|  |  |
| --- | --- |
| **Geode** | Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_ Pd \_\_\_ |

**STEP I**

A Geode ([Greek](https://en.wikipedia.org/wiki/Greek_language) for "earthlike") is a [geological](https://en.wikipedia.org/wiki/Geology) secondary structure which occurs in certain [sedimentary](https://en.wikipedia.org/wiki/Sedimentary_rock) and [volcanic rocks](https://en.wikipedia.org/wiki/Volcanic_rock). They can be of sedimentary origin and are formed by chemical precipitation. Geodes are hollow, vaguely spheroid to oblate masses of [mineral](https://en.wikipedia.org/wiki/Mineral) matter, which may include crystals, that form either by the filling of [vesicles](https://en.wikipedia.org/wiki/Vesicular_texture) in volcanic to sub-volcanic rocks by minerals deposited from [hydrothermal fluids](https://en.wikipedia.org/wiki/Hydrothermal_fluid) or by the dissolution of igneous nodules. Some can form by the minerals precipitating from [groundwater](https://en.wikipedia.org/wiki/Groundwater) or in areas of hot geothermal fluids.

 Geodes also differ from [nodules](https://en.wikipedia.org/wiki/Nodule_%28geology%29) in that a nodule is a mass of mineral matter that has accreted around the nodule nucleus. Both structures had the minerals contained within, deposited from groundwater. Geodes commonly have microcrystal masses of silicate minerals such as quartz. The shell is lined internally by various minerals, often as [crystals](https://en.wikipedia.org/wiki/Crystal), sometimes [calcite](https://en.wikipedia.org/wiki/Calcite), [pyrite](https://en.wikipedia.org/wiki/Pyrite), [sphalerite](https://en.wikipedia.org/wiki/Sphalerite), [barite](https://en.wikipedia.org/wiki/Barite), [celestite](https://en.wikipedia.org/wiki/Celestite), [limonite](https://en.wikipedia.org/wiki/Limonite), and [opal](https://en.wikipedia.org/wiki/Opal). Quartz is by far the most common and abundant mineral found in geodes. Geodes are found mostly in [basaltic](https://en.wikipedia.org/wiki/Basalt) [lavas](https://en.wikipedia.org/wiki/Lava) and [limestones](https://en.wikipedia.org/wiki/Limestone). The [Warsaw rock formation](https://en.wikipedia.org/wiki/Warsaw_Formation) in the region near where the [Missouri](https://en.wikipedia.org/wiki/Missouri), [Iowa](https://en.wikipedia.org/wiki/Iowa), and [Illinois](https://en.wikipedia.org/wiki/Illinois) borders meet is an example of one region where geodes are abundant.

 Geode banding and coloration is the result of variable impurities. [Iron oxides](https://en.wikipedia.org/wiki/Iron_oxide) will impart rust hues to siliceous solutions, such as the commonly observed iron-stained quartz. Most geodes contain clear quartz crystals, while others have purple [amethyst](https://en.wikipedia.org/wiki/Amethyst) crystals. Still others can have [agate](https://en.wikipedia.org/wiki/Agate), or [jasper](https://en.wikipedia.org/wiki/Jasper) banding or crystals such as [calcite](https://en.wikipedia.org/wiki/Calcite), [dolomite](https://en.wikipedia.org/wiki/Dolomite), and [celestite](https://en.wikipedia.org/wiki/Celestite). There is no easy way of telling what the inside of a geode holds until it is cut open or broken apart. However, geodes from a particular area are usually similar in appearance.

**NOW: Complete the statements to the right.**

**STEP III**

**Find and circle you answers on the grid below. Note: Words can read in any direction.**

Q U A R T Z G S N E W E

O L A R E N I M O L O E

E E T I C L A C I P L A

D D E C I A L P T R L R

I T O C A A L O A U O T

F T A E V H E W R P H H

O T R A G L D I O S L L

E O S I O N I L L I C I

R E T A W D N U O R G K

A T E D I N I O C W A E

E U O K S Z R D Q G A B

I Y T T Z C A S V R L I

**STEP IV**

**Now read left to right, row by row, the letters you have not circled for a hidden message about the work sheet topic. Write it here:**

**G\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ C \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the W \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**is L\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .**

 # \_\_\_\_\_

 

**STEP II**

**Write in the missing word to complete the statements below.**

1. Geode banding and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the

 result of variable impurities.

2. Geodes are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, vaguely spheroid

 to oblate masses of [mineral](https://en.wikipedia.org/wiki/Mineral) matter.

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is by far the most common

 and abundant mineral found in geodes.

4. Geode is a Greek word that with a meaning or

 translates to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. Geodes commonly have a microcrystal masses of

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ minerals such as quartz.

6. There is no easy way of telling what the inside of a

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ holds until it is cut open or

 broken apart.

7. Geodes are found mostly in [basaltic](https://en.wikipedia.org/wiki/Basalt) [\_\_\_\_\_\_\_\_\_\_\_\_](https://en.wikipedia.org/wiki/Lava)

 and [limestones](https://en.wikipedia.org/wiki/Limestone).

8. Geodes can form by the minerals precipitating

 from [\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_](https://en.wikipedia.org/wiki/Groundwater) or in areas of hot

 geothermal fluids.

9. Some geodes have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [amethyst](https://en.wikipedia.org/wiki/Amethyst)

 crystals.

10. Geodes are abundant in the Warsaw rock

 formation in the region near where the [Missouri](https://en.wikipedia.org/wiki/Missouri),

 [Iowa](https://en.wikipedia.org/wiki/Iowa), and [\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_](https://en.wikipedia.org/wiki/Illinois) borders meet

11. Sometimes geodes can have [agate](https://en.wikipedia.org/wiki/Agate), or [jasper](https://en.wikipedia.org/wiki/Jasper)

 banding or crystals such as [\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_](https://en.wikipedia.org/wiki/Calcite),

 [dolomite](https://en.wikipedia.org/wiki/Dolomite), and [celestite](https://en.wikipedia.org/wiki/Celestite).

12. Geodes also differ from [nodules](https://en.wikipedia.org/wiki/Nodule_%28geology%29) in that a nodule is

 a mass of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ matter that has

 accreted around the nodule nucleus.