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## Crystal Growing Dolomite

RM-350 / 390

### The Origin of Popcorn Rocks

The rocks contained in this package are magnesium rich dolomite. Dolomite is an evaporative sedimentary rock made up of a variety of sediments and minerals. This dolomite is actually somewhat unique in that it possesses an amazing property that is not necessarily common to other dolomite samples. When placed in distilled white vinegar, this dolomite grows beautiful white aragonite crystals.



This characteristic was first discovered in 1981 by Mr. Richard D. Barnes, then a geology student at the University of Utah, who was working with fossil specimens of horn coral that he had collected. Typically, horn corals are preserved in limestone, a rock that is composed of calcium carbonate, which reacts with vinegar and dissolves in that weak acid so that the fossil can be removed and studied. The interesting thing about this rock is that it did not dissolve but rather produced spectacular, white, bulbous crystals, resembling popped kernels of corn. That is how these rocks came to have the commercial name, popcorn rocks. In going back to the site, Mr. Barnes determined that this rock layer was actually an ancient lagoon that had been surrounded by a coral reef millions of years ago. He attributed the unique, crystal growing property of the rock to the residual minerals deposited in the rock layers by sea grasses that were present in the lagoon at that time.

### Instructions:

1. Place an unwashed sample of crystal growing dolomite in a small glass or plastic bowl.
2. Pour distilled white vinegar over the sample until it is nearly submerged. The rock should be just barely sticking above the surface of the vinegar.
3. Place the bowl with the rock on a shelf or windowsill where it can remain undisturbed but can be easily observed. The warmer the location, the faster the vinegar will evaporate and the more quickly your aragonite crystals will appear and grow.
4. Observe the dolomite every day as the aragonite crystals grow atop the rock. Be careful not to touch them at this point as they are very delicate and will drop off.
5. Let the bowl sit undisturbed until ALL the vinegar has evaporated and the rock is COMPLETELY DRY.

### Materials:

*Sample of Crystal growing dolomite*  
*Small plastic or glass bowl*  
*Distilled white vinegar (available at the supermarket)*

At this point, the rock may be picked up and examined. Note the beautiful aragonite crystals. Also examine the original dolomite sample and how it has changed. Proudly display your fine sample for all to see!

# NGSS Correlations

Our Crystal Growing Dolomite and these lesson ideas will support your students' understanding of these Next Generation Science Standards (NGSS):

## Elementary

### 2-PS1-1 • 2-PS1-2

Students can use the Crystal Growing Dolomite to investigate and analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

### 2-ESS1-1

Students can use the Crystal Growing Dolomite to investigate and make observations to construct an evidence-based account that Earth events can occur quickly or slowly.

### 4-ESS2-1

Students can use the Crystal Growing Dolomite in an investigation to make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

### 2-PS1-4 • 5-PS1-1

Students can use the Crystal Growing Dolomite in an investigation to develop a model to describe that matter is made of particles too small to be seen.

### 5-PS1-3

Students can use the Crystal Growing Dolomite to make observations and measurements to identify materials based on their properties.

## Suggested Science Idea(s)

### DCI/MS-PS1.A

Each pure substance has characteristic physical and chemical properties that can be used to identify it.

### 2-PS1-1 • 2-PS1-2 • 2-PS1-4 • 5-PS1-1 • 5-PS1-3 • MS-PS1-2 • HS-PS1-5

Matter can be described and classified by its observable properties. The various kits offer students an opportunity to see crystal formation and observe how the chemical composition affects the shape and size of those crystals.

### 2-ESS1-1 • MS-ESS2-1 • HS-ESS2-1

Students can use the Crystal Growing Dolomite to observe the crystallization process in a short amount of time, modeling what can take the Earth millions of years.

### 4-ESS2-1

Students can use the Crystal Growing Dolomite to build crystals and then use a variety of methods to witness erosion of the crystal formations.

## Middle School

### MS-PS1-2

Students can use the Crystal Growing Dolomite to analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

### MS-ESS2-1

Students can use the Crystal Growing Dolomite in an investigation to develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

## High School

### HS-PS1-5

Students can use the Crystal Growing Dolomite to investigate and apply scientific principles with evidence to provide an explanation about the effects of changing the temperature or concentration of particles.

### HS-ESS2-1

Students can use the Crystal Growing Dolomite in an investigation to develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.

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## Take Your Lesson Further

As science teachers ourselves, we know how much effort goes into preparing lessons. For us, “*Teachers Serving Teachers*” isn’t just a slogan—it’s our promise to you!

Please visit our website  
for more lesson ideas:

[TeacherSource.com/lessons](http://TeacherSource.com/lessons)

Check our blog for classroom-tested  
teaching plans on dozens of topics:

<http://blog.TeacherSource.com>

To extend your lesson, consider these Educational Innovations products:

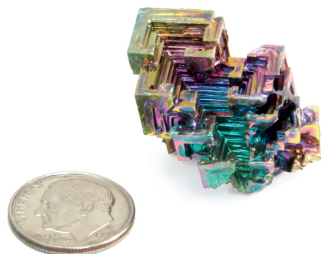
### **Rock Candy Crystal Growing Experiment Kit** (RM-100)

While quartz crystals take tens of thousands of years to grow in nature, you can grow crystals of sugar in only a few days! In the process, students learn about saturated and supersaturated solutions, seed crystals, and the rate of crystalline growth. Included are all the materials to grow sugar crystals, along with a study guide. Includes enough pure sucrose and seeded sticks to make five individual-sized candies.



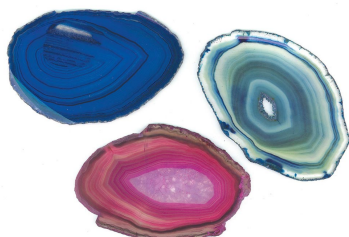
### **Bismuth Crystals** (RM-520)

These beautiful man-made crystals float to the top of a super-cooled bismuth melt and form within minutes. Bismuth is one of the few materials that have a greater density as a liquid than as a solid. Only a few other materials such as water, gallium, and germanium exhibit this property. The trigonal crystal structure accounts for the cubic formations. The iridescent rainbows of colors observed are caused by light scattering off thin layers of bismuth oxide formed when the surface of the hot bismuth reacts with the air. Specimens range from 12 to 17 g with a density of 9.81 g/cc. Great for teaching about crystals, states of matter, or even as a gift!



### **Mica** (RM-910)

Everyone loves to pull apart the layers from a specimen of mica. These mica specimens from New England will provide samples for at least 30 students. Sold in one-pound packages.



### **Agate Slices (Dyed - pack of 4)** (RM-512)

These 1/8 inch thick agate slices are beautifully colored and highly polished. You can clearly see each layer of the different minerals. Approximately 2-3 inches across. Slices are stained to easily show mineral layers. Pack of six. Colors may vary.