

ICP Do Now

Get out your notes and write down answers to the following:

- What happens to the force of gravity between two objects if the mass of either object increases?
- What happens to the force of gravity between two objects if the distance between them increases?

Using those answers, tell whether these statements are true or false and why:

- When you go to the moon, you weigh less because the moon has a smaller mass.
- When you are on top of a mountain, you weigh less because you are further from the main mass of the earth.

Oct 22-7:38 AM

True or False:

1. Without air resistance, objects with different masses will still fall at different rates.
2. Increasing mass will increase the force of gravity.
3. Increasing the distance between two objects increases the force of gravity.
4. The acceleration of gravity for a 5 kg and a 10 kg object is the same, but the 10kg object experiences more force because it has more mass.
5. Your mass doesn't change when you go to the moon, but your weight does because the force of gravity caused by the moon is not as strong as the force of gravity caused by the earth.

Oct 22-7:42 AM

Force and Motion - What Do You Believe?

The following statements pertain in one way or another to common notions regarding force and motion.

Identify each statement as being either true (T) or false (F). T or F?

Statement

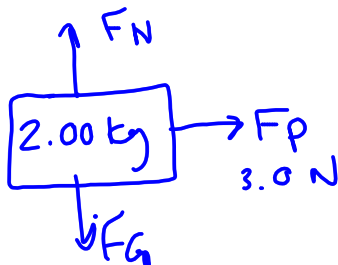
1. A force is required to keep an object moving in a given direction.
2. An upward moving object must be experiencing only an upward force.
3. A rightward moving object must be experiencing only a rightward force.
4. A ball is moving upwards and rightwards towards its peak. At all times the ball experiences a force that is directed upwards and rightwards.
5. If a person throws a ball with his hand, then the force of the hand upon the ball is experienced by the ball for at least a little while after the ball leaves the hand.
6. If an object is at rest, then there are no forces acting upon the object.
7. An object only changes its motion, either direction or speed, if an unbalanced force works upon it.

Oct 22-7:43 AM

$$F = ma$$

net force = mass x acceleration

A 2.00 kg cart on a frictionless track is pulled by a force of 3.00N.
What is the acceleration of the cart?



$$F_{net} = ma$$

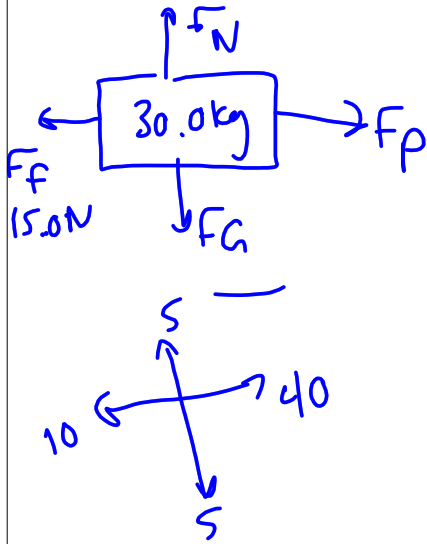
$$F_p = ma$$

$$\frac{3.0 \text{ N}}{2.00 \text{ kg}} = \frac{2.00 \text{ kg} (a)}{2.00 \text{ kg}}$$

$$1.5 \text{ m/s}^2 = a$$

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2. A man pushes his child in a grocery cart. The total mass of the cart and child is 30.0 kg. If the force of friction on the cart is 15.0 N, how hard does the man have to push so that the cart accelerates at 2 m/s/s.



$$F_{net} = ma$$

$$F_p - F_f = ma$$

$$F_p - 15\text{ N} = 30.0\text{ kg} (2\text{ m/s}^2)$$

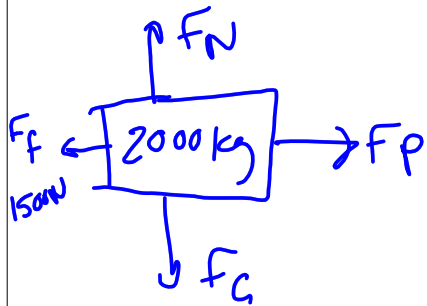
$$F_p - 15\text{ N} = 60\text{ N}$$

+15 N	+15 N
+15 N	+15 N

$$F_p = 75\text{ N}$$

Oct 22-7:47 AM

3. A 2000 kg SUV accelerates from rest at a rate of 3 m/s/s. The total amount of force resisting its motion is 1500 N. How much force is applied to the SUV's tires by the ground to make it accelerate?



$$F_{net} = ma$$

$$F_p - F_f = ma$$

$$F_p - 1500\text{ N} = 2000\text{ kg} (3\text{ m/s}^2)$$

$$F_p - 1500\text{ N} = 6000\text{ N}$$

+1500 N	+1500
+1500 N	+1500

$$F_p = 7500\text{ N}$$

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