

Problem 10-31

Egg masses:

$$\frac{m_l}{m_s} = L^3$$

↙ large  
↘ small

$$\therefore \frac{300 \text{ g}}{60.0 \text{ g}} = L^3 \Rightarrow L = \sqrt[3]{5.00}$$

Shell mass:  $m_{sh} \propto (\underbrace{\text{surface area}}_A) \times (\underbrace{\text{thickness}}_t)$

$$\therefore \frac{m_{sh,l}}{m_{sh,s}} = \frac{A_l}{A_s} \frac{t_l}{t_s} \quad [1]$$

$$\text{But } \frac{A_l}{A_s} = L^2$$

$$\therefore [1] \Rightarrow \frac{7.60 \text{ g}}{2.00 \text{ g}} = (\sqrt[3]{5.00})^2 \frac{t_l}{t_s}$$

$$\Rightarrow \frac{t_l}{t_s} = 1.30$$