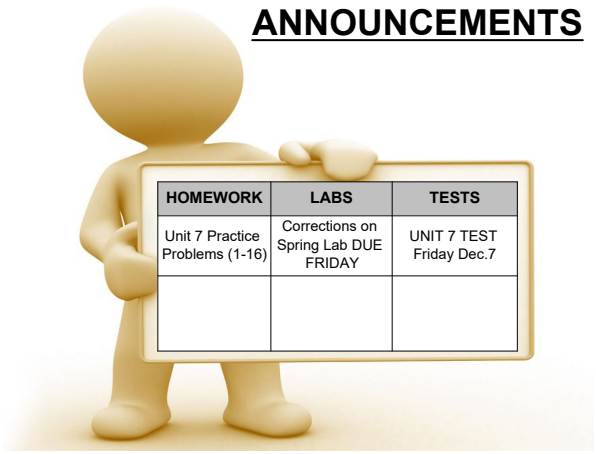
ANNOUNCEMENTS



HOMEWORK	LABS	TESTS
Unit 7 Practice Problems (1-16)	Corrections on Spring Lab DUE FRIDAY	UNIT 7 TEST Friday Dec.7

7.6 Connected Objects

LEARNING TARGETS

7.3	I can define, analyze, and solve dynamic problems involving tension forces and connected objects.

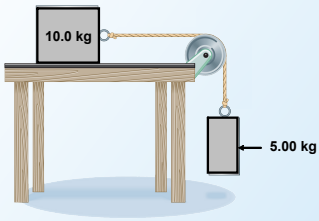
Connected Objects

8) A 10.0-kg block slides on a frictionless tabletop. It is connected to a string that passes over a pulley and suspends a 5.00-kg block.

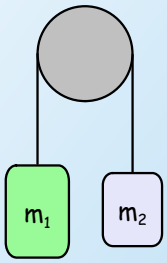
9) Two blocks, one of mass 0.270 kg and the other of mass 0.250 kg, are tied together with a massless rope. This rope is strung over a massless, resistance-free pulley.

Connected Objects

8)

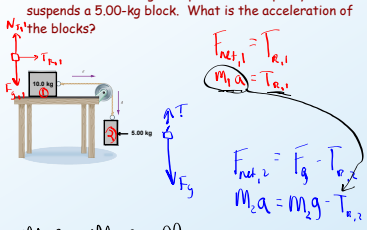


9)



Connected Objects

8) A 10.0-kg block slides on a frictionless tabletop. It is connected to a string that passes over a pulley and suspends a 5.00-kg block. What is the acceleration of the blocks?



$m_2a = m_2g - m_1a$

$5a = 49 - 10a$

$+10a \quad +10a$

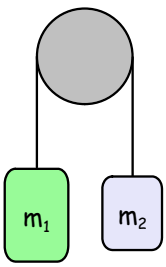
$15a = 49$

$a = 3.27\ m/s^2$

$a = \frac{m_2 g}{m_1 + m_2}$

Connected Objects

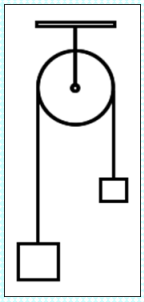
9) Two blocks, one of mass 0.270 kg and the other of mass 0.250 kg, are tied together with a massless rope. This rope is strung over a massless, resistance-free pulley.



George Atwood

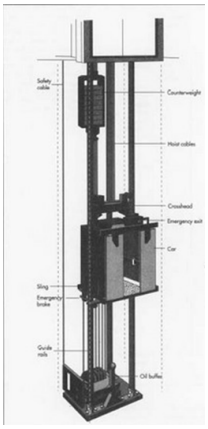
1745 - 1807

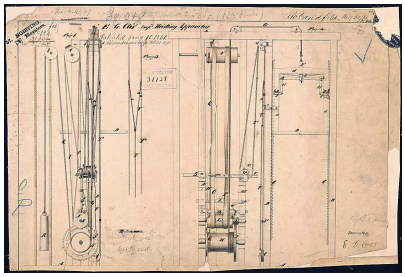
Atwood



An Atwood's Machine is made with two hanging masses connected by a string that passes over a pulley.

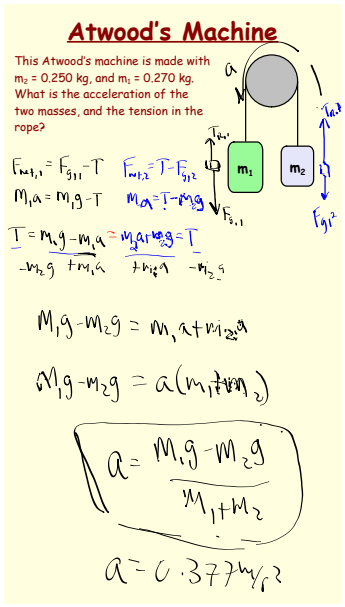
Elevators





Atwood's Machine

This Atwood's machine is made with $m_2 = 0.250$ kg, and $m_1 = 0.270$ kg. What is the acceleration of the two masses, and the tension in the rope?



$F_{net,1} = F_{g1} - T$ $\quad F_{net,2} = T - F_{g2}$

$M_1 a = M_1 g - T$ $\quad M_2 a = T - M_2 g$

$T = M_1 g - M_1 a$ $\quad M_2 a + M_2 g = T$

$M_1 g - M_2 g = M_1 a + M_2 a$

$M_1 g - M_2 g = a(M_1 + M_2)$

$$a = \frac{M_1 g - M_2 g}{M_1 + M_2}$$

$a = 0.377 \text{ m/s}^2$

11.

$y_0 = 0.55\text{m}$

$t = 3.008\text{s}$

$V_0 = 0$

$y_f = 0$

$y = y_0 + V_0 t + \frac{1}{2} a t^2$

$0 = 0.55\text{m} + \frac{1}{2} a (3.008)^2$

a

PRACTICE

UNIT 7 PROBLEMS (17-18)