Why do I need Physics? When will I ever use this? What is physics good for? Etc.

I have been asked these questions or similar ones from many students and parents. As with most classes, the goals of physics classes are many. One must have a basic understanding of how the fundamental processes of the world interact. An educated citizen must be able to process information about topics that must be voted upon. They must make decisions concerning energy policy or global warming for example. They must be able to sift fact from political rhetoric. These are but a few examples of where a person will use physics. The process of learning physics is an important one.

One of the goals of my class is to remind students that physics can be understood and that it need not be scary. However, because physics requires thought, students who are afraid to think will continue to fear it. Physics is an ordered system built on rules, not individual facts. Since straight memorization won’t help students see the order, they must learn the rules and think about them. Because the universe obeys a system of well-defined rules, it permits a logical understanding of its behavior. Like mathematics or computer science, physics offers a field of study where logic reigns supreme. Having learned two or three simple rules, students can combine them logically to obtain new more complicated rules and be certain that those new rules are also true. The study of physical systems is a good place to practice logical thinking.

One of the most fundamental principles of science, not described by equations or complex diagrams, is the notion that every effect has causes. Things don’t just happen willy-nilly. Whatever happens, students can look back in time and find its real causes. They can also predict the future based on insight acquired from the past and a knowledge of the present. What distinguishes the physical sciences from other fields is that there are often absolute answers, free from inconsistency, contradiction, or paradox.

Once students begin to understand how the physical laws govern the universe, they can appreciate how orderly it is. From a practical point of view, they can replace a sense of magic at seeing certain behaviors with a sense of structure and understanding. They can begin to think “physically.”

The applications of logic to everyday situations don’t stop with the physical sciences. In virtually every field of human activity, logic provides a useful way to solve problems. Faced with new situations, new problems, students can often combine knowledge and logic to find new solutions.

As the world becomes more technically complicated and jobs are more specialized, people find themselves more inclined to throw up their hands and take every unfamiliar problem to a specialist. However, the majority of problems people will encounter are fairly straightforward so that, with a little courage and a sense of adventure, combined with logic and a little thinking, they can solve these problems themselves.

Adapted from:

“How Things Work: The Physics of Everyday Life” by L.A. Bloomfield