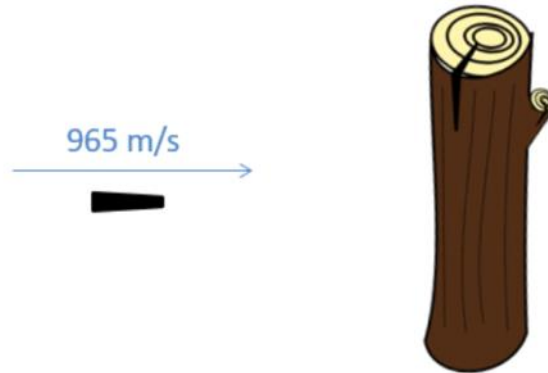


Problem 2

A 4.2g bullet traveling at 965 m/s becomes lodged in a stationary log with a mass of 1.5kg.

- What is the velocity of the log and the bullet immediately after the collision?
- What percentage of the kinetic energy was lost in the collision?



$$\sum m v_i = \sum m v_f$$

$$(.0042 \text{ kg})(965 \text{ m/s}) = (1.5 + .0042 \text{ kg}) v_f$$

$$\boxed{v_f = 2.69 \text{ m/s}}$$

$$KE_i = \frac{1}{2} m v^2 = \frac{1}{2} (.0042 \text{ kg})(965 \text{ m/s})^2$$

$$KE_i = 1955.57 \text{ J}$$

$$KE_f = \frac{1}{2} m v^2 = \frac{1}{2} (1.5042 \text{ kg})(2.69 \text{ m/s})^2$$

$$KE_f = 5.46 \text{ J}$$

$$\boxed{\% \text{ lost} = 99.7\%}$$