

Ames Public Library @HOME Activities for Teens

Geodes

Geodes are rocks that are plain on the outside but have a wonderful surprise inside in the form of beautiful crystals. Geodes can be round or oblong like an egg. They can be just a couple of inches or several feet in size. Geodes are found throughout the world. In the United States they are found in several states including California, Arizona, Illinois, and Iowa. In fact, the geode is Iowa's state rock.

Books and Media:

Title	Author	Call Number:
<i>Geology Lab for Kids: 52 Projects to Explore Rocks, Gems, Geodes, Crystals, Fossils, and Other Wonders of the Earth's Surface</i>	Romaine, Garret	J 550.78 ROM
<i>Geology Rocks! 50 Hands-on Activities to Explore the Earth</i>	Blobaum, Cindy	J 551 BLO
<i>Rocks and Fossils: A Visual Guide</i>	Coenraads, Raymond	552 COE 2005
<i>Rocks, Gems, and Minerals</i>	Romaine, Garret	552 ROM 2019

Websites:

URL	Notes
https://www.iihr.uiowa.edu/igs/publications/uploads/2019-03-07_08-03-55_2015-10-16_11-10-17_em-43-1.pdf	IIHR—Hydroscience & Engineering (University of Iowa) Geode Brochure
https://online.maryville.edu/education-degrees/guide-to-geodes/	Maryville University Guide to Geodes
https://www.newsweek.com/giant-crystals-geode-pulpi-mystery-1465591	Newsweek article about Pulpí geode, one of the largest documented geodes in the world
https://geology.com/articles/geodes/	Geology.com article about geodes

Vocabulary

Rock – A rock can be a single mineral, several minerals, and/or a combination of minerals and organic substances in solid form. Earth's rocks are classified into three main groups: igneous, sedimentary and metamorphic rocks.

Minerals – Minerals are naturally occurring solid substances that have a definite chemical composition. Almost all chemical elements in the Earth's crust are associated with at least one mineral. Most minerals occur naturally as crystals. Examples include sodium, chlorine, and over 4000 other naturally occurring minerals.

Crystals – A crystal is a solid mineral body that is often transparent. Crystals have a very distinct atomic structure. While all minerals have a crystalline structure not all crystals are minerals as there are crystals that are synthetic or manufactured. Examples of crystals include diamonds and table salt.

Rock cycle – The rock cycle is the process in which new rocks are continuously made and old rocks are continuously destroyed or changed into new rocks.

Geologist – Geologists are scientists who study rocks and mineral deposits. A geologist studies the origin, structure, and composition of the Earth and other planets.

Mineralogy – This is the study of minerals, their physical properties, chemical composition, internal crystals and occurrence, and distribution in nature. As a discipline, mineralogy has close connections with geology, as minerals are a basic constituent of rocks.

Fossils – A fossil is the remains of any organism that once lived. Fossils are not the remains of the organism itself, they are rocks. Bones, shell, feathers, and leaves can all become fossils.

How are geodes formed?

Geodes are formed in a variety of ways. In igneous rocks they are formed in voids in a lava flow and cavities like gas bubbles. In sedimentary rocks they can be formed around animal burrows, mud deposits, or even tree roots.

Over time the surface surrounding the cavity hardens into a spherical shape. While geodes look like a solid rock, the surface is porous. Rain water and ground water seeps in through the pores or minute holes on the surface carrying along with it dissolved minerals. These minerals are deposited inside the cavity, and over time this allows crystals to form inside the hollow chamber.

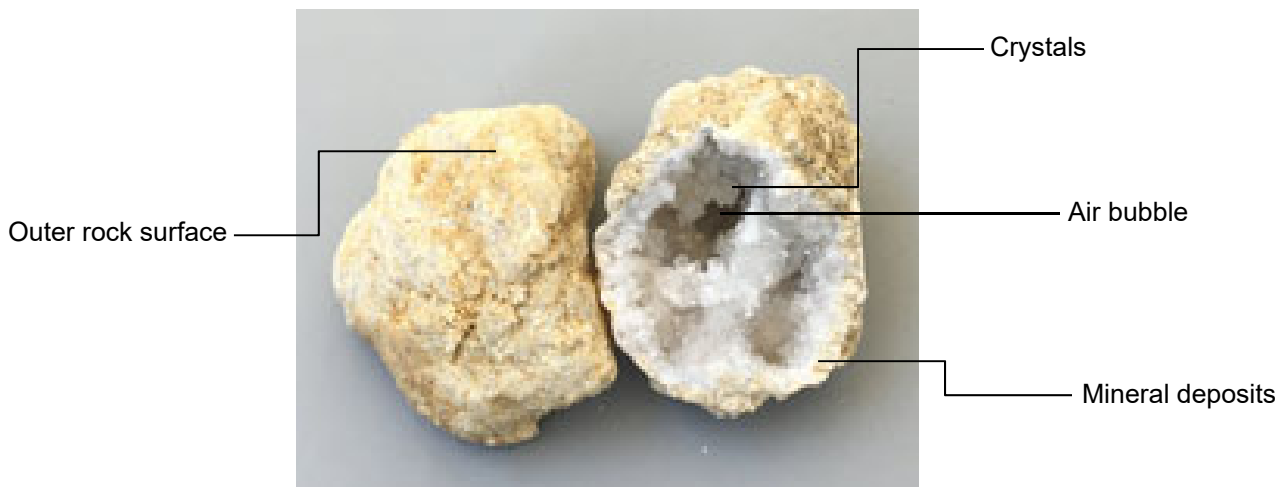
Geodes are formed over thousands, even millions of years. and each geode is unique. Some of the most prized geodes contain black calcite or amethyst crystals.

Fun Facts about Geodes

- The word “geode” is derived from the Latin meaning “earthlike.” This is a reference to their rounded shape.
- Most geodes found in Iowa are roughly spherical, often lumpy or cauliflower-like in form, with diameters typically ranging between two and six inches. However, geodes up to 30 inches across have been found here.
- The most prized geodes have hollow interiors with a layer of crystals surrounding an empty cavity. Many geodes are more solid and have crystal growth in most or all of the interior volume.
- Geodes possess a distinct outer layer which is more resistant to being broken down by weather than the rock material in which they occur. As the rock material the geode formed in is broken down by wind, water, people, or other factors, complete geodes are revealed. This is how geodes end up on creek beds, in rivers, and on paths.

Source: https://www.ihr.uiowa.edu/igs/publications/uploads/2019-03-07_08-03-55_2015-10-16_11-10-17_em-43-1.pdf

Parts of a Geode



Geode take-away kit

The kit contains

- One geode

Some tips for a safe and happy geode experience

- Try to do this activity outside.
- You can put the geode into an old sock or wrap it in some material before breaking it in order to prevent flying rock pieces.
- If you do not want to shatter the geode, score the geode and use a chisel as a lever.

A geode is a rock with a surprise inside. To get to the surprise, geodes have to be cracked or broken open. Breaking open a rock can cause rock shards, so please wear safety goggles. You will also need a hammer and other implements to break it open.

Put on your safety goggles. Take the unbroken geode in your hand and look at it. What does the surface look like? Is it smooth or rough? Does it offer any clues as to what is inside?

Next, use a hammer to break open the geode. Need help? Ask an adult.

Examine the inside. What color are the crystals? Are there any empty spaces or cavities inside? Look at the edge of the geode. Do you notice layers of deposits? What colors are they?

Geodes are a fascinating way to engage with geology. To learn more, check out the resources above.