Minerals form naturally. Each has a specific chemical formula, with atoms arranged in a characteristic structure. While thousands of minerals have already been discovered, there are many more that have not yet been described. The study of minerals gives important information about how the universe formed.

The different properties of minerals make them useful in many ways. Living things depend upon minerals for their survival. Humans use rocks and minerals as raw materials for manufacturing a wide variety of products, building structures and roads, enriching soil, and much else.

Gems and minerals are admired by many for their beauty, value, and longevity. Color, shape, luster (shine), size, and scarcity all play a role in the value of gems and minerals to people. To be a gem, a mineral must be beautiful, rare and durable.

Many minerals are identified using their colors, luster, hardness, streak, and cleavage (the way they split). Other minerals need to be identified using microscopes and special instruments in laboratories.

The resources humans depend upon must either be mined or grown. According to one estimate, each human will use more than three million pounds of rocks, minerals, and metals over a lifetime. It takes minerals from all over the world just to make a smartphone!

Natural diamonds formed 90 to 400 miles below Earth’s surface in temperatures more than 2000 degrees F. The pressure needed to form a diamond is greater than 80 elephants stepping on your big toe! Diamonds were carried to Earth’s surface by special volcanoes called diatremes.

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