PHYS 321 S 2014 HW-5 Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The unit cell for the body-centered cubic crystal structure is shown below.



1. Show that the cube edge length, *a* and the atomic radius, R are
related by: $ a=\frac{4R}{\sqrt{3}}$

2. Show that the atomic packing factor is 0.68 for BCC.

3a. Calculate the atomic radius of a vanadium atom, given that V has a BCC crystal structure, a density of 5.96 g/cm3, and an atomic weight of 50.9 g/mol.

3b. Calculate the planar density for (110) planes in vanadium.