Let's Get Cracking

Duration: 20 minutes

Location: Court Yard

Goals:

- To teach students about geodes and how they form.
- To give the students a chance to not only crack open a geode, but take a half home with them as a memory.

Vocabulary:

- **Geode:** A cavity within a sedimentary or igneous rock that slowly fills with mineral deposits.
- **Nodule:** A rock that once had a geode cavity, but has since completely filled with mineral deposits and is now a solid rock.
- **Quartz:** The second most common mineral in the world behind feldspar. A common crystal found in geodes.

Secondary Vocabulary:

- **Crystal:** A molecularly uniform mineral. Sometimes appears glassy and clear.
- **Igneous Geode:** A geode formed during a volcanic process by which a hollow rock is created where mineral structures form over millions of years.
- **Sedimentary Geode:** A geode where sedimentary stacking creates a space that over millions of years fills in with mineral structures.

Materials:

- Geode Examples
- Geode Cracking Table
- Uncracked geodes
- Geode Cutter
- Geode Cutter Wrench
- Safety Goggles

Preparation (First Person set up):

- Person at the station needs to place geode cutter in the set position on the table, while inserting the pin.
- Example geodes must be placed out.
- Counted amount of uncut geodes must be brought to station.

- Glasses must be worn by instructor and students.

Introduction:

- Introduce the student to what a geode is. Give the definition and show them the different examples.
- Explain to them that a completely filled cavity turns the rock into a nodule.
- Go over how a sedimentary and igneous geode forms.
    - **Sedimentary Geode:** Due to different layers stacking over time, every once in a while, a gap is created in between different layers. Over time, water (through sediment transport), carries in mineral sediment which creates formations inside the cavity. Eventually the cavity completely fills up and becomes a nodule.
    - **Igneous Geode:** When lava meets a water formation, bubbles of lava cool and harden very quickly. The cavities inside these bubbles trap water and sediment. These rocks are also very porous and allow sediment to enter and over time create mineral formations that fill the rock. Since this cannot be simulated, this remains a theory.
- Cite that a metamorphic rock cannot have a geode due to the extreme heat and pressure experienced during formation. No cavity would survive.
- Explain crystals and how quartz is the second most common mineral in the earth's crust, which is why it is found so commonly in geodes.

Activity:

- Have each student find a partner.
- Have a pair come up and hands pick an unbroken geode.
- Place the geode in the cutter (as taught to you by the Earth Science Director) as they put on their safety goggles.
- Explain to the observing students that when you count to three, they must yell: "Let's the Cracking!"
- When they yell this, have the students together use the wrench until the geode is cut in half.
- Have each student take a half, show the other students and place it in a zip lock bag.
- Repeat this until every student has a geode half.
  Questions (Staff members must know these questions)
- What is a cavity within a sedimentary or igneous rock lined with mineral deposits?
  Answer: **A Geode**
- What is a rock called when its geode cavity completely fills?
  Answer: **A Nodule**
- What is the second most common mineral in the earth's crust?
  Answer: **Quartz**