P1: Conservation and Dissipation of Energy Part B Knowledge Organiser (F) PT6.5

Useful Energy	•Energy transferred to where it is wanted in the way it is wanted •Example: Electrical energy transferred to light energy in a light bulb.
Wasted Energy	•Energy that is not usefully transferred. •Example: Electrical energy transferred to thermal energy in a light bulb. •Wasted energy in machines is caused by friction, air resistance, electrical resistance and noise.
Dissipation	•Wasted energy is transferred to the internal energy of the surroundings and gets spread out. •Dissipated energy gets less and less useful the more it is spread out.
Efficiency	•How much of the energy transferred to a system is transferred usefully. •Can be a decimal (e.g. 0.25) or a percentage (e.g. 25%). •No device is ever more than 100% efficient → energy cannot be created so you can't get more out than you put in!
Electrical Appliance	•A device that transfers electrical energy into useful energy e.g. TV, toaster, motor, heater, kettle. •E.g. Lightbulb: Energy transferred usefully as light energy. The filament gets hot so energy is wasted as it gets transferred as thermal energy to the surroundings. •E.g. Kettle : Energy transferred to the thermal energy store of the water. Energy is wasted as the actual kettle gets heated. •Appliances are designed to be as efficient as possible to avoid wasting energy.

Power, P	•How much energy is transferred per second. •Measured in Watts, W. •More powerful device = more energy transferred per second.
Power and Efficiency	•Power can be used to work out efficiency because power is a rate of energy transfer. •Useful Power output = useful energy transferred per second. •Total power input = energy transferred per second. •Can also be a decimal or a percentage.
Wasted Power	•Power wasted = total power in – useful power out.

Key Equations To Learn	
Efficiency	Useful output energy ÷ Total input energy
Power, P	Power = Energy ÷ Time P = E ÷ t
Efficiency	Efficiency = Useful power out ÷ Total power in

P1: Conservation and Dissipation of Energy Part B Knowledge Organiser (H) PT6.6

Useful Energy	•Energy transferred to where it is wanted in the way it is wanted •Example: Electrical energy transferred to light energy in a light bulb.
Wasted Energy	•Energy that is not usefully transferred. •Example: Electrical energy transferred to thermal energy in a light bulb. •Wasted energy in machines is caused by friction, air resistance, electrical resistance and noise.
Dissipation	•Wasted energy is transferred to the internal energy of the surroundings and gets spread out. •Dissipated energy gets less and less useful the more it is spread out.
Efficiency	•How much of the energy transferred to a system is transferred usefully. •Can be a decimal (e.g. 0.25) or a percentage (e.g. 25%). •No device is ever more than 100% efficient → energy cannot be created so you can't get more out than you put in!
Improving efficiency (H)	•Friction causing heating → lubricate moving parts •Resistance in circuits causing heating → use wires with the lowest resistance possible •Air resistance/drag → streamlining •Noise → tighten loose parts to reduce vibration
Electrical Appliance	•A device that transfers electrical energy into useful energy e.g. TV, toaster, motor, heater, kettle. •E.g. Lightbulb: Energy transferred usefully as light energy. The filament gets hot so energy is wasted as it gets transferred as thermal energy to the surroundings. •E.g. Kettle : Energy transferred to the thermal energy store of the water. Energy is wasted as the actual kettle gets heated. •Appliances are designed to be as efficient as possible to avoid wasting energy.

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Wasted Power	•Power wasted = total power in – useful power out.

Key Equations To Learn	
Efficiency	Useful output energy ÷ Total input energy
Power, P	Power = Energy ÷ Time P = E ÷ t
Efficiency	Efficiency = Useful power out ÷ Total power in