FLINN SCIENTIFIC

Name_____

Pascal's Law Worksheet

Data Table 1.

Syringe system	Plunger Pressed	Observations
3-mL/3-mL	3-mL	
3-mL/20-mL	3-mL	
	20-mL	
1-mL/20-mL	1-mL	
	20-mL	

Data Table 2.

Syringe System	Syringe	Initial Distance (cm)	Final Distance (cm)	Net Plunger Movement (cm)
3-mL/3-mL	3-mL			
3-mL/20-mL	3-mL			
	20-mL			
1-mL/20-mL	1-mL			
	20-mL			

Data Table 3.

Syringe System		Mass	Spring-Scale Force (g)
Input	Output		
3-mL	20-mL	1000 g	
1-mL	20-mL	1000 g	

Post-Lab Questions

1. Review the results of the experiments in Data Table 1. Was it easier to move the 20-mL plunger by pressing the 1-mL plunger, or to move the 1-mL plunger by pressing the 20-mL plunger? Which plunger has the larger surface area? Use Pascal's law to explain the result.

2. Use the measurements from Data Table 2 and Equation 2 to determine the ideal mechanical advantage of the following syringe systems.

   Input: 1-mL, Output: 20-mL

   Input: 3-mL, Output: 20-mL

   Input: 3-mL, Output: 3-mL

   Input: 20-mL, Output: 3-mL

   Input: 20-mL, Output: 1-mL

3. Compare the mechanical advantage calculations from Question 2 to how hard or easy it was to move the respective input plunger. Is it better to have a mechanical advantage greater than one or less than one?

4. Use the measurements from Data Table 3 and Equation 1 to determine the actual mechanical advantage of the following syringe systems.

   Input: 1-mL, Output: 20-mL

   Input: 3-mL, Output: 20-mL

5. Use Equation 3 to calculate the efficiency of the two systems described in Question 4.

6. List possible sources of error that may have led to the low efficiency. What improvements could be made to the systems to make them more efficient?

7. Refer to Figure 5. Which would Pascal predict as the winner in a "thumb wars" match? Why?

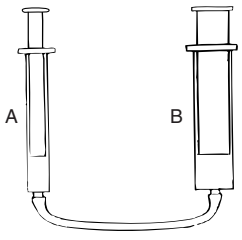

Figure 5.