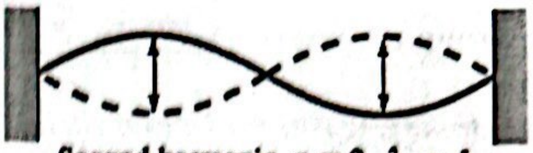
3. Create second harmonic standing wave


Second harmonic, $n = 2$, $\lambda_2 = L$

What would the wavelength of this wave be? $\lambda_2 =$ 250

Using your equation above, predict the value of the hanging mass that would produce this wave. **Note: μ, *f*, and *g* are constant.**

given that the mass is 250 grams.

$m = \frac{TL}{v^2}$ $n = 2$

length = 3.16

$v = \lambda f$ $m_2 = 250.625\,g$

predicted $m_2 =$ 187.5

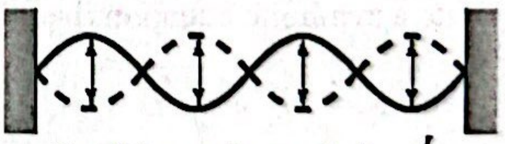
Add this mass and assess the quality of the wave. **Modify mass to improve the quality** of the standing wave.

required $m_2 =$ 250 grams

Is there good agreement between the predicted and required masses?

4. Create 3rd and 4th harmonic standing waves


Third harmonic, $n = 3$, $\lambda_3 = \frac{2L}{3}$


Fourth harmonic, $n = 4$, $\lambda_4 = \frac{L}{2}$

What would the wavelengths of the 3rd and 4th harmonics be?

$\lambda_3 =$ .62 meters $\lambda_4 =$ .465

Predict the hanging masses that would produce these waves.

$\frac{.62 \cdot 51.83}{9.8} \cdot 0.000791$ $\frac{.465 \cdot 51.87}{9.8} \cdot .000791$

$m_3 =$ 82.25 g $m_4 =$ 46.8 g

Add this mass and assess the quality of the wave. **Modify mass to improve the quality** of the standing wave.

required $m_3 =$ 108 grams *required* $m_4 =$ 50 grams

Is there good agreement between the predicted and required masses?