

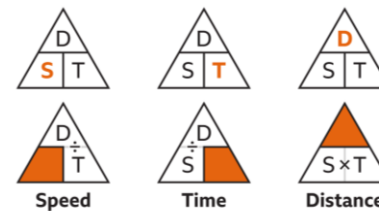
Box 1: Keywords

Word	Definition
Linear Motion	Motion in a straight or curved line, with all body parts moving the same distance, at the same speed in the same direction.
Scalar	Measurements described only in terms of size.
Vector	Measurements described in terms of size and direction.
Mass vs Weight	Mass = Quantity of matter a body possesses (kg) Weight = Gravitational force exerted on an object (N)
Distance vs Displacement	Distance = The path a body takes (m) Displacement = The shortest route in a straight line from point A to B (m)
Speed vs Velocity	Speed = Measurement of a body's movement per unit of time with no reference to direction (eg. m/s). Velocity = Rate of change of displacement (m/s).
Acceleration	Rate of change of velocity. Change in velocity (m/s) divided by time (s), (m/s ²).
Momentum	Product of the mass and velocity of an object. Momentum (kg.m/s) = Mass (kg) x velocity (m/s)

Box 2: Key skills

- Plot, label and interpret biomechanical graphs and diagrams; calculate biomechanical equations; use units of measurement when calculating biomechanical equations; make observations and draw conclusions from data.

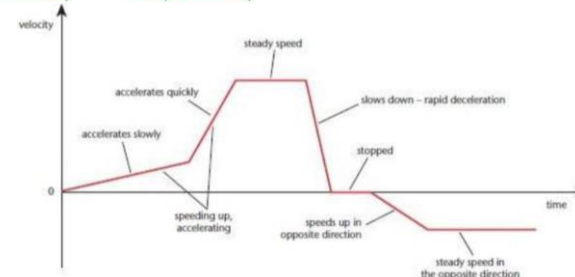
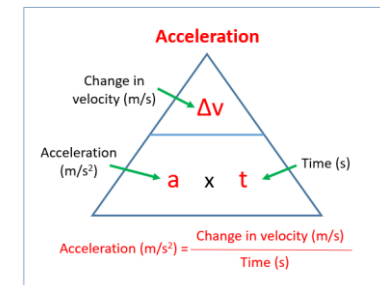
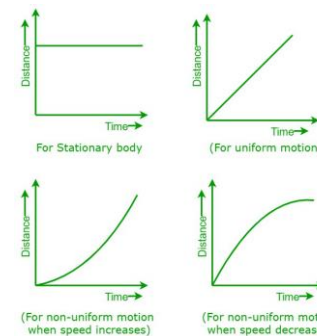
Box 3: Definitions, equations and units of scalars and vectors



momentum

$$\mathbf{p} = m\mathbf{v}$$

mass velocity

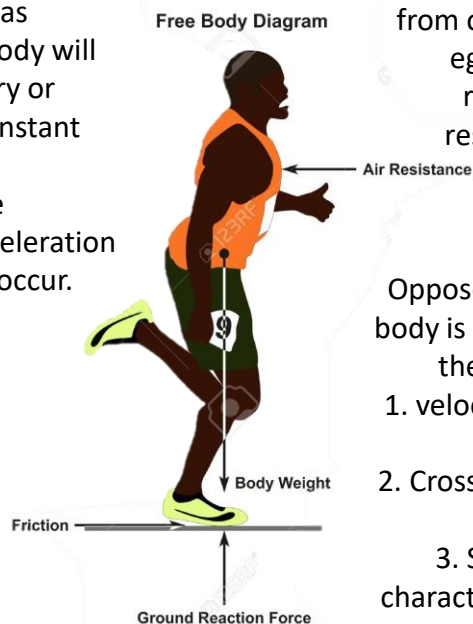


Box 4: The forces acting upon a performer during linear motion

Balanced vs unbalanced forces

When forces are equal they are known as balanced. The body will remain stationary or continue at a constant linear velocity.

When forces are unbalanced, acceleration or deceleration occur.



Internal vs External Force

Internal force is generated through muscular contraction.

External force comes from outside the body, eg. weight, ground reaction force, air resistance, friction.

Air Resistance

Opposes motion when a body is travelling through the air. Impacted by:

1. velocity of the moving body.
2. Cross-sectional area of moving body.
3. Shape and surface characteristics of moving body.

Ground Reaction Force

For every action force there is an equal and opposite reaction force.

This occurs whenever two or more forces come in contact with one another.

Friction

Friction acts in opposition to motion. Friction resists slippage between two objects, therefore the arrow is drawn in the opposite direction to that slippage.

It is affected by:

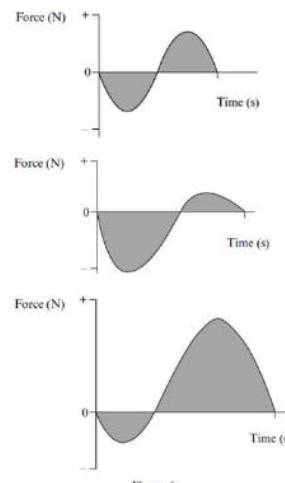
1. Surface characteristics
2. Temperature of the objects
3. Mass of the objects

Box 5: The relationship between impulse and increasing and decreasing momentum in sprinting

Impulse (n.s) = force (n) x time (s)

Impulse is the time it takes for a force to be applied to an object. It is only concerned with horizontal forces.

Momentum = Mass x Velocity



In running, negative impulse occurs first due to the breaking action of the footfall.

When the athlete is accelerating, their muscles contract and a force is applied, positive impulse is seen, the athlete accelerates.

When the athlete is decelerating, their foot remains in contact with the ground for longer periods of time and a larger breaking force occurs. This is shown as a large negative impulse.

Box 6: Pathway

Previous knowledge: from teaching sequence

Future links: from teaching sequence

Careers: from curriculum narratives

Box 7: Cross curricular links