

Density Rainbows and the Great Viscosity Race Worksheet

1. Record the colors of your fluids in the table below.

Fluid	Color
Corn syrup	
Alcohol	
Shampoo	
Oil	Yellow
Strawberry syrup	Red

2. What is density? What are some properties of dense fluids?

3. If you are reminded that density is the measure of mass per unit volume, what can you say about the mass of two cups that contain the same volumes of different fluids? Which one will be heavier? Will the cup filled with the denser fluid be heavier or lighter than the other?

b. Given the density equation, $p=m/V$ (p =density, m =mass, V =volume), describe what happens if you increase mass, but decrease volume. Given that mass has units of grams (g) and volume has units of meters cubed (m^3), what are the units of density?

c. If your density is given as 3 slugs/inch³ and your mass is 12 slugs, what will your volume be? (Don't let the units confuse you. Solve for the number first and then see if you can determine the units)

4. Predict the order of the fluids from heaviest to lightest. Which fluid is going to sink all the way to the bottom?

5. When you poured in the fluids, did they stay in the order you poured them? Or did some that you thought were denser move up a layer? Why did the fluids set in that order?

The Great Viscosity Race

6. What is viscosity?

7. A lot of dense fluids tend to be viscous, such as corn syrup. Yet viscosity and density are different properties of a fluid. Is ketchup denser than chocolate syrup?
 - b. How does ketchup's mass per volume compare to chocolate syrups? (Remember the density equation)

8. Which one do you think is more viscous?

9. Predict which fluid will win the race down the paper, ketchup or chocolate syrup?

10. Was your prediction correct? Which of the two fluids was the *least* viscous (won the race)? Was this fluid also the *least* dense?

11. Viscosity measures the resistance of a fluid to flow. If a fluid is viscous, it does not flow easily and therefore it moves very slowly when you pour it. Is a dense fluid necessarily viscous? (Hint: Review the definition of viscosity; does it mention density?)

12. Of the fluids used for the rainbow, which do you think was the *most* viscous? Which was the *least* viscous?