If you had to choose between being smart or being creative, which would you choose? Most of us might want to say, “I’d rather be smart.” Isn’t it intelligence, being smart, that we all used to get good grades in school, to score as high as we possibly could on ACT or SAT tests, and to get through the tough courses in college and get A’s? And, isn’t it intelligence that is going to help us get through life, figure out problems, and do well in law school, medical school, a graduate program or in a job? Meanwhile, being creative can be something that many successful people treat a little warily. Isn’t it the case that there are creative people who keep coming up new ideas but don’t accomplish much? One could be creative in inventing new ideas, works of art, slogans, et cetera, but not much of this could mean a great deal.

Yes, intelligence is incredibly important. Intelligence, however, is more complicated than it may first seem and its relationship to on-going achievement is also complicated. There are different kinds of intelligence. Some of us have a great deal of logical and mathematical intelligence. We can figure out problems if they are presented as formulae or if they can be turned into logical puzzles. Others of us have linguistic intelligence. We have a wider range of words in our everyday vocabulary or can more quickly master foreign languages, or can write much more effective prose. Others have inter-personal intelligence. If you’ve ever watched an experienced therapist or clinical psychologist unravel a focus group and explain the dynamics among individuals in the group, you realize how impressive a kind of intelligence this can be. Creativity often involves mixing different kinds of intelligence together. Having one kind of intelligence impinge on a problem can make for a breakthrough when another kind of intelligence is stymied.
Let me give you an example. In the scientific revolution, the fundamental advance was being able to reduce complex problems to mathematical formulae. Indeed, in some ways, all of science still depends on this. Galileo was one of the greatest mathematicians and physicists of the scientific revolutions in turning the motion of bodies—in space, along inclined planes, et cetera—into mathematical questions. He thus helped lay the foundations for a science of mechanics. One mystery is why he never got closer to what Newton finally discovered, the laws of gravity. One missing piece is that Galileo never developed the concept of the conservation of momentum, one of the building blocks for the theory of gravity. In a fascinating article, several mathematicians have demonstrated that when Galileo used diagrams to solve problems in the motion of bodies, he went on to make more fundamental discoveries in physics. When he was working on problems of motion which could have led him to a concept of the conservation of momentum, he did not use diagrams. As a result, the mathematicians argue, Galileo had a hard time understanding the role played by mass, and thus he didn’t move farther and see the principle of the conservation of momentum. The mathematics he had at hand in working on both mechanics and continuous motion was the same. But in mechanics, he used diagrams, pictorial demonstrations, and made breakthroughs. When he was working on the problem of motion, he did not use diagrams, and he did not go as far as his mathematics would have allowed him to go. It was left for other scientists in the seventeenth century, particularly Christian Huygens, to arrive at the concept of the conservation of momentum and lay the foundations for Newton’s laws of gravity. We could say that Galileo had tremendous logical-mathematical intelligence, probably much more than Huygens and his collaborators; Galileo had less spatial intelligence, or at least in this case he used it less than he could.

Spatial intelligence, the ability to portray things pictorially or graphically in powerful ways, is its own kind of intelligence. Just how powerful it can be is shown by the genius of Steve Jobs, who dropped out of college, always said he knew little engineering, but clearly had a tremendous ability to re-shape the relationship between function and form, to understand the relationship between our bodies and
machines in novel ways, and to translate information in visually penetrating ways. Instead of telling us what do with our hands to use a computer, Job put in front of us something that attracted our hands. He put on the screen icons that used our eyes to connect our hands with the function he wanted us to carry out. Jobs had, by his own account, relatively little linguistic intelligence or logical-mathematical intelligence. (Given the way he often treated his collaborators, he had little inter-personal intelligence either.) He had enormous spatial intelligence and bodily-kinetic intelligence which he applied to problems that others saw simply as logical-mathematical ones. By the way, if you want to read two moving revelations of these people, read Dava Sobel’s book, Galileo’s Daughter and read Steve Jobs’ 2005 commencement address at Stanford. Despite the difficulties which Galileo had with the Catholic Church, he supported his daughter’s convent of nuns for much of his life; Jobs, a genius at driving technology, admitted that he learned to develop form to carry out function from studying calligraphy, a decidedly low-tech art form.

The examples of Galileo and Jobs reveal important insights about intelligence and creativity. Intelligence alone, even in its variegated form—logical-mathematical, spatial or graphical, linguistic, et cetera—is not a powerful predictor of achievement. It is using one’s intelligence that’s the key. What Galileo did was use his intelligence to reason. Intelligence is potential. But it’s passive if not used to solve problems, develop new interpretations, or craft an object. All fields and disciplines, including artistic disciplines, use reason. If you don’t think that’s true, look sometime at the various versions that a great poet, composer, playwright, or novelist will have of his or her work. Constant thought is applied, sometimes to just a few lines, to convey just the right emotion. Reasoning is applied intelligence.

And creativity is critical to using reasoning most effectively. Creativity involves using one kind of intelligence to shed light upon a problem where you’ve been using another kind of intelligence. When Galileo was most effective in making a breakthrough in mechanics, he brought spatial intelligence to
cast a problem in a new light by creating diagrams which illuminated new mathematical pathways.

When he encountered problems in understanding motion, one that could have led him to a concept of mass and the theory of the conservation of momentum, he did not use spatial intelligence and his powerful logical-mathematical intelligence wasn’t invigorated by a new approach. Steve Jobs took problems that engineers had seen as logical-mathematical ones and applied insights from graphics and bodily-kenesthetic intelligence to revolutionize how we use, first, computers, and more recently, almost all electronic devices.

As you continue to grow as scholars, scientists, writers, and artists, remember that learning to develop your powers of reasoning—applying your intelligence—becomes even more crucial as you move through life. The goal of all your A’s, your completed experiments or term papers, should be to build up your ability to be curious, to turn problems over in novel ways, to look for solutions that haven’t been tried, and to question conventional ways of solving problems. That’s one reason why research projects with faculty members, service learning projects, and internships can help you “activize” your intelligence: you use your reasoning to apply everything you know to new areas. The most creative ways to use your reasoning are to bring together insights from other domains to bear on what you’re doing. That’s one reason why collaboration, group projects, and working with people from different disciplines are often so stimulating. Ideas you and I had not thought of before, happen to us because people around us ask questions we had not thought of, bring in skills and ways to looking at the world we’d not encountered, and blend kinds of intelligence that we could not do alone.

Congratulations on what you have accomplished thus far. You are clearly intelligent. You have demonstrated an impressive level of reasoning and creativity thus far. Learn all you can from hands-on work, collaboration, and the insights of others. The sky’s the limit. You can take your creative reasoning as far as you can. Best wishes.