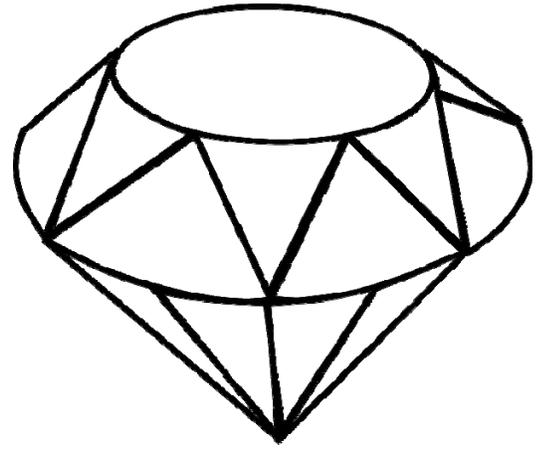


Gemstones

Gemstone is another name for jewels or precious gems like diamonds, emeralds and rubies. Humans have prized gemstones for their unique colors and clarity for thousands of years. Even in ancient civilizations, rulers, nobility and wealthy merchants hired skilled craftsmen to combine gold with gemstones to create fancy jewelry or other artifacts such as drinking cups or elegant swords.



Monarchs during the Middle Ages in Europe began the custom of wearing a jeweled crown as a symbol of power. The Russian czars took the quest for jewels to a new height. When Empress Catherine of Russia, also known in history as Catherine the Great, assumed control of Russia in 1762, her imperial crown contained 4,936 brilliant-cut diamonds. Within the crown is a 56-carat diamond. Carat is a special measure of weight for gemstones and equals about 200 milligrams. In comparison, a one-carat diamond is a treasure to Americans.

Gemstones are minerals. For example, there is a mineral named diamond. Diamonds are prized not only for their brilliance and clarity but also for their hardness. Diamond is the hardest naturally occurring substance known. The Mohs scale of hardness for minerals, developed by German mineralogist Frederich Mohs (1773-1839), ranks minerals from one to ten based on hardness. On the Mohs scale, diamonds have a value of 10; beryl, the source of emeralds, has a value of 8; and iron has a value of just $4\frac{1}{2}$. A diamond is 140 times harder than minerals with a value of 9 on the Mohs scale.

The remarkable hardness of gemstones is due to how they were formed. In general, mineral deposits are a result of the changes that occurred during the development of the earth's crust billions of years ago. Gemstones formed within the earth's crust as a result of the tremendous heat ($1,300^{\circ}\text{C}$) that melted magma and the eventual cooling that solidified the molten magma. Over billions of years mineral deposits rose closer to the earth's surface and can now be mined. Mining for gemstones, like mining for other minerals, requires digging up huge quantities of rock, crushing the rocks and carefully removing the pieces of valuable minerals. Mineral deposits of gemstones occur only in certain places on earth. For example, the country of Columbia is the main location for emeralds.