

force changes motion—that is sets acceleration

focus on object plus environment to isolate one member of an interacting pair: identify forces from interactions.

driving forces

retarding forces

kinds of forces

3 normal
3 frictional
3 non-contact

free-body diagram

resultant force

mass

acceleration

acceleration determines changes in velocity: velocity determines changes in displacement

force-pairs replace interactions of pairs of masses

force-pair

interaction diagrams

interacting masses

pair-wise linked set of free-body diagrams

focus on a pairs of interacting objects

connecting the effects two interacting objects

instantaneous

acceleration

acceleration connects dynamics and kinematics

duration

interval

velocity

$\Delta(\text{velocity})$

position

displacement

change in position

clock time

distance

speed

graphical representations of motion

diagrammatic representations of motion

algebraic representations of motion

momentum and energy in the kinetic store are both good measures of the quantity of motion

energy in kinetic store

mechanical working

energy shifted by mechanical working

collisions

momentum

impulse

momentum changed by impulse

focus on a single object

explosions

accumulations
change quantities over time