

Question:

Can a ball ever push downward on a table with a force greater than the ball's weight?

Type of Force

- Support force
 - Prevents something from penetrating a surface.
 - Points directly away from that surface (normal).

Physics Concept

- Net Force
 - The sum of all forces on an object.
 - The determinant of the object's acceleration.

Newton's Third Law

For every force that one object exerts on a second object, there is an equal but oppositely directed force that the second object exerts on the first object.

Forces Present:

1. The ball's weight
2. The ball's support force on the table
3. The table's support force on the ball

All three forces have the same magnitude for the stationary ball

Question:

Can a ball ever push downward on a table with a force greater than the ball's weight?

Forces Present:

1. The ball's weight
 2. The ball's support force on the table
 3. The table's support force on the ball
- } Pair

Forces Present:

1. The ball's weight on the earth
 2. The earth's weight on the ball
 3. The ball's support force on the table
 4. The table's support force on the ball
- } Pair
} Pair

Question:

If you push on a friend who is moving away from you, how will the force you exert on your friend compare to the force your friend exerts on you?

1. You push harder
2. Your friend pushes harder
3. The forces are equal in magnitude

Physical Quantities

- Energy
 - A conserved quantity

Physical Quantities

- Energy
 - A conserved quantity
 - The capacity to do work

Physical Quantities

- Energy
- Work
 - The mechanical means of transferring energy.

$$\text{Work} = \text{Force} \cdot \text{Distance}$$

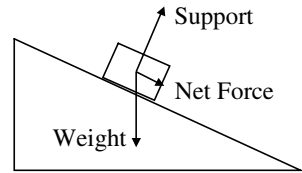
(where Force and Distance are in the same direction)

Work Lifting Ball

- Going straight up:
 - Force is large
 - Distance is small

$$\text{Work} = \text{Force} \cdot \text{Distance}$$

Forces on a Ramp



Work Lifting Ball

- Going up ramp:
 - Force is small
 - Distance is large

$$\text{Work} = \text{Force} \cdot \text{Distance}$$

Work Lifting Ball

- Going straight up:

$$\text{Work} = \text{Force} \cdot \text{Distance}$$

- Going up ramp:

$$\text{Work} = \text{Force} \cdot \text{Distance}$$

Physics Concept

- Mechanical Advantage
 - Doing the same amount of work
 - Redistributing force and distance