THE LIFE CYCLE OF CLAY

Subject: 8th Grade Science **Lesson:** The Life Cycle of Clay

Standard Addressed: Understand the properties of matter and the changes that occur when matter interacts. Classify matter as elements, compounds, or mixtures based on how the atoms are packed together in arrangements. (NC.8.P.1.1)

Objectives:

- Understand that mixtures are physical combinations of two or more different substances that retain their own individual properties and are combined physically.
- Show that mixtures can be separated by physical means (filtration, sifting, or evaporation).
- Identify mixtures as heterogeneous or homogeneous
- Review how transfer of heat affects the movement of atoms and produces change in states of matter.

Materials Needed:

- Device for showing the video
- "The Life Cycle of Clay" Activity sheet

Outline:

- Prior to the lesson, students should understand:
  - The difference between an element, a compound, and a mixture
  - The definitions of homogeneous and heterogeneous
  - How heat affects the movement of atoms and produces change in states of matter
- Before the video, have students look over page 1 of the activity and review some of what you have learned about mixtures.
- Watch the 7:54 minute video, *The Life Cycle of Clay*. https://youtu.be/skUnLZYM0rY
- Students may fill out page 1 of the activity while watching the video.
- After the video, students may complete the activity sheets individually or in a group.

Take It Further: One of the most common minerals in different types of clay is called kaolinite. It is a type of clay that is often used in medications for upset stomach, sometimes in powder makeup, or even to thicken milkshakes! Students will research the structure of kaolinite to find out what elements are combined to create the mineral. Then they must determine if kaolinite is an element, a compound, or a mixture.

Cross Curriculum Connection: In a pottery kiln, the silica in a porcelain clay reaches its melting point at around 2284°F. This is what fuses the various particles of the clay mixture together and allows it to harden into one solid piece of pottery. Have students act out the movement of silica molecules at room temperature when the silica is a solid, and at melting point when the silica becomes liquid.

LEARNING IN PLACE

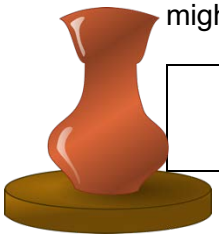
THE LIFE CYCLE OF CLAY

Grade 8 Science

Student Name: _____ Date: _____

What is Clay?

In the video, we saw how the potter begins the clay-making process with a mixture called “slop”. Based on the sediments mentioned in the video, what are three substances that might be in a slop mixture?



Which of these substances need to be partially removed from the mixture to get the right consistency of clay for pottery?

Mixtures can be separated by filtration, sifting, or evaporation. Potters sometimes use all three of these methods to work with their clay. But which of these methods was shown in the video?

Using your knowledge about how molecules move in the different states of matter, why would a slop mixture with too much water have trouble holding a shape outside a container?

LEARNING IN PLACE

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Student Name: _____ Date: _____

Types of Clay

In reality, pottery clay is actually a ***mixture*** made up of *other* mixtures. All types of pottery clays are made of millions of microscopic particles of different ***silicate*** *rocks* and minerals like Mica, Granite, Feldspar, and Kaolinite.

What in the world is a silicate rock?

The most important thing about all of those types of rocks is that they contain the mineral ***silica***. Silica is the purest type of glass that the earth can make. That is what melts in the high temperatures of a pottery kiln and allows pottery to harden into one solid piece. The more silica that a clay mixture contains, the harder the pottery will be. The purest clays with the highest amount of silica are called ***"porcelain."***

Write your own definition for a silicate rock:

In this stone-ware clay pot, you can see specks of Granite and Mica.

Would this clay mixture be considered homogeneous or heterogeneous?

David Drake, South Carolina, 1858

In this porcelain bowl, the clay is so pure, and the particles are so fine, you can't find any individual particles.

Would this clay mixture be considered homogeneous or heterogeneous?

Jingdezhen, China, 1785

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ANSWER KEY

What is Clay?

In the video, we saw how the potter begins the clay-making process with a mixture called “slop”. Based on the sediments mentioned in the video, what are three substances that might be in a slop mixture?

Clay	Sand	Water

Which of these substances need to be partially removed from the mixture to get the right consistency of clay for pottery?

Sand	Water

Mixtures can be separated by filtration, sifting, or evaporation. Potters sometimes use all three of these methods to work with their clay. But which of these methods was shown in the video?

Evaporation

Using your knowledge about how molecules move in the different states of matter, why would a slop mixture with too much water have trouble holding a shape outside a container?

The water is a liquid and in liquids molecules move around with more frequency. The liquid state wants to take the shape of its container, therefore too much water allows for too much movement of molecules and makes the mixture weak.

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Types of Clay

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Write your own definition for a silicate rock:

A silicate rock is a rock with a high silica content.

In this stone-ware clay pot, you can see specks of Granite and Mica.

Would this clay mixture be considered homogeneous or heterogeneous?

Heterogeneous

David Drake, South Carolina, 1858

In this porcelain bowl, the clay is so pure, and the particles are so fine, you can't find any individual particles.

Would this clay mixture be considered homogeneous or heterogeneous?

Homogeneous

Jingdezhen, China, 1785