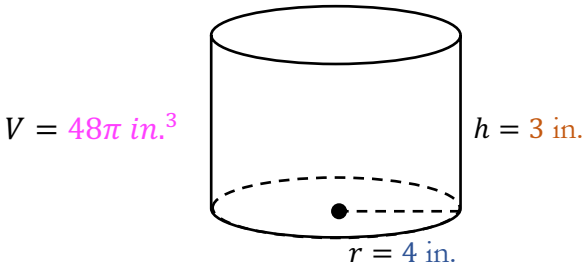
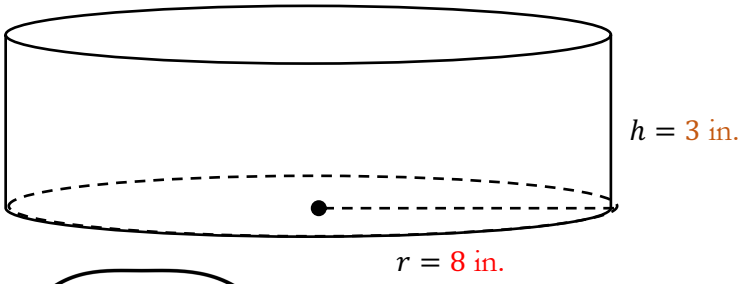
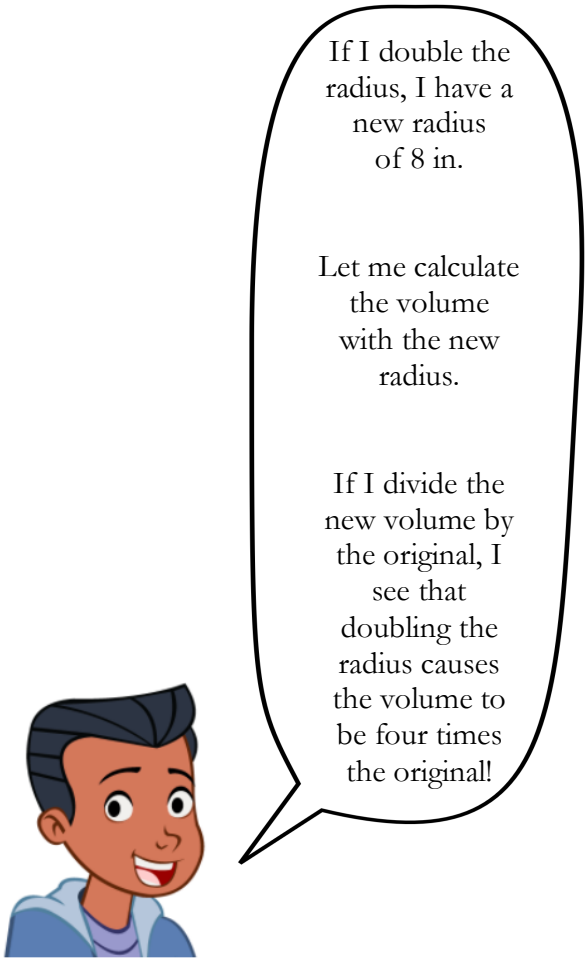
What happens to the volume of a cylinder with radius 4 in. and height 3 in. when you scale the radius?



Damien's "Double the Radius" Method





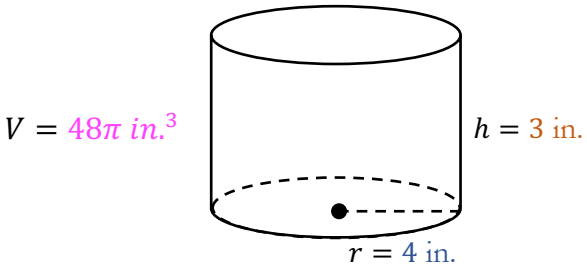
$V = \pi r^2 h$

$V = \pi(8)^2(3)$

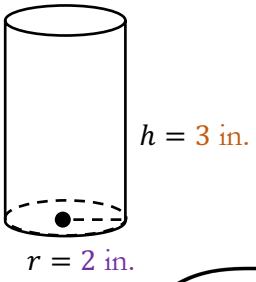
$V = 192\pi\ in.^3$

$$\frac{192\pi}{48\pi} = 4$$

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



Sydney's "Halve the Radius" Method



$V = \pi r^2 h$

$V = \pi(2)^2(3)$

$V = 12\pi\ in.^3$

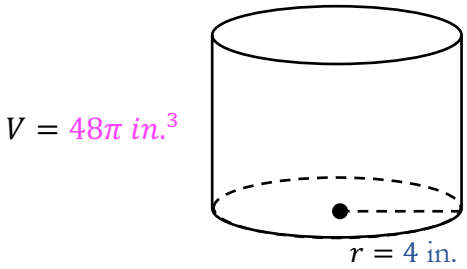
$\frac{12\pi}{48\pi} = \frac{1}{4}$

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

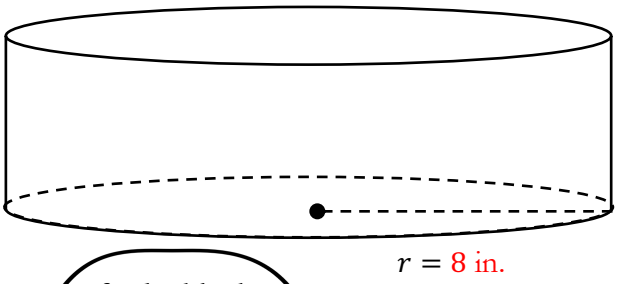
Let me calculate the volume with the new radius.

If I divide the new volume by the original, I see that halving the radius makes the volume ¼ the volume of the original!

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



Damien's "Double the Radius" Method



If I double the radius, I have a new radius of 8 in.

Let me calculate the volume with the new radius.

$V = \pi r^2 h$

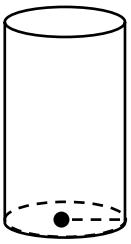
$V = \pi(8)^2(3)$

$V = 192\pi\ in.^3$

If I divide the new volume by the original, I see that doubling the radius causes the volume to be four times the original!

$$\frac{192\pi}{48\pi} = 4$$

Sydney's "Halve the Radius" Method



$V = \pi r^2 h$

$V = \pi(2)^2(3)$

$V = 12\pi\ in.^3$

$$\frac{12\pi}{48\pi} = \frac{1}{4}$$

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

Let me calculate the volume with the new radius.

If I divide the new volume by the original, I see that halving the radius makes the volume ¼ the volume of the original!

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

Similarities	Differences

2) When you scale the height of a cylinder by some number, the volume is multiplied by that number. Why is that NOT true when you scale the radius?

3) If a cylinder has a radius of $3\ in.$ and a volume of $11\ in.^3$, what would the new volume be if the radius were scaled to $9\ in.$?

4) What happens to the volume of a cylinder if you multiply the radius by any number, x?

What happens to the v … l height 3 in.

… ' Method

This was interesting to see the differences between making the radius bigger and making it smaller. When Damien doubled the radius, the volume was 4 times the original, but when I halved the radius, the volume was only ¼ the original.

I … halve the … eight, I have a new radius of 2 in.

Let … the … with the ne… radius.

Let me calculate the volume with the new radius.

If I divide the new volume by the original, I see that doubling the radius causes the volume to be four times the original!

$\frac{192\pi}{48\pi} = 4$

$\frac{12\pi}{48\pi} = \frac{1}{4}$

… f I divide the … w volume by … e original, I … ee that halving … radius … the … ¼ the … of the ori…