

A Portrait of an Artist-Scientist

In fact, medieval cathedrals are also made up of hexagons and pentagons. Medieval thinkers, including architects, believed that these simple geometric forms represented the order of the universe. The pairing of the hexagonal and pentagonal shapes of cathedral foundations with the pentagonal and hexagonal shapes of molecules that make up nucleotides is a close visual match to the pairing that happens inside of DNA itself.

The parallels do not stop there. Four different nucleotides make up all of DNA. In the *Foundations* series, there are four pieces, one for each nucleotide. Although they all share similar components, each molecule is different, just as the architecture of the four cathedrals in *Foundations* is slightly different.

To make each piece in his *Foundations* series, Mark sketched out the visual relationship between the architecture and the nucleotide. He then used a computer-controlled laser to transfer the drawing to a piece of Plexiglas, and mounted the Plexiglas on a shallow box hanging on the wall. The back of the shallow box contains cloudy formations that create a sense of mystery, while the gap between the Plexiglas and the back of the box allows the etched drawings to cast shadows and create a sense of distance and time.

By pairing an image of science past with an image of science present, Mark creates a comparison between how little we knew in medieval times and how much we know now. And he invites us to wonder about how much more we'll know in the future.

Drawing from Life

When Mark was diagnosed with MS, he began to incorporate the experience of disability into his works of art.

Mark had lost sight in his right eye. To make sure this was not being caused by a brain tumor, his doctor took pictures of the optic nerves behind his eye. His doctor used a Magnetic Resonance Imaging machine (MRI) to take pictures of the optic nerve. Mark's doctor showed him the pictures and then drew mysterious little circles over some of the spots where there might be problems. This process helped to determine that there was no tumor and led to the diagnosis of MS.

Later, Mark used chalk to copy the MRI scan and the circles his doctor drew onto a black background. Next to this black square, he placed a neat white square with gold circles arranged in the shape of a necklace. By comparing two sets of circles, one in a familiar pattern and one in an unknown pattern, Mark wanted to show how science simultaneously offers information and creates mystery.

Making Connections

- ▲ After reading about Mark Parsons, can you explain what part of Mark's process is science and what part is art? How do you think they go together?
- ▲ To make his art, Mark often combines two different sets of images. How does pairing two images change your perception of each?

For more on the intersection of art and science as seen through the eyes of Mark Parsons, view the vodcast at www.vsarts.org.




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Explore how artist Mark Parsons draws inspiration from the relationship between science and art



Cover photo courtesy of Mark C. Parsons



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Check out how Mark Parsons blends biology and architecture to create art!

“Have you ever wondered what made the earth spin, or why waves crash against the shore for ever and ever, or been curious about the world around you—from the biggest ideas to the smallest? Do you ask questions? Do you investigate and learn? Then you are young scientists in search of answers, or you are young artists who enjoy speculating about the importance of the answers.”

This quote is artist Mark Parsons' response when asked about what art and science have in common. He knows something that many people may not: art and science are both tools for understanding and describing the world.

A Quick History of Mark Parsons

Mark Parsons has the distinction of being a prominent artist with a disability. He has multiple sclerosis (MS) and incorporates his experience with both disability and science into his works of art.

From the time he was a child, Mark wanted to figure out how things work. He took apart flashlights, train sets, and even his father's motorcycle. When he was in eighth grade, his father, who is a surgeon, took him to see an autopsy. Mark became fascinated by the way the human body works. When it was time to go to college, he decided to pursue a career in medicine.

For three years, Mark focused his studies on science. He also was required to take other courses, and the art and architecture courses that he took interested him as much as the science. Then, something happened. “I was working in the art studio one night. I was carving a large chunk of stone, which is no easy task. Knowing my friends were out having fun, I asked myself, ‘If I could be anywhere doing anything right now, where would I be?’ In that moment I knew there was no place else I'd rather be.”

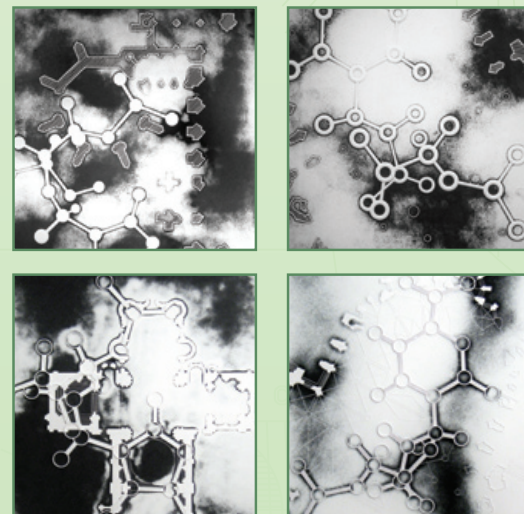
That was the night that Mark decided to pursue his love of art and architecture. Now he has an art studio inside the Pratt Institute architecture building in New York, where he also works as a teacher.

To get to Mark's studio, you walk down a long hallway filled with hundreds of architectural models. These models are not of buildings; they are complex spirals that could represent anything from a spiral staircase to the double helix of DNA. There are also shapes that look like patterns found in nature. These shapes were designed by students using computers and created by the complicated 3-D printers that Mark brought to Pratt.

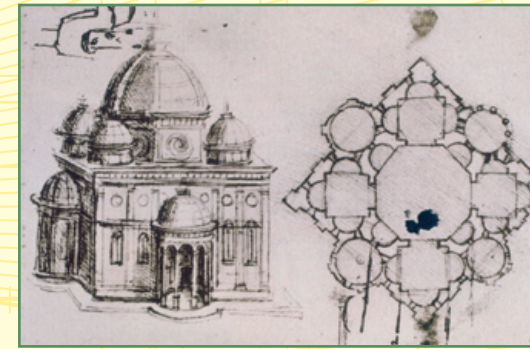
The artwork inside Mark's studio could almost be an extension of the images lining the hallway. This area is full of a mix of nature and architecture. His creative mind has blended what he's learned about biology and architecture to create art that explores the ways in which science affects our lives.

Foundations

The artwork in Mark's *Foundations* series is a good example of how biology has influenced his work. A “foundation” is the basis or groundwork upon which many different kinds of things are built, so it could be the cement foundation of a building, or DNA, the biological foundation of all life. In the *Foundations* series (a group of four artworks), Mark brought together both of these definitions by pairing images of DNA with images of the foundations of medieval religious structures.



Details of the four pieces in Mark Parsons' *Foundations* series © 2004–2005 Mark C. Parsons



Leonardo da Vinci's drawing of a church

A Quick History of Science

Many people associate medieval monasteries with the Dark Ages and a time without science. In truth, monasteries were the centers of the latest scientific knowledge. At the end of the 11th century, people began using monastery buildings as schools and colleges. The best and brightest biology students in Europe came to these places to learn about how living things work, but there were many gaps in their knowledge. For one thing, they didn't understand heredity (the way in which genetic characteristics like hair color and facial features are transferred from parents to offspring).

In the years 1856 through 1863, an Augustine monk named Gregor Mendel formulated the basic principles of heredity by growing pea plants in the monastery garden.

Mendel noticed that the same kind of pea plants had many different characteristics. Some plants produced round peas, while others produced wrinkled ones. Some plants were short, while others were tall. Mendel wanted to explain these differences, so he cross-pollinated pea plants with different traits to see what their offspring would look like. After many years of experimentation, Mendel discovered laws that are still used today.

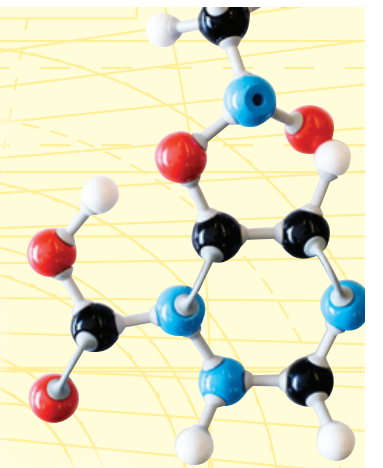


Gregor Mendel, the father of modern genetics

Science Present

Today we know that traits are encoded in and passed on through deoxyribonucleic acid (DNA), a molecule found inside the nucleus of every cell. DNA lets scientists understand anything from what determines eye color to how much humans have in common with animals. It represents the most advanced knowledge we have of what makes us who we are.

The DNA double helix looks like a spiral staircase or a twisted ladder. It's made up of two twisting strands that are composed of stacked building blocks called nucleotides. Nucleotides are composed of smaller molecules shaped like hexagons and pentagons. There are four different kinds of nucleotides. Each nucleotide has a partner that it pairs with to hold the two DNA strands together.



A 3-D representation of a molecule

Pairing and Comparing

Mark Parsons was inspired by the pairing of nucleotides. He was also fascinated by the idea of a monastery or a cathedral as an expression of scientific achievement in physics and engineering, as well as achievements in art and craftsmanship. Once again, a combination of interests led to a unique approach to art and science. Parsons discovered that when he changed the scale of the architectural drawing of a cathedral and held it side by side with an enlarged drawing of the molecules of a nucleotide, the similarities were astounding.

“The discovery of DNA was the pinnacle of scientific research of contemporary times,” says Mark. “Both are heroic efforts separated by hundreds of years, yet there's a distinct similarity in the representation and the earth-shattering implications of each. The scale shift allows for these two seemingly disparate elements of our human experience to be compared and related.”

A detail from Mark Parsons' *Foundations* series

