

Name _____

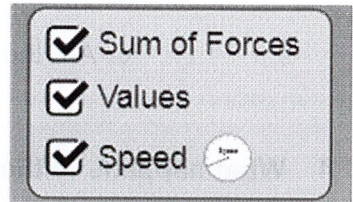
Forces and Motion: Basics

PhET Simulation

Learning Target: I will explore the relationship of forces and motion by using an interactive PhET simulation.

FORCES & MOTION

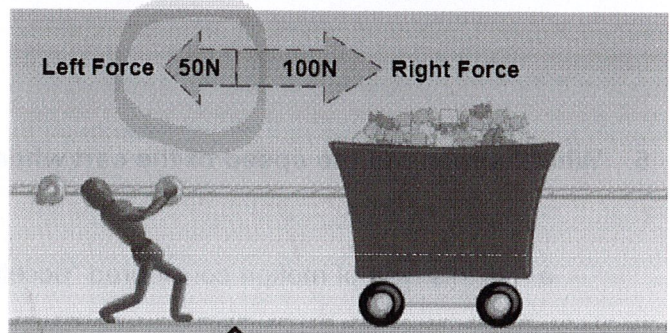
Net Force Section – enable measurement functions by checking boxes in top corner



1. Explore the program by placing red and blue people on each side of the rope to simulate a tug of war

a. Which person can pull with the most force?

b. What is the exact measurement of force that each figure can pull the rope?

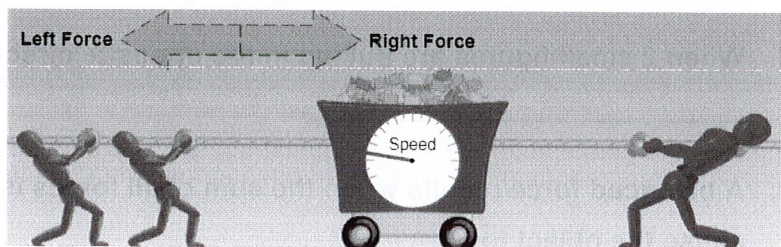


Look at the numbers in the arrows.

- Small person –
- Medium person–
- Large person–

2. Place 2 small blue people on the left against 1 medium red person on the right

a. Which way do they go and how fast?

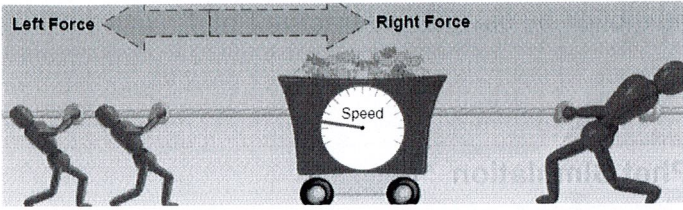


b. What is the sum of the forces (net force)?

c. Are the forces balanced or unbalanced? How do you know?

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3. Place 2 small blue people on the left against 1 large red person on the right

a. Which way do they go and how fast?

b. What is the sum of the forces (net force)?

c. Are the forces balanced or unbalanced? How do you know?

4. What happens to the speed of the cart when one side is winning the tug of war?

a. Is this type of motion considered "acceleration"? Why or why not?

5. What happens to the speed of the cart when the tug of war is a tie?

a. Is this type of motion considered "acceleration"? Why or why not?

6. When 2 small figures are both pulling in the same direction, their individual forces are _____ together.

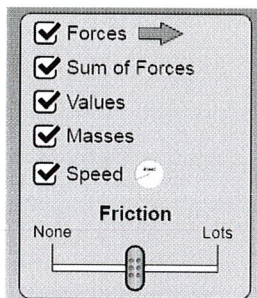
7. When 2 small figures are pulling in the opposite direction, their individual forces _____.

8. A balanced force results when the sum of all forces is _____ and does not cause the object to _____.

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Forces and Motion: Basics PhET Simulation

Friction Section – Click on Friction at the bottom of your screen.



Be sure to enable the functions at the top corner of the screen.



9. Set your friction bar to medium, select one 50-kg crate, and slowly apply a force to the right using the single arrow button.
- Stop when applied force reaches 10N
 - What is the friction force?
 - What is the sum of the forces? In which direction?
 - Is the crate accelerating (speeding up, slowing down, or changing direction)?
 - Stop when applied force reaches 100N
 - What is the friction force?
 - What is the sum of the forces? In which direction?
 - Is the crate accelerating (speeding up, slowing down, or changing direction)?
 - Stop when applied force reaches 200N
 - What is the friction force?
 - What is the sum of the forces? In which direction?
 - Is the crate accelerating (speeding up, slowing down, or changing direction)?

