

PES 1.4 Key Vocabulary

air resistance : The force that opposes the motion of an object through air. Friction caused by an object hitting air particles. *Example: A skydiver falling through the air is slowed by air resistance.*

bulb : A component that produces light when an electric current passes through it. *Example: The light in a torch or lamp is made by a bulb.*

cell : A single electrical energy source that converts chemical energy into electrical energy. *Example: AA batteries are cells.*

chemical potential energy : Energy stored in the chemical bonds of a substance. *Example: Food and batteries contain chemical potential energy that can be released when used.*

component : A part of a circuit that has a specific function. *Example: A resistor is a component in an electrical circuit.*

compressed : Made more dense by pressure, reducing its volume. Squashed together. *Example: Air in a bicycle pump is compressed to push the tyre full of air.*

conduction : The transfer of heat or electricity through a material without the movement of the material itself. Transfer of heat energy when particles in a substance 'bump' into others. *Example: A metal spoon gets hot when its end is in a pot of boiling water.*

conserve / conservation : The principle that energy cannot be created or destroyed, only changed from one form to another. *Example: When a pendulum swings, gravitational potential energy transforms into kinetic energy and back, conserving total energy.*

constant : A quantity that stays the same

convection : The transfer of heat through a fluid (liquid or gas) caused by the movement of the fluid itself. The particles move closer together or further apart so the density of the fluid changes. *Example: Boiling water moves in a circular pattern because of convection.*

current : The flow of electric charge / electrons through a conductor. *Example: The current flows through the wires when you switch on a lamp.*

elastic potential energy : Energy stored in an object when it is stretched or compressed. *Example: A stretched rubber band or a compressed spring has elastic potential energy.*

electric potential energy : Energy stored in an electric charge due to its position in an electric field. *Example: A charged balloon has electric potential energy that can make it stick to a wall.*

energy efficiency : How well a device converts energy from one form to another intended form without wasting it. Example: LED bulbs are more energy efficient than old incandescent bulbs because they produce more light and less heat.

gravitational potential energy : Energy stored in an object because of its height above the ground. Example: A book on a shelf has gravitational potential energy that is released if it falls.

heat : Energy transferred from a hotter object to a cooler one. Example: Heat flows from a hot stovetop to a saucepan.

heat capacity : The amount of heat needed to raise the temperature of a substance by 1 °C. Example: Water has a high heat capacity, so it heats up slowly. Sand has a low heat capacity, so it heats up quickly in the sun.

kinetic energy : The energy an object has because it is moving. Example: A rolling ball has kinetic energy.

latent heat : Energy absorbed or released by a substance during a change of state, without changing temperature. Example: Ice absorbs latent heat when it melts but stays at 0 °C until fully melted.

latent heat of fusion : Energy needed to change 1 kg of a substance from solid to liquid phase at constant temperature. Example: Ice requires latent heat of fusion to melt at 0 °C.

latent heat of vaporisation : Energy needed to change 1 kg of a substance from liquid to gas phase at constant temperature. Example: Water requires latent heat of vaporisation to turn into steam at 100 °C.

light energy : Energy carried by light in the form of electromagnetic waves that can travel through space. Example: Sunlight gives plants light energy for photosynthesis.

mass : The amount of matter in an object. Property of an object based on the type and amount of particles it contains. Example: A bag of sugar has a mass of 1 kg.

parallel circuit : A circuit in which components are connected on separate branches, so each has the same voltage. A circuit that has more than one pathway for the electrons to flow. Example: In a house, lights are connected in parallel so that turning one off does not turn off the others.

radiation : Energy transferred through space as waves or particles, without needing a medium (particles). Example: The Sun transfers energy to Earth by radiation.

resistance : A measure of how much a material opposes the flow of electric current. Example: A thin wire has higher resistance than a thick wire.

resistor : A component that limits the flow of electric current in a circuit. Example: Resistors are used in electronics to protect LEDs from too much current.

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series circuit : A circuit where components are connected one after another, so the same current flows through all. *Example: Old-style Christmas lights often use series circuits.*

specific heat capacity : The amount of heat needed to raise the temperature of 1 kg of a substance by 1 °C. *Example: Water has a high specific heat capacity, so it heats up slowly.*

speed : How fast an object moves, regardless of direction. *Example: A car traveling 60 km/h is moving at a speed of 60 km/h.*

substance : A type of matter with specific properties and composition. *Example: Water, oxygen, and iron are all substances.*

temperature : A measure of how hot or cold something is, related to the average kinetic energy of its particles. A measure of how quickly the particles are moving. *Example: Boiling water has a temperature of 100 °C.*

thermal energy : Energy stored in a substance due to particle motion; increases with higher temperature and larger mass. *Example: A swimming pool has more thermal energy than a bathtub because it contains more water, even if both are at the same temperature.*

transfer (energy) : The movement of energy from one object or system to another.

Example: Heat transfers from a hot pan to your hand.

transformation (energy) : The change of energy from one form to another. *Example: A battery transforms chemical energy into electrical and light and heat energy in a torch.*

velocity : The speed of an object in a particular direction. *Example: A car moving north at 60 km/h has a velocity of 60 km/h north.*

voltage : The energy per unit charge supplied by a source or used by a component in a circuit. Also known as potential difference. *Example: An AA battery provides 1.5 V.*

weight : The force of gravity acting on an object's mass. *Example: A 10 kg object has a weight of about 100 N on Earth.*

work : Energy transferred when a force moves an object over a distance. *Example: Pushing a box across the floor involves doing work.*