

# Marble

## Chapter 9

**M**arble is a metamorphic rock that forms when limestone is subjected to heat and pressure. It is composed primarily of the mineral calcite. Other minerals that are often in marble include clay minerals, micas, quartz, pyrite, iron oxides and graphite.'

During metamorphism the calcite in limestone recrystallizes into marble as a mass of interlocking calcite crystals form in the rock. Dolomitic marble is a similar rock that is produced when dolostone metamorphoses into a metamorphic rock.



Taj Mahal, a pure white marble building

### **Regional metamorphism**

Most marble forms at convergent plate boundaries. When two continental plates collide large areas of the crust are subjected to regional metamorphism. Marble also forms by contact

## FS Metamorphic Rocks

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metamorphism when molten rock heats adjacent limestone or dolostone.

### **Limestone changes during metamorphism**

Limestone before it is metamorphosed into marble often contains fossils that have turned to stone. The limestone also contains other debris that may have accumulated on seafloors.

During metamorphism, calcite recrystallizes and the texture of the rock changes. Some of the limestone begins to metamorphose into marble. The calcite crystals in the rock are very small. If you were to break a small piece off the marble, you would be able to recognize a sugary sparkle of light. The light is reflecting off the tiny cleavage faces of the crystals.



Marble  
quarry on  
Thasos  
island,  
Greece  
Dr. P.  
Tzeferis

### **Metamorphism continues**

The crystals grow larger and become easily recognizable as interlocking crystals of calcite as the metamorphism continues. The original fossils and sedimentary structures of the limestone are destroyed by the recrystallization into higher grades of marble. Foliation does not form in the marble. Normally foliation develops in rocks that are altered by the direct pressure of a convergent plate boundary.

# Sugar Cube Building

## Activity 9

### Introduction

Interlocking crystals of calcite give marble a sugary appearance. In this activity you will be creating house out of sugar cubes. The sugar cube house below is left unfinished to show how to construct your own sugar cube house.



Incomplete sugar cube building with rooms inside.

### Materials

- Board or table
- Box of sugar cubes
- Frosting
- Parchment paper, tinfoil, etc.

### Directions

1. Decide on the length and width of the building. The building in the picture is 12 cubes long and 8 cubes wide. When finished the building will be 7 cubes high.
2. Begin by putting frosting on 1 side of a cube and placing a second cube on the surface so they are stuck together.

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