

Pulley Example



- Two boxes are connected by a string over a frictionless pulley. Box 1 has mass 1.5 kg, box 2 has a mass of 2.5 kg. Box 2 starts from rest 0.8 meters above the table, how long does it take to hit the table.

• Compare the acceleration of boxes 1 and 2

A) $|a_1| > |a_2|$

B) $|a_1| = |a_2|$

C) $|a_1| < |a_2|$

$$a_1 = (m_2 - m_1)g / (m_1 + m_2)$$

$$a = 2.45 \text{ m/s}^2$$

$$\Delta x = v_0 t + \frac{1}{2} a t^2$$

$$\Delta x = \frac{1}{2} a t^2$$

$$t = \sqrt{2 \Delta x / a}$$

$$t = 0.81 \text{ seconds}$$

