Narrator: Trouble with your beads? Can't drill that hole? Does it always come out crooked? Does everything keep cracking, breaking, or even exploding? Well, you need the Beadmaker 2000, trademark pending! Just line up your shells and let the Beadmaker 2000, trademark pending, do its thing! Beads come out shiny, holed, and ready to string perfectly, every time. Only costs $19,000 and requires four 240 volt power sources. This can be yours for... Lee Francis IV: What is... Man (offscreen): We’re shooting here. Lee Francis IV: Yeah, no, I know. That's all well and good, but for thousands of years Indigenous people have been making beads by hand, using traditional engineering methods. And, you will learn more about those engineering methods here on Indigi-Genius! I, I don't know... ♪ ♪ Lee Francis IV: Thousands of years ago, Native people on the Northeastern coasts of North America noticed the beauty and brilliance of the local quahog shells that they had been cultivating as a food source. The pearl white and deep purple were so striking, they soon became a commodity in trade and commerce. Over time, the Indigenous peoples of the area learned to refine the shells into incredible beads, known as Wampum. As the colonist Roger Williams observed, “They that live upon the seaside generally make of it, and many make of it as well, the manufacturing process involved precise grinding and polishing of these shells into small cylindrical tubes, approximately 6.7 millimeters in length and 4.7 millimeters in diameter, with the center drilled through by means of a stone drill, of Indian manufacture, called the Puckwhegonnautick.” The process of creating the beads began in the summer months, primarily among the Narragansett, Montauk, Niantic and Quinnepiac peoples. They would collect the shells after eating the clams first, of course. Then they would be separated and carved or blocked. Once the blocks were created, they would segment those blocks into rectangles of the appropriate length. Then, they would drill the center hole and finally polish and shape the bead into the cylindrical shape needed to create the dynamic belts, necklaces, strands and more. Now, Wampum beads were difficult to make, even back then. There were no mechanical drills and the people learned early that the dust from drilling the center holes could cut up the lungs, if inhaled. Additionally, the shells and beads are incredibly small and prone to breaking. So, the artisans created a few indigi-genius solutions. First was the creation of a vise, made from split wood and secured with leather. The vise could be used to hold each individual bead for carving, shaping and drilling. The second innovation was the development of the drilling process. A Puckwhegonnautic, or stone drill, was used, in coordination with a slurry of fine grit and water, which would eliminate much of the dangerous dust and make the drill more effective. What continues to astound, is how powerful the Puckwhegonnautic were engineered to be. Modern tests showed that the drill could yield almost 3000 rpms. Imagine the skill and precision needed to drill a hole less than an eighth of an inch, using only hand power. Indigenous people have been crafting beads for millennia, from the Choctaw, to the people of the vast coasts of the Americas. Beads have played such an important role in many aspects of Indigenous societies. Today, modern techniques and machinery are used to manufacture Wampum beads with incredible accuracy. Places like Wampum Magic specialize in large-scale Wampum sourcing, but even with modern technology, the time and attention, care and craft, are still present in each bead and artisan who molds them. When I was little, I taught myself how to bead. I would go from person to person at Powwows selling custom-designed earrings. I never would have imagined taking the time to drill each hole for each bead. When we think of science, we often think of those folks hanging in laboratories, peering through microscopes and conducting experiments, but the science of engineering, of creating machinery, of those ancestral Indigenous, mechanical engineers, has been and continues to be a hallmark of Indigeneity. That high degree of skill necessary to develop consistent methods for manufacturing continues to be awe-inspiring. And these wonders of manufacturing and engineering, are on display each and every day, here on Indigi-Genius. What... it’s not... is that duct tape? I just, I can’t.