Equivalent Solids

- If 3-dimensional shapes have the same volume,
  they are said to be EQUIVALENT.

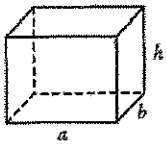
Measurements of Solids

- Side Lengths
- Lateral Area
- Surface Area
- Volume

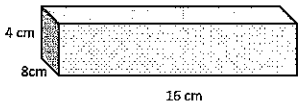
Comparing Equivalent Rectangular Prisms

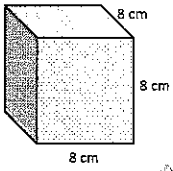
	a (cm)	b (cm)	h (cm)	Volume	Area (cm²)
Prisme 1	64	1	1	64	258
Prisme 2	32	2	1	64	196
Prisme 3	16	2	2	64	136
Prisme 4	8	4	2	64	112
Prisme 5	4	4	4	64	96

Which prism has the largest area??



Which would have the smallest surface area? Find Volume and Surface Area to Verify





$V = 8^3$
$= 512 cm^3$

$V = 8 \times 4 \times 16$
$= 512 cm^3$

$A_s = 6(8)^2$
$= 384 cm^2$

$A_s = 2(4 \times 8) + 2(4 \times 16) + 2(8 \times 16)$
$= 448 cm^2$

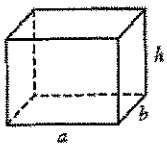
Rule #3

- Of all equivalent solids with the <u>same number of faces</u>, the **regular solid** will always have the **smallest surface area**

Comparing Rectangular Prisms with Same Area

	a (cm)	b (cm)	h (cm)	Area (cm²)	Volume (cm³)
Prisme 1	6	6	1	96	36
Prisme 2	6	4.5	2	96	54
Prisme 3	6	4	2.4	96	57.6
Prisme 4	3	3	6.5	96	58.5
Prisme 5	4	4	4	96	64

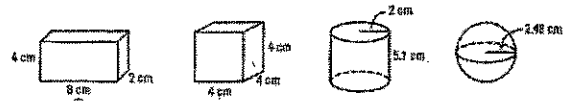
Which prism has the largest volume??



"Flip it"

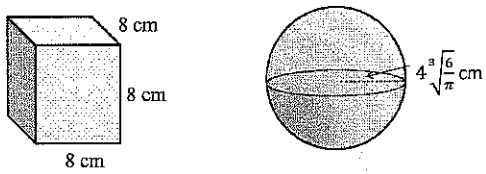
- Of all solids with the <u>same number of faces</u> and the <u>same surface area</u>, the **regular solid** will have the **greatest volume**

Find the Surface Area and Volume



V= 64 V=64 V= 64 V= 64

A=112 A=96 A=89.2 A=77.3



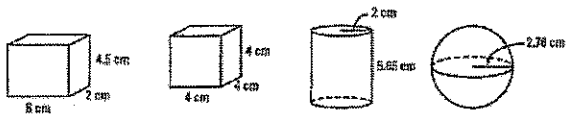
V= 512 V= 512

A_s= 384 A_s= 309.5

Rule #4

- Of all equivalent solids, the one with the **greatest number of faces** will always have the **smallest surface area**

Find the Surface Area and Volume



A_s = 96 A_s=96 A_s=96 A_s=96

V= 54 V= 64 V= 71 V=88

"Flip it"

- Of all solids with the <u>same surface area</u>, the **one with the most faces** will have the **greatest volume**