Name: _____

Viscosity Lab

Part 1

Materials:

- Cardboard
- Sheet of 8.5”x11” paper
- Something to prop the cardboard up with
- 5 mL of molasses, poured into a 10mL graduated cylinder
- 5 mL of corn syrup, poured into a 10mL graduated cylinder
- Timer
- Ruler
- Tape

Make a prediction: Which liquid has the highest viscosity, corn syrup or molasses? Why do you think that?

Procedure:

1. Make a long horizontal line at the top of the sheet of paper and another one at the bottom (to mark the start and finish points), and tape the paper to cardboard.
2. Measure the distance between each point and record it in the table.
3. Prop the cardboard up so it is at an angle.
4. Pour the first fluid on the starting line and start the timer. Record the time it takes the fluid to reach the finish line on the table.
5. Pour the second fluid on the starting line a few inches away from the first and start the timer. Record the time it takes the fluid to reach the finish line on the table.
6. Calculate the speed for each fluid (time/distance traveled) and record it in the table.

Part 2

Materials:

- Propped cardboard from Part 1
- New sheet of 8.5”x11” paper
- 5 mL of cold corn syrup, poured into a 10mL graduated cylinder
- 5 mL of room temperature corn syrup, poured into a 10mL graduated cylinder
- 5 mL of hot corn syrup, poured into a graduated cylinder
- Timer
- Ruler
- Tape

Make a prediction: Which liquid has the highest viscosity, the hot, cold, or room temperature corn syrup? Which liquid has the lowest viscosity? Why do you think that?

Procedure

1. Make a long horizontal line at the top of the new sheet of paper and another one at the bottom (to mark the start and finish points), and tape the paper to cardboard.
2. Measure the distance between each point and record it in the table.
3. Prop the cardboard up so it is at an angle.
4. Pour the first fluid on the starting line and start the timer. Record the time it takes the fluid to reach the finish line on the table.
5. Pour the second fluid on the starting line a few inches away from the first and start the timer. Record the time it takes the fluid to reach the finish line on the table.
6. Pour the second fluid on the starting line a few inches away from the second and start the timer. Record the time it takes the fluid to reach the finish line on the table.
7. Calculate the speed for each fluid (time/distance traveled) and record it in the table.

Part 3

Materials:

- Propped cardboard from Part 1
- New sheet of 8.5”x11” paper
- 5 mL of room temperature corn syrup, poured into a 10mL graduated cylinder
- 5 mL of room temperature corn syrup mixed with water, poured into a 10mL graduated cylinder
- Timer
- Ruler
- Tape

Make a prediction: Which liquid has the highest viscosity, corn syrup or the corn syrup with water? Why do you think that?

Procedure:

1. Make a long horizontal line at the top of the sheet of paper and another one at the bottom (to mark the start and finish points), and tape the paper to cardboard.
2. Measure the distance between each point and record it on the table.
3. Prop the cardboard up so it is at an angle.
4. Pour the first fluid on the starting line and start the timer. Record the time it takes the fluid to reach the finish line on the table.
5. Pour the second fluid on the starting line a few inches away from the first and start the timer. Record the time it takes the fluid to reach the finish line on the table.

Analysis:

	Distance traveled	Time	Speed (time/distance)
Corn syrup			
Molasses			
Room temp corn syrup			
Cold corn syrup			
Hot corn syrup			
Corn syrup without water			
Corn syrup with water			

Discussion Questions:

1. Did the molasses have a higher or lower viscosity than corn syrup?

2. Which temperature of corn syrup had the highest viscosity, and which had the lowest viscosity?

3. How did water impact the viscosity of corn syrup?

4. Based on what we learned about composition and temperature of magmas, would felsic or mafic lava have higher viscosity (see below for description of felsic/mafic magma)?

5. Based on what you know about the viscosity of mafic magma, what type of volcanic eruption would you expect?

6. Based on what you know about the viscosity of felsic magma, what type of volcanic eruption would you expect?

Magma compositions

Ultramafic: mostly olivine and pyroxene, very high melting point, mantle material

Mafic: high in iron, calcium, and magnesium, less olivine, more amphibole than ultramafic, high melting point

Intermediate: high in biotite mica and potassium feldspar, medium melting point

Felsic: high in silica, potassium, and sodium, high in quartz, muscovite mica, and potassium feldspar, low melting point