the other.

Image Source:

Image of Rabbit-
http://www.publicdomainfiles.com/show_file.php?id=13953948019519

Time to teach	Asset Type	Theme	SubTheme
10 Minutes	Main Script	Integers	Integer & Additive inverse, Integer & Additive inverse

13. MS_Integers - Subtraction

Subtraction of Integers

Teacher should revise the concept of opposite/additive inverse of an integer before teaching the concept of subtraction of integers.

- The opposite of +5 is -5
- Opposite of +55 is -55
- Opposite of -1 is +1

Rules to be followed while performing subtraction of integers.

- Keep the first number exactly the same along with the sign
- Change the subtraction sign to an addition sign
- Change the sign of the second number to the opposite sign (Example if it is -4 then it is +4 , if it is -2 then it is +2)
- After this, follow the rules of Addition

Examples:

a. (+5) - (+12)

(+5) + (-12) = -7 (Rule of adding one positive and negative integer is subtract the absolute value of two integers and give the greater number sign)

b. (-7) - (-8)

(-7) + (+8) = +1 (Rule of adding one positive and negative integer is subtract the absolute value of two integers and give the greater number sign)

c. (+24) - (-21)

(+24) + (+21) = +45 (Rule of adding two positive integers is positive)

d. (-12) - (+6)

(-12) + (-6) = -18 (Rule of adding two negative integers is to add integers and give the negative sign)

Number line representation:

While representing Addition of Integers on Number Line,

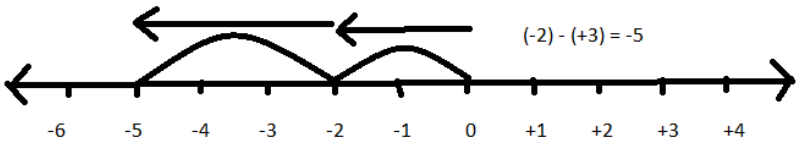
- Positive integers will be moved to the right of the first number
- Negative integers will be moved to the left of the first number

But in Subtraction.

- Positive integers will be moved to the left of the first number
- Negative integers will be moved to the right of the first number

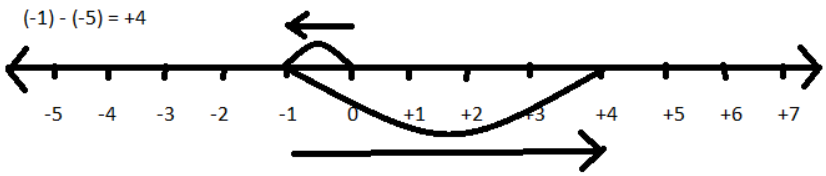
Examples

1) (-2) - (+3) = -5



+3 units in subtraction is 3 units to the left of -2 = -5.

2) (-1) - (-5) = +4



-5 units in subtraction is 5 units right side of -1= +4

3) (+4) - (+5) = -1

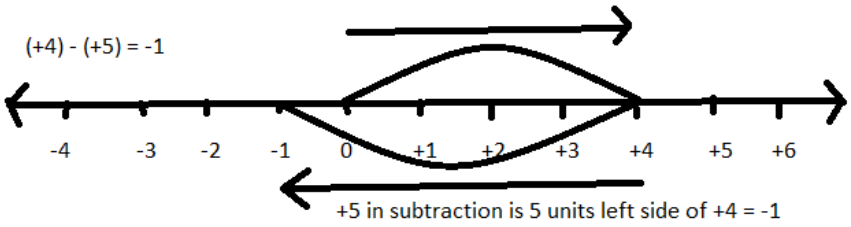


Image Source:

Original contribution by **girijashankeran@yahoo.com**

Time to teach	Asset Type	Theme	SubTheme
20 Minutes	Main Script	Integers	Addition & Subtraction of integers on number line, Addition & Subtraction of integers on number line

14. SA_Activity on Integers

Activity 1

Aim: To demonstrate the addition of integers using coloured buttons

Type of Activity: **Individual**

Setting of Activity: **Classroom**

Materials Required:

Two different coloured buttons of 10 each (say grey and orange coloured), ¼ chart, fevicol

Procedure:

Step 1:

- Let each grey coloured button represent + 1
- Let each orange coloured button represent – 1
- We know that (+1) + (-1) = 0, thus each grey coloured button cancels an orange coloured button

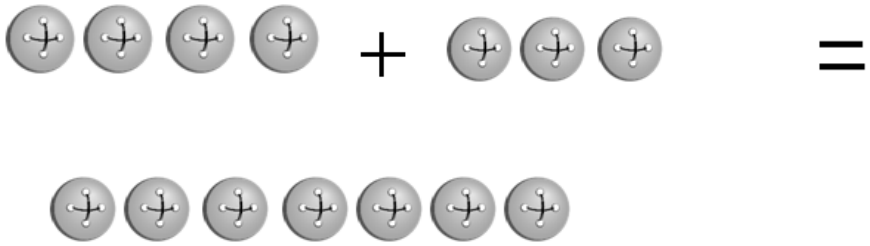
Step 2: Let us add (-3) and (+2)

Take 3 orange coloured buttons and 2 grey coloured buttons and paste them on a white sheet of chart. (Two grey coloured buttons will get cancelled with 2 orange coloured buttons leaving 1 orange coloured button, which represents negative integer -1. We get total of -1, which is orange coloured button)

Thus (-3) + (2) = -1

Step 3: Let us add (+4) and (+3)

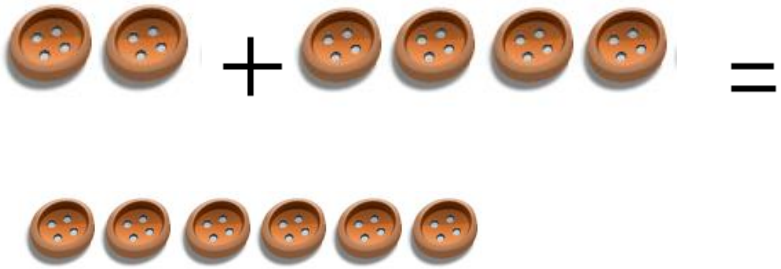
Take 4 grey buttons and 3 more grey coloured buttons and paste them on the chart. We get a total of 7 grey coloured buttons.



Thus (+4) + (+3) = + 7

Step 4: Let us add (-2) and (-4)

Take 2 orange buttons and 4 more orange coloured buttons and paste them on the chart



We get a total of 6 orange coloured buttons.

Thus, (-2) + (-4) = (-6)

Observation: Children will learn how to do the addition of integers.

Activity 2

Integer Subtraction

Aim: To understand the concept of subtraction of integers.

Type of Activity: Individual

Setting of Activity: Classroom

Materials Needed: Two coloured buttons of 10 each, ¼ chart, fevicol

Procedure:

Step1: Two days before the activity, the teacher will explain subtraction of a number, is same as adding the additive inverse of the number

E.g. 1) 5 – (+3)

We are subtracting +3 from 5

Additive inverse of +3 is -3

Thus subtracting +3 from 5 is same as adding -3 to 5

5 – (+3) = 5 + (-3)

Similarly,

2) -7 – (-4) = -7 + (+4) (add +4, additive inverse of -4 to -7)

3) 10 – (+6) = 10 + (-6)

4) 8 – (-5) = 8 + (+5)

5) -17-(+4) = -17 + (-4)

Step 2: Let each grey colour button represent + 1

Let each orange colour button represent – 1

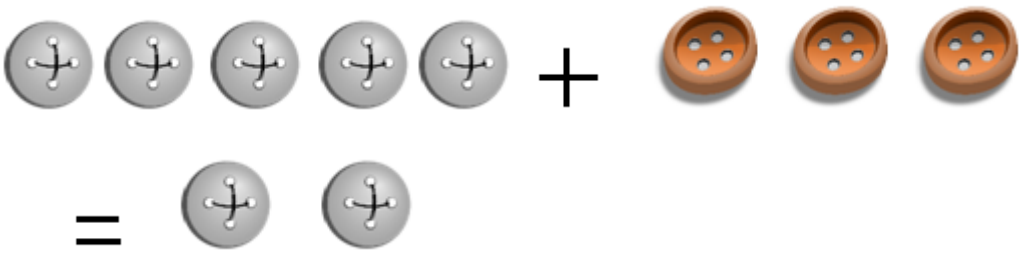
Thus each grey colored button cancels an orange colored button

Step3: Let us subtract +3 from 5

To find 5 - (+3)

5 - (+3) = 5 + (-3)

To find 5 + (-3) teacher will ask the children to take 5 buttons of grey colour and 3 buttons of orange colour and paste them on the chart



Two grey buttons is equivalent to +2

Thus, 5 - (+3) = 5 + (-3) = +2

Step 4: Let us subtract -4 from -6

To find -6 – (-4)

We have -6 – (-4) = -6 + (+4)

To find -6 + (+4) teacher will ask the children to take 6 buttons of orange colour and 4 buttons of grey colour and paste it on the chart

Two orange buttons is equivalent to -2

Thus -6 – (-4) = -6 + (+4) = -2

Conclusion: Children will understand subtraction of integers in an easy manner.

Image source:

https://pixabay.com/vectors/button-gray-clothes-sewing-thread-162132/

https://pixabay.com/vectors/button-clothing-fashion-design-159444/

Time to teach	Asset Type	Theme	SubTheme
20 Minutes	Suggested Activity	Integers	Addition & Subtraction of integers on number line, Addition & Subtraction of integers on number line

15. QA_Practice Sheet

I. Fill up the blanks with a suitable number:

a) Identify the smallest integer:

i) – 21, -2, - 5, 7, 8, 23, -15 ----------

ii) – 37, - 8, 7, - 19, 4, 2, -11 ----------

b) Identify the biggest integer:

i) - 3, 4, - 7, 8, 0, - 11, - 21, 46

ii) 23, - 37, 14, 0, -8, 9, - 19, 16, -43

Solution:

a) (i) -21 (ii) -37

b) (i) 46 (ii) 23

II. Answer the following

a) Find additive inverse of the following:

3, -6, 46, 78, -26

b) Find the sum of 26 and additive inverse of 27.

c) If additive inverse of 17 is subtracted from 48, what number do you get?

d) Consider the number 35 on the number line. Move to the right by 3 places and then move to the right by 7 places. Now move to the left by 11 places. What is the final number?

Solution:

II. a) -3, +6, -46, -78, +26.

b) 26 + (-27) = -1

c) 48 - (-17) = 65

d) 35 + 3 + 7 -11 = 34

III Subtract

a) 549 – (-306)

b)549 – 504

c) -549 – (-210)

Solution:

1) 855 (2) 45 (3) -339

IV. Evaluate

a) The sum of two integers is -337. If one of them is 250, find the other

b) 250 + (-130) – 50

c) 280 + (-150) – (-110)

Solution:

a. ---- + 250 = -337

adding -250 to both sides,

---- + 250 – 250 = -337 - 250

---- + 0 = -587

------ = -587

The number is -587

(b) 70

(c) 240

V. a) A man gained Rs.1, 500 in one transaction and lost Rs.1, 756 in another transaction. What was his final gain or loss?

b) From the sum of -38 and -12, subtract -18

Solution:

a) Gain =+1500 Loss = -1756

Final gain or loss = 1500 – 1756 = -256

There is a loss of Rs 256

(b) (-38) + (-12) - (-18) = (-50) - (-18) = -32

Time to teach	Asset Type	Theme	SubTheme
20 Minutes	Assessments	Integers	Integer & Additive inverse, Integer & Additive inverse

16. VC_Keep Good Company and Become Good

When one positive and one negative integer are added, we subtract them and put the sign of the bigger integer. [e.g. (+4) + (–3) = + 1 and (–4) + (+ 3) = – 1].

Note that association of a positive integer with a smaller negative integer has resulted in a positive integer and association of a higher negative integer with a positive integer has resulted in a negative integer.

Similarly in this world, when you make friendship only with good people, your positive value will go up because the good people's good qualities will rub off on you. On the other hand, if we are with negative people all the time, gradually we will find ourselves becoming just like them. Even if we want to maintain a positive outlook, it would be a difficult task in such situations.

It is said, "As is your company, so you become." The people around us affect the way we live our life.

Group Activity:

Materials required:

1) A plain paper / tissue paper

2) A paper in which jasmine flower was wrapped and kept over night

3) A paper in which Samosa / any good smelling food wrapped and kept over night

4) A paper in which any bad smelling item / any rotten fish / food wrapped and kept over night

Procedure:

1. Pass the first paper around and ask them if the paper has any aroma / smell

Elicit the answers

2. Pass the 2 nd and 3rd papers and ask them to identify the smell and how it smelt. Good or bad?

3. Finally pass the last paper and ask them to identify the smell and how it smelt. Good or bad?

Elicit which paper they liked. Paper that smelt good or the one that smelt bad?

To be explained by the teacher

A piece of plain paper does not have an aroma of its own. But if the same paper is used to pack Samosa or dry fish or jasmine flowers, it picks up the smell associated with them.

However good we are (like the plain paper), we acquire good or bad qualities by our respective association. If we ever do a bad act that ruins our name due to bad association (like the smelly paper), it will be very difficult to get a good name from society again. It takes years to build a good name but can take just a moment to get a bad name.

We can remove the blemish from our names only through the filter of good company and repentance, making a promise never to repeat it again.

Vladimir Lenin, the great leader of Russia said – “Tell me who your friends are and I will tell you who you are”.

Children, always choose your friends carefully. Choose good people as friends so that your friendship can be mutually beneficial. Stay away from negative people.

Image source:

https://pixabay.com/illustrations/praying-men-five-religion-pray-1051079/

Chips: SSSVV Gallery-Keyword-snacks

Time to teach	Value Type	Value Sub Type	Value Attribute
5 Minutes	Truth	**Discrimination**	Group Activities

17. MS_Summary_Integers

- The difference between positive and negative integers is explained
- Integers, are described as collection of natural numbers, whole numbers and negative integers
- The uses of positive integers, negative integers and 0 in daily life are listed
- The meaning of negative temperature is explained by taking the example of temperature at the coldest part of India
- Representation of positive integers, negative integers and 0 on the number line is explained and similar examples are solved
- The comparison of integers is explained
- Examples related to comparison of integers, writing integers in ascending and descending orders are solved
- Addition of integers is explained using number line and related problems are solved
- Additive identity and additive inverses of integers are defined
- Subtraction of integers is explained using number line
- Addition and subtraction of integers are demonstrated in an activity
- Examples related to addition, subtraction and additive inverses of integers are solved
- The need to discriminate between the company of positive and negative people in real life is demonstrated in an activity

Time to teach	Asset Type	Theme	SubTheme
5 Minutes	Main Script	Integers	