

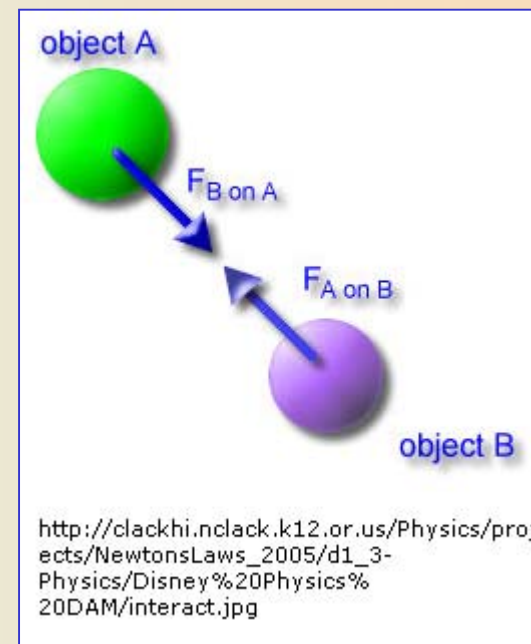
Dynamics: Newton's third law



The action and reaction forces act upon different bodies

Newton's third law

It may be stated as: **For every action (force) there is a reaction force: equal in magnitude, opposite direction and acting on a different body.**



A body "A" exerts a force F_{AB} on body "B"; then "B" exerts a force F_{BA} on "A". The two forces are equal in magnitude and opposite in direction.

Dynamics: Newton's third law

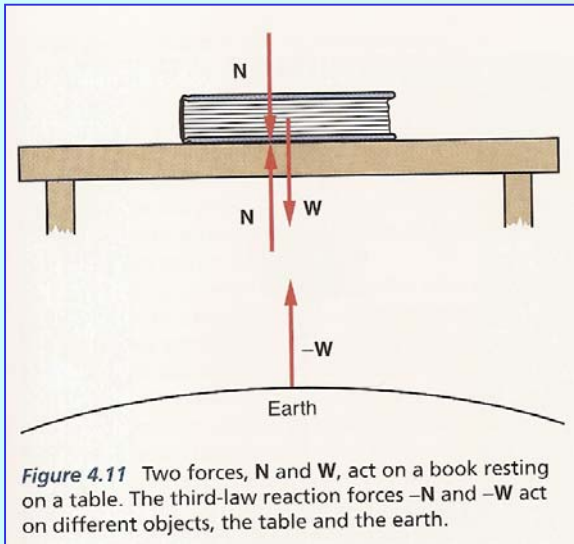


Figure 4.11 Two forces, N and W , act on a book resting on a table. The third-law reaction forces $-N$ and $-W$ act on different objects, the table and the earth.

Griffith, W. Thomas. *The Physics of everyday phenomena*. McGraw-Hill

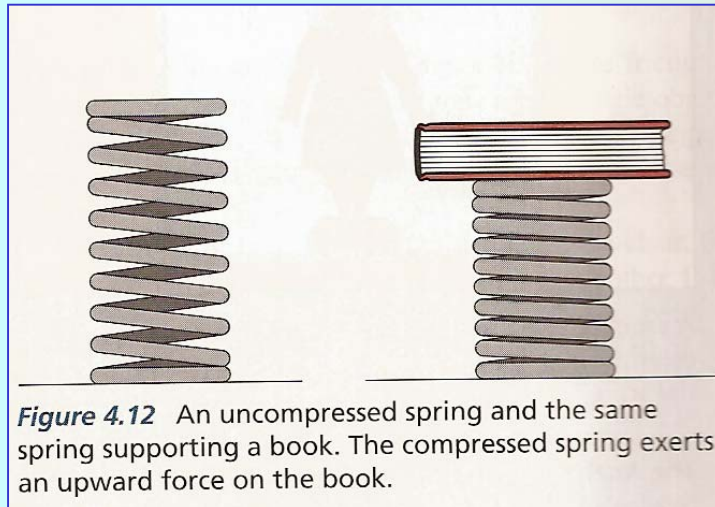


Figure 4.12 An uncompressed spring and the same spring supporting a book. The compressed spring exerts an upward force on the book.

Griffith, W. Thomas. *The Physics of everyday phenomena*. McGraw-Hill

Examples

Here, we have some applications of Newton's third law.

The action and reaction forces are always of the same type (normal, friction, tension...).

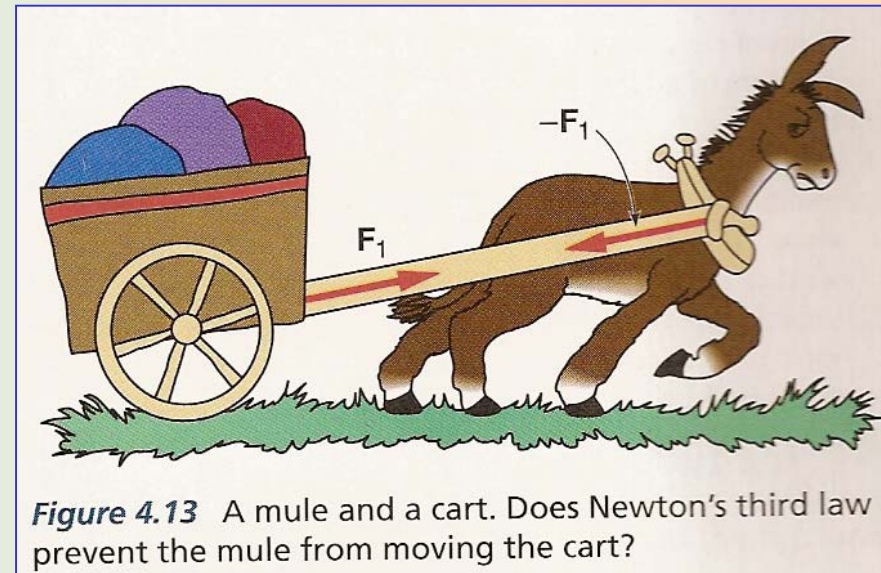


Figure 4.13 A mule and a cart. Does Newton's third law prevent the mule from moving the cart?

Griffith, W. Thomas. *The Physics of everyday phenomena*. McGraw-Hill

Action and reaction forces act on different bodies (they don't cancel out each other)