

ATech Educator News

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From time to time the ATech newsletter includes articles submitted by individuals who have demonstrated expertise in certain areas of automotive diagnostics, repair, and/or instruction. This month we are privileged to welcome Phil Jelinek retired Automotive Instructor from California as our guest author.

S.T.E.M. The Basics!!

This is the second of many articles about S.T.E.M. to help students/learners understand the basic concepts of what everyone is talking about, in easy to understand terms. I have attended many S.T.E.M. symposiums, only to discover that after the students explain their projects, they are unable to separate which part of their project is either the Science part, Technology Part, Engineering part, or the Math part. You see, S.T.E.M. is an acronym that stands for Science Technology Engineering and Mathmatics.

Science!

Many people believe they know what science is but few can put it into words. They believe that science has variables and is subject to opinions and/or preferences. Nothing could be farther from the truth. Science has to do with the Laws of the Universe that have **NO** exceptions!!! If there are any exceptions, it just is not a Science Law (rule).



There are a few examples I will use to highlight the point.

Let's take the English Language, considered by many to be a difficult language to learn because there are so many exceptions to the rules. I was taught "The Exception makes the rule" in learning the English Language.

I before E, except after C, or when sounding like A, as in neighbor or weigh is a [mnemonic rule of thumb](#) for [English spelling](#) that gives both the rule and all the exceptions to that rule.

Let us use an analogy to explain what I mean. Consider the simple question: **Can we change Time???** Most people's first response would be to say no!! Then I ask them what we do each November and March???? We change time. In fact, in 1592 we lost 10 days. See the article below:

Imagine waking up tomorrow and finding out that the calendar date is now 10 days later than when you went to bed! Sound likes a movie right? Truth is stranger than fiction. Europeans went to bed on Thursday, October 4, 1582 and awoke the next morning to learn that the date is now Friday, October 15, 1582. Where did 10 days go?!

We know that a year measures how long it takes the Earth to make one complete revolution around the Sun. In the 16th century, whether the Earth was at the center of the Solar System or it was the Sun, was still a controversial question. But what was known to even earlier cultures was that the pattern of stars you would see repeats every 365 days or so. We know that a year is roughly 365.25 days meaning that unless we add a leap day every 4th year (or so), our civilian calendar will slowly drift with respect to the stars.

The Julian calendar, introduced by Julius Caesar in 46 BC has a regular year of 365 days divided into 12 months. Although Greek astronomers had known that the solar year was a few minutes shorter than 365.25 days, the Julian calendar did not compensate for this difference. So the calendar year gained about three days every four centuries compared to observed equinox times and the seasons. But so what? The calculated date of Easter gradually moved out of alignment with the March equinox. By 1582, Easter was ten days out of alignment from where it supposedly had been in 325 during the Council of Nicaea. Because the celebration of Easter was tied to the spring equinox, the Roman Catholic Church considered the steady drift in the date of Easter too long to be undesirable. So the Gregorian calendar was introduced in 1582 and 10 days were removed from the calendar! Our civilian calendar is now again in synch with the stars.

Some people say yes!!! To them I ask, Can we change the physical time the Earth rotates one revolution and we call that a Day. We could change the 24 divisions of that day we call Hours into 10, 20 or 50 if we all could agree but we can't change the time of the actual 24 hour day.

The correct answer would be another question, What do you mean by changing Time???

These are the laws I am talking about. Laws that have no exceptions, opinions or preferences!!! Some of these Laws include but are not limited to: The Laws of Fluid Dynamics, The Three Laws of Motion, The Four laws of Thermodynamics and the Laws of Gravity just to name a few.



So what is Science? **Science is a systematic and logical approach to discovering how things in the universe work.** It is derived from the Latin word “scientia,” which translates to knowledge. Unlike the arts, science aims for measurable results through testing and analysis. **Science is based on fact, not opinion or preferences.** According to Webster’s New Collegiate Dictionary, the definition of science is “knowledge attained through study or practice,” or “knowledge covering general truths of the operation of **General Laws**, esp. as obtained and tested through scientific method [and] concerned with the physical world.”

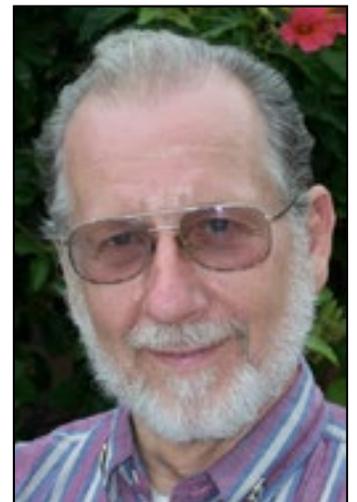
So here is a simple sentence to help you understand what Science is: **Science deals with the Physical Laws of the Universe where there are no Exceptions, Opinions or Preferences.**

by Phillip Jelinek



Phil Jelinek, who is now retired, was an award winning automotive instructor for over 25 years. He developed and implemented the first UC approved Automotive Physics (d-Lab Science) class and Automotive Engineering (g-Elective) class in California, there-by helping to save HS auto programs from extinction in that state. Three different years, he had teams attend the National New Car Competition in New York City, has been selected Teacher of the Year by three different organizations, and is currently the Past-President of the California Automotive Teachers Association.

You may contact Phil at pjelinek@calautoteachers.com



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