

Definitions and Concepts for WJEC (Wales) Physics GCSE

Topic 2.3: Work and Energy

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Aerodynamic Losses: The energy lost by a vehicle as it does work against aerodynamic forces. The greater these losses, the less efficient the vehicle will be.

Efficiency: The ratio of useful output energy transfer to total energy input. It can never exceed 1 (or 100%), due to the conservation of energy.

Elastic Potential Energy: The store of energy that an object has when stretched or compressed.

Force-Extension Graph: The gradient of a force-extension graph for a spring obeying Hooke's law is equal to the spring constant. **The area under the graph is the work done in stretching the spring.**

Gravitational Potential Energy: The store of energy that all raised matter has. **It is directly proportional to the mass of the object, the distance that it is raised, and the gravitational field strength at that point.**

Hooke's Law: The extension of a spring is directly proportional to the force applied to it, up to the limit of proportionality. The constant in this relationship is known as the spring constant.

Kinetic Energy: The store of energy that all moving matter has. **It is directly proportional to the object's mass and to the square of its velocity.**

Limit of Proportionality: The point beyond which the extension of an elastic object is no longer directly proportional to the force applied to it.

Linear Relationship: A relationship between two variables where if one variable increases, so does the other by the same factor. They produce straight lines when plotted.

Spring Constant: A measure of a spring's stiffness. The higher the spring constant, the smaller the extension is for a given force.

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Streamlining: The altering of a vehicle's shape to reduce the drag forces that act on it.

Useful Energy Transfer: The transfer of energy by a system, to directly serve the purpose of the system.

Waste Energy Transfer: The transfer of energy by a system to a form that doesn't directly serve the purpose of the system.

Work Done: Work is done on an object when a force causes it to move through a distance. It is equal to the product of the distance travelled and the magnitude of the force in the direction of motion.

