Force and Motion Misconceptions

Lesson Notes

What Do You Believe?

Before you watch the video, think about what you believe regarding the following statements and identify them as being TRUE or FALSE. Place a **T** or an **F** in the blanks.

_____ A force is required to keep an object moving in a given direction.
_____ A rightward-moving object must be experiencing more rightward force than leftward force.
_____ A ball moving upward and rightward through the air is experiencing an upward and rightward force.
_____ A force can act upon an object for some time after the contact ends.

Misconception #1: A force is required in the direction of motion.

Why does a rightward-moving book stop while moving across the floor?

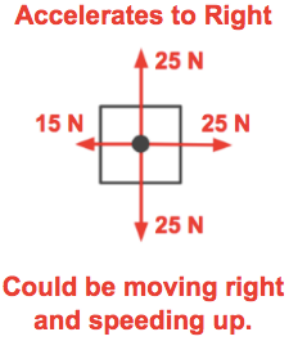
In which direction is the force on the book as it is moving right and slowing down?

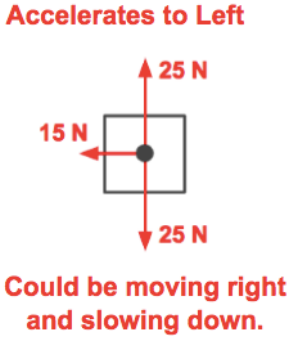
What does an air track teach us about misconception #1?

Misconception #2: There is always more force in the direction of motion than against it.

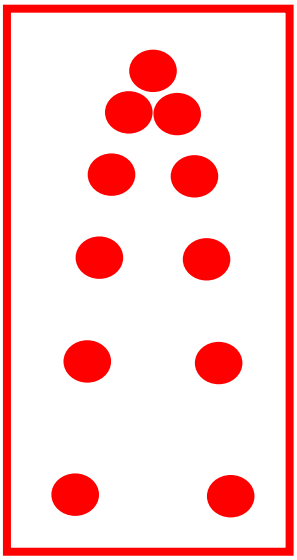
Forces, when unbalanced, cause objects to accelerate in the direction of the unbalanced force.

- Forces do NOT cause objects to move in a given direction.
- Forces cause objects to accelerate in given direction.
- A rightward-accelerating object must be experiencing more rightward force than leftward force.





Misconception #3: A ball moving upward and rightward through the air must be experiencing an upward and rightward force.



The force on an object results from its interaction with other objects.

What object(s) are an upward moving ball interacting with?

Does the thrower's hand act upon the ball as it is moving upward and rightward?

Misconception #4: Forces continue to act upon an object after the contact the object and the *agent* has ceased.

When you give a book a push across a table, how long does the force of the hand on the book act upon the book?

The Rocket Sledder

1. The sled begins at rest with a balance of force.
2. A rightward force on the sled causes a rightward acceleration.
3. Once moving, the sled continues moving at a constant speed even when there is no continued rightward force.
4. When there is a leftward force on the high speed sled, it continues moving rightward with a slowing down motion.