8.12 Cube Packing, Volume Ratios, and Scaling

Chapter 8: Geometry and Measurement

Name: _____ Date: _____ Class/Period: _____

Problem 8.177 How many cubes with side length $\frac{1}{2}$ unit fit exactly in a rectangular prism measuring $3 \times 2 \times 1$ units?

Problem 8.178 How many cubes with side length $\frac{1}{4}$ unit fit exactly in a larger cube with side length 2 units?

Problem 8.179 How many rectangular boxes measuring $2 \times 1 \times 1$ fit in a rectangular crate measuring $8 \times 6 \times 5$ when all edges remain aligned?

Problem 8.180 A large cube has side length 9, and each small cube has side length 3. How many small cubes fit exactly?

Problem 8.181 A scale factor is 4. Find area and volume factors.

Problem 8.182 A scale factor is $\frac{1}{2}$. Find area and volume factors.

Problem 8.183 Lengths increase 20%. Find area factor.

Problem 8.184 Lengths increase 20%. Find volume factor.

Problem 8.185 Lengths decrease 30%. Find area and volume factors.

Problem 8.186 Area is multiplied by 9. Find positive linear scale factor.

Problem 8.187 Volume is multiplied by 64. Find positive linear scale factor.

Problem 8.188 Explain why halving side length makes eight times as many cubes fit in a fixed cube.

Problem 8.189 A box measures $6 \times 5 \times 4$. Cubes have side $\frac{1}{2}$. Find the exact cube count two ways.

Problem 8.190 A rectangular image is enlarged by 25% in both dimensions. Find the percent increase in area.

Problem 8.191 A model's linear dimensions are 40% of the original. Find the percent of original surface area and volume.

Problem 8.192 A cube's volume increases by 72.8%. Find the percent increase in side length.