History of Stained Glass

Stained glass or **colored glass** has been around since ancient times. The oldest example of colored glass is from around 2700 BC in ancient Egypt. This glass began to be used in windows in the homes of wealthy Romans during the first century AD.

Later, in the 7th century, the first instance of a window containing multiple pieces of colored glass was found in England. Colored glass windows continued to become more complex, and by the 10th century, what we think of as stained glass windows began to appear. Stained glass windows are still used today, though the look and style continues to change based on popular art trends.

While the ability to create colored glass has been around for centuries, the science behind how the different colors form is a more recent discovery. The scientific process behind colored glass not only helps artists create new materials, but has also helped scientists create ways to harness solar energy, create new medical treatments, and more!

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Science of Stained Glass

Stained glass is not painted, but actually changes color through the addition of tiny pieces of metal. Clear glass is made by heating sand until it becomes a liquid. Once melted, the liquid sand can be poured into molds to create flat sheets for use as windows. The color is created from tiny pieces of metal that become trapped as the glass cools.

For example, colored glass can be created with tiny gold and silver particles. These particles are called nanoscale, meaning they are very small, approximately 100,000 times smaller than the width of a piece of human hair.

When the particles are this small, they appear as colors you might not expect. Gold has a yellow color, but round gold nanoscale particles appear red. Round silver particles with nanoscale sizes have a yellow color.

The color of metal particles depends on particle size, particle shape, what it's made of, and their environment. Tiny gold and silver particles to be nearly any color of the rainbow!

can

Explore these properties by "coloring" a virtual stained glass image. The properties of many materials depend on their particle size. New properties are found when particles are nanoscale. Scientists and engineers are studying these properties to find new materials that address needs related to solar energy, medicine, national security, and more.

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Meet the Scientists

Video still to be made.

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