Force and Translational Dynamics

AP Physics 1 · 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.
Newton's first law /ˈnjuːtnz fɜːst lɔː/	**Newton's first law** says an object keeps moving unless a force acts.
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/	In **translational equilibrium**, the net force is zero.
Newton's second law /ˈnjuːtnz ˈsekənd lɔː/	**Newton's second law** says $F = ma$. $$F = ma$$
gravitational field strength /ˌgrævɪˈteɪʃənl fiːld streŋθ/	The **gravitational field strength** on Earth is 9.81 N/kg. 9.81 N/kg

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Newton's law of gravitation /ˈnjuːtnz lɔː ɒv ˌgrævɪˈteɪʃn/	**Newton's law of gravitation** gives the pull between two masses.
gravitational field /ˌgrævɪˈteɪʃənl fiːld/	The Earth's **gravitational field** pulls the Moon.
apparent weight	Your **apparent weight** changes in a moving lift.
inertial mass /ɪˈnɜːʃl mæs/	**Inertial mass** resists changes in motion.
gravitational mass /ˌgrævɪˈteɪʃənl mæs/	**Gravitational mass** decides the pull of gravity.
Friction /ˈfrɪkʃn/	**Friction** slows things down.
Kinetic friction /kɪˈnetɪk ˈfrɪkʃn/	**Kinetic friction** acts on moving objects.
Static friction /ˈstætɪk ˈfrɪkʃn/	**Static friction** stops an object from starting to slide.
normal force /ˈnɔːml fɔːs/	The **normal force** acts perpendicular to the contact surface.
coefficient of friction /ˌkəʊɪˈfɪʃənt ɒv ˈfrɪkʃn/	The **coefficient of friction** μ shows how rough two surfaces are. $$\mu$$
restoring force /rɪˈstɔːrɪŋ fɔːs/	The spring gives a **restoring force** towards the middle.
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**.

Word	Example
centripetal acceleration /sen'trɪpɪtl ək,selə'reɪʃn/	A car turning a corner has a **centripetal acceleration**.
net inward (centripetal) force /net 'ɪnwəd fɔːs/	A **net inward (centripetal) force** keeps an object moving in a circle.
period /'pɪərɪəd/	The **period** of the wave is 0.02 s. 0.02 s
frequency /'friːkwənsi/	A **frequency** of 50 Hz means 50 waves every second. 50 Hz 50
tangential acceleration /tæn'dʒenʃl ək,selə'reɪʃn/	**Tangential acceleration** changes the speed along a circle.
weight /weɪt/	Your **weight** is the pull of the Earth on you.
incline /ɪn'klaɪn/	The block slides down an **incline**.
tension /'tenʃn/	The **tension** in the rope holds up the lamp.

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