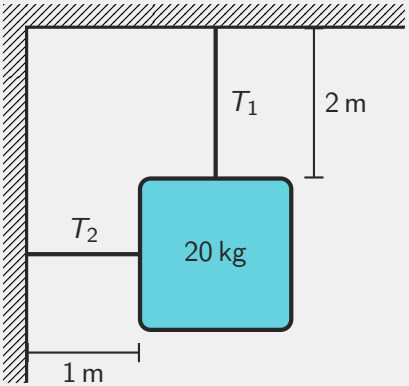
Announcements

- Homework
  - WebWorK 8 due tonight
  - Video HW 4 will be posted this afternoon
- Test 2 is a week from next Wednesday
- I didn't get a chance to update the grade reports yet, so I'll try to make that happen this weekend
- Polling: `rembold-class.ddns.net`

Understanding Check



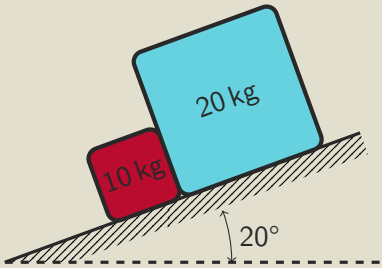
Given the hanging object to the left (and assuming it is hanging near the surface of the Earth), what is the magnitude of the tension T_2? You can assume the mass is in equilibrium and unmoving and that the wires have insignificant mass in comparison to the hanging block.

A) 0 N
B) 98 N
C) 196 N
D) 392 N

Solution: 0 N

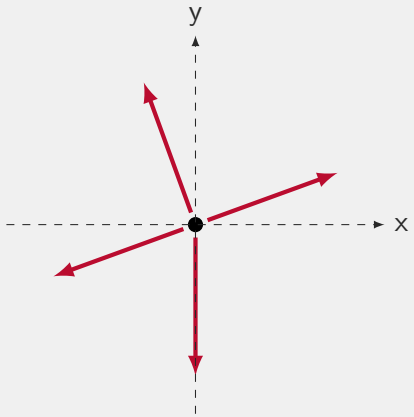
Slip or No Slide?

Suppose you have the two block system to the right which are placed on a 20° slope. The smaller block is rough and has a coefficient of static friction with the surface of $\mu_s = 0.65$, but the larger block is smooth and frictionless. The blocks are initially stationary, and then released. Will they slide down the slope?



Simplifying Life

- Sometimes we don't want to deal with all the angles
- Can rotate our coordinates to give a nicer system
- Still need to keep axes 90° from each other
- Everything else proceeds as per normal
- Only useful if majority of forces lie along new axes



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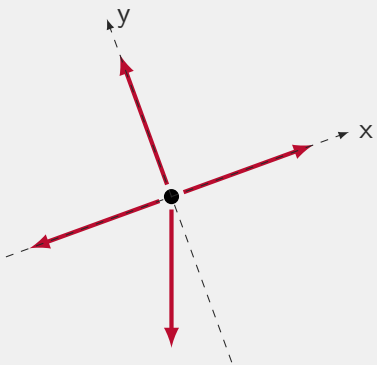
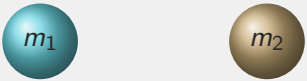
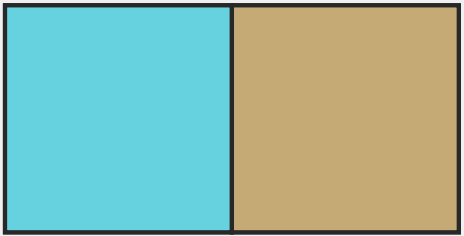


Equal and Opposite

- Both gravity and the electrostatic force have only the direction differ depending on the system



- Since all contact forces build from these, each contact force has equal and opposite pairings



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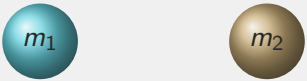

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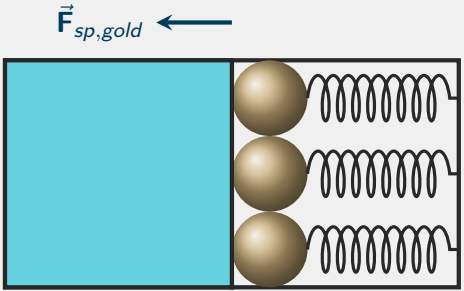

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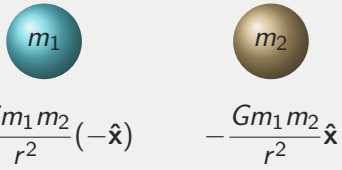

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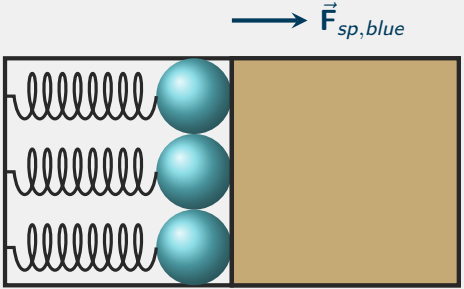

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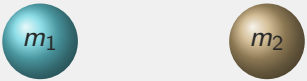

$$-\frac{Gm_1m_2}{r^2}(-\hat{\mathbf{x}}) \qquad -\frac{Gm_1m_2}{r^2}\hat{\mathbf{x}}$$

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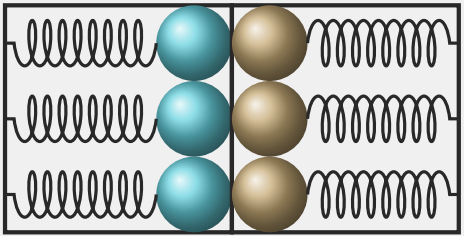

$$\vec{\mathbf{F}}_{sp,gold} = -\vec{\mathbf{F}}_{sp,blue}$$

Slide or No Slide

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