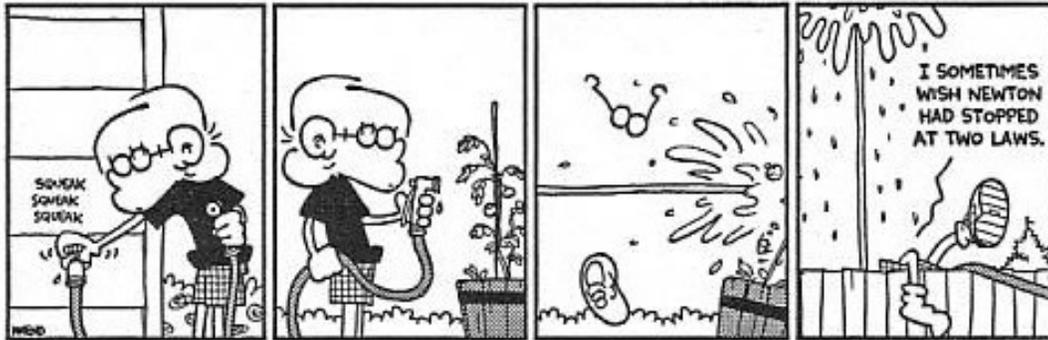


Newton's 3rd Law

SPH4C



“For every action, there is an _____ and _____.”

More accurately: for every action force on _____ due to _____,

there is a reaction force, equal in _____ but opposite in _____,

on _____ due to _____.

What does this mean in practice?

Examples:

An object near the Earth’s surface experiences a gravitational force of 15 N [down].
What is the reaction force?

The same object resting on a table experiences a normal force of 15 N [up].
What is the reaction force?

A 55 kg person standing on a frictionless ice rink throws a 5.0 kg ball with a force of 25 N [E].
What is the acceleration of the: (a) ball; (b) person?

The acceleration of the ball is:

The acceleration of the person is:

More Practice

- A book is resting on a table. The Earth is exerting a gravitational force of 8 N [down] on the book. Which of the following is the reaction force?
 - 8 N [up] the table exerts on the book
 - 8 N [down] the book exerts on the table
 - 8 N [up] the book exerts on the Earth
 - There is no reaction force.
- Box A has a mass of 30 kg. Box B has a mass of 60 kg. If Box A is exerting a force of magnitude 20 N on Box B, what is the magnitude of the force Box B is exerting on Box A?
 - 10 N
 - 20 N
 - 40 N
 - It cannot be determined.
- Object A of mass 2 kg is attached to Object B of mass 4 kg by a string suspended over a pulley. The tension in the part of the string attached to Object A is _____ the tension in the part of the string attached to Object B.
 - the same as
 - less than
 - greater than
 - It cannot be determined.
- The propulsion of a rocket in space by the expulsion of gases from the rocket is best explained using which of Newton's 3 Laws of Motion?
 - Newton's 1st Law
 - Newton's 2nd Law
 - Newton's 3rd Law
 - Newton's Laws do not apply in space.
- Given the action force, describe the reaction force for each situation.
 - You push forward on a book with 5.2 N
 - A hockey player hits the boards with a force of 180 N [toward the boards]
- Explain each event in terms of Newton's 3rd Law:
 - A small balloon releases air and flies around the room.
 - You start walking across the floor.

