

# BASIC SCIENCES & HUMANITIES NEWSLETTER

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- Without knowing what I am and why I am here, life is impossible - Leo Tolstoy
- Without mathematics, there's nothing you can do. Everything around you is mathematics. Everything around you is numbers - Shakuntala Devi
- I have not failed. I've just found 10,000 ways that won't work – Thomas Edison
- The chemistry involved made everything Factory did quite special - Derek Harold Richard Barton
- Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has - Margaret Mead

## Struggling will make you stronger

“Once upon a time, a man found a butterfly that was starting to hatch from its cocoon. He sat down and watched the butterfly for hours as it struggled to force itself through a tiny hole. Then, it suddenly stopped making progress and looked like it was stuck. Therefore, the man decided to help the butterfly out. He took a pair of scissors and cut off the remaining bit of the cocoon. The butterfly then emerged easily, although it had a swollen body and small, shriveled wings. The man thought nothing of it, and he sat there waiting for the wings to enlarge to support the butterfly. However, that never happened. The butterfly spent the rest of its life unable to fly, crawling around with small wings and a swollen body. Despite the man's kind heart, he didn't understand that the restricting cocoon and the struggle needed by the butterfly to get itself through the small hole were God's way of forcing fluid from the body of the butterfly into its wings to prepare itself for flying once it was free.”

## ALGEBRAIC EQUATIONS

What comes to mind when you hear the term “equation”? Equations... equality... equal sign? That's what equations are all about. Equating one quantity with another.

**Equations In Algebra**

$ax^2 + bx + c = 0$

*Example:*

$5x^2 + 7x - 9 = 4x^2 + x - 18$

$5x^2 + 7x - 9 - 4x^2 - x + 18 = 0$

$x^2 + 6x + 9 = 0$

Equations are like a balance scale. If you've seen a balance scale, you would know that an equal amount of weight has to be placed on either side for the scale to be considered “balanced”. If we add some weight to just one side, the scale will tip on one side and the two sides are no longer in balance. Equations follow the same logic. Whatever is on one side of the equal sign must have exactly the same value on the other side else it becomes an inequality.

## Equations

For example, in an equation  $1+1 = 2$ , it is balanced as both sides have the same value. To avoid committing an error that tips the equation out of balance, make sure that any change on one side of the equation is reciprocated on the other side. For example, if you want to add a number 5 to one side of the equation you will have to add the same 5 to the other side of the equation.

$$1 + 1 = 2$$

$$1 + 1 + 5 = 2 + 5$$

The same goes for subtraction, multiplication, and division. As long as you do the same thing to both sides of the equation it will remain balanced.

Consider the following situation. I am going for a trip. In one bag I carry some t-shirts, shorts, and towels. A total of 8 items can fit in the bag. So I pack 4 shirts and 2 shorts. How many towels can I now carry?

Consider the number of towels to be 'x'. Let's form the equation now.

$$4 \text{ shirts} + 2 \text{ shorts} + 'x' \text{ towels} = 8 \text{ clothes}$$

The left-hand side (LHS) of our equation is being compared to the right-hand side (RHS) of the equation.

Many a times students are confused between expressions and equation. Here is the difference between them

Algebra: Expressions And Equations	
<u>Expression</u>	<u>Equation</u>
<input type="checkbox"/> True for <u>all</u> values of $x$ .	<input type="checkbox"/> True for <u>some</u> values of $x$ .
<input type="checkbox"/> Common key terms: <ul style="list-style-type: none"><li>▪ Simplify</li><li>▪ Expand</li><li>▪ Factorise</li></ul>	<input type="checkbox"/> Common key terms: <ul style="list-style-type: none"><li>▪ Solve</li><li>▪ Example:<ul style="list-style-type: none"><li>▪ <math>5x - 4 = x</math></li></ul></li></ul>
<input type="checkbox"/> Example: <ul style="list-style-type: none"><li>▪ <math>8x + 5y - 3x - 5</math></li></ul>	

### Solved Examples

**Example**– Let's solve this equation.

$$4+2+x=8$$

$$6+x=8$$

$$6+x-6=8-6$$

$$x=2$$

I can carry 2 towels for my trip.

In the same way, what would depict an inequality? Obviously, when the left hand side is not equal to the right hand side. How would this happen?

Let's take the same  $6 + x = 8$  and change that equal to into a greater than or a lesser than sign. These aren't equations! Consider some examples to clarify this concept.

$$x + 2 = 21, xy + 9 = z \text{ are equations but } 6p > 77 \text{ is not.}$$

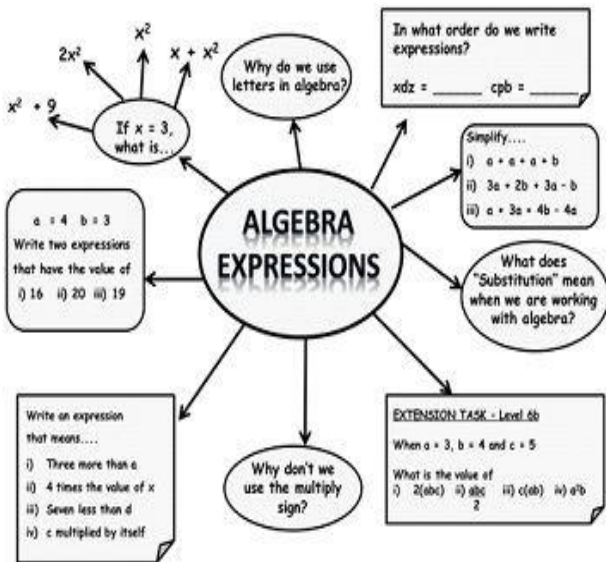
Algebraic equations are of various types, some of them being:

#### **Polynomial equations-**

Linear equations:  $ax+b=c$  (a not equal to 0)

#### **Quadratic equations-**

$ax^2+bx+c=0$  (a not equal to 0)



### Cubic equations-

$$ax^3 + bx^2 + cx + d = 0$$

### Rational polynomial equations-

$$P(x)/Q(x) = 0$$

### Trigonometric equations-

$$\cos 2x = 1 + 4\sin x$$

Solving algebraic equations:

**Example: Simplify the given equation**

$$: 2(x+4) + 3(x-5) - 2y = 0$$

**Solution:** Given equation:  $2(x+4) + 3(x-5) - 2y = 0$   
 $2x + 2 \times 4 + 3x - 3 \times 5 - 2y = 0$  (Using Distributive property to get rid of parenthesis)  
 $2x + 8 + 3x - 15 - 2y = 0$  (Simplifying)  
 $5x - 2y - 7 = 0$  (on further simplifying terms)

## YOU HAVE A BIT OF ALAXENDER, SOCRATES, ARISTOTLE IN YOUR BODY!

Is it ? yes.

Let us say, long long ago Socrates took a cupful of water from sea-shore and washed his face. Today, you took a cupful of water from the sea near your place and washed your face. Have you used any of the water molecules that Socrates used long back? You may think the chances are highly remote. But the scientific answer is really surprising.

A little calculation: you may skip

The total mass of earth's oceans =  $10^{18}$  metric ton or  $10^{24}$  grams.

Mass of one water molecule =  $3 \times 10^{-23}$  gm.

Hence No. of molecules in the ocean =  $3 \times 10^{46}$

Mass of water in a cup = 250 gm.

No. of water molecules in a cup =  $8.3 \times 10^{24}$

No. of cups of water in the oceans = No. of molecules in the oceans / No. of molecules in a cup

$$= 3 \times 10^{46} / 8.3 \times 10^{24}$$

$$= 3.6 \times 10^{21} \text{ cups}$$

Hence No. of cups in the oceans is far less than no. of water molecules in a cup. That means, if you draw out a cupful of water from a sea, .There is high chance that It might contain some molecules used by Socrates long back

= No. of molecules in a cup / No. of cups of water in the oceans

$$= 8.3 \times 10^{24} / 3.6 \times 10^{21}$$

$$= 2300 \text{ molecules.}$$

That is, "every cup, we draw out from the ocean may contain 2300 molecules that is once used by Socrates( in 400 BC)

By the same argument, we can conclude that each of us might expect to be made of a considerable number of the atoms and molecules that made up Socrates or Aristotle's body.

When one's life ends, he may turn into parts of a tree, flower, fruit, tooth of a child or nail of a beautiful girl.

As long as we are alive, we are constituted by collections of various molecules that we call as "I" with ego.

We know, water is recycled; cloud, rain, river, ocean and back to cloud. The oxygen-carbon-di-oxide cycle is maintained by the animals and the plants. There is food-fertilizer cycle again through animals and plants.

Recycling is the way of the nature. We should learn and adopt from it.

“Which Came First: the Dinosaur or the Bird?”

Audubon magazine, January-February issue. Michael Balter explains the convergence of ornithology and paleontology in a radical rethinking of avian evolution, which sees birds as “living dinosaurs, the one surviving lineage of extinct carnivorous beasts like Tyrannosaurus rex.”

In 1996, a farmer and amateur fossil collector from China’s northeastern Liaoning Province found a one-meter-long dinosaur embedded in two separate limestone slabs, which he sold to two different Chinese museums. Paleontologists quickly put two and two together and realized that the specimen, which they named Sinosauropteryx and dated to about 125 million years ago, was the first discovery of a feathered dinosaur.

Although a small number of skeptical researchers have since argued that the claimed feathers are really degraded collagen fibers, further discoveries of similarly plumed dinos bolstered the case. Some of them — such as the four-winged Microraptor, first reported from China in 2000 — probably could fly.

To date more than 20 suspected flying dinosaur species have been reported, and there is now an overwhelming consensus that birds represent a lineage of flying dinosaurs that survived the mass dinosaur extinction at the end of the Mesozoic Era, about 66 million years ago. A flood of new genetic research released at presstime confirmed that birds subsequently saw an early, rapid, evolutionary “big bang” that led to the more than 10,000 species we have today.



The 1<sup>st</sup> year students performed a dance recital signifying national integrity at KITS YUVA – 2019. The team won 1<sup>st</sup> prize for its beautiful performance. A few more teams performed some cultural events which received big applaud from guests.

The 1<sup>st</sup> year girl students took an enthusiastic part in the march past held at the inauguration of sports meet which caught the attention of all the participants.

The KHO-KHO team girls stood as runners in the meet.

## **FACULTY PARTICIPATION**

- Mrs. J. Rama Kumari participated in a short term course on “Leadership, Management Strategy and Professional Ethics” held NIT, Narasaraopet from 8<sup>th</sup> to 12<sup>th</sup> April, 2019.
- Dr. A.Raghavendra Rao, Mr. Y. Mohan Rao and Mr. M.Raghavendar participated in national workshop on “Material Characterization Techniques” held at KL University on 18<sup>th</sup> April, 2019.
- Mrs. D. N. Bhargavi presented a paper in a national conference on “Advances in Computational Fluid Dynamics” held at AKTP Univeristy on 12<sup>th</sup> and 13<sup>th</sup> April, 2019.
- Ms. G. Pavani published papers in IL&CT, BIS&C and JETIR in March and April, 2019.
- Dr. A. Raghavendra Rao published a paper in IJRASET in March, 2019.
- Mrs. K. Bhagya Lakshmi published papers in IJMT&E and IRJET in March, 2019.