

Energy Stores & Systems

Reading: pages 167-169 higher, 169-171 foundation

Knowledge

1. Name the 8 different energy 'stores'
2. What is a 'closed system'?
3. Name the two general ways energy can be transferred
4. What is the equation to calculate kinetic energy?
5. What is the equation to calculate Gravitational Potential Energy?
6. What is the equation to calculate the energy stored in an object that is stretched or compressed?
7. What is 'Specific heat capacity'?
8. How do you calculate the specific heat capacity of a material?
9. Give two things you would need to keep the same if you were investigating the specific heat capacity of materials.

Application

1. Describe the energy transfers occurring in a kettle when it is switched on.

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2. Calculate the gravitational potential in an object of mass 150Kg, raised to a height of 50m. Earth's gravitational field is 9.8N/Kg. Show all your working. Give the unit.

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3. What happens to the energy in Q2 when the object begins to move?

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4. Assuming that 100% of the energy is transferred, calculate the maximum velocity of the object as it falls to the ground.

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5. Why will the object not actually reach that velocity?

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6. Describe how you could use the equipment below to compare the specific heat capacity of oil and water. Include Independent, dependent and control variables and suitable values.

50W heater, polystyrene cup, measuring cylinder, thermometer, oil, water, stopwatch

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7. Explain two ways you could calculate how much energy had been supplied to the oil and water to allow you to calculate SHC values.

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8. A metal block of 2.5Kg is heated from a temperature of 20°C to 50°C, using 50000J of energy. Calculate the specific heat capacity, given the equation $\text{Energy} = \text{SHC} \times \text{temp rise} \times \text{mass}$. Give your answer to 3 significant figures.

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8. Calculate energy stored in a spring that has stretched from 5cm to 35cm, with a spring constant of 3N/cm. Give the unit

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