Force and Translational Dynamics

AP Physics C: Mechanics · Vocabulary in context

Word	Example
system /ˈsɪstəm/	A pond is a **system** with water, plants and animals.
center of mass /ˈsentə ɒv mæs/	The **center of mass** is the balance point.
force /fɔːs/	You use a **force** to push a door open.
free-body diagram /friː ˈbɒdi ˈdaɪəgræm/	Draw a **free-body diagram** with an arrow for each force.
Newton's third law /ˈnjuːtnz θɜːd lɔː/	**Newton's third law** says forces come in equal and opposite pairs.
inertia /ɪˈnɜːʃə/	**Inertia** keeps you moving forward when a bus stops suddenly.
net force /net fɔːs/	The **net force** is the sum of all forces.
translational equilibrium /trænˈsleɪʃənl ˌiːkwɪˈlɪbrɪəm/	A car at a steady speed is in **translational equilibrium**.
differential equation /ˌdɪfəˈrenʃl ɪˈkweɪʒn/	A **differential equation** links a quantity and its rate of change.
incline /ɪnˈklaɪn/	The block slides down an **incline**.
tension /ˈtenʃn/	The **tension** in the rope holds up the lamp.
Newton's law of gravitation /ˈnjuːtnz lɔː ɒv ˌgrævɪˈteɪʃn/	**Newton's law of gravitation** gives the pull between two masses.

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Friction /ˈfrɪkʃn/	**Friction** slows things down.
kinetic /kɪˈnetɪk/	**Kinetic** friction acts while a box slides across the floor.
static /ˈstætɪk/	**Static** friction stops a parked car from sliding down the hill.
normal force /ˈnɔːml fɔːs/	The **normal force** acts perpendicular to the contact surface.
Hooke's law /hʊks lɔː/	**Hooke's law** says the extension is proportional to the force.
spring constant /sprɪŋ ˈkɒnstənt/	A stiff spring has a large **spring constant**.
resistive force /rɪˈzɪstɪv fɔːs/	Air drag is a **resistive force** that slows a falling ball.
terminal velocity /ˈtɜːmɪnl vəˈlɒsɪti/	A skydiver reaches **terminal velocity** when drag equals weight.
separate the variables /ˈseprət ðə ˈveərɪəblz/	To solve $\mathrm{d}v/\mathrm{d}t = -kv$, **separate the variables** and integrate both sides. $$\mathrm{d}v/\mathrm{d}t = -kv$$
centripetal acceleration /senˈtrɪpɪtl əkˌseləˈreɪʃn/	A car turning a corner has a **centripetal acceleration**.