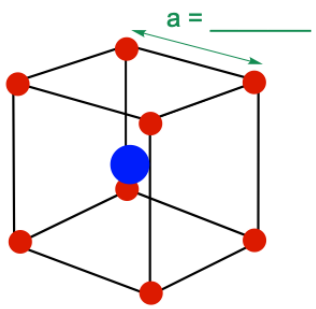
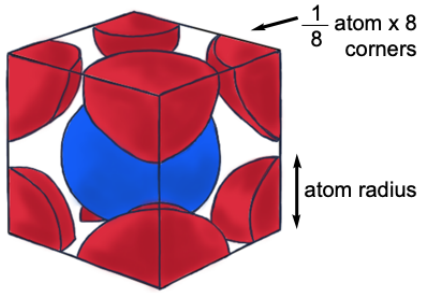
CONCEPT: BODY CENTERED CUBIC UNIT CELL

- The **Body-Centered Cubic Unit Cell** is composed of a cube with an atom at each corner and ____ atom(s) in the center.

Body Centered Cubic Unit Cell

- □ Contains ___ atom(s)
  - _____ atom(s) in the center
- □ Edge length (a) = _____
- □ Packing Efficiency = _____
- □ Coordination Number = ____





EXAMPLE: Iron adopts a body-centered cubic unit cell structure. Illustrate how the number of atoms per unit cell for the iron atom are obtained.

PRACTICE: Tungsten possesses a body-centered cubic structure. If its density is 19.28 g/cm^3, what is its radius in pm?

a) 910 pm b) 316 pm c) 137 pm d) 3.18 pm

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PRACTICE: Vanadium has a body-centered cubic structure. If the atomic radius of vanadium is 134 pm, calculate the density of solid vanadium.

a) 5.33 g/cm^3 b) 4.29 g/cm^3 c) 5.71 g/cm^3 d) 0.52 g/cm^3

PRACTICE: The edge of a body-centered cubic unit cell of an element Z was found to be 2.88×10^{-8} cm. The density of the element is 7.2 g/cm^3. What is the approximate molar mass of Z?

a) 101.7 $g \cdot mol^{-1}$ b) 39.107 $g \cdot mol^{-1}$ c) 10.291 $g \cdot mol^{-1}$ d) 51.996 $g \cdot mol^{-1}$