

Handout 4: Don't Be So Dense

1. What is density? What units is density in?
2. Explain Cavalieri's principle. What does it tell us?
3. A cylindrical cup of water has a circumference of 8 centimeters and a height of 12 centimeters. If the amount of water in the cup weighs 61.1 grams, what is the density of water?
4. The mass of a single dumbbell needs to be 25 pounds. If its volume is 32.4 cubic centimeters, how dense should the material be?
5. The density of lead is about 11 grams per cubic centimeter. How much volume does 490 grams of lead take up? If the volume were to be contained in a sphere, what would be the length of the radius?
6. A brain weighs about 48 ounces and takes up 1200 cubic centimeters of volume. What is the brain's approximate density in ounces per cubic centimeter?
7. A cylinder with a radius of 2 centimeters weighs 16 grams. If the density of the cylinder is 0.4 grams per cubic centimeter, how tall is the cylinder?
8. A pyramid made of wood has a density of 0.9 grams per cubic centimeter and weighs 340 grams. If it has a square base and a height of 20 centimeters, what is the surface area of the pyramid?
9. An orange weighs about 200 grams. If its radius is about 4 centimeters, what is the average density of the orange?
10. A hemisphere with a radius of 13 inches has had a cone with radius 13 inches and a height of 13 inches hollowed out of it. The solid weighs 1 kilogram. If 1 kilogram is 1000 grams, what is its density in grams per cubic inch?