

How Is Concrete Made?

Did you know that twice as much concrete is used in construction as all other building materials combined? Concrete is undoubtedly an important material. You can find it in sidewalks, in the foundations of buildings, and even in bridges. But what exactly *is* concrete?

Concrete is considered a **synthetic material**, which is a material made by humans. People create synthetic materials by applying chemical processes to **natural resources**, which are materials that can be found in nature. A **chemical process** causes the atoms that make up the original substance to regroup into different molecules so that the new substance has different properties.

Concrete is formed when cement is combined with water, sand, and rock. Cement is made from **limestone**, a type of sedimentary rock, and clay minerals. The limestone and clay minerals are heated in a kiln to extremely high temperatures—around 2,700 degrees Fahrenheit! This chemical process produces a rock-like substance that is then ground into a fine powder to make the cement. Water and cement form a paste when mixed together, and the paste binds with sand and rock to harden into concrete.

Concrete is one of the most durable building materials, and it gains strength over time. Concrete also provides much better fire resistance for buildings than wood and offers excellent energy efficiency. For these reasons, civil engineers and construction workers often use concrete when designing and building structures. See how many concrete structures you can spot in the area where you live!



Show what you know! Using what you learned from the reading, answer the questions below. **Sample answers**

1. What is the relationship between natural resources and synthetic materials?

Natural resources are materials that can be found in nature, while synthetic materials are made by humans through chemical processes. Even though synthetic materials are not found in nature, they are made from natural resources.

2. Is cement a natural resource or a synthetic material? How do you know?

Cement is a synthetic material because it is made from the chemical processing of natural resources. To make cement, limestone and clay minerals are heated in a kiln to produce a rock-like substance, which is then ground into a fine powder.

3. Why is concrete important to society?

Concrete is an important construction material. It is used to build sidewalks, bridges, and buildings, among other things. Concrete is used to make buildings that are strong, fire-resistant, and energy efficient.