Hi. I'm Anne McNeil from the University of Michigan, where I study chemistry. Did you know that 90% of our current energy comes from fossil fuels, which includes coal, oil, and natural gas? Well, it wasn't always this way. And so the question is how did we get here and where are we going? What will be our major source of energy in the future? So, millions of years ago, the earliest source of energy came from the dying and exploding stars which brought us the elements of the periodic table, and from this collective dust of the universe emerged the solar system, and eventually life on Earth began to develop. And it was the genesis and eventual demise of this early life that brought us the fossil fuels that we now consume today. So, the early humans learned to innovate with the materials around them, using rocks as weapons and tools and burning wood as fuel. And this all changed when the industrial revolution came around, where big changes in manufacturing, transportation, and agriculture occurred thanks to the invention of engines, machines and various tools, and all of this was fueled by coal and using steel as a resource. Then the discovery of oil occurred and our ability to refine this oil into useful products including gasoline as well as petroleum-based products, and this ushered in the modern transportation era as well as the modern chemical industry. So, currently, the U.S. chemical industry uses about seven percent of our energy resources to bring you the products you enjoy, ranging from pharmaceuticals to cleaning supplies to the plastic products that house these materials. So, the U.S. chemical industry uses fossil fuels both as the fuel source for the manufacturing as well as the raw materials to make these products and this model is not sustainable, due to the dwindling supplies and rising costs. And this has led to the search for alternative fuels and feedstocks. And chemists are actively involved in this search for alternative fuels and feedstocks. So, for example, chemists are developing materials that can capture sunlight, which is a renewable resource, and convert that into electricity. And so you may be familiar with some of these developments including silicon-based solar cells, which you can currently purchase and install in your house. My own research is aimed at developing flexible versions of these materials so that you can wear on your backpack or on your jacket a solar cell and charge your devices on the go. But because sunlight is not available 24 hours a day, we need a way to store this energy and so chemists are also developing materials that can be used in batteries to store and harvest this energy. Chemists are also developing materials that are used in other renewable resources. So, for example, they're working on the materials that are used to manufacture the giant fins of windmills and take advantage of the wind energy. So, this addresses one aspect of the equation, which is where is our future fuel source going to come. But the other part of the equation is what is our future source of feedstocks? And chemists are also turning to nature for inspiration here and we're wondering whether or not we can take plants and convert them into plastic bottles. Now, as you can imagine, there's a lot of processes that need to occur to go from a plant to a plastic bottle. Starting with the plant, they need to capture carbon dioxide in the form of these sugar-based polymers. Chemists then need to break down these sugar-based polymers into simpler sugars and break those sugars down even further into simpler raw materials that can be used to manufacture these plastics. So, everything I've talked about is how can we maintain our current lifestyle while undergoing a major shift in our source of fuel and feedstocks. But the bigger, more interesting question is where will we go in the future? Using these new sources of fuel and feedstocks, can we innovate new materials and new resources? And it's for these reasons it's an exciting time to be a chemist and it's exciting to be a part of all of this research.