

Math Lab: Surface Area and Volume Analysis **Possible Solutions**

Predictions

1. When the dimensions of a 3-D object are doubled, the surface area increases by a factor of $2^2 = 4$.
2. When the dimensions of a 3-D object are doubled, the volume increases by a factor of $2^3 = 8$.
3. When the dimensions of a 3-D object are tripled, the surface area increases by a factor of $3^2 = 9$.
4. When the dimensions of a 3-D object are tripled, the volume increases by a factor of $3^3 = 27$.

Analysis

5. Specific surface area calculations will vary depending on the objects selected by the student. However, in each instance, the student should discover that the surface area increases fourfold when the original dimensions are doubled.
6. Specific volume calculations will vary depending on the objects selected by the student. However, in each instance, the student should discover that the volume increases $2 \times 2 \times 2$, or eightfold, when the original dimensions are doubled.
7. The surface area and volume ratios are the same for each object.