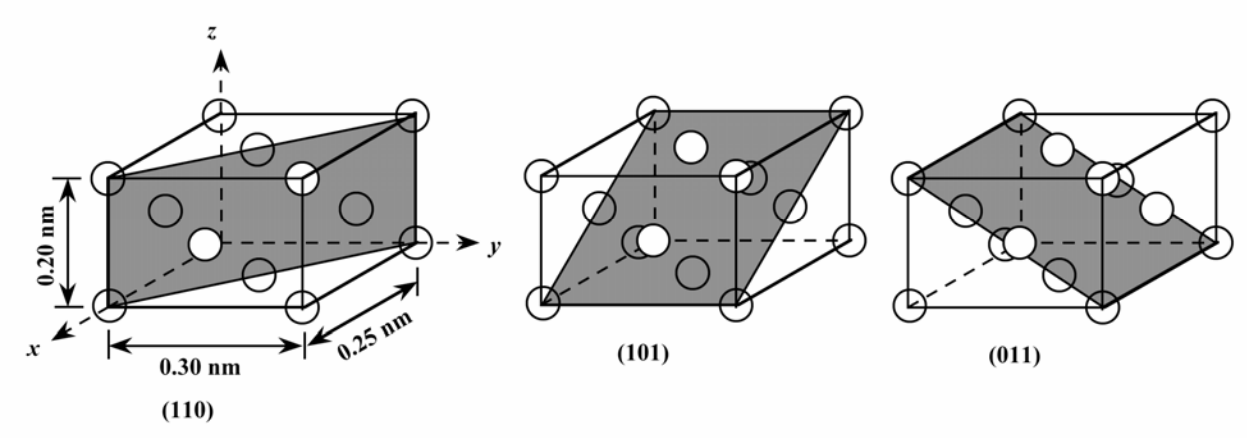
3.47 The unit cells constructed below show the three crystallographic planes that were provided in the problem statement.



(a) This unit cell belongs to the orthorhombic crystal system since $a = 0.25$ nm, $b = 0.30$ nm, $c = 0.20$ nm, and $\alpha = \beta = \gamma = 90°$.

(b) This crystal structure would be called face-centered orthorhombic since the unit cell has orthorhombic symmetry, and an atom is located at each of the corners, as well as at each of the face centers.

(c) In order to compute its atomic weight, we employ Equation 3.5, with $n = 4$; thus

$$A = \frac{\rho V_C N_A}{n}$$

$$= \frac{(18.91 \text{ g/cm}^3)\,(2.0)(2.5)(3.0)\,(\times 10^{-24} \text{ cm}^3/\text{unit cell})(6.023 \times 10^{23} \text{ atoms/mol})}{4 \text{ atoms/unit cell}}$$

$$= 42.7 \text{ g/mol}$$