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Department of Physical Education and Yoga

Course Title : SPORTS BIOMECHANICS AND KINESIOLOGY
Course Code : 21MPE22

Unit- (III)

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What is a force?

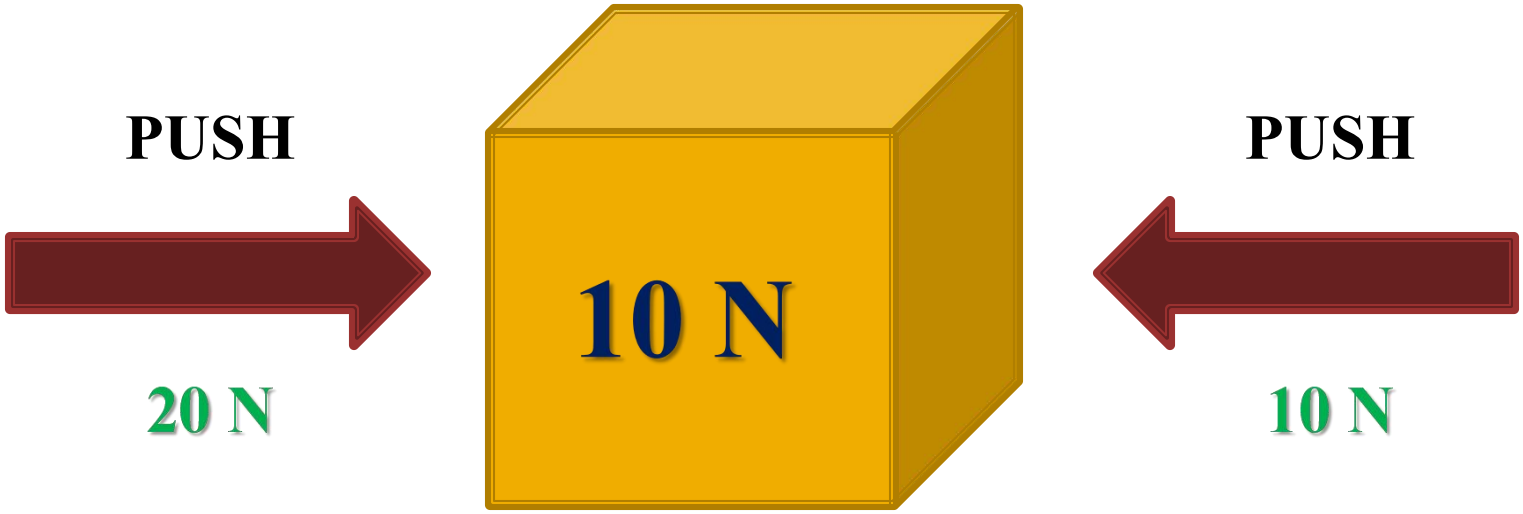
- A force is a push or pull in a specific direction.
- Forces can applied in the same or opposite direction.
- More than one force can be applied to an object at the same time.
- We are interested in the **NET** force applied.
  - Net force = Combination of ALL forces acting on an object
- The unit for measuring force is the Newton (N). [Named after Isaac Newton]

Examples of force on an object

The NET force = 20 N + 10 N = 30 N to the right

Force should always include MAGNITUDE and DIRECTION!!

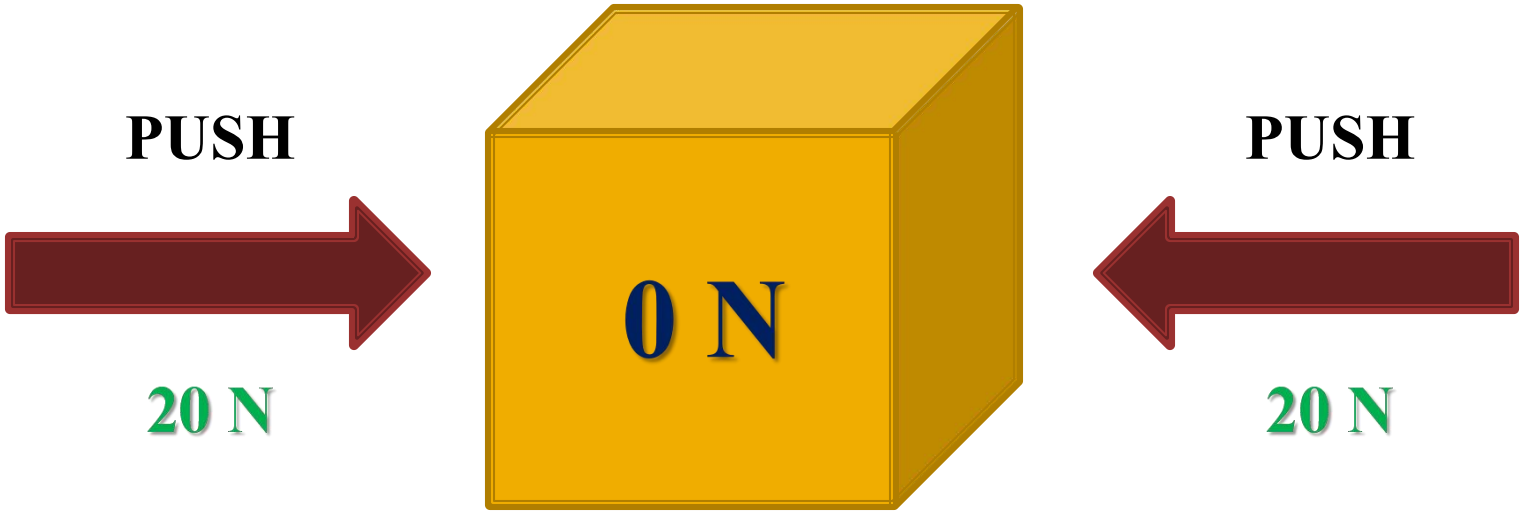
Examples of force on an object



The NET force = 20 N - 10 N = 10 N to the right

Force should always include MAGNITUDE and DIRECTION!!

Examples of force on an object

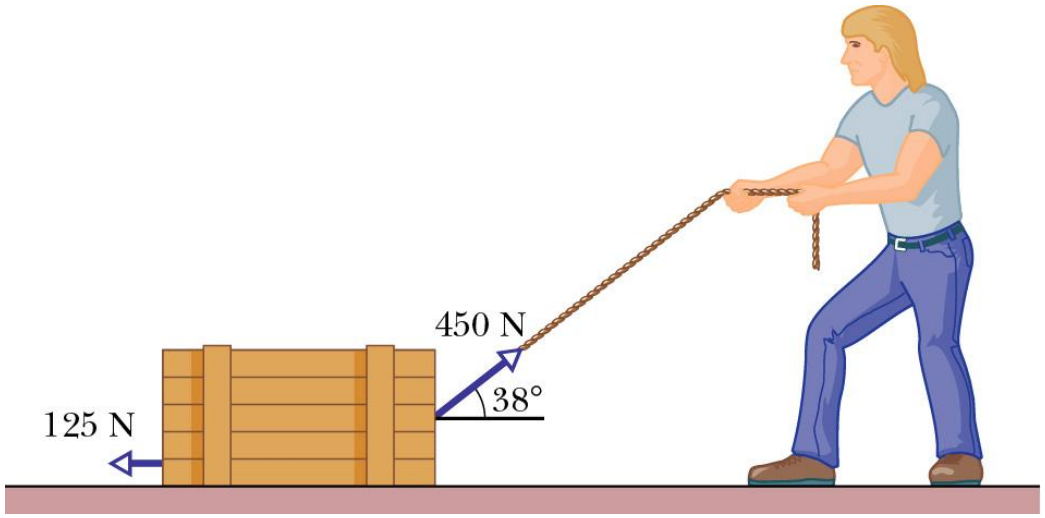


The NET force = 20 N - 20 N = 0 N to the right

Force should always include MAGNITUDE and DIRECTION!!

Necessary force information

- A force can start an object at rest in motion.
  - **What does 'at rest' mean?**
- Forces can change the shape of an object.
- Forces can have no effect at all on an object.



May the force be with you

- Force has SIZE (magnitude) and DIRECTION.
- Force is measured with a SPRING scale (not a mass balance).
- Units are in NEWTONS (N) named after Sir Isaac Newton.

SPRING SCALES

There is always more force…

- Weight is a measurement of gravitational force on an object.
- Weight does NOT equal mass!
  - How do we measure mass?
- An object's weight depends on the force of gravity at a given location.
  - Compare the Earth and the moon?
  - Why do astronauts 'float' in space?

Citations and Credit

- **Image Sources**
- Microsoft Office Clip Art (Office 2007)
- Slide 6 : Image - http://panda.unm.edu/Courses/Price/Phys160/F11-1.jpeg
- Slide 7 : Image - http://www.the-planets.com/star-biography/yoda_biography_3.jpg, http://www.heathscientific.net/Portals/0/spring%20scale.jpg, http://www.northerntool.com/images/product/images/19393_lg.jpg, http://www.fromoldbooks.org/Aubrey-HistoryOfEngland-Vol3/pages/vol3-401-Sir-Isaac-Newton/vol3-401-Sir-Isaac-Newton-q75-484x500.jpg

- **Information Source**
- Region 4 Educated Solutions, Gateways to Science Grade 6. 2005. pp. 70-78.