**SCIENCE IN TEN MINUTES**

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**We are all scientists!**

Albert Einstein is believed to have said, *“You do not really understand something unless you can really explain it to your grandmother.”* When we think of SCIENCE (or WHAT SCIENTISTS DO!), we always see it as something hard or complicated or not easy to understand. But, if we absorb what Einstein just said, science can be fun if put in simple words. Let’s try this before we get any further. I am a biologist, and if someone stops me on the street and asks me to my face, “WHAT IS A GENE?” This is how I would respond, “We are all made of skin, muscle and bone. The smallest or basic units of the skin, muscle and bone are called cells. Inside the cell is what is called a nucleus. Inside the nucleus are sausage shaped things called chromosomes. Inside those chromosomes is a thread like structure called DNA. Small stretches of that DNA make something called proteins and these proteins are responsible for your traits or characters or to put it more simply, what you see yourself as from the color of your eyes, the texture of your hair or how emotional you can be. So those small stretches or pieces of DNA that define your traits or characters are what are known as GENES.” Let’s try something else. A physicist is walking down the road, and someone accosts him with the question, “Can you tell me the meaning of the Einstein equation, E=MC2 ?” He could respond with a serious look, “E is energy, and if a mass M travels at speed of light C, all that mass becomes energy.” This wouldn’t cut much ice, but if he had to explain it to his grandmother (as Einstein himself said), this would be a better way: “Think of a flashlight. What happens when we switch it on? We see light. That light is a form of energy or E. Where is that coming from? It’s coming from the mass (M) of chemicals inside the battery of the flashlight. When you push that switch, the atoms in the chemicals inside the battery are moving at a certain speed and the mass (M) of those chemicals is being converted to energy (E) which we see as light. Now if those atoms could somehow travel at the speed of light (C), which is 186,000 miles per second, then every bit of the chemicals there would give out a massive amount of energy and that would be a lot of light. Want to see where that is happening? Look up at the sun, that’s a huge flashlight, where everything is moving at the speed of light. What Einstein is telling us when he writes E=MC2, is that everything that has mass (M) on this planet or elsewhere, if catapulted to the speed of light (C) will get converted to massive amounts of energy that can be calculated as the mass M multiplied by the square of C that is 186,000 twice over.”

The lesson learned is that science can be fun if put in simple words. And what if I say that science is not a subject as in physics, chemistry or biology, but science is a thought process and a way of life? Science is a systematic way of analyzing and solving problems. Hard to believe? Let’s try this situation. You got into your car and turned on the ignition and the car does not start. If you are not thinking scientifically, you would just trash your car. But is that what you do? No, you think or guess about a dead battery. And then either you turn the ignition again, open your hood to check for a loose cable, and if that fails, you then replace the battery. This process has science built into it. If you followed those steps instead of trashing your car, you are doing science and YOU ARE A SCIENTIST. It all started with an OBSERVATION that the car did not start. The initial guess you had about the dead battery is what is called a HYPOTHESIS. The things you did later in turning the ignition and checking for a loose cable to finally replacing the battery are what are called EXPERIMENTS to prove or disprove your HYPOTHESIS. If your dead battery hypothesis is proved, your hypothesis in essence becomes a THEORY. This is what any scientist does when he observes something in nature. He starts with a hypothesis (or to put it simply, a guess!) and he then proves or disproves his hypothesis through experiments. This systematic way of doing things is called SCIENCE and that is how it can be a way of life. Now that we are all scientists, let’s begin an enjoyable journey to know more about science. Science is all about people, nature and spreading the word. So, each time we meet, let’s look at a scientist, something from nature and a book on science that makes science fun.

Until next time, keep that scientific thought process, as in how you dealt with the car situation, intact!

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