

Bronze - Each question worth 1 point	Silver - Each question worth 2 points	Gold - Each question worth 3 points
Write the equation to calculate work done. $W = F \times d$	What is the work done if we apply a 1.2N force and we move 4 m in the direction of force? $W = F \times d = 1.2\text{N} \times 4\text{m} = 4.8\text{Joules (J)}$	Thinking about energy transfers: When you rub your hands together what are the energy transfers? 1. Kinetic energy: Your muscles provide the energy to move your hands, creating motion (kinetic energy). 2. Thermal energy: Due to friction between your hands, the mechanical energy is converted into heat (thermal energy), which is why your hands feel warm after rubbing them together. energy transfer is from kinetic energy to thermal energy.
Rearrange this equation for force applied. $F = W/d$	What is the work done if we apply a 7N force and we move 8 m in the direction of the force? $W = F \times d = 7\text{N} \times 8\text{m} = 56\text{Joules (J)}$	When you boil a kettle what energy transfers are happening? Electrical energy: The kettle is powered by electricity, so electrical energy is supplied to the heating element. Thermal energy: The electrical energy is converted into thermal energy by the heating element, which heats the water. energy transfer is from electrical energy to thermal energy Kinetic energy of water molecules: As the water heats up, the thermal energy increases the kinetic energy of the water molecules, causing them to move more rapidly.
Rearrange this equation for distance moved in the direction of force. $d = W/F$	What distance is moved if we have a 8N force and the work done is 90 J? $d = W/F = 90\text{J}/8\text{N} = 11.25\text{meters (m)}$	Walking up a flight of stairs, what are the energy transfers? Chemical energy to kinetic energy: Your body uses the chemical energy stored in your muscles (from food) to move, converting it into kinetic energy. Kinetic energy to gravitational potential energy: As you move upward, some of the kinetic energy is transferred to gravitational potential energy, which increases with height.

What is the unit of force? N, Newton	What is the distance moved if we have a 70N force and work done is 8 J? $d = W/F = 8J/70N = 0.114\text{meters (m)}$	When you roll a ball down a hill what are the energy transfers? • Gravitational potential energy to kinetic energy: As the ball starts at a height, it has gravitational potential energy, which is converted into kinetic energy as it moves down the hill. • Kinetic energy to thermal energy (due to friction): As the ball rolls, some energy is also transferred to thermal energy because of friction between the ball and the surface. energy transfer is from gravitational potential energy to kinetic energy, with a small amount converting to thermal energy due to friction.
What is the unit of work done? Joules	What force is required to move 7 m if the work done is 9 J? $F = W/d = 9J/7 = 1.29\text{Newtons (N)}$	What is the work done when a force of 5 N is applied to a ball and it moves 80 m? $W = F \times d = 5N \times 80m = 400\text{Joules (J)}$
What is the unit of distance? Metre	What force is required to move 19 m if the work done is 9 J? $F = W/d = 9J/19m = 0.474\text{Newtons (N)}$	What is the work done to a car if a force of 9 N is applied and it moves 7 km? $W = F \times d = 9N \times 7000m = 63,000\text{Joules (J)}$
What work is done when we apply a force of 5N and move in the direction of the force 2 m? $W = F \times d$ $= 5 \times 2 = 10J$	What force is required to move 7 m if the work done is 21 J? $F = W/d = 21J/7 = 3\text{Newtons (N)}$	What is the work done to a person if a force of 1.3N is applied and the person moves 6m? $W = F \times d = 1.3N \times 6m = 7.8\text{Joules (J)}$

How many points can you earn?