

Name _____

1. Are the normal force and the weight equal and opposite forces, according to Newton's 3rd Law?
A: Yes, **B:** No, **C:** It depends on the situation

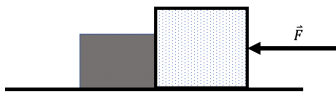
2. Why are the normal force and weight force NEVER considered Newton's 3rd law force pairs?

Since the normal force is NOT an equal and opposite force pair to your weight, what is the equal and opposite force of your weight?

3. Imagine you are standing on a scale in an elevator that is at rest. The elevator starts accelerating up, moves at a constant velocity for awhile, and eventually the elevator slows and stops as you reach your desired floor. What happens to your weight when going from the ground floor to the 4th floor? **A:** Stays the same **B:** You get lighter **C:** You get heavier **D:** First you get lighter, then normal weight, then you get heavier **E:** First you get heavier, then normal weight, then you get lighter

What happens to your weight when going from the 4th floor down to the ground floor? (Same answer options as above)

4. The force applied is $25N$ and the small grey block has a mass of $1kg$ and the white block has a mass of $2kg$.
 - (a) What is the acceleration of the two blocks?
 - (b) What is the force (magnitude and direction) that the grey block exerts on the white block?
 - (c) Now treat the two blocks as one system and find the acceleration. It should agree with what we just found.



1. A box hangs from a string. Weight refers to weight of the box.

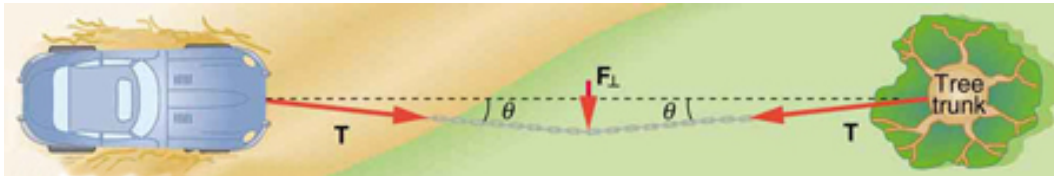
A: Tension = Weight, and points up **B:** Tension = Weight, and points down **C:** 0N

D: Tension > Weight, **E:** Tension < Weight

What is the tension in the string if

- The box is at rest.
- The box is pulled upwards with a constant velocity.
- The box accelerates up.
- The box accelerates down.

2. Your car is stuck in the mud. You are alone, but you have a long, strong rope in the car. Having studied physics, you tie the rope tautly to a tree trunk and pull on it sideways in the middle of the rope. You're pretty good at judging how strong you are, so you estimate your force on the rope is about 400N. When the angle of the rope is at about 5° the car just starts to budge. With what force is the rope pulling on the car, i.e. what is the magnitude of the tension in the rope?



3. A traffic light with a mass of 16kg hangs from two ropes with the angles as shown. Find the tension in the left rope and the tension in the right rope.

