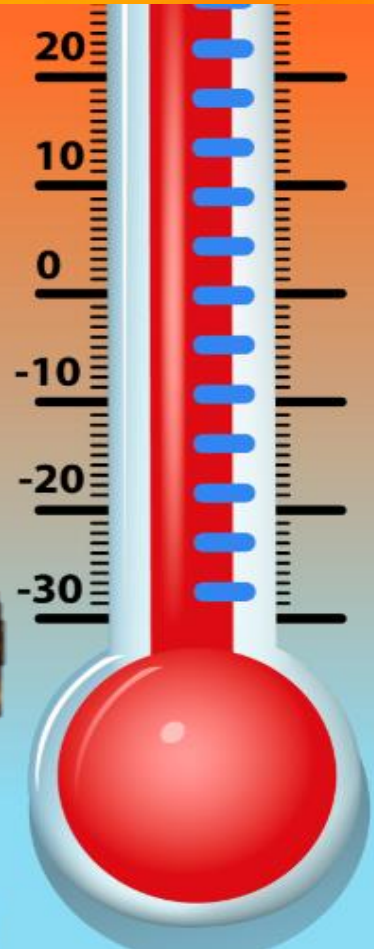
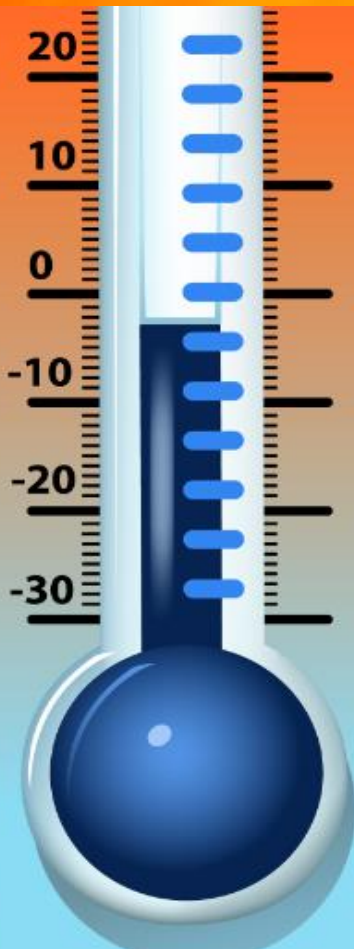


MATHEMATICS CLASSES 6 & 7 INTEGERS JOURNEY AROUND ZERO



Acknowledgement

We sincerely appreciate the endeavor of each team member who contributed their lot to stream line this dream project. We are grateful to their constant support and guidance.

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Disclaimer

This book is published as a reading material to enrich the students to have a better understanding of the concept of integers through the “Journey Around Zero”

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Preface

This enthralling graphic novel- Journey Around Zero will help our students to grab and comprehend the concept of positive and negative numbers. This topic usually haunts them but through this adventurous and interesting interaction they would be at ease to understand this topic. We intend to give our children a pleasant experience to enjoy Mathematics learning and shun their fear.



0756CH01



To access the comic book and additional interactive content, download DIKSHA app from Google Play Store on your Android smartphone or tablet. The QR code has to be scanned through DIKSHA app.

Learning Outcomes:

- To Familiarize students with negative numbers and introduce them the concept of integers on the basis of real-life situations.
- To represent integers on number line for determining their positions along with successor and predecessor.
- To enable students to order integers and compare them.
- To apply the rules of operations on integers.
- To apply the properties of four fundamental operations in order to devise methods for easier calculations.

STORY BOARD

INTEGERS

INTEGERS ON NUMBER LINE

RELATION OF INTEGERS WITH OTHER NUMBERS

OPERATIONS ON INTEGERS

PROPERTIES OF INTEGERS FOR VARIOUS OPERATIONS

CHARACTERS



Father of Children

An Engineer

Age 42 years

Personality Traits-

1. Intelligent
2. Smart
3. Cautious
4. Vigilant



Grandfather

-Ex Serviceman

Age 65 years

Personality Traits-

1. Affectionate
2. Caring
3. Family lover



Ria.....Age 14 years

Personality Traits-

Intelligent and Helping



Aman...Age 11 years

Personality Traits-

Curious and Active



Mother of Children

A Homemaker

Age 39 years

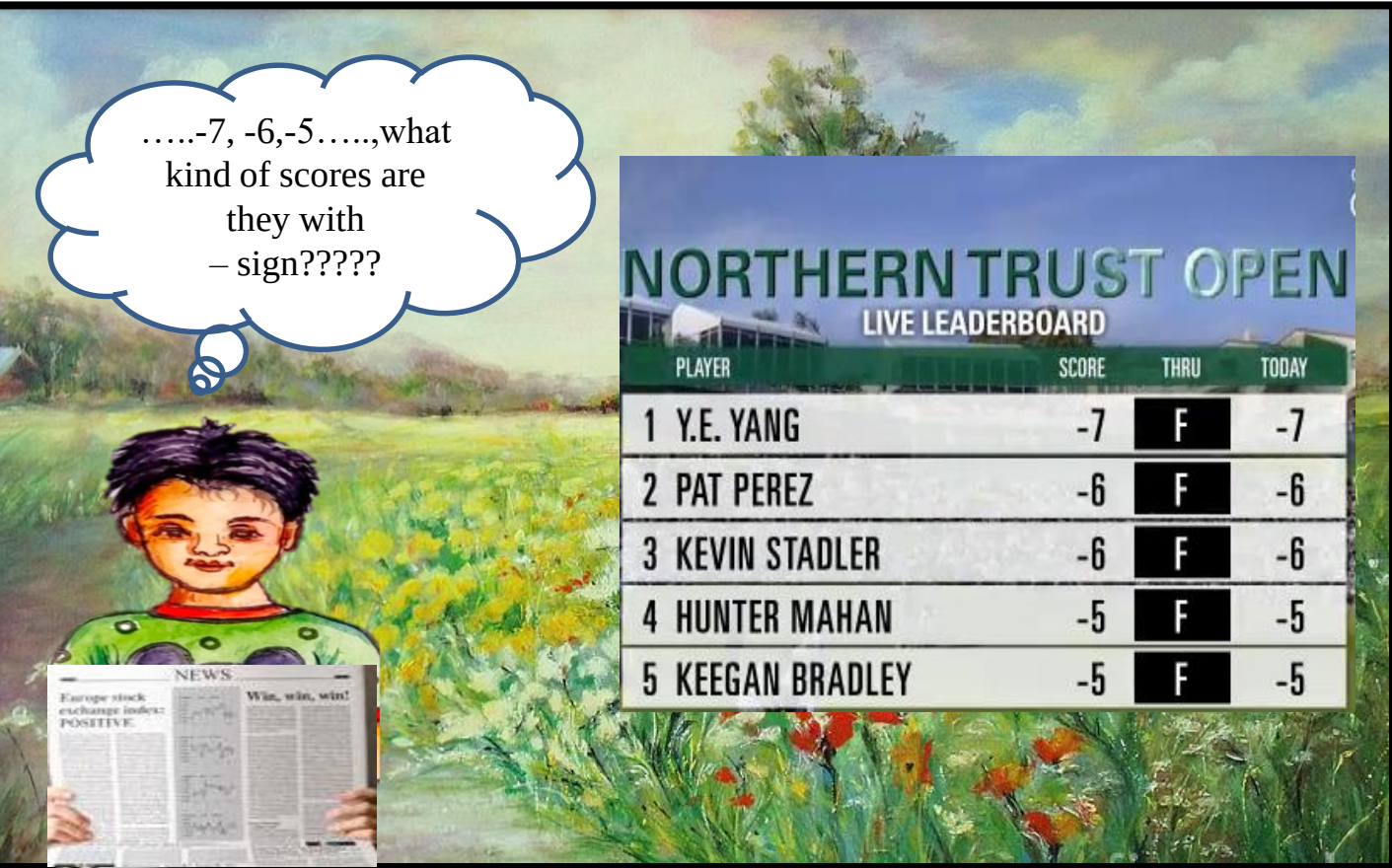
Personality Traits-

1. Skilled
2. Loving and Caring

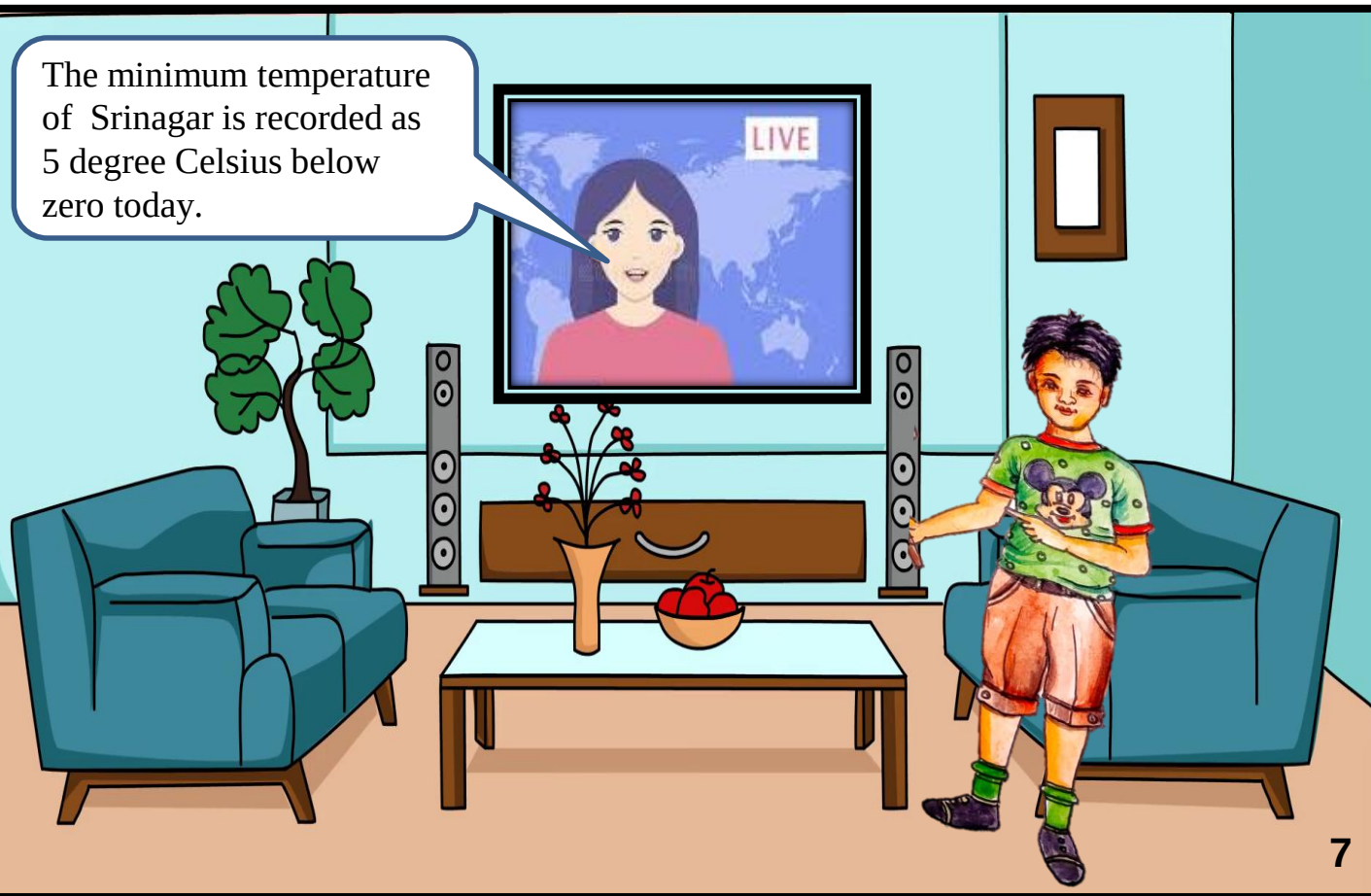
JOURNEY AROUND ZERO

S.NO	SITES	CONTENT COVERED	Page .No.
1.	Living Room	a) Introduction to integers b) Representation of terms in form of integers c) Opposite of numbers	7 to 13
2.	Garden Scene (Day time)	a) Application of integers (Below/Above sea level) b) Number Line c) Ordering of integers	15 to 18
3.	Dining Room	Introducing operations on integers	20-21
4.	Garden scene (Night)	Adding and subtracting integers	22 to 24
5.	Sea Beach	Multiplication and Division of integers	26 to 28
6.	Study Room	a) Closure Property for integers b) Commutative property	30 to 33
7.	Lift of shopping Mall	Application of integers (buttons in lift for moving to basement , ground, upper floor .	34 - 35
8.	Living room	a) Associative Law b) Multiplicative identity c) Additive identity d) Distributive Law e) Additive and Multiplicative inverse	35 to 39
9.	Study Room	Chart on properties of integers	40
10.		Check yourself Final Check Puzzle Time	14,19,25,29 41 42
11.		Answer Key	43- 45
12.		References	45

Aman was reading the newspaper in a garden. He saw a golf score table there. He was a little bit surprised:



When Aman entered the drawing room , weather forecast was being telecast on television. .He was surprised to hear the temperature .



Soon, His sister Ria entered the room and offered ice cream to Aman.

Let's enjoy the strawberry ice cream.

Wow! strawberry ice cream.....
But first I want to ask you something.

Yes! Aman what do you want to ask?

NORTHERN TRUST OPEN			
LIVE LEADERBOARD			
PLAYER	SCORE	THRU	TODAY
1 Y.E. YANG	-7	F	-7
2 PAT PEREZ	-6	F	-6
3 KEVIN STADLER	-6	F	-6
4 HUNTER MAHAN	-5	F	-5
5 KEEGAN BRADLEY	-5	F	-5

Today in newspaper ,I saw golf score as -7, -5,

.....and in the news, the news reader was telling the temperature of Srinagar is below zero degree Celsius.. In my wits, zero is the smallest number, but how is it possible to take anything below zero....?

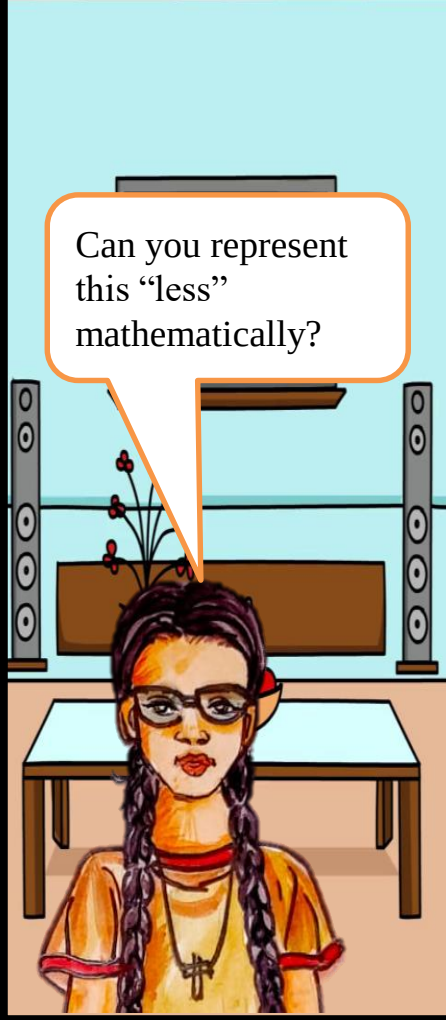
Aman, I will answer it but first tell me how many toffees do you have in your pocket?

I have four

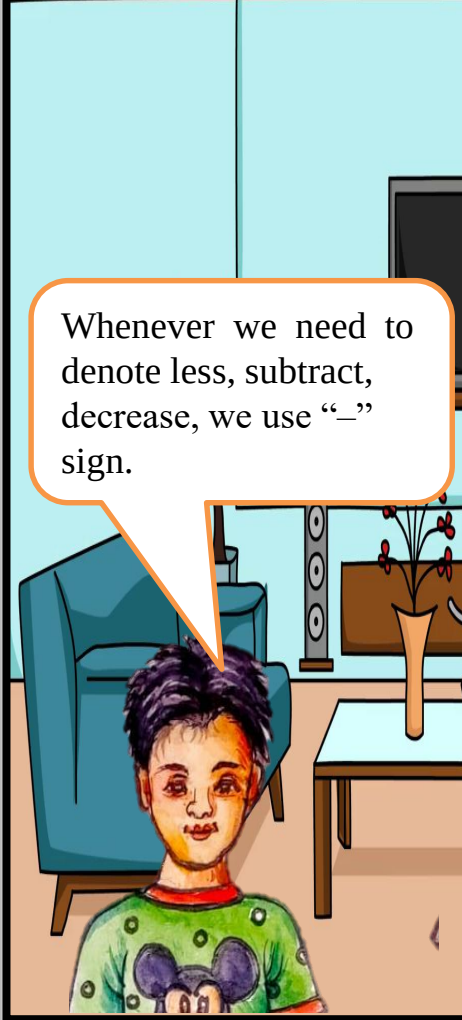
But I have six.

It means that you have two more.

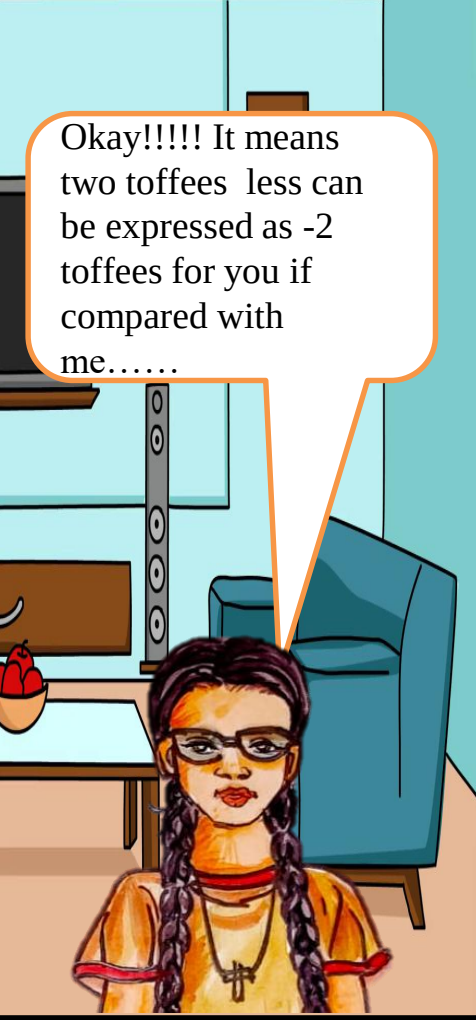
Yes, But It means you have two less too.



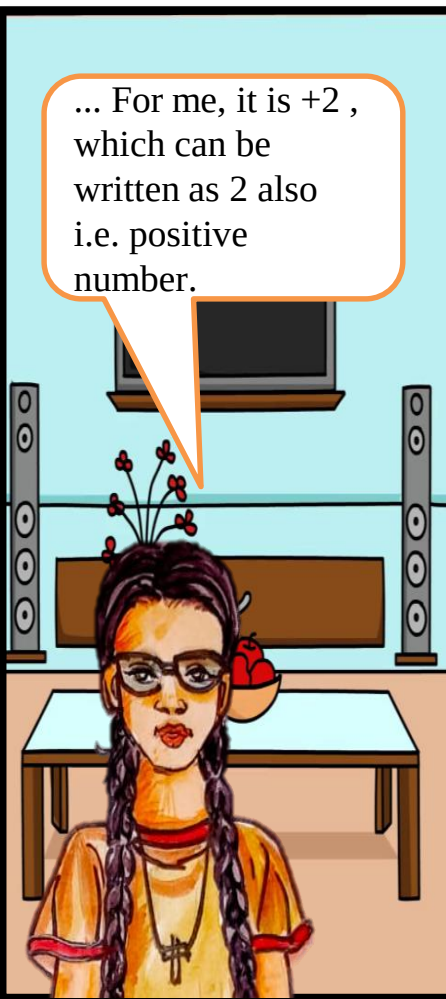
Can you represent this “less” mathematically?



Whenever we need to denote less, subtract, decrease, we use “-” sign.



Okay!!!! It means two toffees less can be expressed as -2 toffees for you if compared with me.....



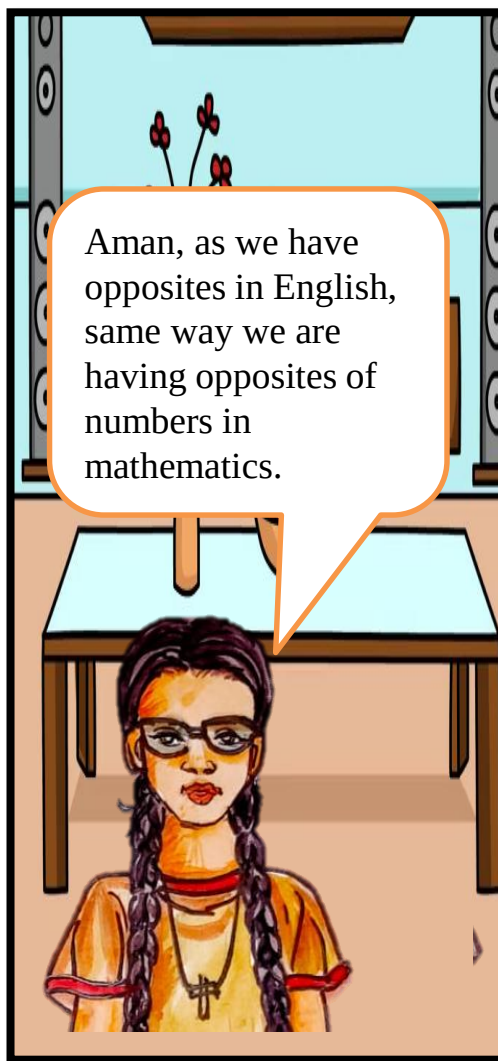
... For me, it is +2 , which can be written as 2 also i.e. positive number.



Okay! It’s really interesting.

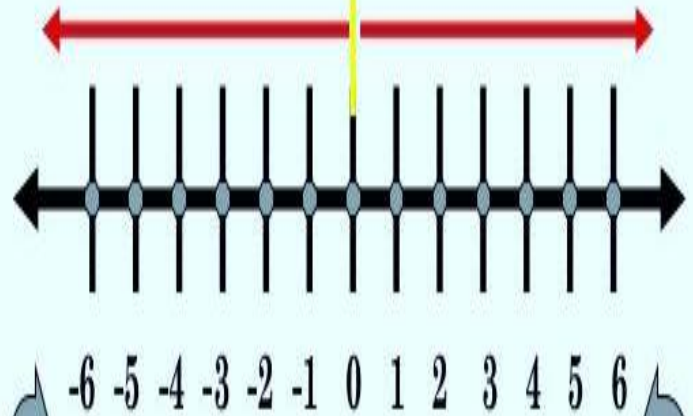


It means if we want to show increase, more ,above, gain etc. they will be expressed with “+” sign.



	POSITIVE	NEGATIVE
DISTANCE	Forward	Backward
TEMPERATURE	Above 0 degree	Below 0 degree
BUSINESS	Gain	Loss or Deficit
VERTICAL DISTANCE	Up	Down
BANK ACCOUNT	Deposit	Withdrawal
ACCELERATION	Accelerate	Decelerate

No, No.....Let's understand it again. If I say opposite of 1 is -1 then it also means opposite of -1 is 1. Opposite of 20 is -20 and of -9 is 9 etc.



Negative numbers are written with a (-) sign

zero is neither negative nor positive

Positive numbers can be written with a (+) sign (but not usually)

But I have never learnt these numbers before. I have only heard about whole numbers' family and natural numbers' family.

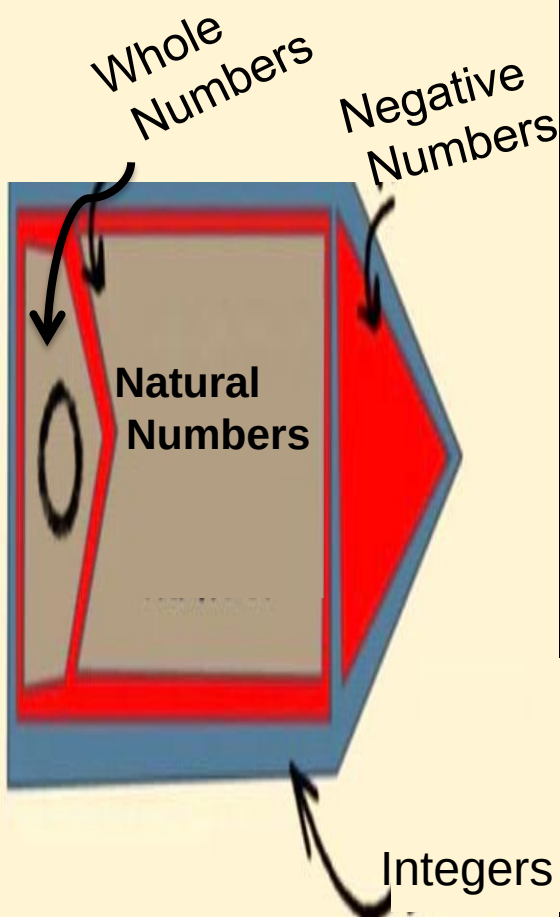
The numbers with their opposites, along with zero live in a family known as 'integers'.

Then what is the opposite of zero? I guess it is -0 .

Buddy, Zero has no opposite as it values nothing itself.

It means the natural numbers with their opposites and zero live in a family known as integers.

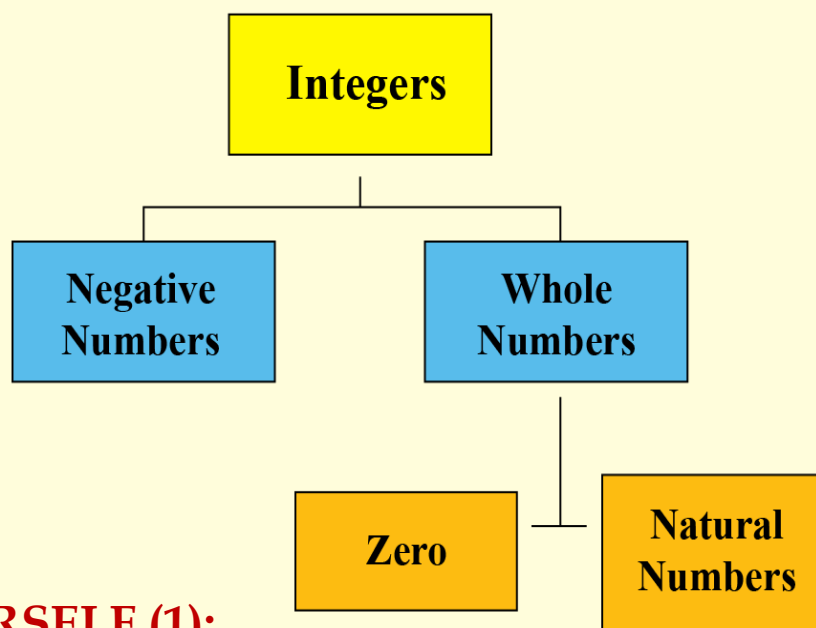
Now you got it , Aman all-natural numbers and whole numbers are integers.



Oh! That's interesting, let's go to play now.

Let's Recall

1. The numbers.... $-4, -3, -2, -1, 0, 1, 2, 3, 4, \dots$ are integers.
2. All natural numbers, Zero and negative of natural numbers together form integers.
3. Zero is an integer which is neither positive nor negative.



CHECK YOURSELF (1):
Match the following:

Column A	Column B
(a) 10 steps to the right of zero	(p) Rs. -1000
(b) 10 km below sea level	(q) Rs.1000
(c) Deposit Rs. 1000 in a bank	(r) 10
(d) Spending Rs. 1000	(s) -10 km

A colorful illustration of a family in a garden. Aman is perched high in a large green tree on the left. His father, wearing a blue shirt and tan pants, stands with arms crossed in the center. His mother, in a blue and red sari, stands to the right. Ria, wearing glasses and an orange shirt, is in a small blue pool in the foreground. The garden features a wooden fence, purple flowers, and a large red mushroom.

Look mummy! I am on the tree. Didi! Will you come here?

Be Careful! it is 4 metre high, don't hurt yourself, I will be back soon after shopping. Have Fun!

A vertical illustration showing the mother in her blue and red sari standing near a wooden fence. Ria is in the blue pool in the foreground, looking up.

Okay, as you wish

Aman, now I will dive into the pool

After some time, Ria and Aman with their father in the garden.



Look! I was at a greater height than you.



No, I was at the same depth.

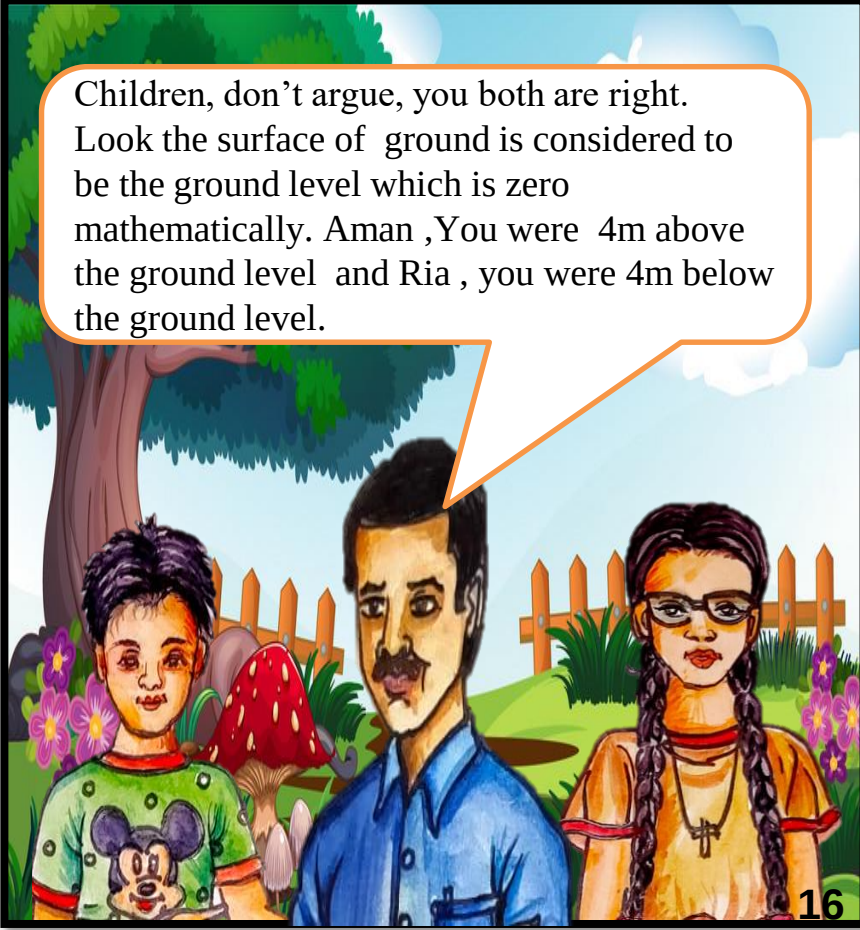


No, I was at a more adventurous place.



I was equally at the adventure.

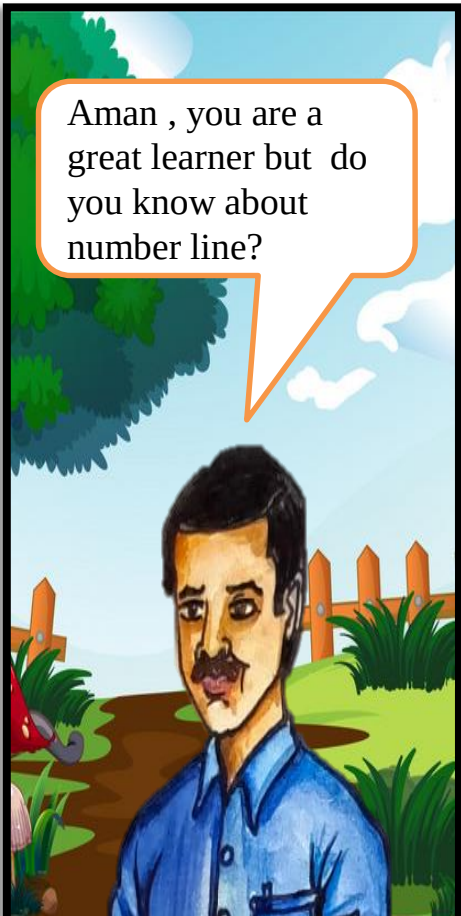
Before the argument takes the shape of quarrel, father interrupts.



Children, don't argue, you both are right. Look the surface of ground is considered to be the ground level which is zero mathematically. Aman ,You were 4m above the ground level and Ria , you were 4m below the ground level.



It means $+4m$ and $-4m$.



Aman, you are a great learner but do you know about number line?



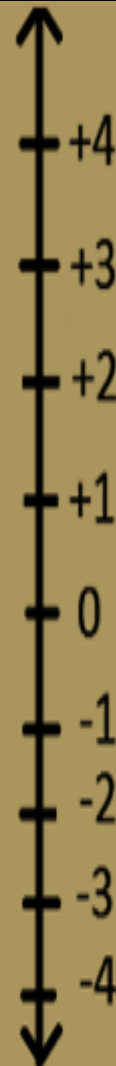
What is that daddy?



Look this ground level is zero, from here if you go upwards it's positive and when you go downwards it's negative.



GROUND LEVEL

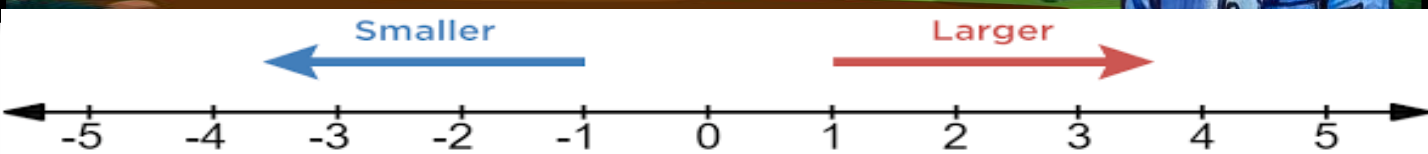


See the positive numbers are at equal distance from zero as negative numbers are, only they are in opposite direction on number line.

Yes, Right side of zero, there are positive numbers and left side of zero, there are negative numbers. Do you know which is greater 3 or -3 ?

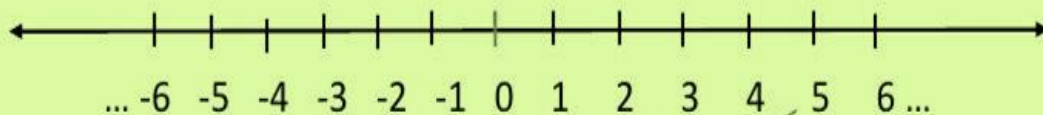
Yes, 3 is greater as you told me that increase, more etc. are shown by positive sign.

Aman you are right, but remember that all negative numbers are less than zero. As we move towards left of zero continuously, the number's value decreases and towards right, it increases.



Points to be noted.....

- ❖ The Absolute Value of a number is always a positive number. The absolute value of " x " is written as $|x|$.
- ❖ Example : $|5| = 5$ and $|-5| = 5$
- ❖ The Absolute Value can be described as the distance from zero on a number line. 5 and -5 are both 5 units away from zero on the number line.



REMEMBER.....

- ❖ Zero is less than every positive integer and greater than every negative integer.
- ❖ All negative numbers are less than zero. As we move towards left of zero continuously, the number's value decreases and towards right, it increases.

CHECK YOURSELF (2)

I .Fill in the blanks by $<$ or $>$ to make the statement true:

(i) 3 _____ 0

(v) 5 _____ -1

(ii) 0 _____ -8

(vi) -13 _____ 0

(iii) -9 _____ -3

(vii) -8 _____ -18

(iv) -3 _____ 3

(viii) 516 _____ -316

II. In each case, arrange the given integers in ascending order:

(i) $-8, 0, -5, 5, 4, -1$

(ii) $3, -3, 4, -7, 0, -6, 2$

(iii) $-1, -7, 8, -3, 0, 3, 17$

(iv) $15, 19, -10, -7, 6, -6$

III. On number line I am on (-10) now. I take 3 steps in a jump. After 5 jumps towards right direction where will I reach?



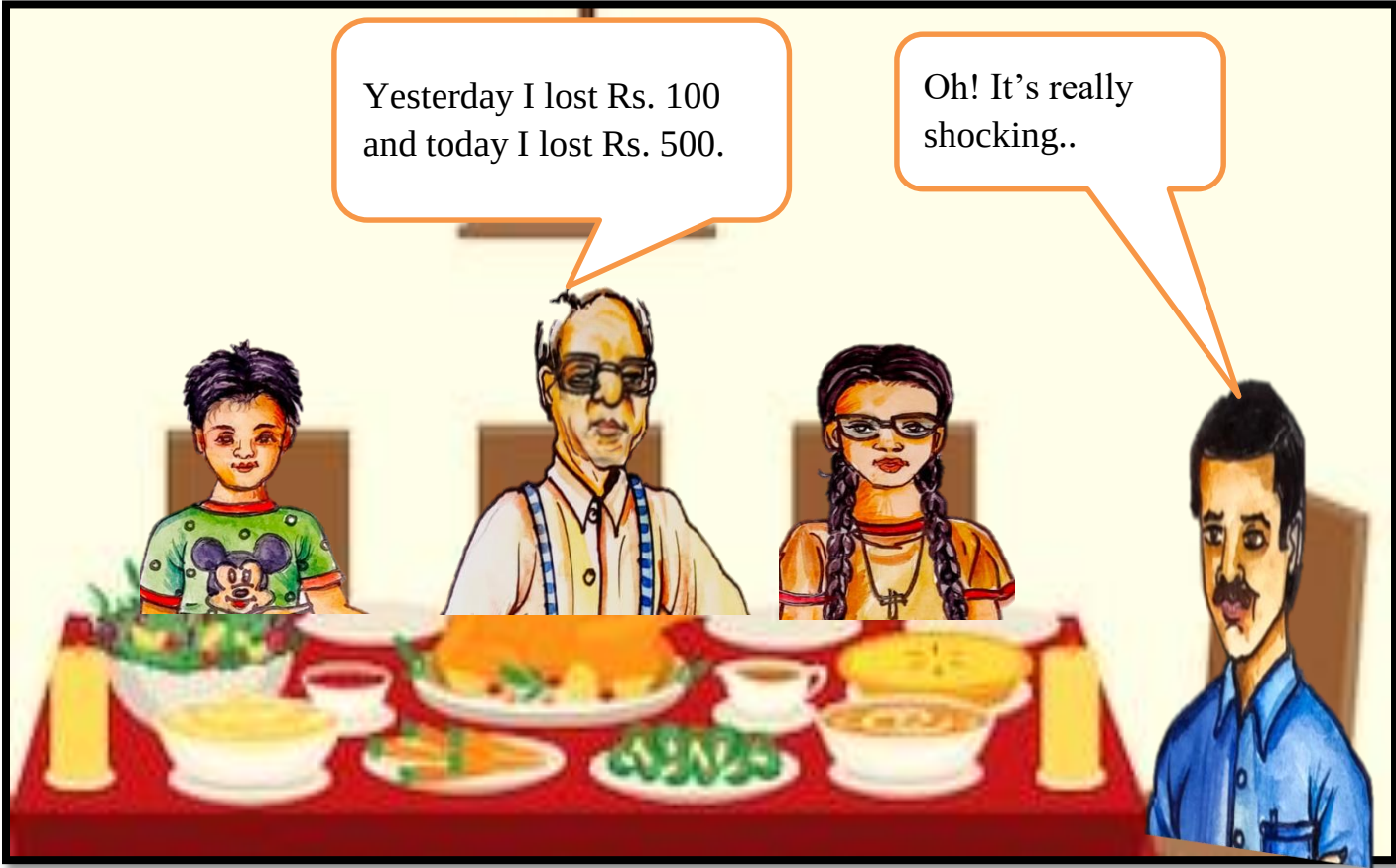
IV. What comes next:

$12, 9, 6, 3, \dots, \dots, \dots$

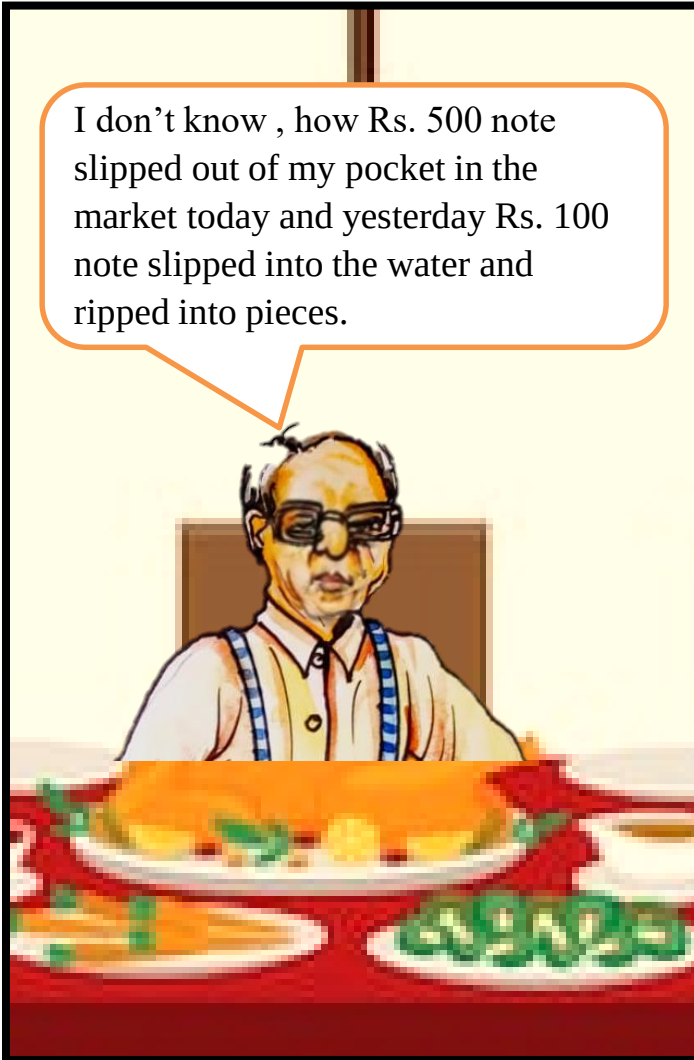
Family at the dining table

Yesterday I lost Rs. 100
and today I lost Rs. 500.

Oh! It's really
shocking..



I don't know , how Rs. 500 note
slipped out of my pocket in the
market today and yesterday Rs. 100
note slipped into the water and
ripped into pieces.



Oh that's sad Dadaji, It means
you lost Rs. 600 in all.



Aman, can you show it mathematically?



Yes, it's (-Rs.600) from Dadaji's pocket.



Okay, we will discuss after having dinner.



In the garden ,after Dinner.....

Look Aman, we can write it as
 $(-100) + (-500) = (-600)$



It's really interesting. Negative numbers are added otherwise we generally subtract when it's negative sign.



Aman, do you know that 4 can be subtracted from 1 mathematically.



How is it possible?



See $1 - 4 = -3$, First you take 1 step towards right from Zero, So you will be at 1, From there you come back 4 steps, you will find yourself at 3 steps left to Zero i.e. -3.



$$1 - 4 = -3$$



Really very interesting.



Look Aman, integers are added and subtracted in a little bit different manner.



Aman, can you answer $8 + (-9)$ now?

No Didi,
Please explain.



Look Aman, When we add one positive and one negative integer, we always subtract and consider the absolute values for putting the sign in the final answer.



Okay Didi , I understand, $8 + (-9) = -1$, Let's go to sleep, but.....how to subtract -2 from -4?



Aman it's $-4 - (-2)$, Now you see $- (-2)$ means opposite of -2 that is +2, So it becomes $-4 + 2$, Now you tell the result.



Oh it's -2. Didi I am feeling sleepy now, let's sleep, Good Night.



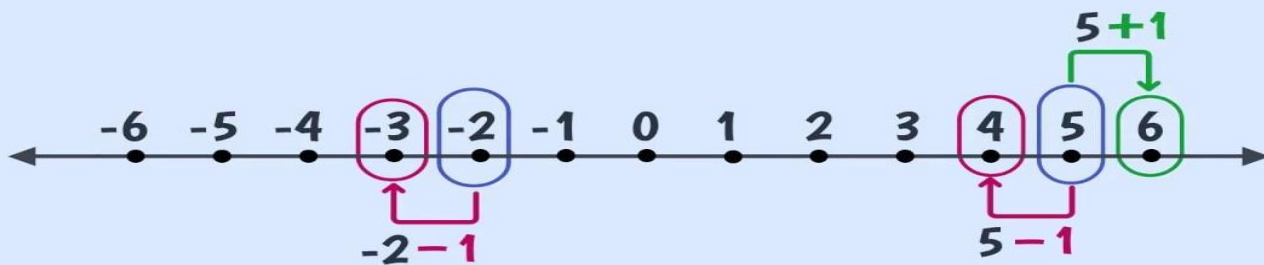
YOU SHOULD ALSO KNOW THIS

Predecessor

Number -1

Successor

Number $+1$



- **Predecessor** of an integer is the integer which is one step left to the integer on number line.

OR

We can say it is one less than the integer.

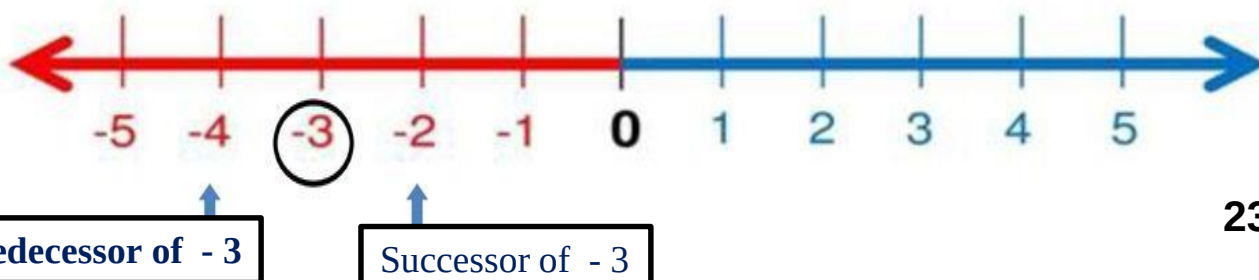
For example : Predecessor of integer -3 is -4

- **Successor** of an integer is the integer which is one step right to the integer on number line.

OR

We can say it is one more than the integer.

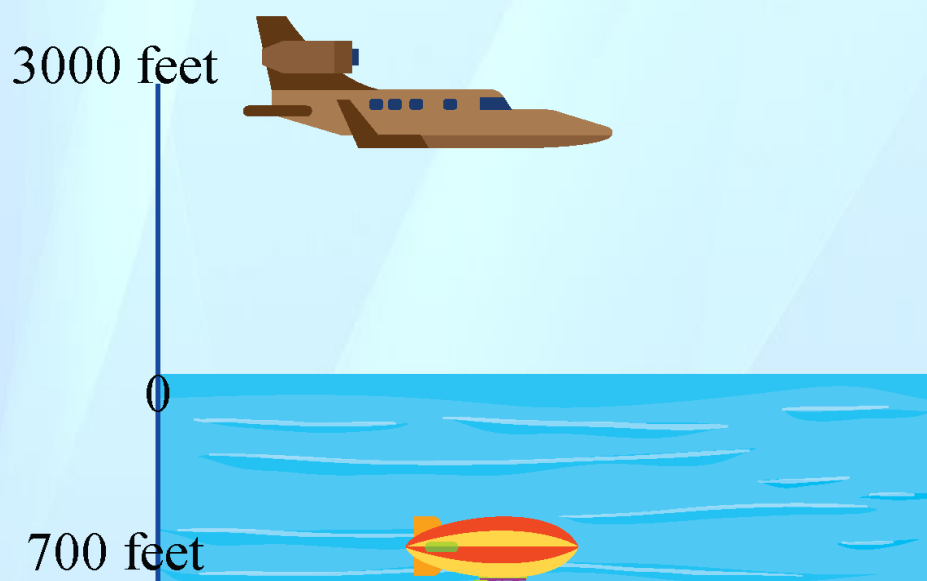
For example : Successor of integer -3 is -2



LET'S UNDERSTAND....

- ❖ To add two integers with like signs we add the numerical values and give the sign of the addends to the sum.
- ❖ To add two integers with unlike signs, we take the difference of their numerical values and give the sign of the integer having the greater value to the difference.

Example: A plane is flying at the height of 3000 feet above sea level. At some point, it is exactly above the submarine floating 700 feet below sea level. What is the vertical distance between them?



Solution:

The height at which the plane is flying = 3000 feet

The level of the submarine = -700 feet

(Negative, as it is below the sea level)

To calculate the vertical distance between them, we will use the subtraction of two integers:

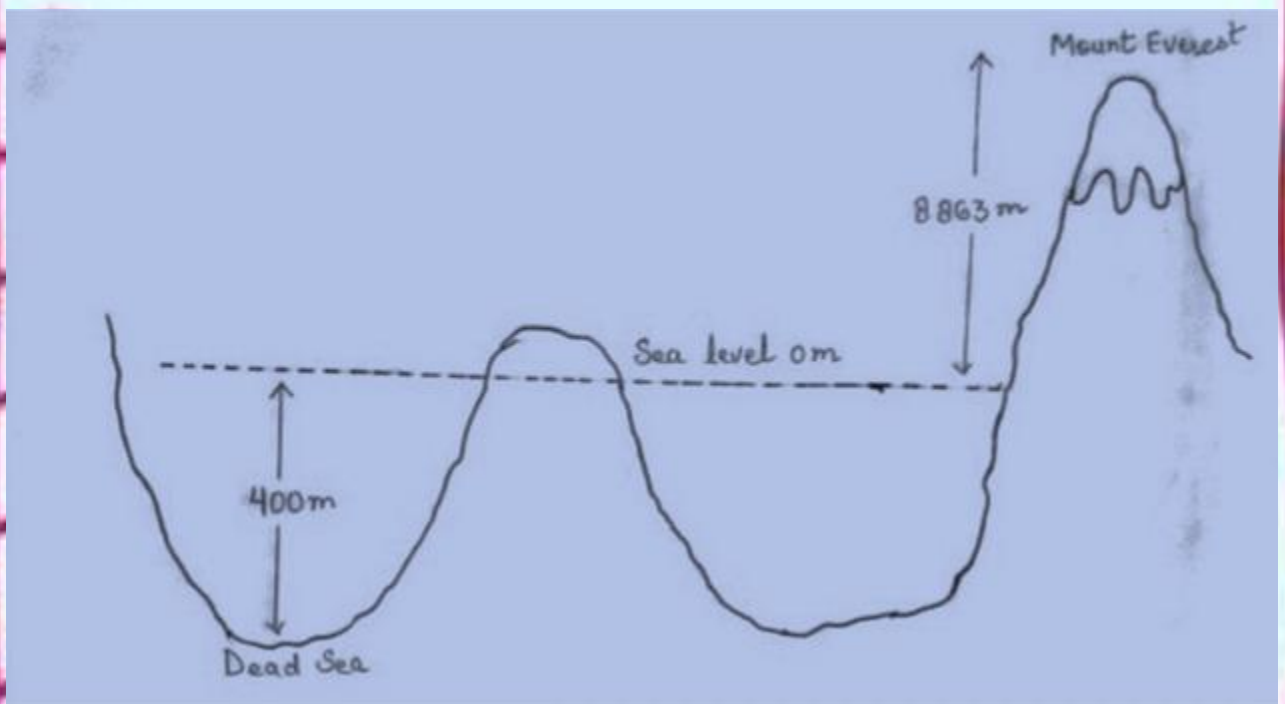
$$3000 - (-700) = 3000 + 700 = 3700 \text{ feet}$$

Hence, the vertical distance between them = 3700 feet

∴ Vertical distance between plane and submarine is 3700 feet.

CHECK YOURSELF 3

1. The temperature of a city is 4°C . Next day the temperature falls by 5°C . What is the temperature of the city next day?
2. Sapna climb up 10 stairs . Then she came down 7 stairs again moved 5 stairs up. What is her position now ?
3. John's golf score was -4 and Taylor's score was -2 . What was the difference between the two golf scores ?
4. A carrot has grown 5 inches above the ground and goes 6 inches below the ground . How tall is the whole carrot plant ?
5. See the following figure and write the Mount Everest and Dead Sea elevation as an integer. Also find the vertical distance between their extreme top and bottom points.



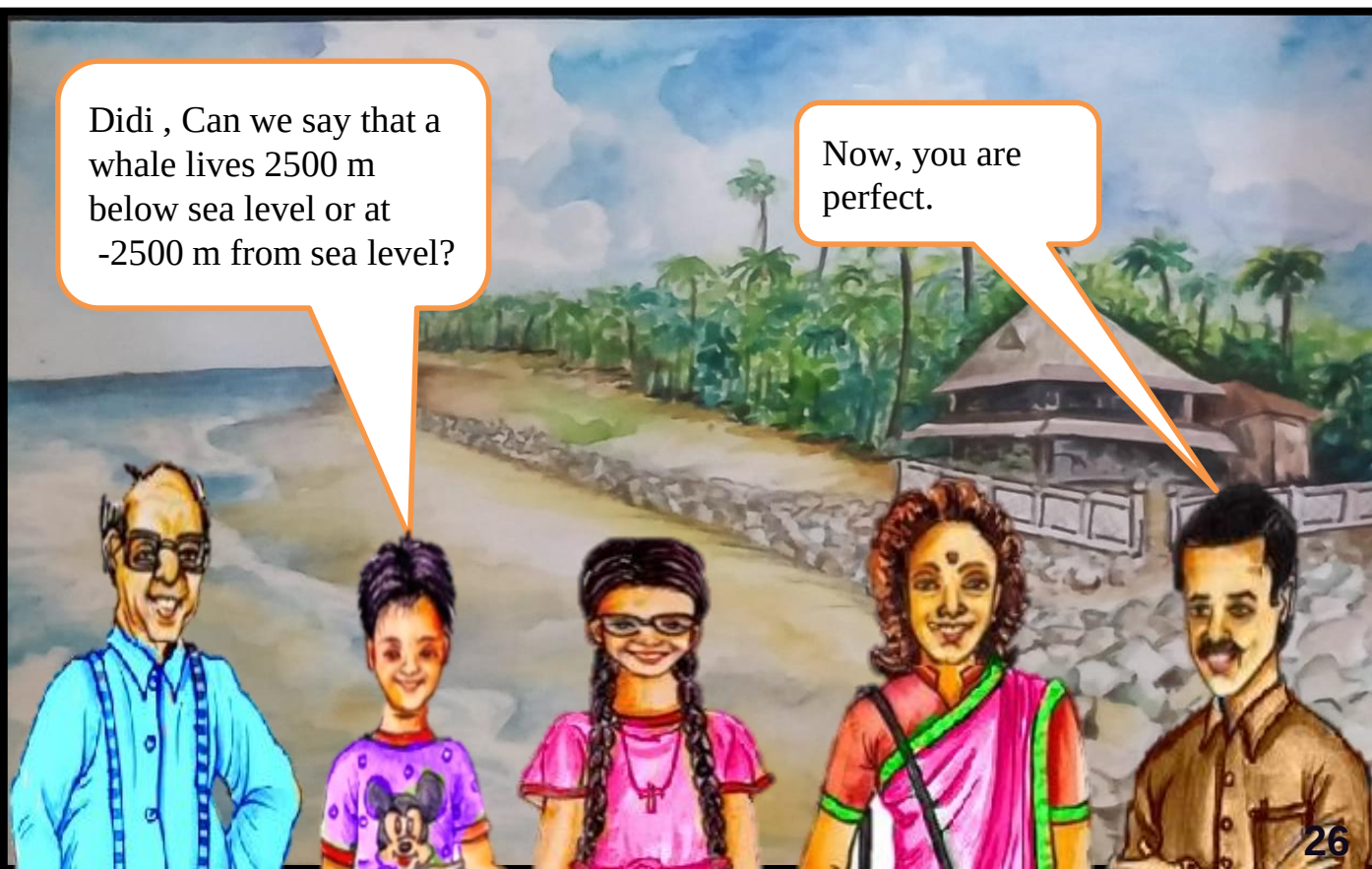


Children let's go for a walk on the sea beach.

Oh! Daddy, it will be great fun.

Wow ! Let's take Mummy and Dadaji too.

At the Sea Beach



Didi , Can we say that a whale lives 2500 m below sea level or at -2500 m from sea level?

Now, you are perfect.

But Daddy can we multiply and divide integers?

Yes ! Of course

Aman! Teach me this too afterwards.

Aman, What is the result of 2×3 ?

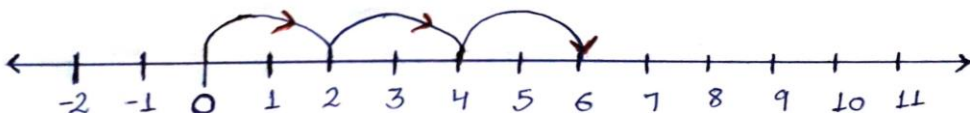
6

And what about $2 \times (-3)$?

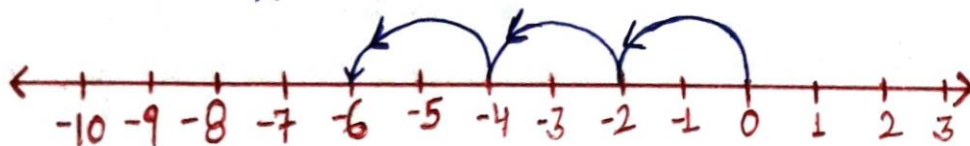
???

It will be - 6

$$2 \times 3 = 6$$



$$2 \times (-3) = -6$$



So, if it is $(-2) \times (-3)$, then it will be -6.

No , Aman when we multiply two negative signs , they become positive, Look negative of negative is positive, like $-(-2) = +2$, so $(-2) \times (-3) = 6$.

And If you divide a negative number by positive and positive by negative, you will get negative result but if you divide a negative number by negative, you will get positive result.

Didi, will (-50) divided by (-10) give 5 ?

Yes Aman, You are right.

So now I am the champion of learning integers.

Yes, to a certain extent.....
.Ha!Ha!Ha!,
Still something is left.....

Okay children, let's go to home now.

Remember..

+	×	+	=	+
+	×	-	=	-
-	×	+	=	-
-	×	-	=	+

+	÷	+	=	+
+	÷	-	=	-
-	÷	+	=	-
-	÷	-	=	+

POINTS TO BE NOTED.....

- If none of the factor in multiplication is zero, then....
 - ❑ The product of an **even** number of **negative numbers** is **positive**.
 - ❑ The product of an **odd** number of **negative numbers** is **negative**.
- If any factor is zero, the product is zero.

LET'S RECALL.....

- ☐ To find the product of two integers with like signs we multiply their numeric values and give a '+' sign to the product.
- ☐ To find the product of two integers with unlike signs, we multiply their numerical values and give a '-' sign to the product.
- ☐ The quotient of two negative or two positive integers is always positive.
- ☐ The quotient of one positive and one negative integer is always negative.

CHECK YOURSELF 4

Fill in the blanks:

(i) $296 \div \dots\dots\dots = -148$

(ii) $-88 \div \dots\dots\dots = 11$

(iii) $84 \div \dots\dots\dots = 12$

(iv) $\dots\dots\dots \div (-5) = 25$

Complete the following grid:

$\times$	-4	-3	-2	-1	0	1	2	3	4
-4	16	12							
-3									
-2									
-1									
0									
1									
2									
3									
4									

Aman , What are you thinking?

Didi! I am still thinking what is left?

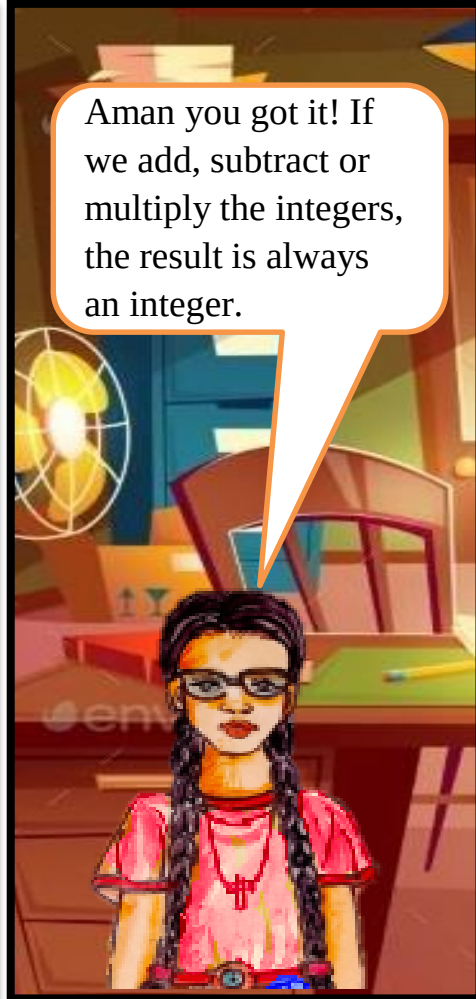
Okay Aman,
answer me few
questions:

Okay didi , I am
ready.

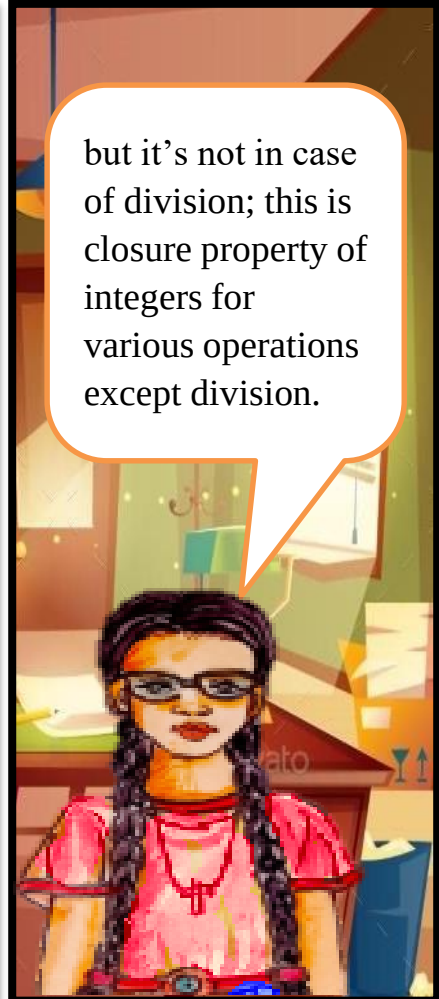
$2+(-3) = -1$; $6-7 = -1$;
 $8+(-6) = 2$;
 $2 \times (-3) = -6$ ". Tell me
the result in each case
is an integer or not?



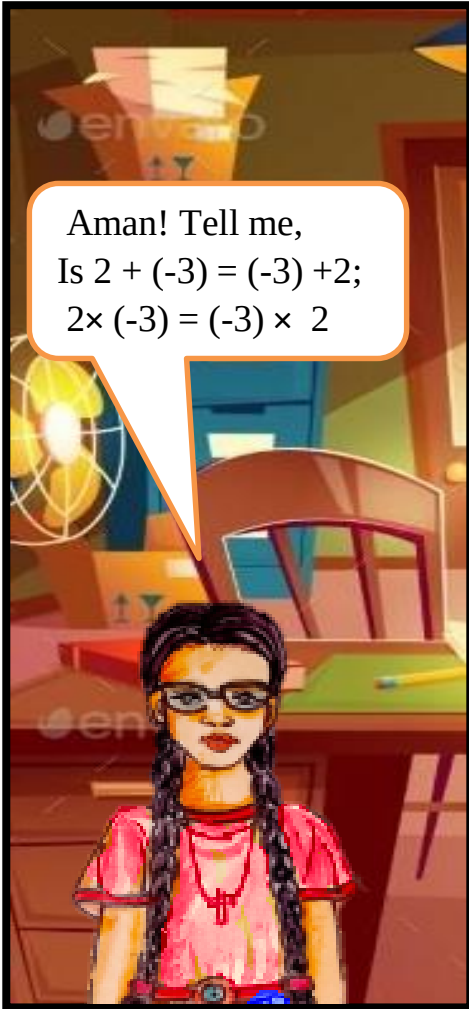
Yes it is! But what about $3 \div 2$, It will give $3/2$ which is not an integer.



Aman you got it! If we add, subtract or multiply the integers, the result is always an integer.



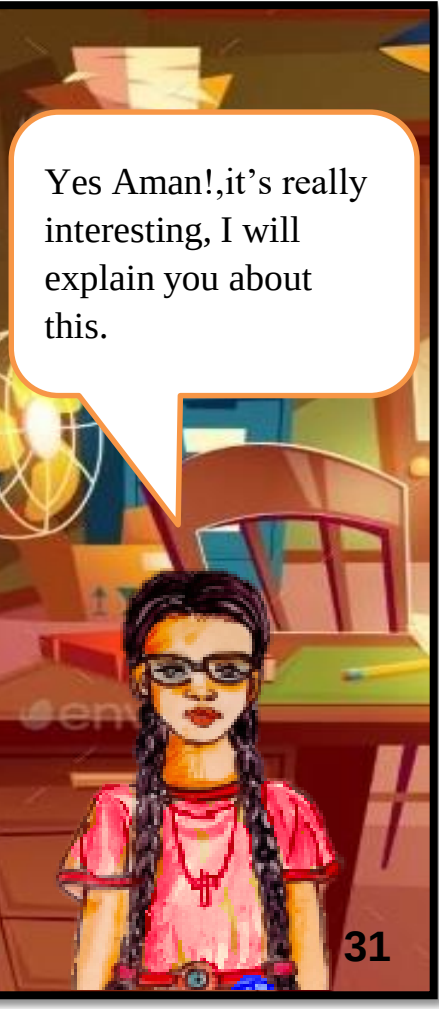
but it's not in case of division; this is closure property of integers for various operations except division.



Aman! Tell me,
 $2 + (-3) = (-3) + 2$;
 $2 \times (-3) = (-3) \times 2$



Yes, didi, it's interesting they are equal



Yes Aman!, it's really interesting, I will explain you about this.

Aman , here the order of integers are changed but result is same. It's commutative property of integers.

So $2-3$ will be equal to $3-2$???

No Aman, You can solve and check it, it's not so. Same way $6 \div (-2) = (-3)$ but $(-2) \div (6) = (-1)/3$, they are not same.

Okay! Commutative property is not true for Subtraction and Division.

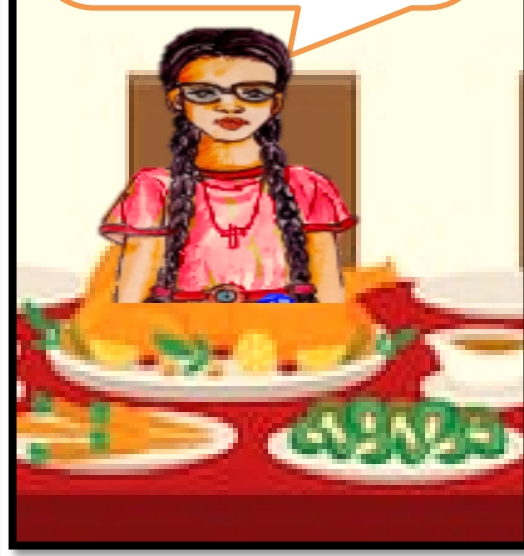
Yes Aman! Now I am feeling hungry, We will discuss rest of the things in the evening with Daddy. Let's have our food.

Okay Didi, but I am very curious to know more.....

Aman! Do you know that we will go to shopping mall in the evening.

Really! I will purchase a bat and a ball from the sports shop in basement 2 as my friend told me that it's a really good shop with best quality products.

Aman, you and your cricket, I am not interested in that. I will purchase a scenery from the shop which is on the 5th floor.



Outside the lift of a Shopping Mall

Look Daddy, here also -1, -2 is written, it means 1st and 2nd floor below ground, isn't it?

Yes, Aman. Children we are on the ground floor, let's first move to the 5th floor by lift to purchase the scenery.



Daddy, Now we will press (-2) in the lift to go to the 2nd basement to purchase the bat and ball.



Yes! Aman, you are really a champ.



No Daddy ,still something is left.....



At home, in the living room

Daddy please tell me about remaining properties of integers for different operations. I have understood closure and commutative property.

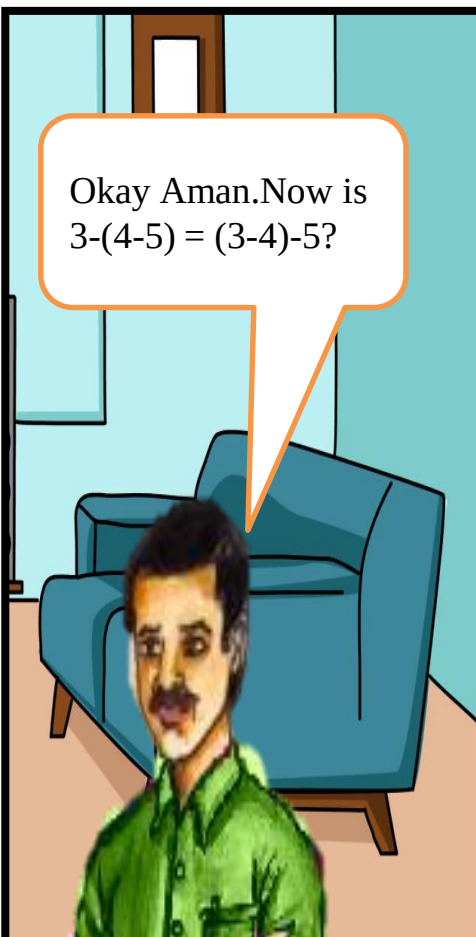




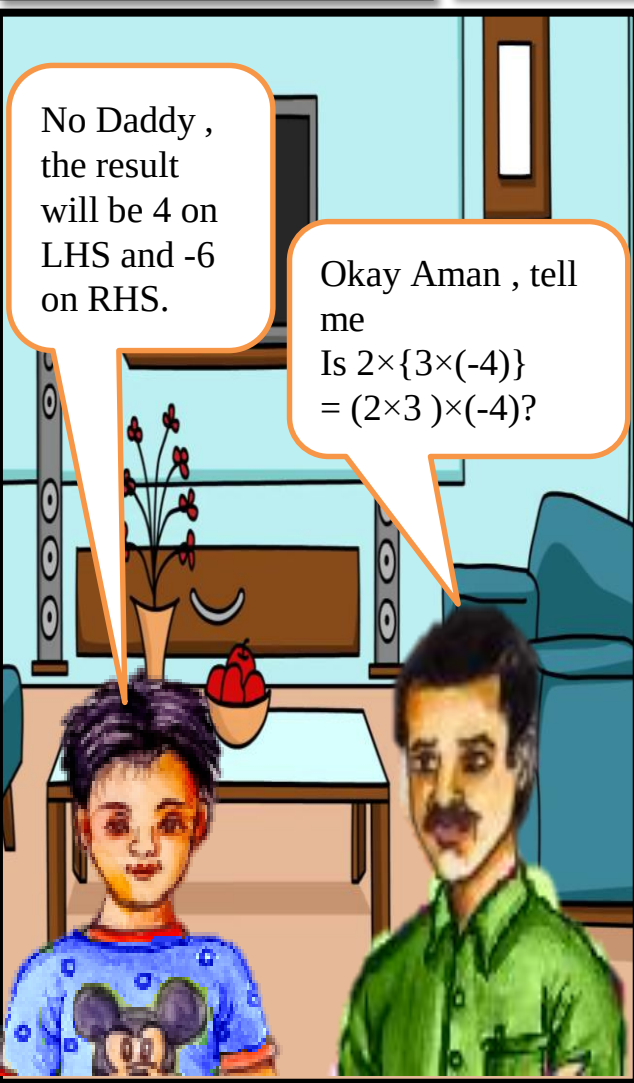
Aman tell me
 $2 + \{3 + (-5)\} =$
 $(2+3) + (-5)$, is it
true ?



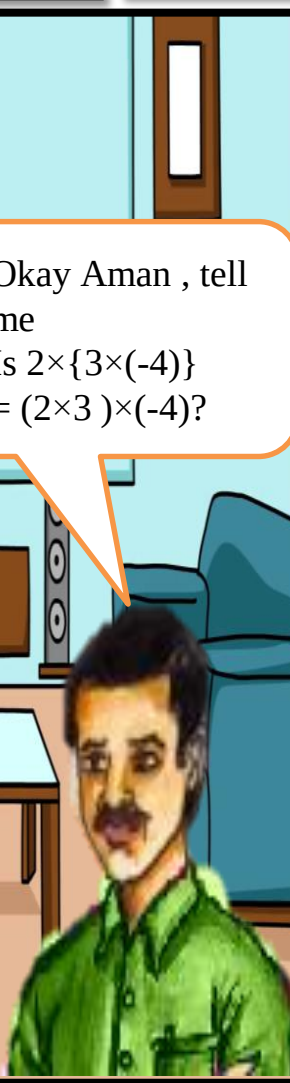
Yes Daddy! The
result will be zero
in both the cases.



Okay Aman. Now is
 $3 - (4 - 5) = (3 - 4) - 5$?



No Daddy ,
the result
will be 4 on
LHS and -6
on RHS.



Okay Aman , tell
me
Is $2 \times \{3 \times (-4)\}$
 $= (2 \times 3) \times (-4)$?



Yes Daddy
it's -24 both
sides.



But Daddy,
 $2 \div \{3 \div (-4)\}$ is not
equal to
 $\{(2 \div 3) \div (-4)\}$.

Yes! children it's associative property of integers for addition and multiplication, but it's not applicable for subtraction and division.



Aman tell me what is identity?



Didi, it's our own recognition.



Okay Aman, Let's understand this identity for integers. Look! $2 + 0 = 2$ and $2 \times 1 = 2$, So, when we add zero to 2, the number 2 remains same. Here 0 is additive identity for integers.



Okay, I understood, Similarly when 1 is multiplied to 2, then also it remains the same. It means 1 is multiplicative identity for integers.

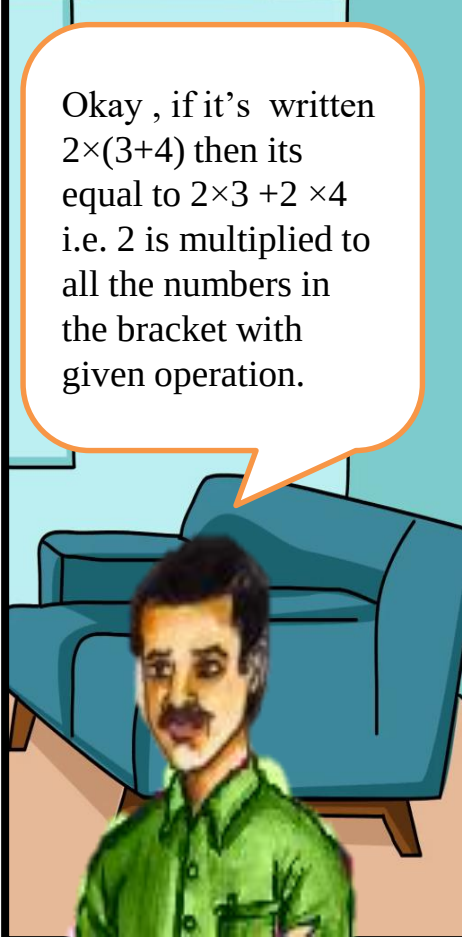


Aman, there is one more property, that is distributive law over addition and subtraction.





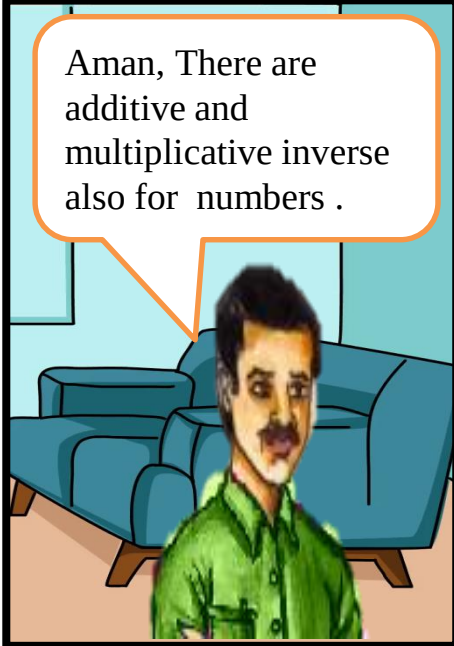
Please explain me that.



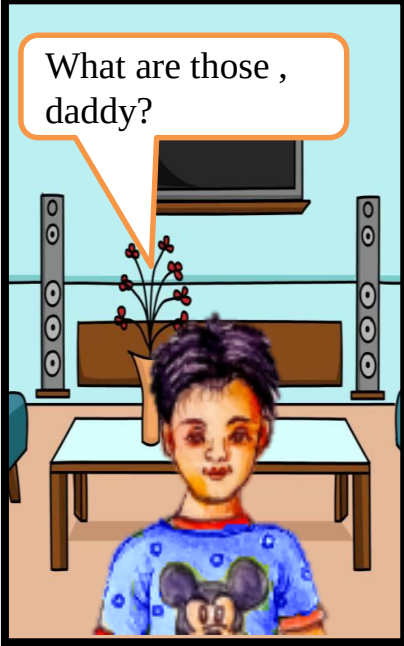
Okay , if it's written $2 \times (3+4)$ then its equal to $2 \times 3 + 2 \times 4$ i.e. 2 is multiplied to all the numbers in the bracket with given operation.



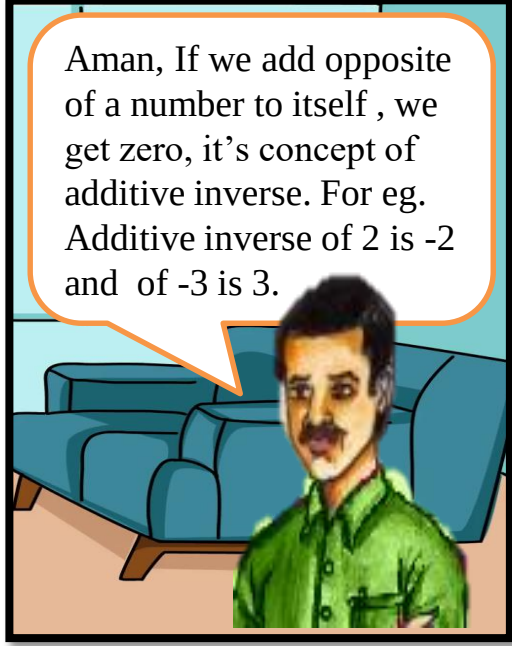
And if it's $50 \times 25 + 50 \times 75$, we can simplify it as : $50(25 + 75) = 50 \times 100 = 5000$ i.e. taking common number outside the bracket.



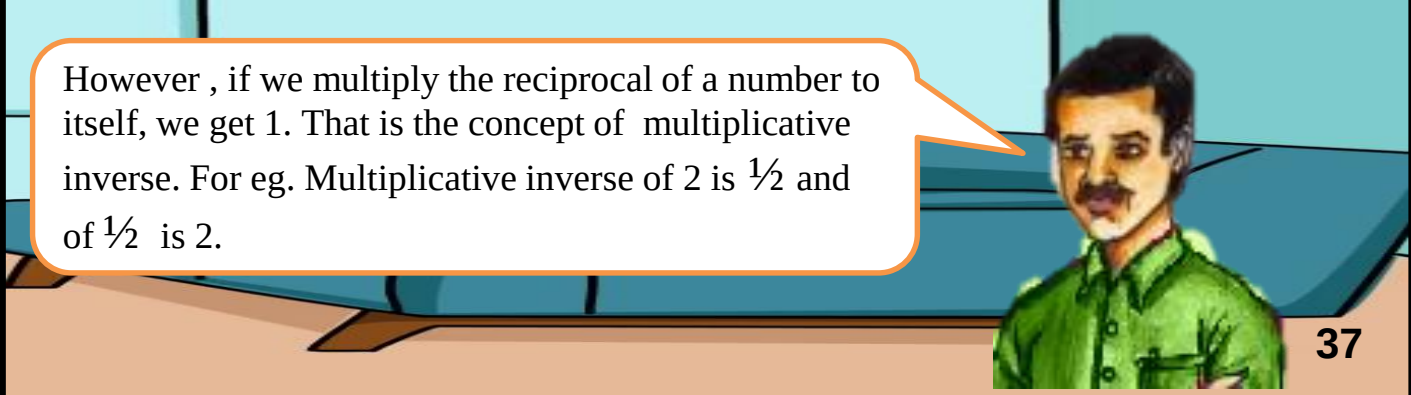
Aman, There are additive and multiplicative inverse also for numbers .



What are those , daddy?



Aman, If we add opposite of a number to itself , we get zero, it's concept of additive inverse. For eg. Additive inverse of 2 is -2 and of -3 is 3.



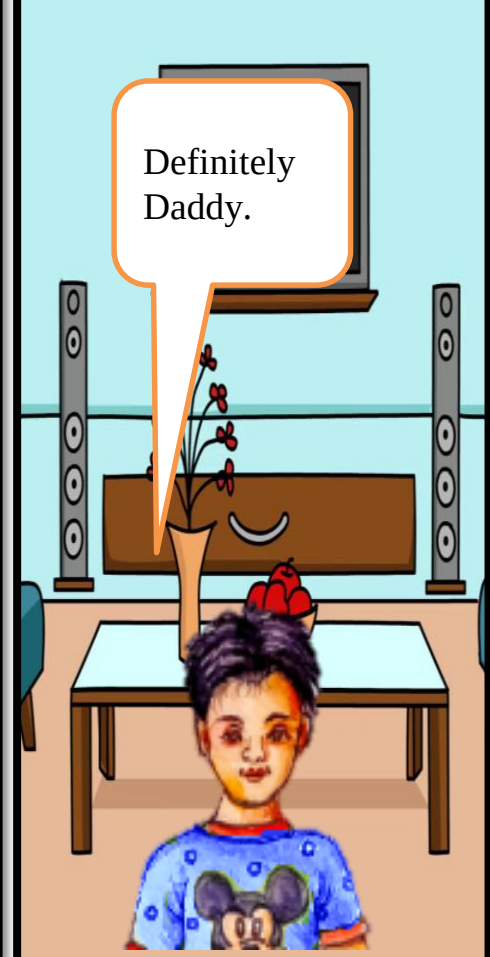
However , if we multiply the reciprocal of a number to itself, we get 1. That is the concept of multiplicative inverse. For eg. Multiplicative inverse of 2 is $\frac{1}{2}$ and of $\frac{1}{2}$ is 2.



Okay Daddy! I understood.
Thanks a lot!



Aman, Now you tabulate all the important things to master these properties so that they remain fixed in your mind.



Definitely Daddy.

TAKE ME WITH YOU.....

INVERSE PROPERTY

Additive Inverse

- The sum of any number and its additive inverse is zero.
- $-a$ is the additive inverse of the number a .

$$a + (-a) = 0$$

Multiplicative Inverse

- The product of any number and its multiplicative inverse is one.
- $\frac{1}{a}$ is multiplicative inverse of the number a .

$$a \times \frac{1}{a} = 1$$



Wow Aman! You have prepared the chart, that's great.

Yeah didi , Just have a look at the properties of integers with four fundamental operations...



...and thank you so much Didi ! I am really very happy .Please have a look at my chart before you go to sleep. Good Night!

Oh, sure. Now, good night! dear.

PROPERTIES OF INTEGERS

Property	Operations			
Name	Addition	Subtraction	Multiplication	Division
Closure	$a + b \in Z$	$a - b \in Z$	$a \times b \in Z$	$a \div b \notin Z$
Commutative	$a + b = b + a$	$a - b \neq b - a$	$a \times b = b \times a$	$a \div b \neq b \div a$
Associative	$(a + b) + c$ $= a + (b + c)$	$(a - b) - c$ $\neq a - (b - c)$	$(a \times b) \times c$ $= a \times (b \times c)$	$(a \div b) \div c$ $\neq a \div (b \div c)$
Identity	$a + 0 = a$ $0 + a = a$	Not applicable	$a \times 1 = a$ $1 \times a = a$	Not applicable
Distributive	$a \times (b + c)$ $= ab + ac$	$a \times (b - c)$ $= ab - ac$	Not applicable	Not applicable

Where “Z” is set of integers
a, b , c are non-zero integers.

Final Check

1. Fill in the blanks :

a) Integer which is neither positive nor negative _____ .

b) Additive inverse of -5 + successor of -5 = _____

c) $(-12) + \{ _ + (+8) \} = \{ (-12) + (-7) \} + (+8)$,

Property used:_____

d) $34 \times (-87 + 17) = 34 \times _ + 34 \times _$, Property used :_____

e) When we multiply 45 negative integers and 21 positive integers , the sign of product is ____ .

2. True or False :

a) The product of positive and negative integer is negative.

b) Every integer when multiplied with -1 gives its additive inverse.

c) Commutative property holds for multiplication and division of integers .

d) $a \div b$ is always an integer .

e) Associative property holds for addition and multiplication only.

3. Solve the following and choose the option with smallest result.

a) $-6 + 9$

b) $-6 - 9$

c) $-6 - (-9)$

d) $6 - 9$

4. In a class test containing 10 questions 5 marks are awarded for every correct answer and (-2) marks are awarded for every incorrect answer and 0 for each question not attempted. Ravi gets 5 correct and 5 incorrect answers. What is his score ?

PUZZLE TIME.....

DETECTIVE TUKARAM AND HIDDEN NUMBERS

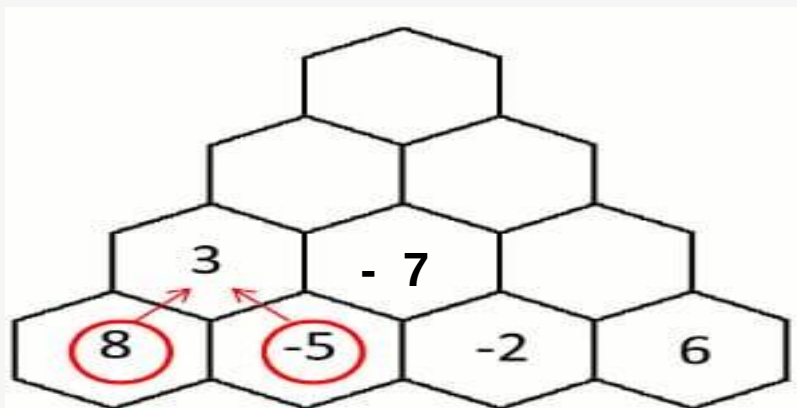
Set of three integers have committed a crime and are hiding now. Find all the three integers in a row, column or diagonal, Where the third number is the difference of the first and second (can be taken in any order). One set has been found by Tukaram. Find at least 9 more.



-9	0	60	-64	1	18	8	22
8	-3	20	-42	-10	9	1	99
5	0	-6	-22	-16	2	6	-100
6	-1	7	14	8	20	4	199
-3	2	21	7	13	-6	100	10
-2	180	6	-2	-18	-44	-1	-43
0	90	10	8	-23	-11	2	-7
42	2	-4	9	26	-4	-3	4



Observe the pattern and fill the blocks by suitable numbers.



ANSWER KEY:

CHECK YOURSELF (1)

a- (r) ; b- (s) ; c- (q) ; d- (p)

CHECK YOURSELF (2)

I (i) >

(ii) >

(iii) <

(iv) <

(v) >

(vi) <

(vii) >

(viii) >

II. (i) -8, -5, -1, 0, 4, 5

(ii) -7, -6, -3, 0, 2, 3, 4

(iii) -7, -3, -1, 0, 3, 8, 17

(iv) -10, -7, -6, 6, 15, 19

III. on +5 IV. 0, -3

CHECK YOURSELF (3)

1. -1degree Celsius

2. on 8th stair

3. +2 or -2

4. 11 inches

5. +8863m,-400m,9263m

CHECK YOURSELF 4

Fill in the blanks

(i) -2 ; (ii) -8 ; (iii) 7 ;(iv) -125

Completing the grid:

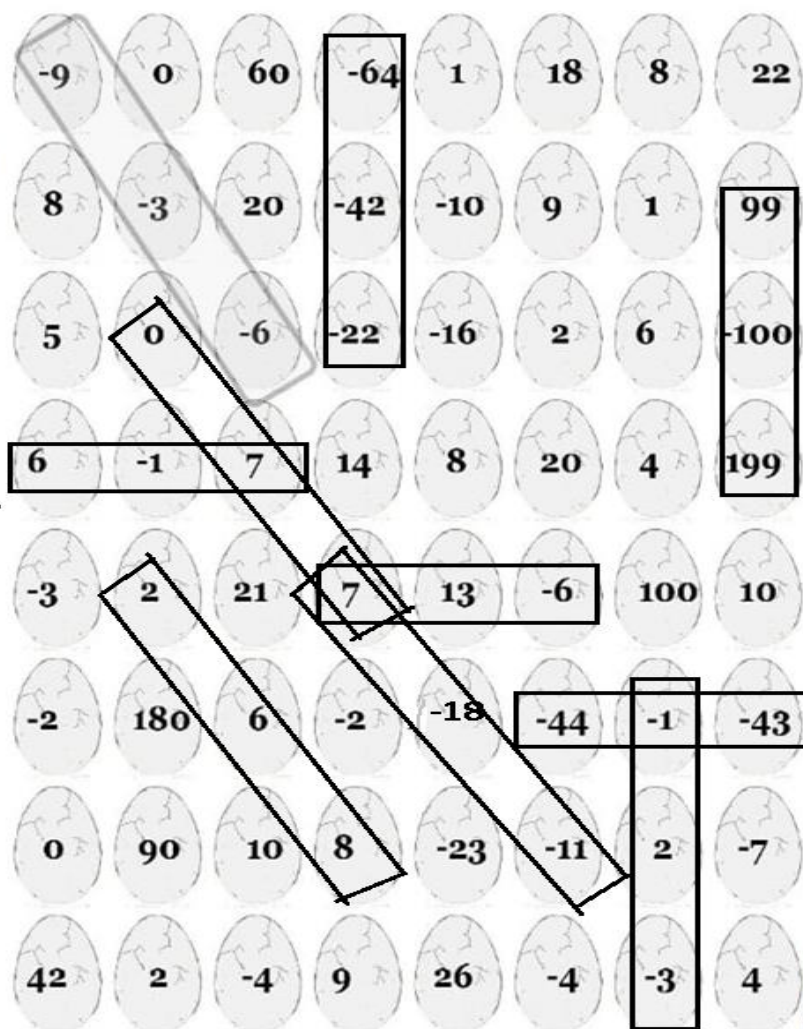
×	-4	-3	-2	-1	0	1	2	3	4
-4	16	12	8	4	0	-4	-8	-12	-16
-3	12	9	6	3	0	-3	-6	-9	-12
-2	8	6	4	2	0	-2	-4	-6	-8
-1	4	3	2	1	0	-1	-2	-3	-4
0	0	0	0	0	0	0	0	0	0
1	-4	-3	-2	-1	0	1	2	3	4
2	-8	-6	-4	-2	0	2	4	6	8
3	-12	-9	-6	-3	0	3	6	9	12
4	-16	-12	-8	-4	0	4	8	12	16

FINAL CHECK

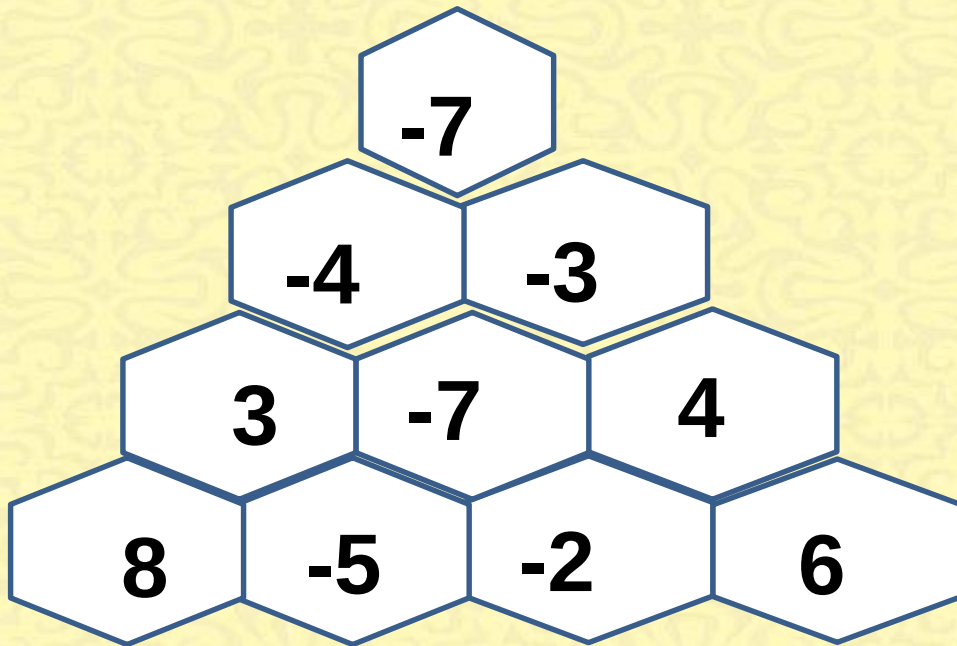
1. (a) zero (b) 1 (c) -7, associative
(d) -87, 17, distributive (e) negative
2. a) True b) True c) False d) False e) True
3. b 4. 15 marks

PUZZLE TIME

DETECTIVE TUKARAM AND HIDDEN NUMBERS



Observe the pattern and fill the blocks by suitable numbers.



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- ☐ <https://youtu.be/crFJlYLCMrE>

From the desk of Chairman...



This illustrated graphic novel on “Journey Around Zero” is an outcome of honest and diligent efforts of the entire team of MPS, Pratap Nagar. When a thought that has been enduring in mind becomes a reality, it is truly interesting and exciting. This issue is intended to be published to cater to the curiosity and edification needs of the students of today. Besides this, this innovative venture will serve as a medium to arouse the interest of the inquisitive minds in complex topics. I earnestly wish that it will succeed in providing maximum benefit to readers.

Happy reading!

Shri Pradeep Baheti
Chairman, ECMS



A Message to acknowledge....

It gives me a great sense of pride when I see a perceptible change in the teaching learning process .We have been doing exceedingly well and have touched the pinnacles of achievement in almost all spheres of learning. This innovative idea of graphic novel will definitely endow our kids with a sense of joyful learning. I congratulate each and everyone who relentlessly contributed to this constructive project and made this dream come true .

Happy Learning!

Shri Natwar Lal Ajmera
General Secretary , Education, ECMS

A Message...



Our temple of learning has always taken necessary steps to improve quality of education ,standard of teaching, methods of assessment, development of skills etc. Our sole objective is to cater to the inquisitive minds of our new generation .In this regard ,I am truly elated to introduce this innovative idea of teaching through graphic novel. I congratulate the team associated with this noble mission and wish them a great success ahead.

Shri Mukesh Rathi

Honorary Secretary , mps Pratap Nagar



Principal's Pen...

It is my sincere pleasure to welcome the readers to the graphic novel based on the integers. The book illustrates the graphics with great features and dialogue blocks easy to follow. Apart from the aesthetic pleasure it provides by being a well illustrated and well thought out graphic novel, I would describe its major conceptual goal to be that of conveying to its reader a taste of the exciting nature of mathematical discovery. Our goal in the 'Journey around Zero' is to popularize the fascinating and extraordinary similarities between the fine details of the structures of integers and several key cultural issues in mathematics, The book is lively enough to make meticulous understanding of the topic!

Happy reading! Happy learning!

Ms. Reeta Bhargava
Principal

Summary

The graphic novel “Journey Around Zero” will help the students to explore the concept of integers in real life situations. The novel will enhance the capacity of students to evaluate integers in a confident way with easy approach. Students will be able to develop logical thinking and reasoning for the concept and make use of their learning in day to day life.



The Education Committee of
The Maheshwari Samaj (Society), Jaipur

Legacy of ECMS



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