

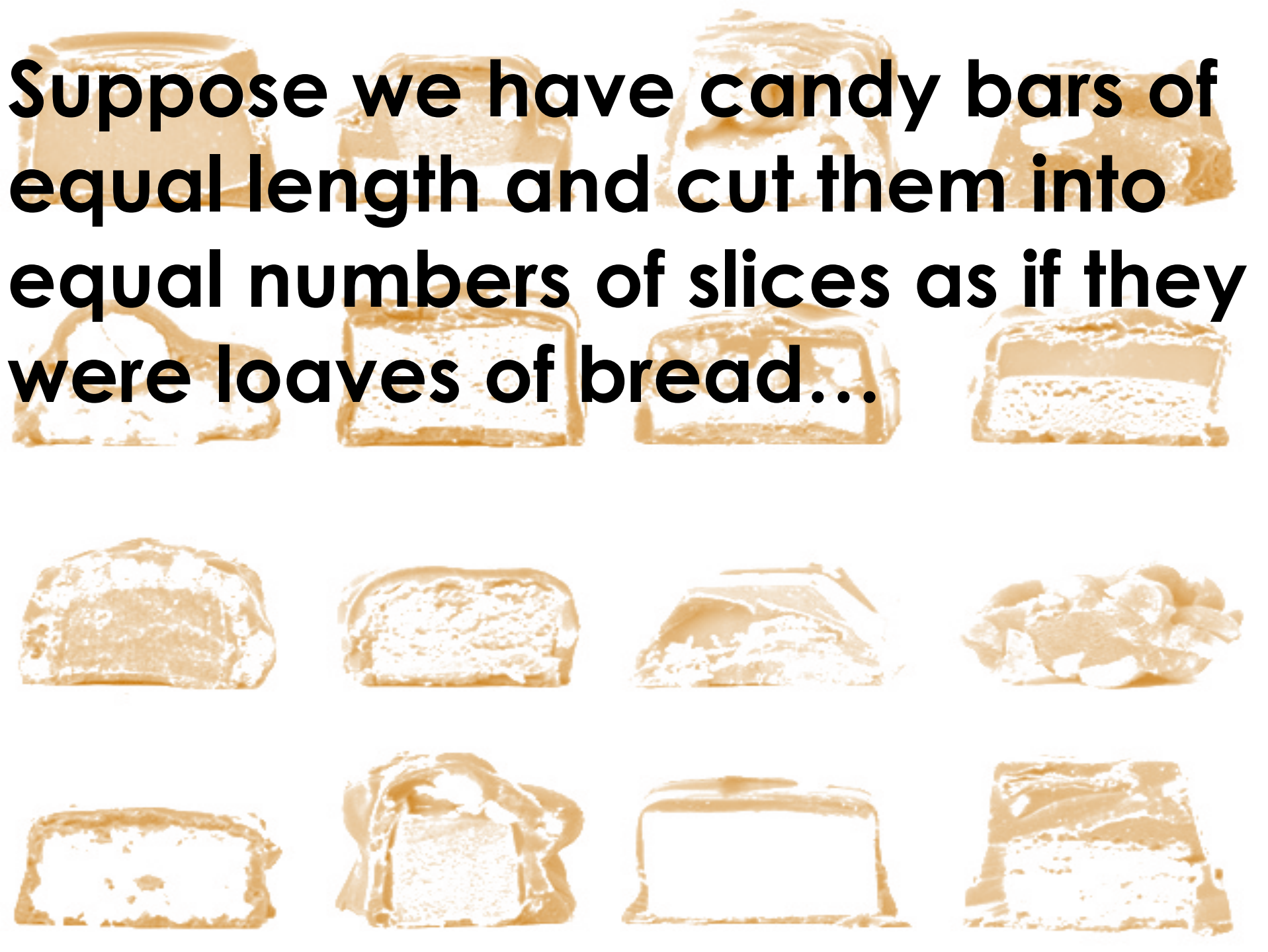


VOLUME

An Introduction to Cavalieri's
Principle

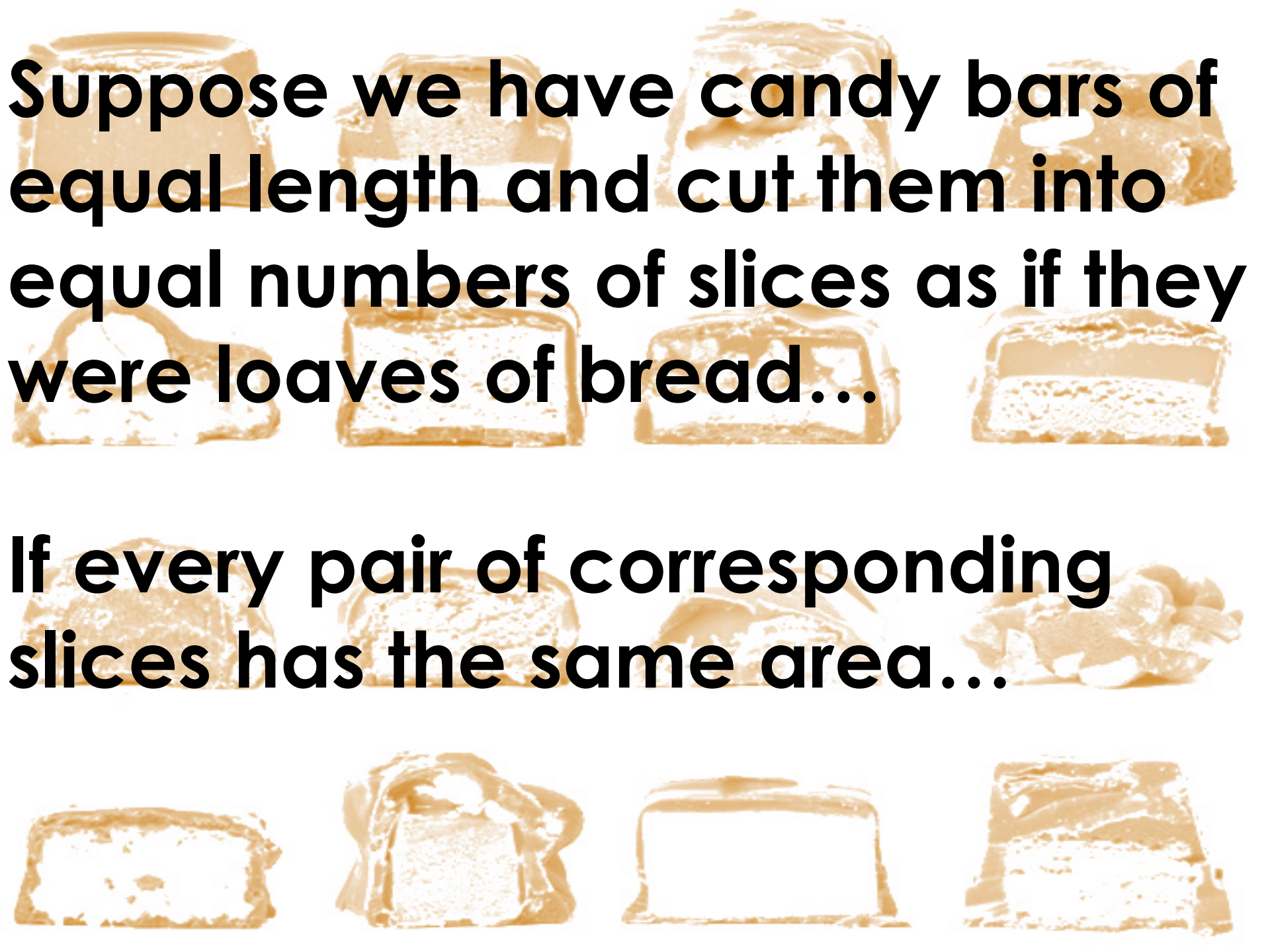


Suppose we have candy bars of equal length and cut them into equal numbers of slices as if they were loaves of bread...



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If every pair of corresponding slices has the same area...





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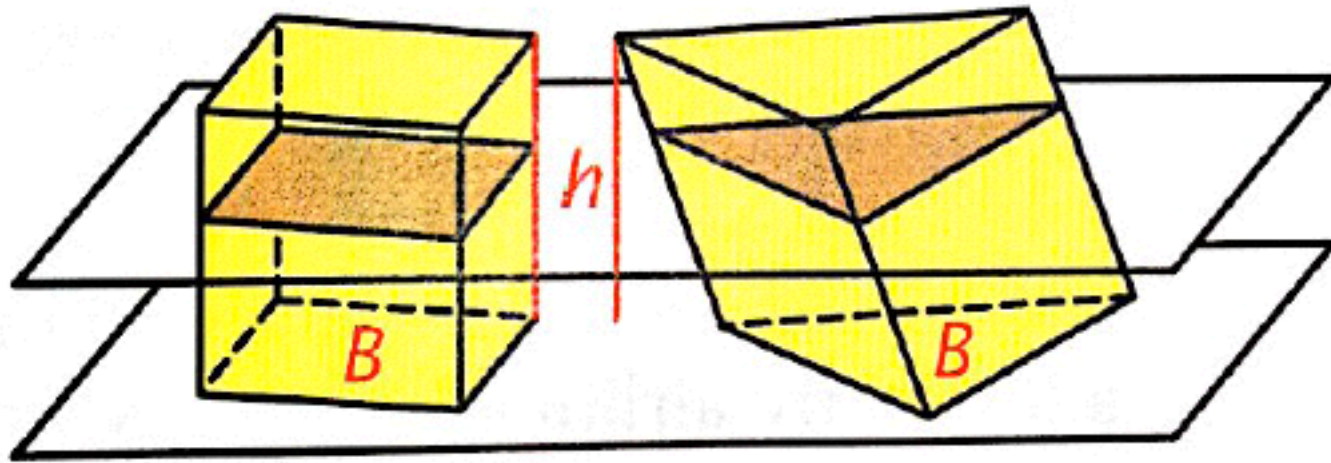
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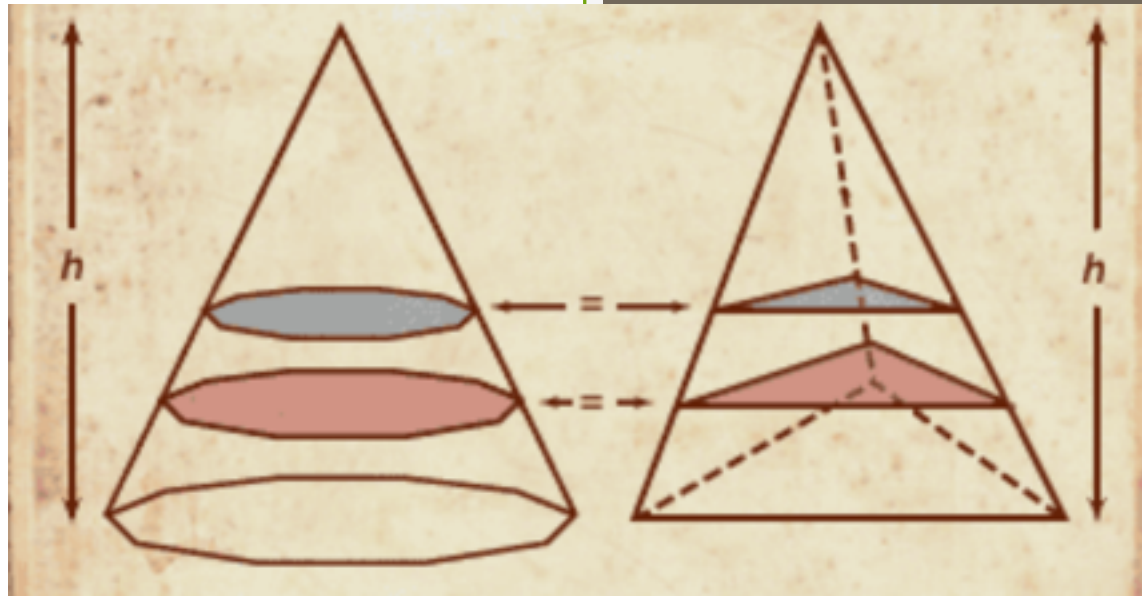
What could we conclude?



**Discuss with Your Group
and
Be Prepared to Share!**



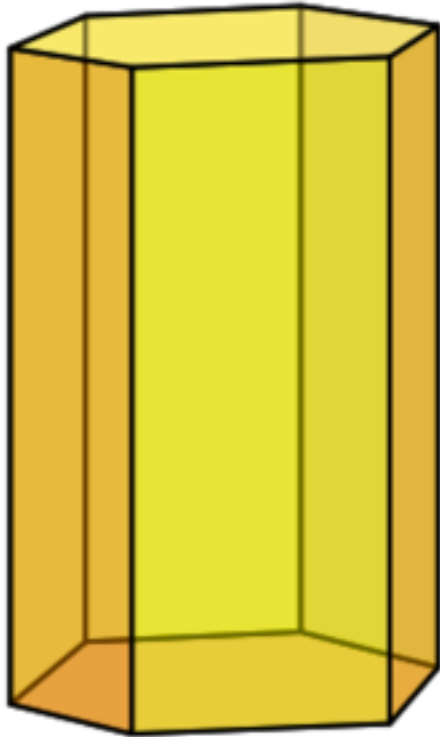
If the corresponding cross-sections have equal areas...



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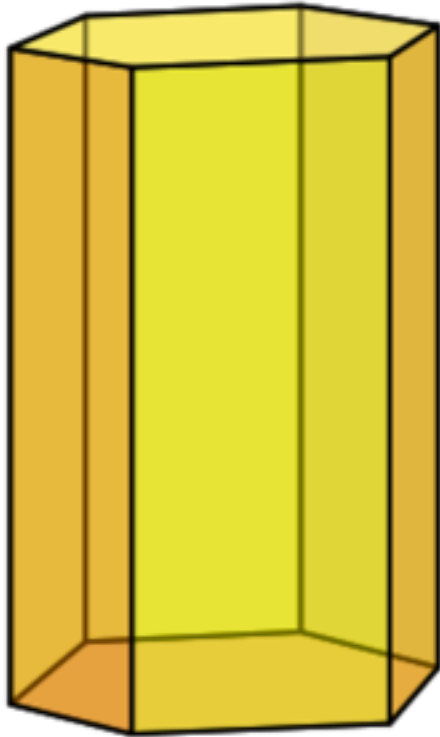
The Volume of ANY Prism...

Right



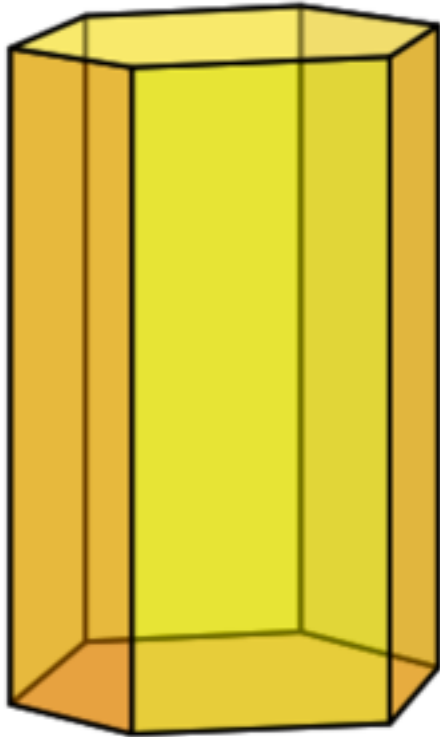
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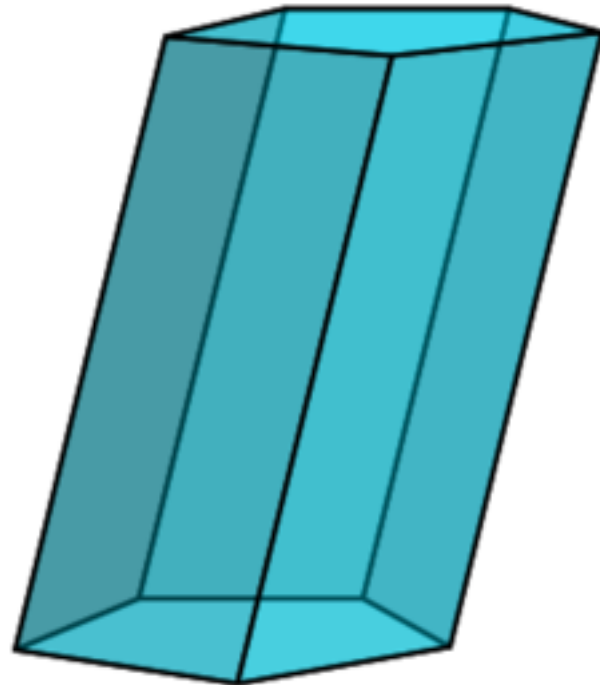


The Volume of ANY Prism...

Right

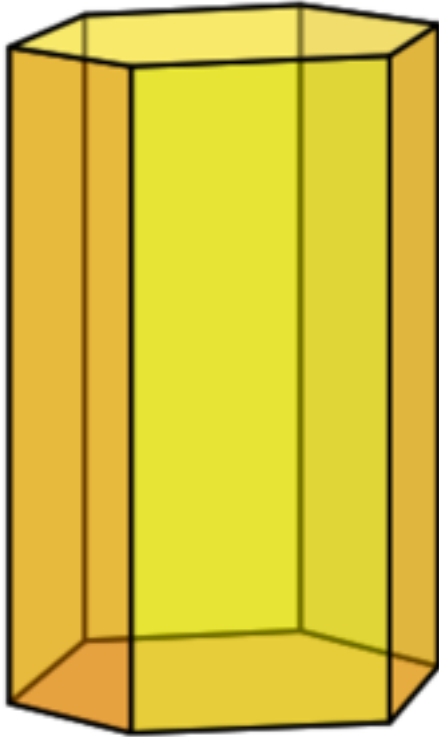


Oblique

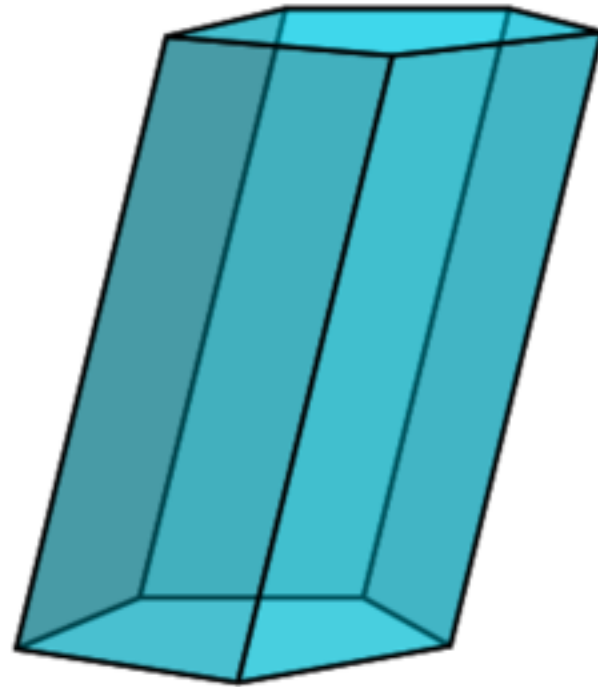


The Volume of ANY Prism...
is the (area of the base) x (height)

Right



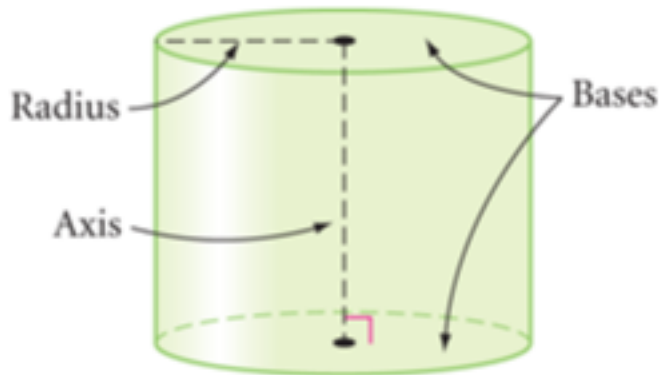
Oblique



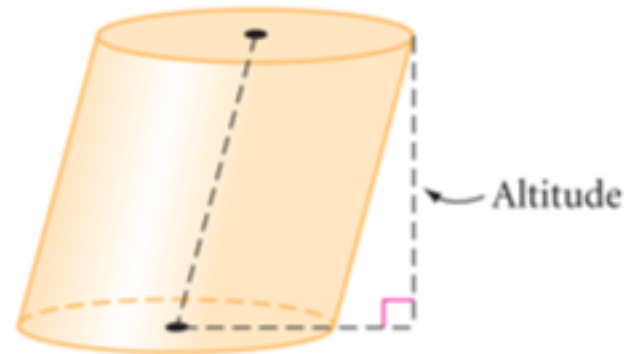
The Volume of any CYLINDER is...

$V = (\text{area of the base}) \times \text{height}$

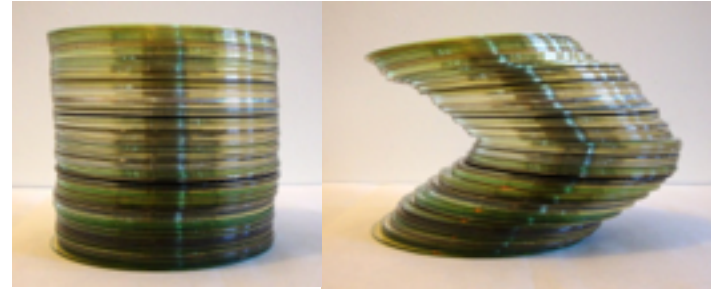
$$V = \pi * r^2 * h$$



Right cylinder

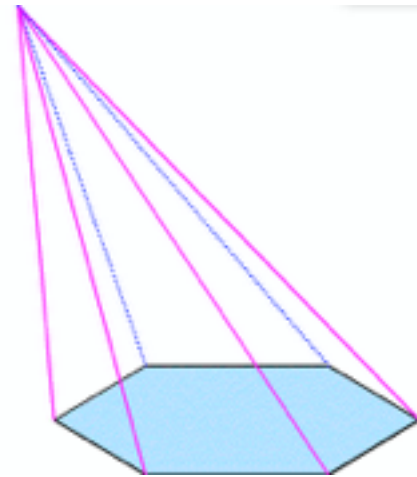
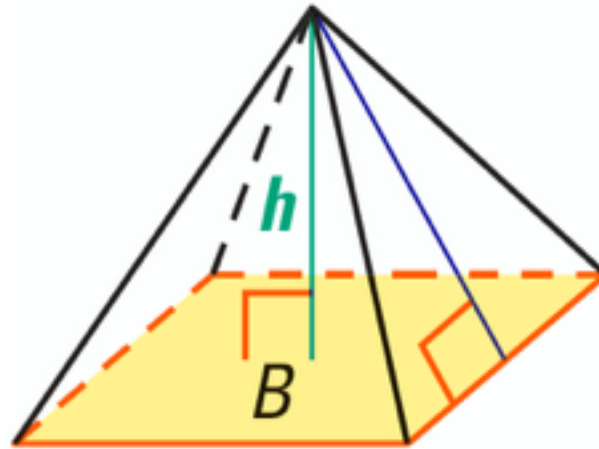
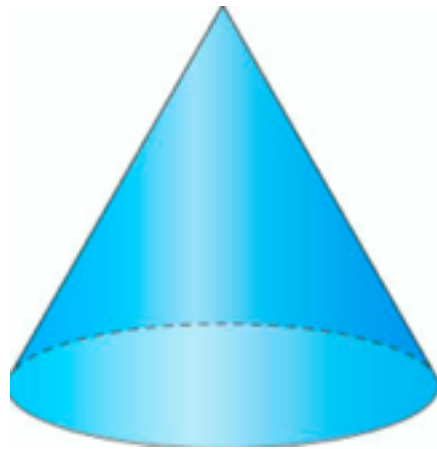


Oblique cylinder

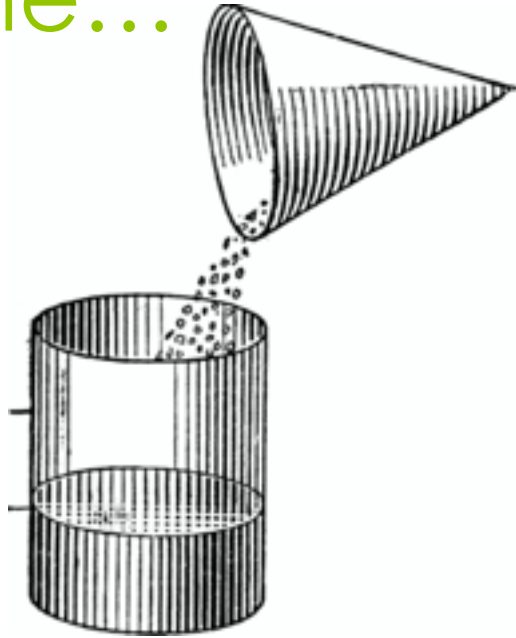


If the corresponding cross-sections have equal areas...

The Volume of ANY Pyramid or Cone...

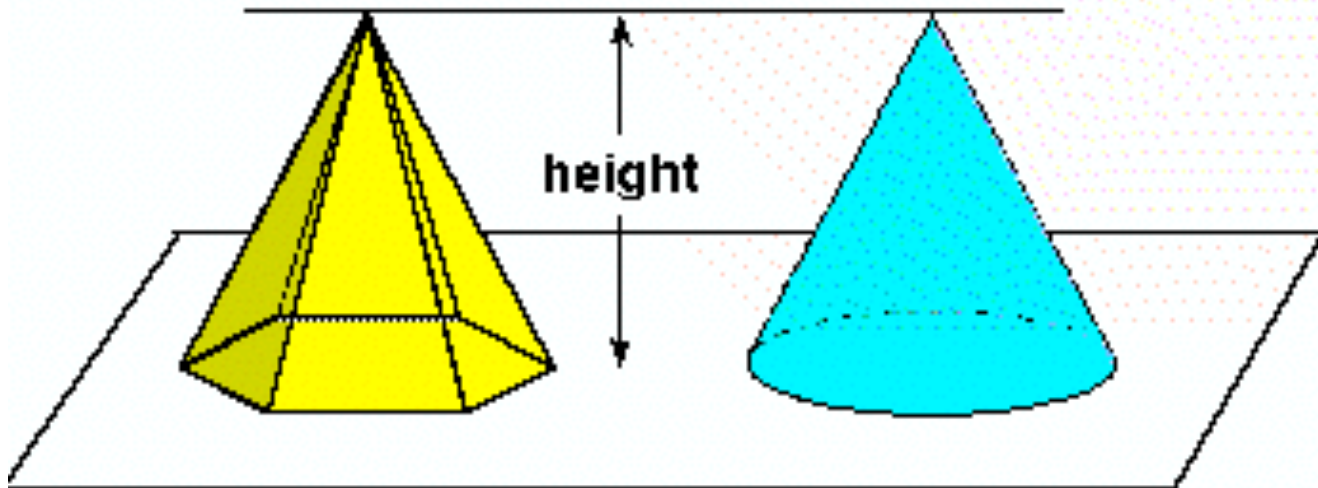


The Volume of ANY Pyramid or Cone...



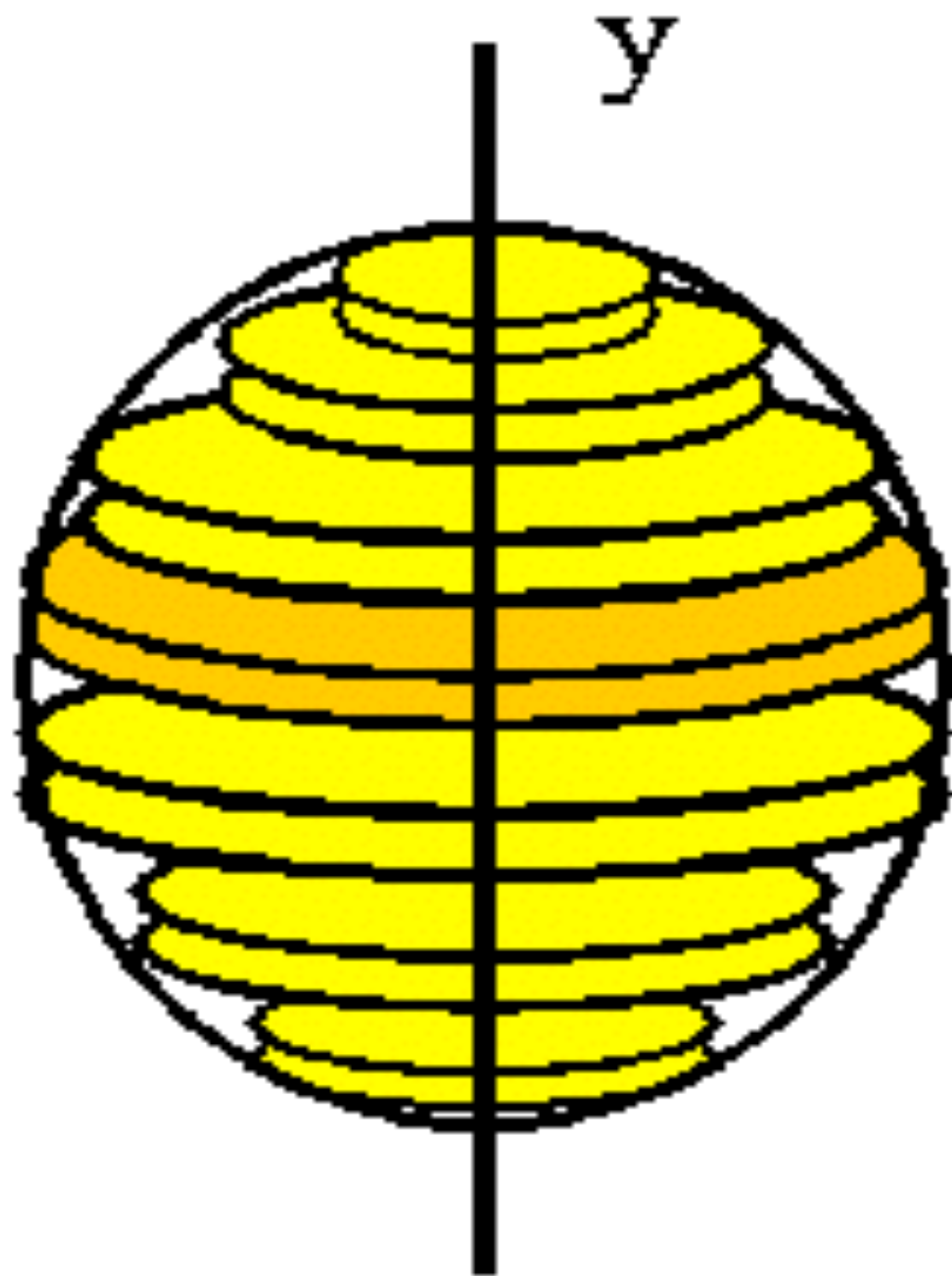
The Volume of ANY Pyramid or Cone...

$$V = \frac{1}{3} * (\text{area of the base}) * \text{height}$$





Taking it Further...



The Volume of any SPHERE is...

$$V = \frac{4}{3} * \pi * r^3$$

