Name: _____ **Key!!** _____   Date: _____

Volume
Effects of Changing Dimensions

1.) Surface Area= $88 ft^2$
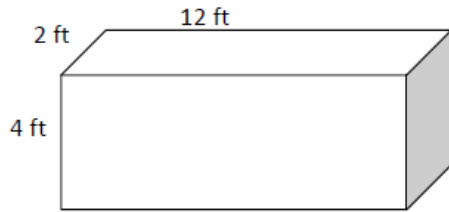
   Volume= $48 ft^3$

   $2 \times 4 \times 6$

6 ft
2 ft
4 ft

$P_{base} \; h + 2(8)$
$12(6) = 72 ft^2$

2.) Surface Area= $160 ft^2$

   Volume= $96 ft^3$

   $12(8)$

12 ft
2 ft
4 ft
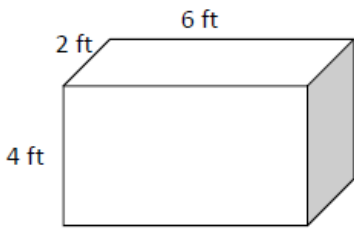
$12(12)=$
$144 + 2(8)$

3.) How did the three dimensional shape change from #1 to #2?

   the height doubled

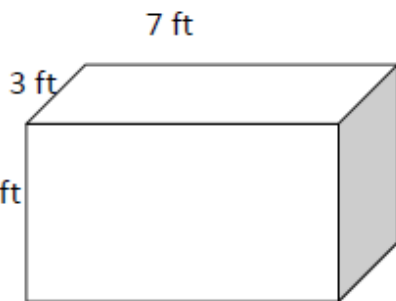   a.) How did this change affect our surface area and volume?

   Volume is doubled / Surface Area Doubled
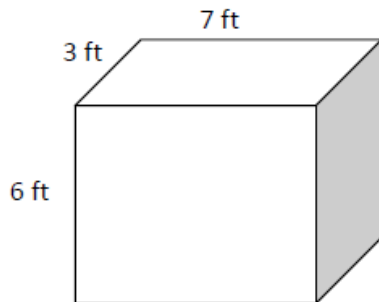
4.) Surface Area= $122 ft^2$

   Volume= $84 ft^3$

$SA = 14(7) + 2(12)$

7 ft
3 ft
4 ft

5.) Surface Area= $162 ft^2$

   Volume= $126 ft^3$

$SA = 18(7) + 2(18)$
$= 162$

7 ft
3 ft
6 ft

6.) How did the three dimensional shape change from #4 to #5?
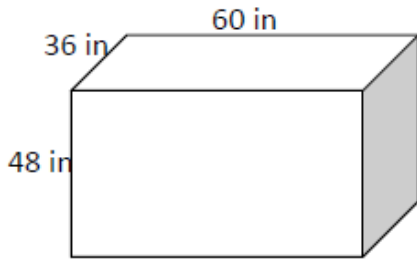
   the height of the base is 2 more in #5

   a.) How did this change affect our surface area and volume?

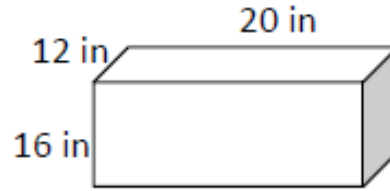   Surface Area increased by 40, volume increased by 42.

7.) Surface Area = **11808 in²**

Volume = **103680 in³**

60 in
36 in
48 in

8.) Surface Area = **1504 in²**

Volume = **3840 in³**

20 in
12 in
16 in

1120 + 2 (192)
1120 + 384 =
1504

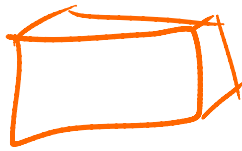9.) How did the three dimensional shape change from #1 to #2?

multiplied by a factor of ⅓

a.) How did this change affect our surface area and volume?

Volume was multiplied by $\frac{1}{27}$.
Surface Area was multiplied by ⅑.

Directions: Show all work. (Suggestion: Draw diagrams!)

10.) How would the volume of a rectangular solid change if the length, width, and height are doubled?

$V = (2x)(2y)(2z)$
$V = 6(xyz)$

The volume would be multiplied by 6.

11.) If the length and width of a rectangular solid are unchanged but the height is doubled, how does the volume change?

From question #1 & #2, the volume doubles.

12.) A side of a cube measures 8 centimeters and a side of a smaller cube measures 4 centimeters. The volume of the larger cube is how many times the volume of the smaller cube?

$V = s^3$ $V = 8^3$ $V = 4^3$

$V = 512 cm^3$ $V = 64 cm^3$

The larger cube is 8 times as much in volume.