

Mathematics in the 'real' world

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One of the most misunderstood and abused subject of all is mathematics. Students see it with such fear that they start hating it without even knowing the reason for this hatred. Very few non-mathematicians appreciate the fact that mathematics is indispensable for all of the real world happenings. They seem to see the subject as so abstract that it becomes very hard to make them see the contrary picture.

For most of us, the day begins with the ubiquitous name is internet search, Google. But very few are aware that whatever Google does is because of a single mathematical quantity called an 'eigenvector'. The mathematics that Google uses is quite advanced and is obviously beyond the masters level curriculum. But that in no way means that people should not appreciate it. The underlying principle is very simple indeed. What Google does is that it assigns a pagerank to each web page that it accesses, this is based on other web pages that link to it and some of its content. If a web page with higher pagerank links to your website than that in turn increases your pagerank and so on. But this is easier said than done. The web is a collection of more than a billion web pages and it is increasing at the rate of millions every week. What Google does is that it uses two branches of mathematics called linear algebra and graph theory to make its work easier and to implement its algorithm smoothly. This is just one application of mathematics in our daily life.

Take another example of the credit card or debit card that one uses frequently. The entire process of acquiring money or doing transactions online is based of a simple mathematical concept of prime numbers. The entire process can be described in so little a space and time that it would seem absolutely impossible for this method to work. But such is the unreasonable power and effectiveness of mathematics, that it makes not only this work but many other wonderful things too.

You name any technology that you use frequently and chances are that there is a substantial amount of mathematics involved in it. Take for example GPS navigation. The basis of GPS navigation is simple spherical geometry which any high school student with enough motivation will be able to master in a day or two. Mathematics is not really that abstract as some of us might think. Infact for people who have devoted their life to mathematics, it is really the supreme form of beauty. Mathematical truths unlike other forms of truths are absolute, most of them are intangible but in no way does that mean it is less important.

The public perception of mathematics is just because of the way we are led to believe right since our childhood about the subject. We are not shown real world applications of the subject and somehow the beauty of this subject is lost in the myraid symbols and equations that students are forced to master. This

lack-lustre method of teaching is omnipresent all over the world, and is a serious cause of worry for academicians, specially mathematicians.

Most of the time, mathematics is abused as being just a tool for other subjects of study like physics or engineering. The truth is actually physics and engineering are just slower younger brothers of mathematics who are entirely dependent on it to be in existence. The language of the world is not written in terms of physical constants or quantities, it is infact written in the beautiful language of mathematics. But this language is too abstract so that the one who is not initiated into it, will always be lost in this abstract setting. That is the bane of mathematics and she will perhaps always live with it.

However, it has entered the psyche of many people all across the world that people must be initiated into the ways mathematics influences them, and thus they have formed an initiative called the 'Mathematics of Planet Eath 2013' or MPE 2013 in short. This program launched worldwide with over a hundred partnering institutes have really made an impact with making the common man aware of how mathematics influence the world around them. In India the partnering organisations are the International Centre for Theoretical Sciences (Bangalore) and Gonit Sora (<http://gonitsora.com>) as a magazine partner. Initiatives such as this will perhaps be able to make the hatred and fear of mathematics disappear from the young students' minds and only then will they be able to understand what the great mathematician Carl F. J. Gauss meant when he said – 'Mathematics is the quenn of all sciences, and arithmetic is the queen of mathematics.'

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