Polleverywhere

- 1 point for each response
- 1 additional point if response is correct

A thought experiment

- Suppose everyone on the planet gathered in one spot and jumped all at once. What would happen to the Earth?
- Text keyword 'PHYSJC' and your answer to 22333

Ch 4.5-6
Free Body Diagrams

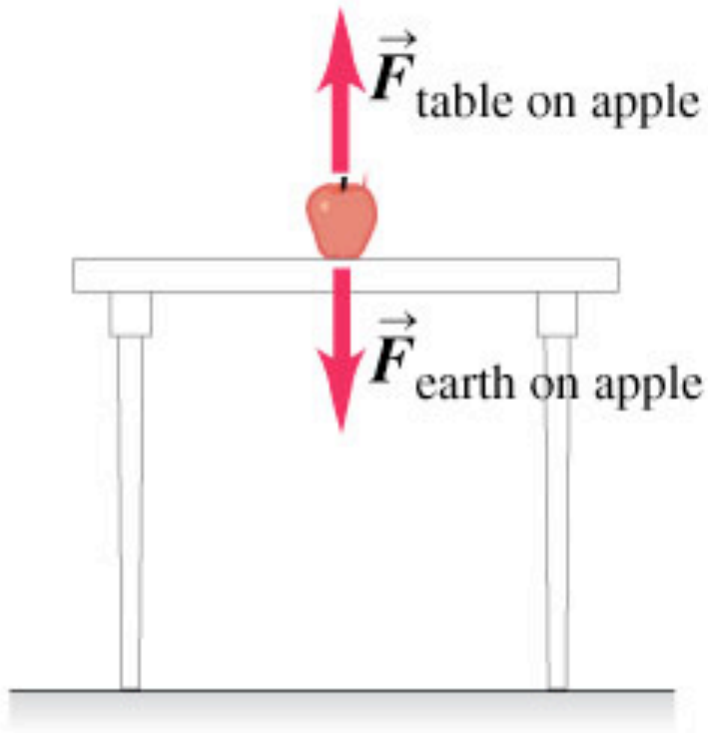
PHYS 1210 - Prof. Jang-Condell

Goals for Chapter 4

- To understand the meaning of force in physics
- To view force as a vector and learn how to combine forces
- To understand the behavior of a body on which the forces balance: Newton's First Law of Motion
- To learn the relationship between mass, acceleration, and force: Newton's Second Law of Motion
- To relate mass and weight
- To see the effect of action-reaction pairs: Newton's Third Law of Motion
- To learn to make free-body diagrams

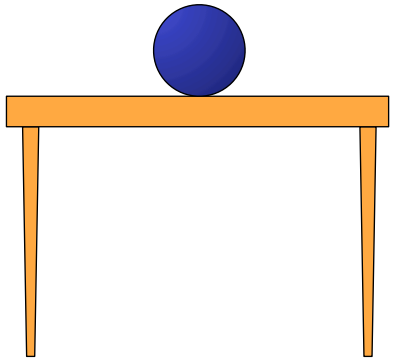
Free-Body diagrams

- A sketch of all the forces acting on a body



Q4.11

A ball sits at rest on a horizontal table top.



The weight of the ball is equal to the magnitude of the upward force that the table top exerts on the ball. Why?

A. This is a consequence of Newton's first law.

B. This is a consequence of Newton's third law.

C. Because we assume that the table top is perfectly rigid.

D. Two of the above three statements are correct.

E. All of the first three statements are correct.

Q4.8

You are standing at rest and begin to walk forward. What force pushes you forward?

F. the force of your feet on the ground

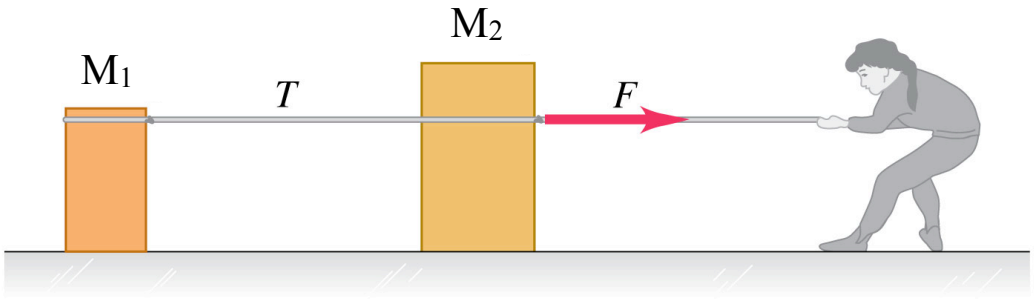
G. the force of your acceleration

H. the force of your velocity

I. the force of your momentum

J. the force of the ground on your feet

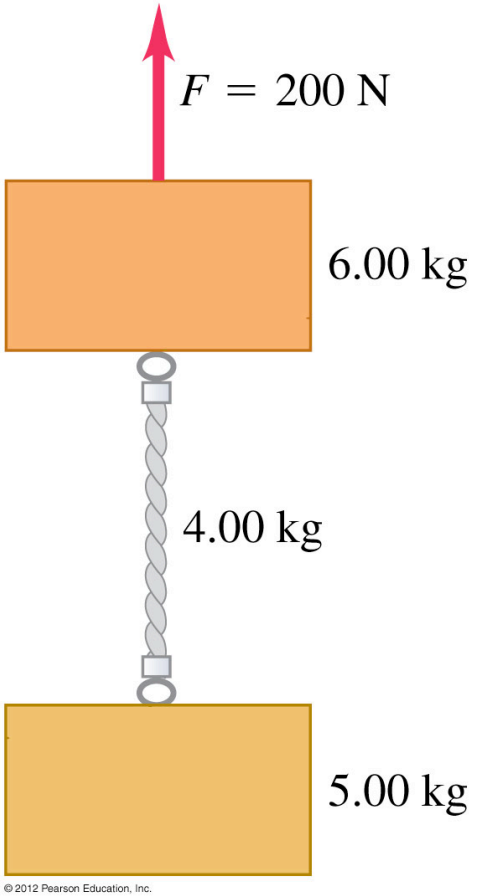
Example 1



- Assume a frictionless surface for boxes, woman is wearing sneakers for traction.
- Ropes are massless and don't stretch.
- What is T (tension on rope between boxes?)

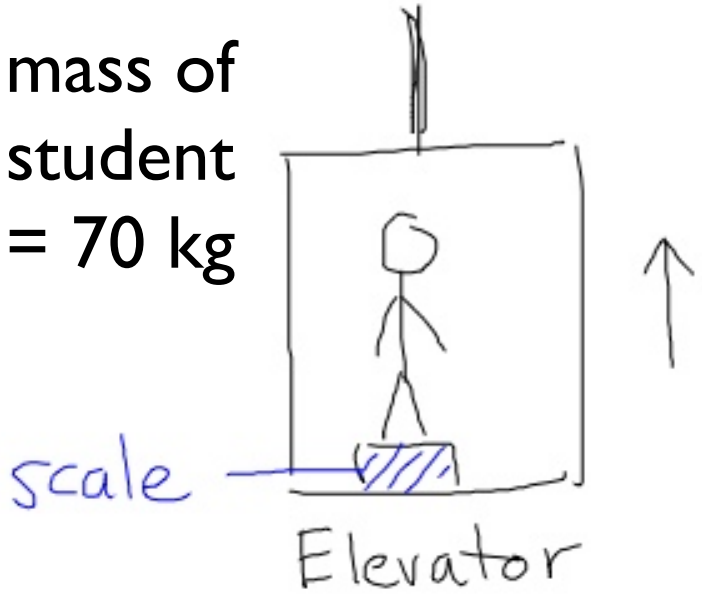
Example 2

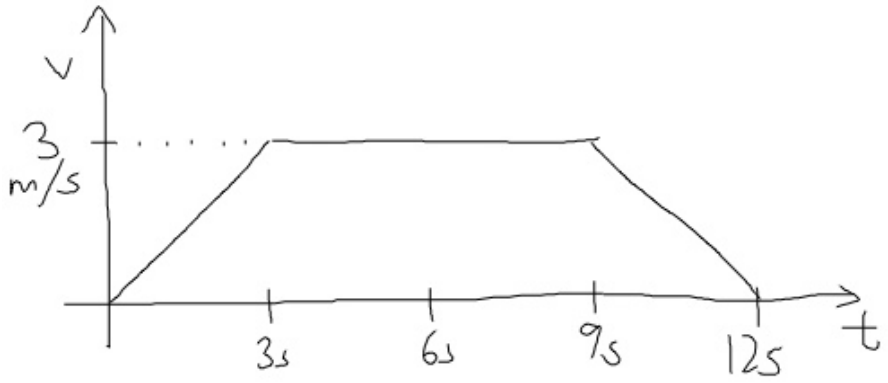
- Draw FBDs for both boxes and the chain
- What is the tension at the top of the rope? Bottom of the rope?



Grad student in an elevator

mass of student = 70 kg



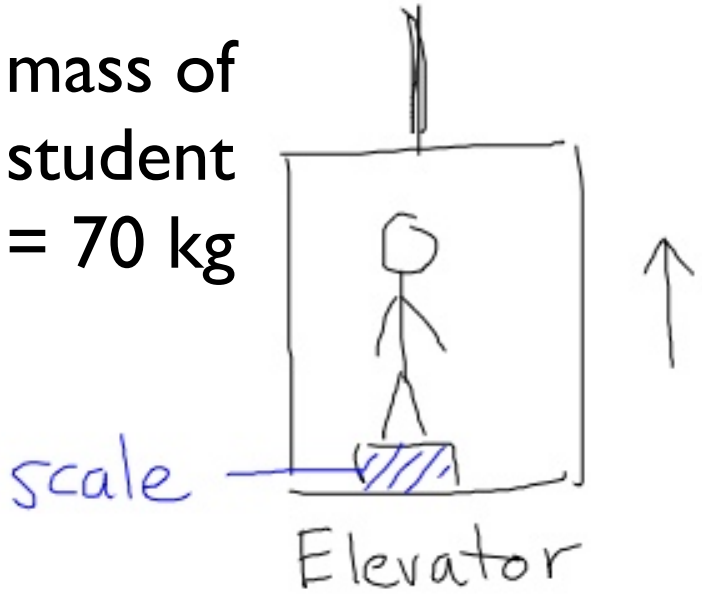


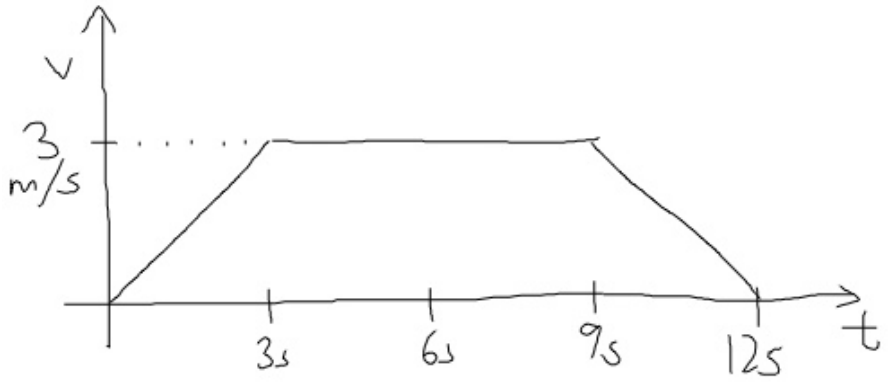
According to the scale, is the weight of the student greater than (G), less than (L), or the same (S) as before the elevator moves up at 1s? 5s? 10s?

Text your answers to 22333

Grad student in an elevator

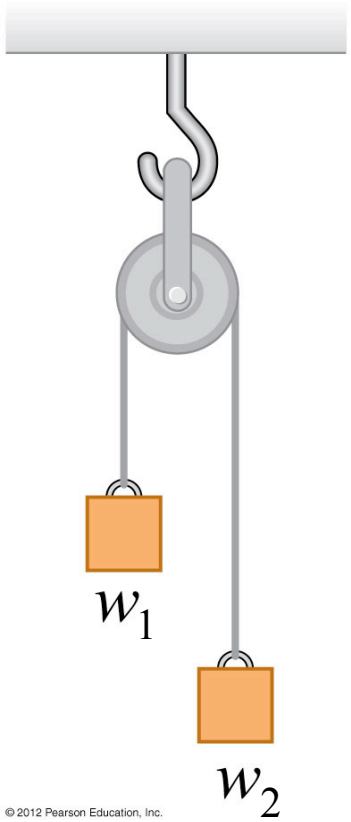
mass of student = 70 kg





Plot the reading of the scale (in Newtons) as the elevator moves upwards

Atwood Machine



- What if $w_1 = w_2$?
- Find the acceleration of w_1.
- Solve for the tension on the rope.