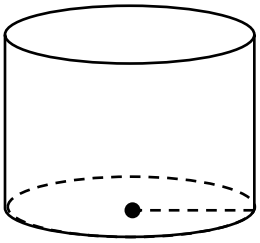
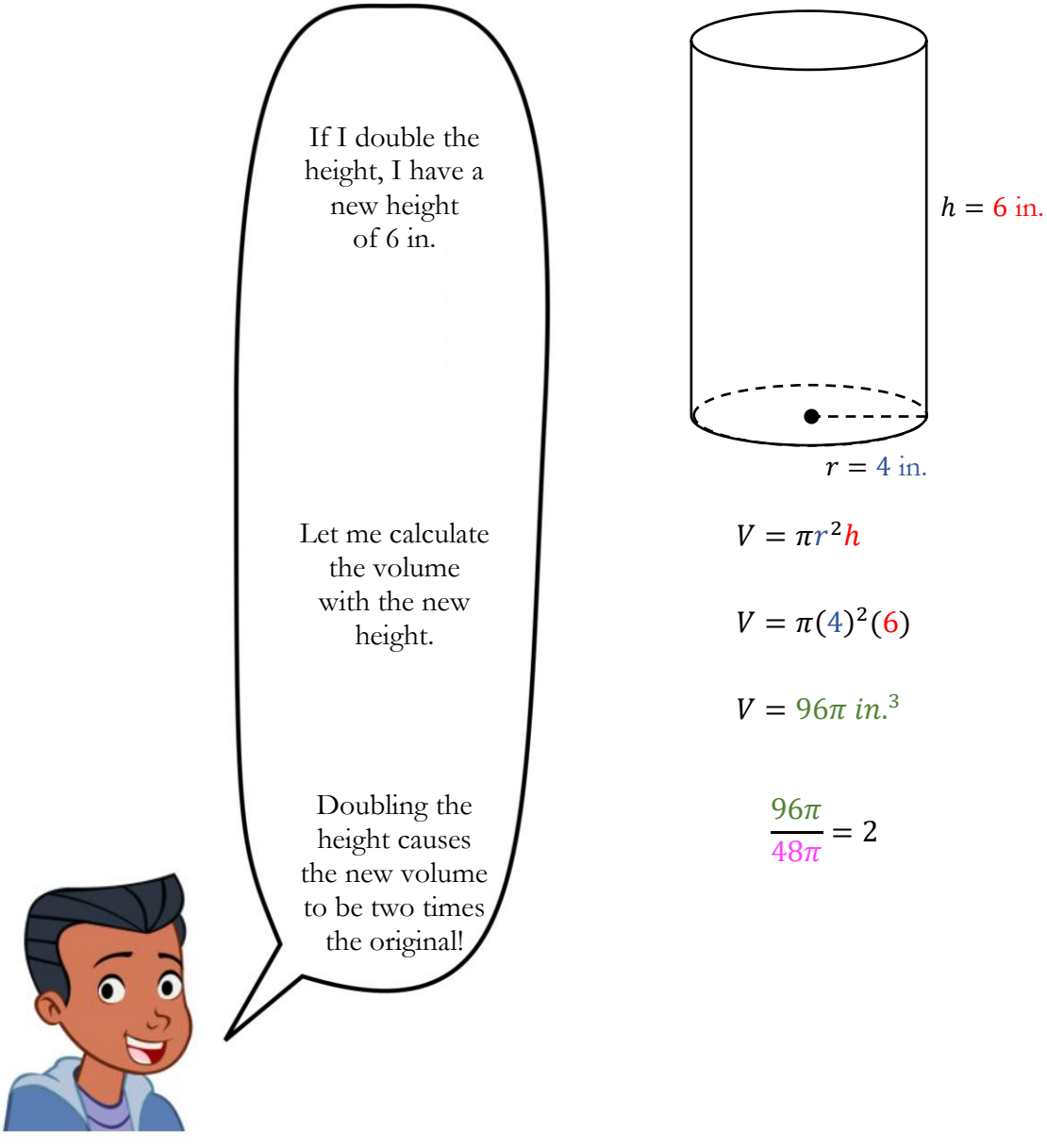
What happens to the volume of a cylinder with radius 4 in. and height 3 in. when you scale the height?



Damien's "Double the Height" Method



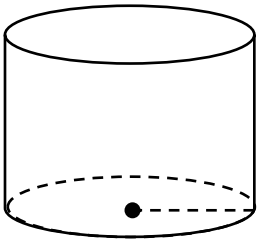
$V = \pi r^2 h$

$V = \pi(4)^2(6)$

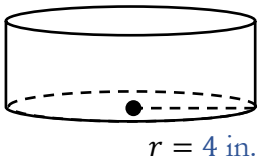
$V = 96\pi\ in.^3$

$\frac{96\pi}{48\pi} = 2$

What happens to the volume of a cylinder with radius 4 in. and height 3 in. when you scale the height?



Sydney's "Halve the Height" Method



If I halve the height, I have a new height of 3/2 in.

Let me calculate the volume with the new height.

$V = \pi r^2 h$

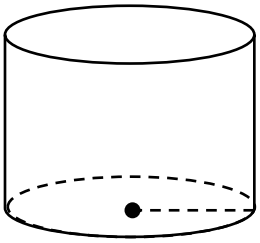
$V = \pi(4)^2\left(\frac{3}{2}\right)$

$V = 24\pi\ in.^3$

Halving the height makes the new volume ½ the original volume!

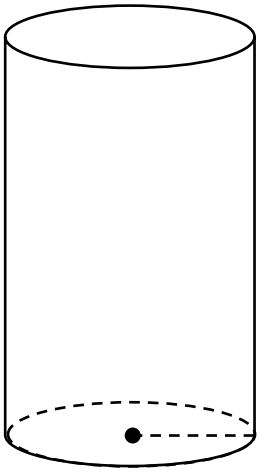
$$\frac{24\pi}{48\pi} = \frac{1}{2}$$

What happens to the volume of a cylinder with radius 4 in. and height 3 in. when you scale the height?



Damien's "Double the Height" Method

If I double the height, I have a new height of 6 in.



Let me calculate the volume with the new height.

$V = \pi r^2 h$

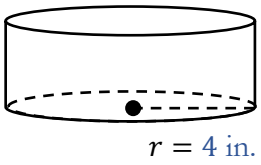
$V = \pi(4)^2(6)$

$V = 96\pi\ in.^3$

Doubling the height causes the new volume to be two times the original!

$\frac{96\pi}{48\pi} = 2$

Sydney's "Halve the Height" Method



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$V = 24\pi\ in.^3$

Halving the height makes the new volume ½ the original volume!

$\frac{24\pi}{48\pi} = \frac{1}{2}$

1) What are the similarities and differences between Damien and Sydney's methods?

Similarities	Differences

2) If a cylinder has a height of $9\ in.$ and a volume of $18\ in.^3$, what would the new volume be if the height were scaled to $3\ in.$?

3) Explain what would happen to the volume of a cylinder if we scaled the height by any number, x.

4) Explain what would happen to the volume of a cone if we scaled the height by any number, x.

What happens to the volume of a [illegible] in. when [illegible]

Damien's "D[illegible]

How cool! When I doubled the height, the volume doubled, and when Sydney halved the height, the volume halved. I wonder if this always works.

If I double[illegible] height, I ha[illegible] new height of 6 in.

Let me calculate the volume with the new height.

= 96[illegible]

Doubling the height causes the new vo[illegible] to be two [illegible] the origin[illegible]

$\frac{96\pi}{48\pi} = 2$

[illegible]me calculate the volume with the new height.

[illegible]^3

$\frac{24\pi}{48\pi} = \frac{1}{2}$

Halving the height makes the new volume ½ the original volume!