Chapter 17
Properties of Matter

Section 17.2
Density of Fluids

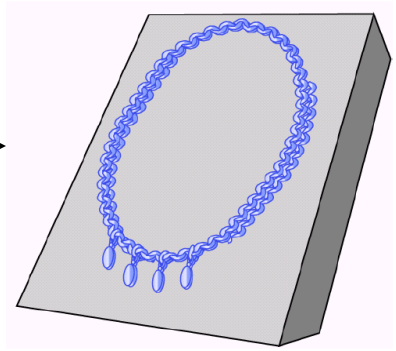
What is a fluid?

- A fluid is matter that can flow or be poured.
- Includes liquids and gases.

Density

- **Recall that size and shape do <u>NOT</u> change a material's density.**

same density



Silver candlesticks **Silver necklace**

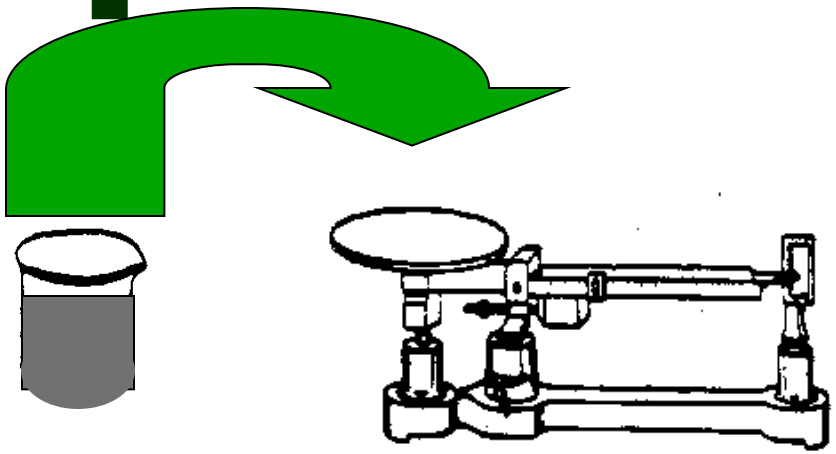
But…what if you melt the silver?

- Can you measure density in liquid form?
- Would the density change?

Remember the formula for density…?

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

How would you measure the mass of liquid silver?



The mass of silver will not change when melted.

However, the volume of liquid silver is greater than that of solid silver.

Why?

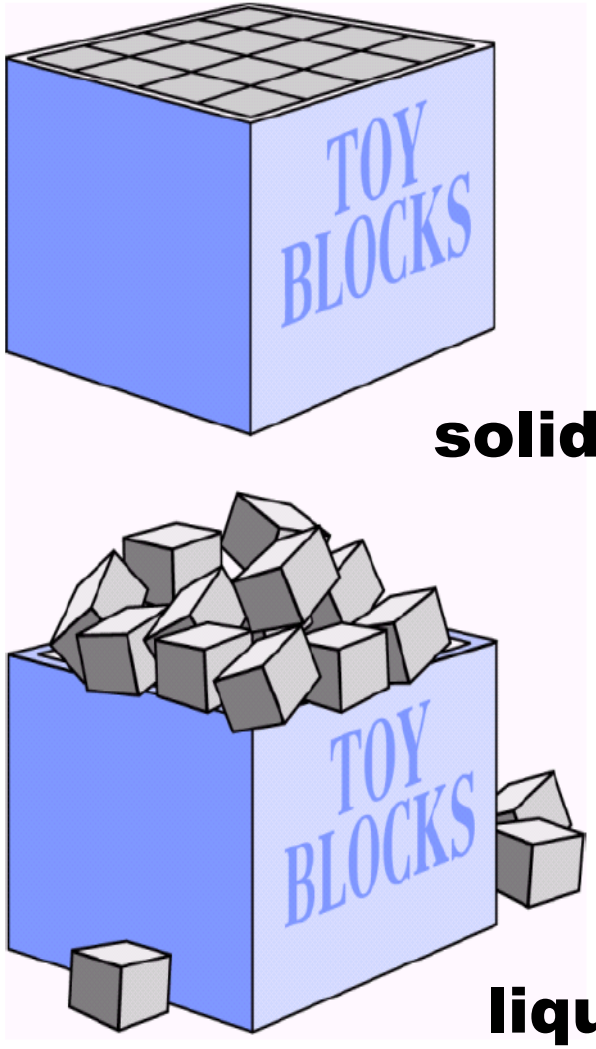


Figure 17.6: *Toy blocks arranged in a tight, repeating pattern take up less space than those in a random arrangement.*

So how does greater volume affect the density of liquid silver?

$$D = \frac{m}{V}$$

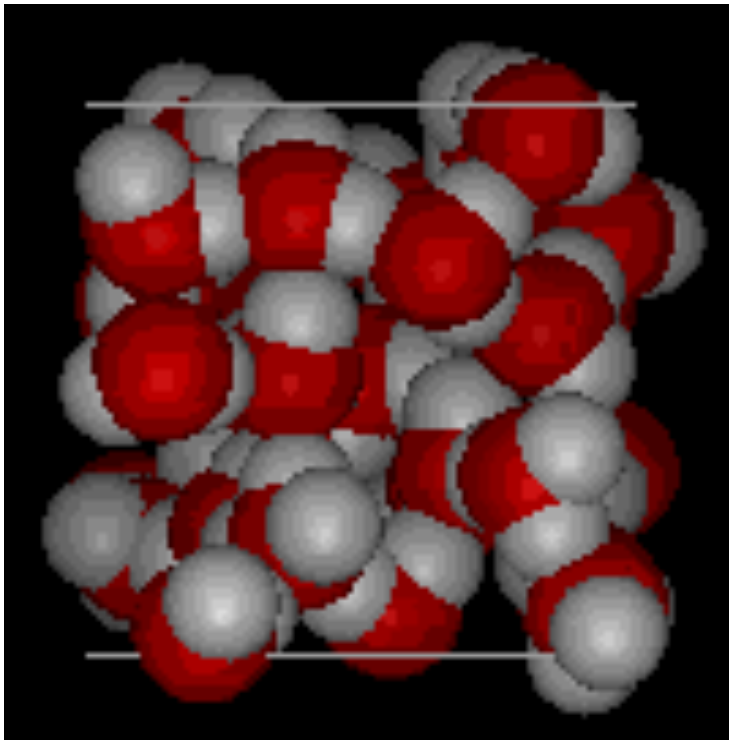
If volume gets bigger, what happens to the density?

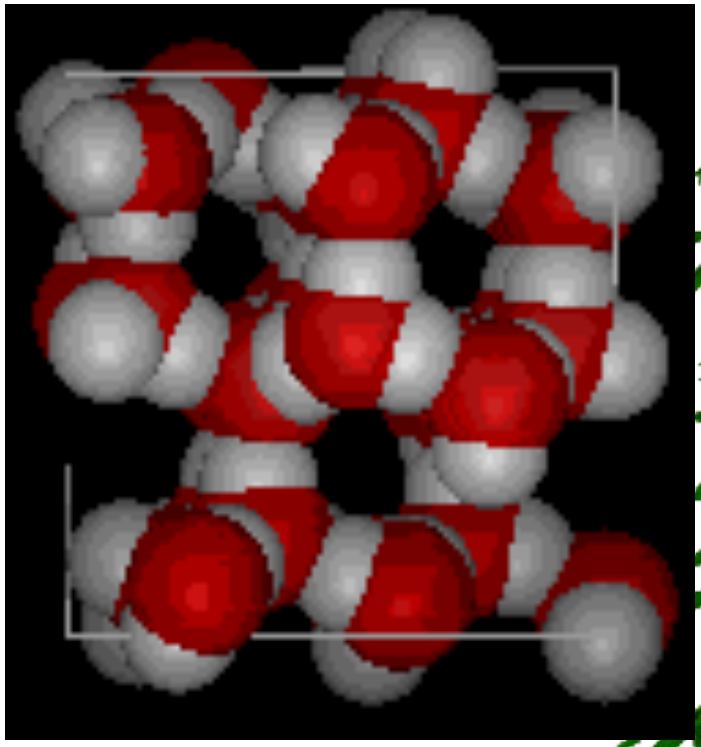
$$D = \frac{m}{V}$$

The density of solids usually decreases slightly as temperature increases because solids expand (volume increases) when heated.

Most materials are more dense in the solid state.

- **Water is an exception. Ice is less dense than water. Why?**





When water molecules freeze, they form a crystalline pattern with holes, so ice is less dense.

What would some of the consequences for life on Earth be if ice were more dense than water?