

Unit Handout
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Lesson 12: Investigating Viscosity and Volcano Type

Purpose: Design an experiment to identify and compare how three different liquids flow, how liquids flow when mixed with a solid, and how their flow changes when heated.

Guiding Questions: - How does the viscosity of a liquid affect its movement?
 - How is the viscosity of lava related to the type of volcano formed?

1. Look at the three liquids for this activity: corn syrup (brown), shampoo (green), and water. What general observations can you make about each liquid? Then, answer questions A-C. A good answer to A-C will include an explanation.

Corn Syrup	Shampoo	Water

- a. How do you think each liquid will flow at room temperature?

- b. How do you think the room-temperature liquids would flow if you added sand to them?

- c. How do you think the liquids would flow if they were heated?

2. See page 161 in the XPT book for a list of materials you will have available to use for this experiment (see "Sample Substances"). Keep this in mind as we complete the back of this sheet.

3. As a class, we will read through and answer questions A-E on page 163 of the XPT book. We will record our answers on the back of this sheet.

Investigation Planning

Question(s) we will try to answer (this is found in your plastic box):

What we think will happen (prediction):

What we will keep the same when testing each liquid:

Procedure we will use to answer the question:

Things we will measure and how we will measure each one (dependent variables):

- Amount of liquid:
- Height of the slope:
- Time of flow:
- Distance of flow:
- How many trials we will conduct:

Complete the data table below as you investigate your liquids. You may not need all the space provided as some groups have 3 liquids to test and others only have 2 liquids to test.

Liquid (indicate whether it is room temperature, heated, or mixed with sand)	Time of Travel (s)				Other Observations
	Trial 1	Trial 2	Trial 3	Average	

Complete the table below with data from the entire class.

Liquid	Room-Temperature Liquid			Heated Liquid			Liquid with Sand		
	Time of Travel (s)			Time of Travel (s)			Time of Travel (s)		
	Trial 1	Trial 2	Trial 3	Trial 1	Trial 2	Trial 3	Trial 1	Trial 2	Trial 3
Corn Syrup									
Shampoo									
Water				Does not apply.					

Averages	Room Temperature		Heated	With Sand
	Corn Syrup			
Shampoo				
Water		Does not apply.		

Analysis. Answer the following questions based on the data you collected. All answers must be written in full and complete sentences.

1. Which room-temperature liquid flowed the fastest? _____
2. Which room-temperature liquid flowed the slowest? _____
3. What evidence do you have to support your answers to questions 1 and 2? Cite specific data to support your claim.

4. How did adding sand to each liquid change how it flowed? Support your answer with evidence.

5. How did heating each liquid change how it flowed? Support your answer with evidence.

6. What is the connection between the viscosity of liquid and how that liquid flows?

