Lesson Title	Magma and Viscosity
Length of Lesson	1 Day (50 minutes)
Created By	Hannah Box
Subject	Earth Science
Grade Level	8th
State Standards	Eighth Grade: 4b
DOK Level	DOK 1
DOK Application	Measure, arrange, recognize, identify
National Standards	5-8: D: Earth and Space Science
Graduate Research Element	Viscosity and chemical composition

Student Learning Goal:

State Standards Eighth Grade:

(4b) Describe the cause and effect relationship between the compositions of and movement within the Earth's lithosphere. (DOK 1)

National Standards 5-8: B: Physical Science:

Lithospheric plates on the scales of continents and oceans constantly move at rates of centimeters per year in response to movements in the mantle. Major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions.

Materials Needed (supplies, hand-outs, resources):

Magma powerpoint, worksheet for each student, beakers for each group of students, Stopwatch for each group, common household liquids, test tubes, and marbles.

Lesson Performance Task/Assessment:

The students will be taught about the types of magma (composition and viscosity) and asked to fill in a worksheet as the teacher is speaking. Then using what they learn about viscosity, the students will be asked to classify groups of liquids in order of increasing viscosity.

Lesson Relevance to Performance Task and Students:

Students will learn that there are different types of magma and that these types have different viscosities and chemical compositions. After learning the concept of viscosity and how it applies to magma, the students will preform an activity that will show them that common household liquids have varying viscosities.

Anticipatory Set/Capture Interest:

The students will watch the Brain Pop on volcanoes as a refresher and take the quiz at the end.

Guided Practice:

First, the students will watch the Brain Pop for volcanoes as a refresher for what was covered the previous day. Once the video is complete, the students will take the quiz at the end. Once the students have completed the quiz and the answers are reviewed, the teacher will go through the power point on magma that is attached.

After the teacher has completed the power point and has answered any questions that the children may have, a video of several erupting volcanoes will be shown. This video will show the types of magma that were discussed and also show the viscosity of different magma.

Finally, the students will be split into groups of 3-4 and they will complete the activity on viscosity.

Independent Practice:

Students will be given common household liquids and asked to put them in order of increasing viscosity. Water, ethyl acetate, milk, syrup, vegetable oil, honey, corn syrup, chocolate syrup, and ketchup were used in this case. The students will be given the liquids, beakers, marbles, and stopwatches. The first test will be to time how long it takes to pour (not sqeeze) each liquid into the beaker until there are 20 mL. Each student will record their observations and order the liquids. If the students have trouble placing certain liquids that are close in viscosity, they will fill a test tube with the liquid and line up all test tubes in a rack. Once the test tubes are in line, the students will drop marbles into each test tube on the count of three. The marble will travel through the liquids at different speeds due to the differing viscosity, which will help the students place them in order.

Remediation and/or Enrichment:

Remediation: Individual IEP. Instead of having the students break off into groups and preform the activity, the teacher can demonstrate varying levels of viscosity to the class.

Enrichment: If time allows, the temperature of the liquid should be varied to prove to the students that temperature does affect viscosity.

Check(s) for Understanding:

While watching the video of volcanoes ask the students what type of lava they are seeing.

If you and your family were trying to escape a volcanic eruption, what type of lava would you rather be running from? Explain.

Closure:

The students will see a broad range of viscosities from water to honey and relate back to the different types of magma.

Possible Alternate Subject Integrations:

Physics: Fluid mechanics

Teacher Notes: