

Chapter 6

How Forces Affect Motion

“ Forces are pushes and pulls that can start, stop, change the speed, or change the direction of motion.



Observe



Think



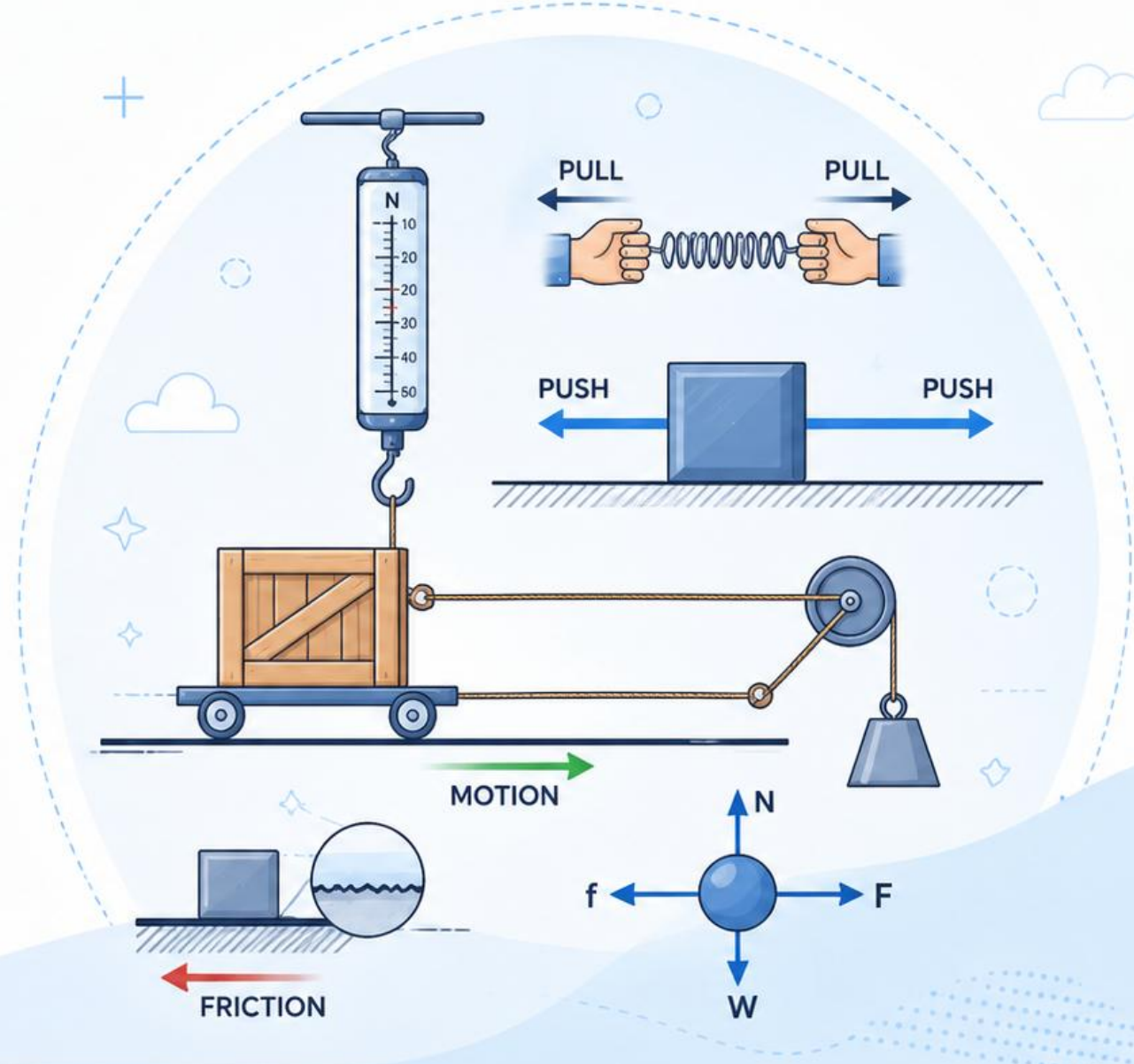
Experiment



Explore



Discover



HOW FORCES AFFECT MOTION

1. FORCE

A push or pull that can change motion or shape.

3. THREE LAWS

1st: motion without net force
2nd: force, mass & acceleration
3rd: forces come in pairs

2. NET FORCE

The combined effect of all forces on one object.

4. BIG IDEA

A non-zero net force changes velocity.



Force



Friction



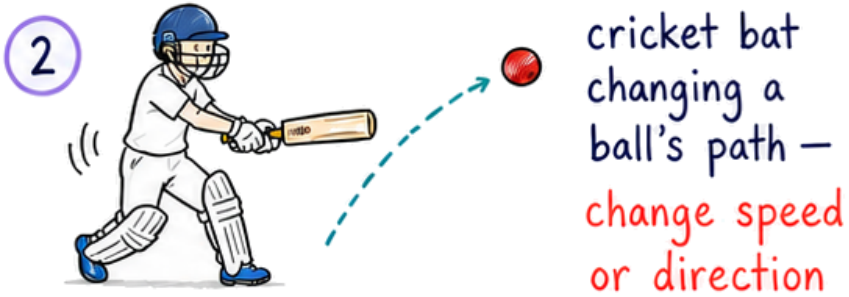
Newton's laws



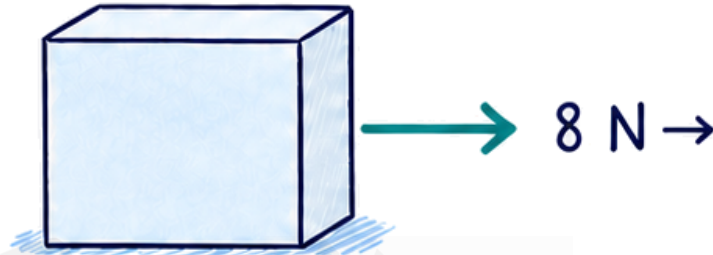
Systems

FORCE: EFFECTS, DIRECTION & UNIT

WHAT CAN A FORCE DO?



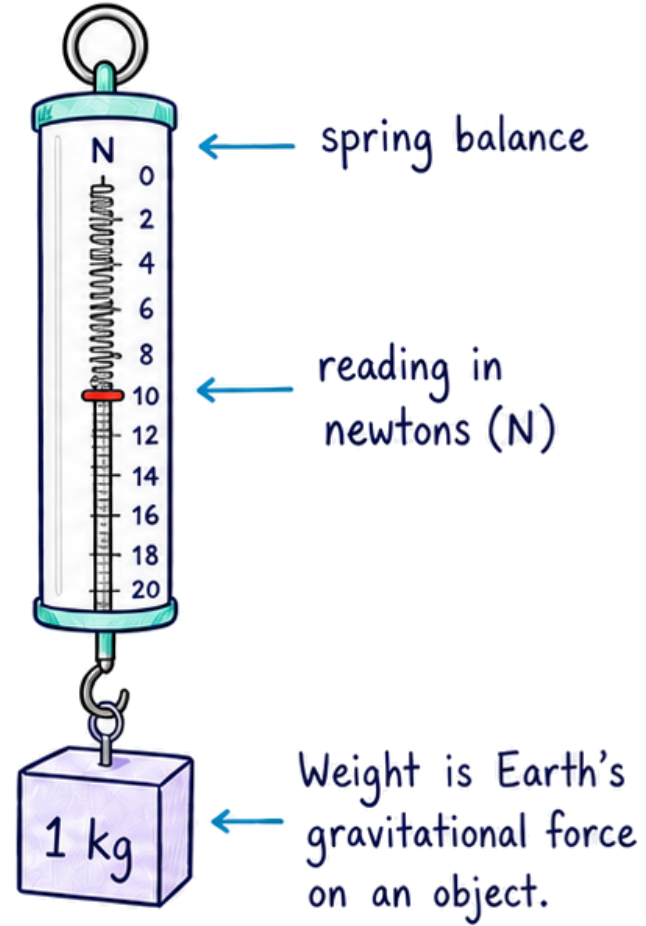
MAGNITUDE + DIRECTION



- Magnitude tells strength.
- Direction tells which way.

Changing either one can change the effect.

MEASURING FORCE



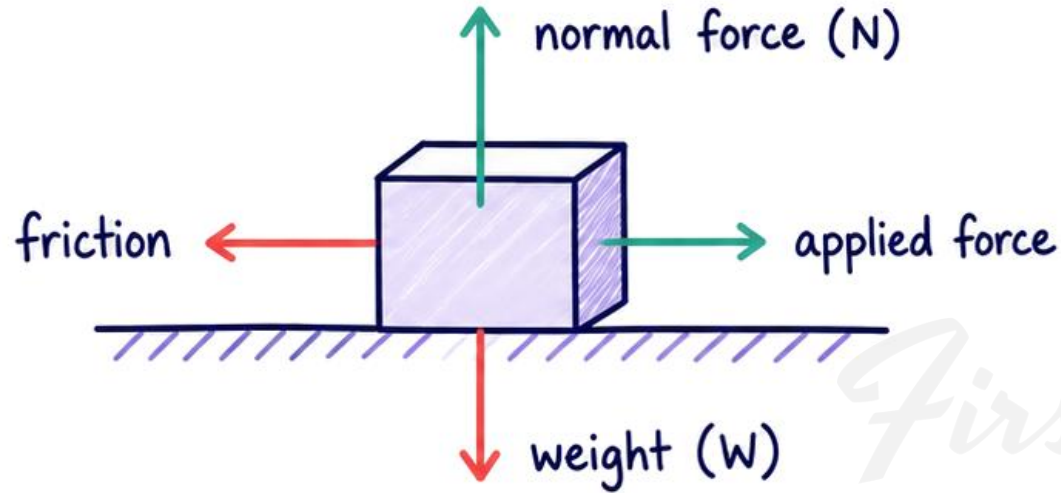
SI unit: newton

symbol: N

$1 \text{ N} = 1 \text{ kg} \cdot \text{m/s}^2$

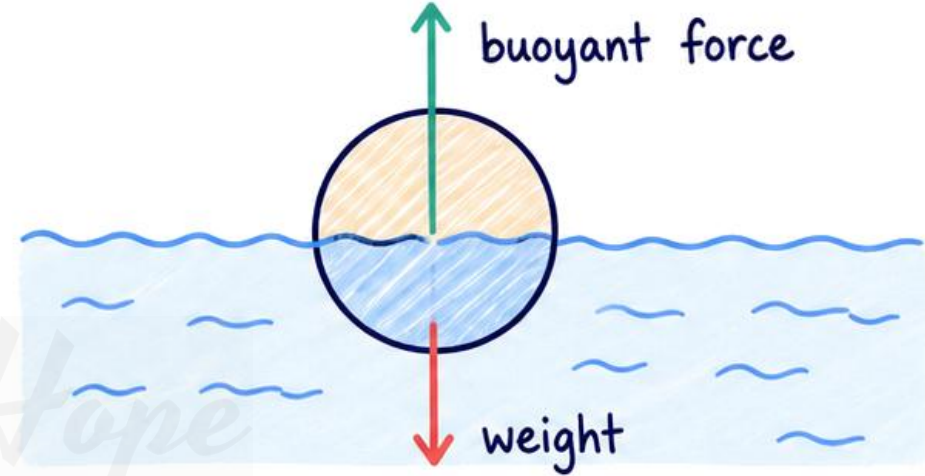
FORCES ACTING ON ONE OBJECT

BOX ON A FLOOR



- N and W balance vertically.
- Horizontal motion depends on applied force — friction.

BALL FLOATING ON WATER



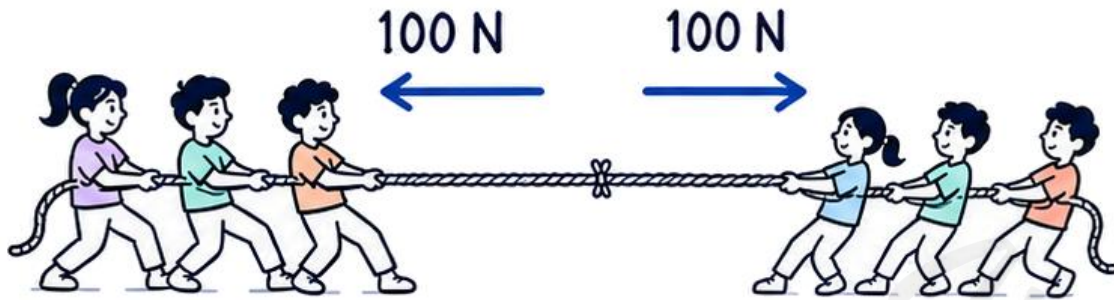
- Equal opposite forces $\rightarrow$ net force = 0
- The ball stays at rest.

Many forces may act at once. Motion depends on the NET FORCE on that object.

$$F_{\text{net}} = \text{combined effect of all forces}$$

BALANCED & UNBALANCED FORCES

BALANCED FORCES



$$\text{Net force} = 100 - 100 = 0 \text{ N}$$

No acceleration.

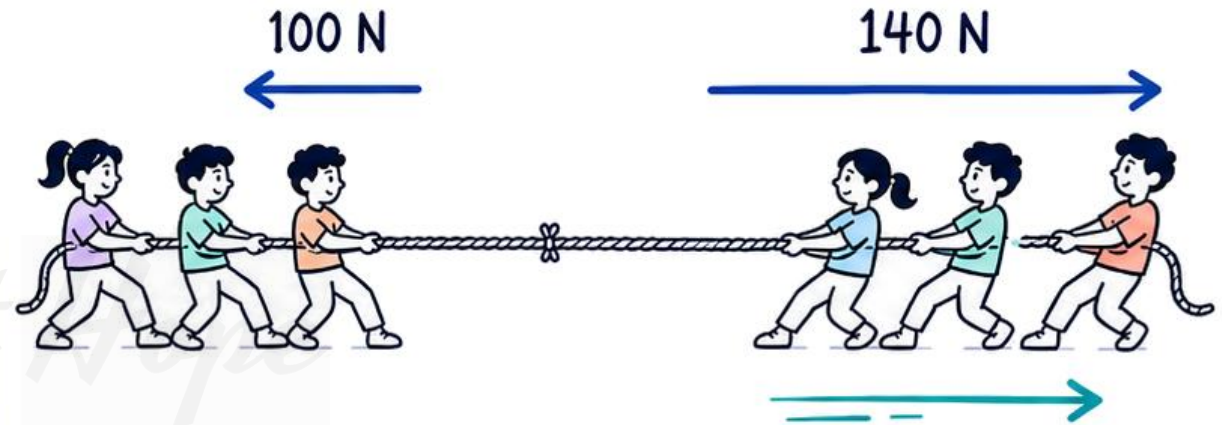


At rest $\rightarrow$ stays at rest



Already moving $\rightarrow$ constant velocity

UNBALANCED FORCES



$$\text{Net force} = 140 - 100 = 40 \text{ N} \rightarrow$$

Acceleration is toward the larger force.



Balanced does NOT always mean stationary.
It means $F_{\text{net}} = 0$.



Key: Net force is the combined effect of all forces on the SAME object.

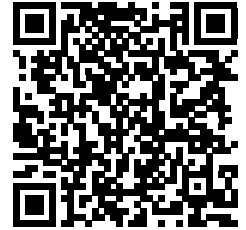


FREE PREVIEW

[Click here to visit our website](#)

SCHOOL NOTES & NCERT SOLUTIONS

Complete notes and
NCERT solutions are
available on
FirstHope app only.



[Scan or click here](#)

Click here to get the app

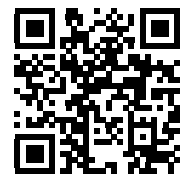


Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram



[Scan or click here](#)

@FirstHope_CBSE_Notes

Instagram

@firsthope.school

[Click here to follow >](#)

YouTube channel

@firsthope.school

[Click here to watch >](#)

FirstHope website

firsthope.co.in

[Click here to visit our website >](#)

CBSE / Class 9 / Class 10 / Class 11 / Class 12

Preview notes and NCERT solutions. Full PDFs in the FirstHope app.