



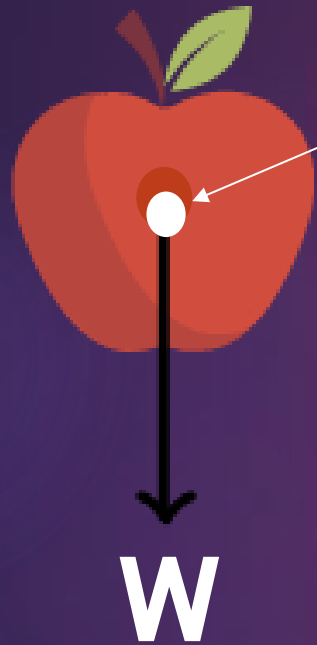
# Forces



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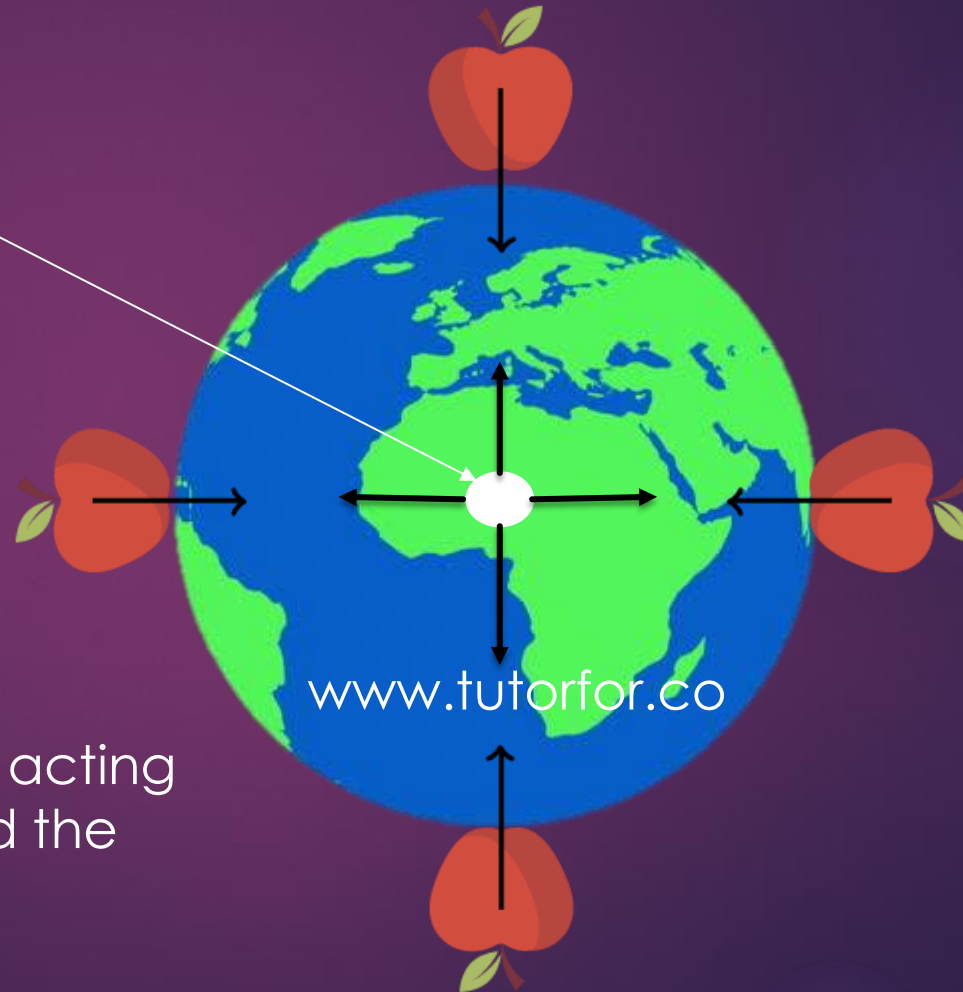
# Types of forces

## Weight



Centre of gravity

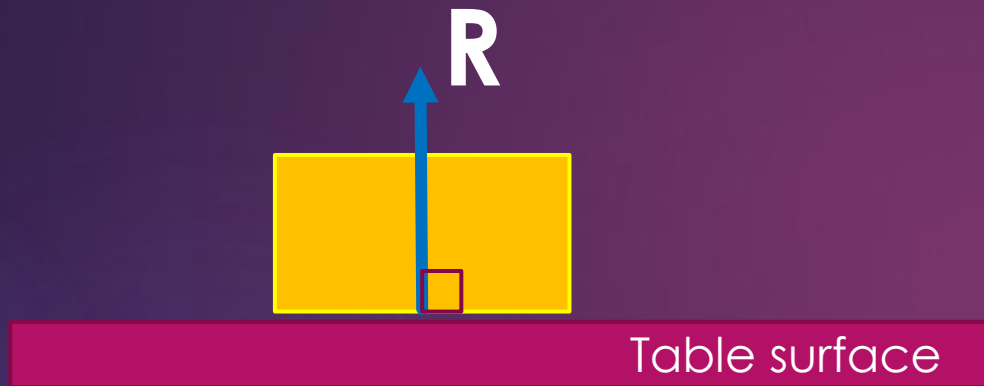
The gravitational pull acting on an object is called the weight (W).



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# Types of forces

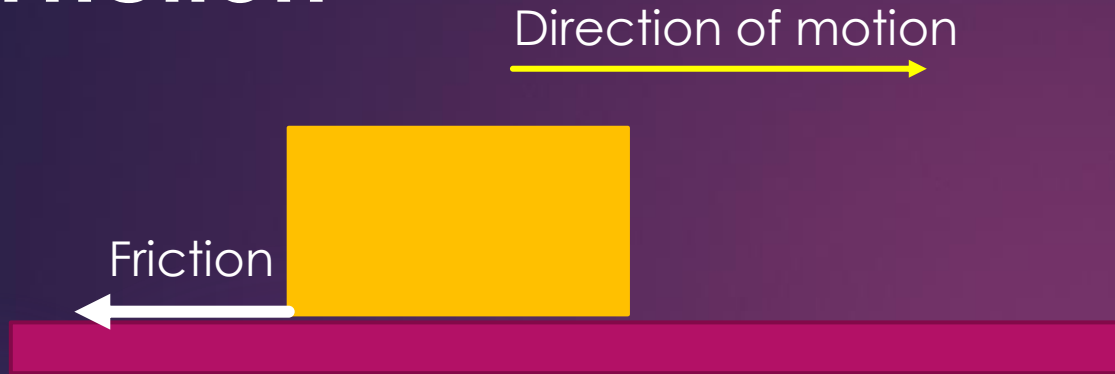
## Normal reaction force



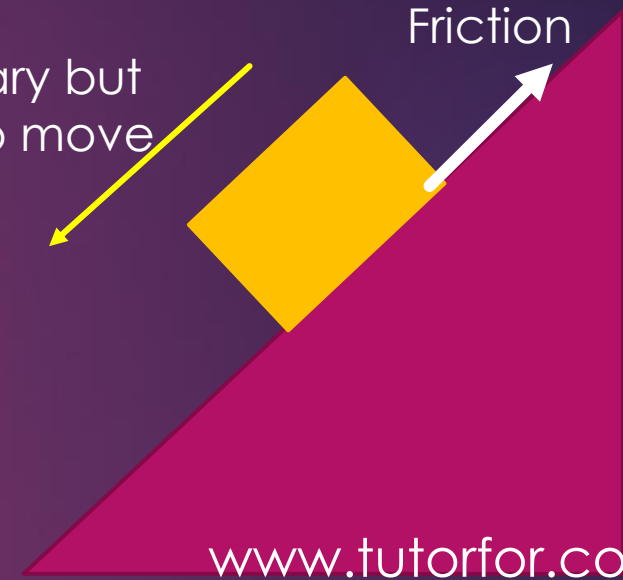
The force acting perpendicular to two surfaces in contact with each other is called normal reaction force.

# Types of forces

## Friction



Stationary but  
trying to move



□ Friction is a force between two surfaces that are sliding, or trying to slide, across each other.

□ Friction always works in the direction opposite to the direction in which the object is moving or trying to move.

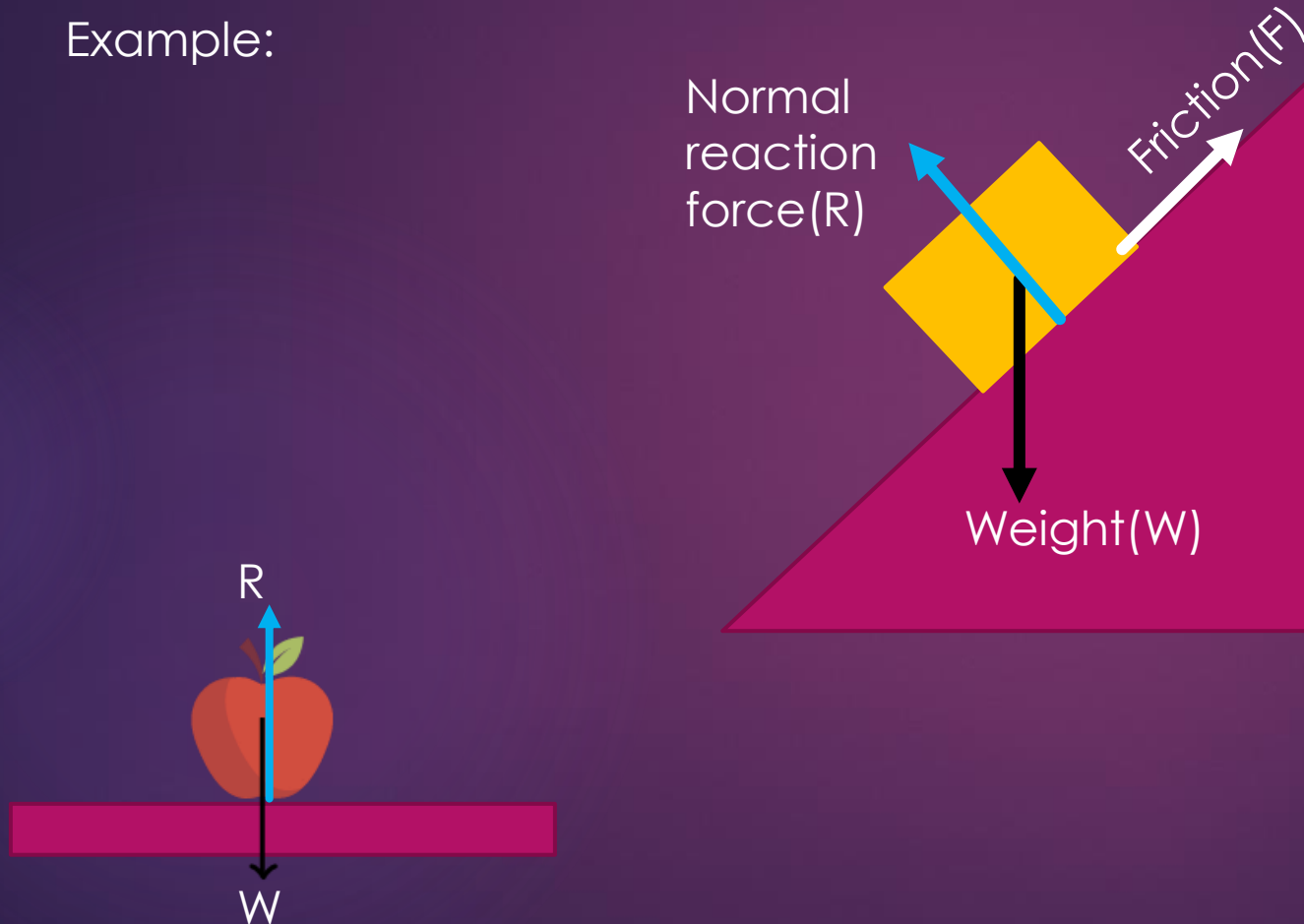
# Friction



# Free body force diagram

Labelling all the forces acting on an object and their directions on a diagram is called a free body force diagram.

Example:



# Balanced and Unbalanced Forces



PHYSICS



If the forces are balanced, resultant force is zero.

$$\begin{aligned}\text{Resultant} &= 300 \text{ N} - 300 \text{ N} \\ &= 0 \text{ N}\end{aligned}$$

# Balanced forces

If the forces (acting on the same line) are equal in magnitude and opposite in direction, they are called balanced forces.





- **Unbalanced forces acting on an object cause it to change the way it is moving.**
- **Unbalanced force causes acceleration.**

# Unbalanced forces

Above diagram:

$$\begin{aligned}\text{Unbalanced force} &= 400 \text{ N} - 300 \text{ N} \\ &= 100 \text{ N}\end{aligned}$$

# Concept learning

Find the unbalanced (resultant) force.



# Concept learning

Find the unbalanced (resultant) force.

