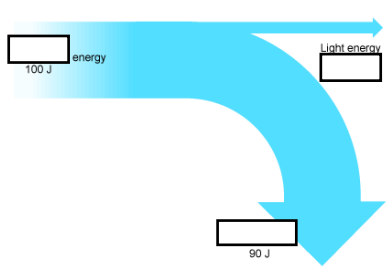
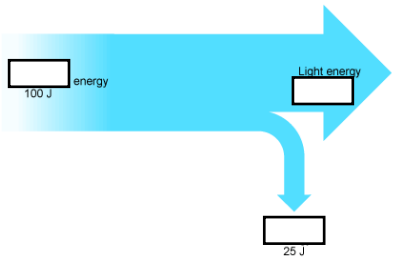
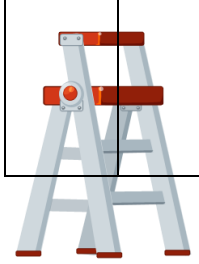
Energy

%	I can …		Prove it!
80%+	**1. Independently draw a Sankey diagram (MM2)** **2. Independently calculate efficiency of a device (MM2)** **3. Evaluate an experiment provide suggestions for improvements (linking to accuracy, validity, repeatability and reproducibility) (MM3)** **4. Link convection and conduction to real world scenarios, explaining in terms of particles why they can only happen in certain states (MM3+4)** **5. Thoroughly evaluate the use of a range of energy sources, deciding which would be the best for different scenarios (MM4+5)**		1) Draw a Sankey diagram for a toaster if the energy input is 100J of electrical energy and the output energies are 50J thermal energy, 30J Kinetic energy and 20J Light energy. 2) Can you calculate the efficiency of the device above? 3) Suggest one way that the experiment in Q4 (50%) could have been made more accurate. How could Davell have checked his results were repeatable and reproducible? 4) Explain how a kettle uses conduction and convection to boil water. 5) Write a note to Miss Hunt. Explain why conduction does not occur in gases and why convection does not occur in solids. 6) Miss Mitchell is trying to decide how to generate energy for the school. Write her a letter evaluating the different energy sources that we have learnt about, coming to a conclusion about which would be the most appropriate for use to generate energy for the school. 7) How much energy does a pair of 800W hair straighteners transfer every second?
70%	**1. Label a Sankey diagram correctly to show the energy transfers occurring in different scenarios (MM2)** **2. Use an equation to calculate efficiency (MM2)** **3. Evaluate an experiment (MM3)** **4. Describe how nuclear sources can be used to generate electricity** **5. Link energy sources to the energy transfers occurring (MM1)** **6. Evaluate energy sources (MM4 + 5)** **7. Use an equation to calculate power (MM6)**		1) Label the Sankey diagrams below.   2) From the Sankey diagrams above, which device is the most efficient? Use data to support your answer. 3) Give 3 things that the experimenter should have controlled (kept the same) in the conduction experiment in Q4 (50%). 4) Can you identify the independent and dependent variables in the experiment in Q4 (50%)? 5) Draw a table to compare Conduction, Convection and Radiation. 6) Write a brief information poster (the best ones will go up on the wall!) to explain how a nuclear source can be used to generate electricity. 7) For each of the energy sources in Q6 (60%), draw an energy transfer diagram. 8) Complete the table in Q6 (60%) with **<u>at least</u>** 2 advantages and 2 disadvantages for each. 9) If James mows the lawn using an electric mower, which has a power of 50W for 1 hour, what is the energy transferred?
60%	**1. Draw correct energy transfer diagrams for a range of scenarios (MM1)** **2. Define efficiency and explain why it is important for a device to be efficient (MM2)** **3. Use data to support a conclusion (MM3)** **4. Evaluate energy sources (MM4 + 5)**		1) Can you complete the energy transfer diagram for: (in each one, put the useful energy at the top!) a) Torch ☐ → ☐ → ☐ ☐ b) Kettle ☐ → ☐ ☐ ☐ c) Make your own one up! 2) What is meant by **<u>"efficiency"</u>**? Why do we use energy efficiency light bulbs rather than normal ones? 3) Rewrite your conclusion from 50% Q4 using data as evidence. 4) Complete a mind map with a vacuum flask in the middle. Explain the different ways in which thermal energy heat loss is prevented. Include the key words: conduction, convection and radiation. 5) Complete the table below:

Energy Source	Renewable?	Advantage	Disadvantage
Fossil Fuels			
Nuclear Sources			
Wind			
Solar			
Tidal			
Hydroelectric			
*Geothermal			

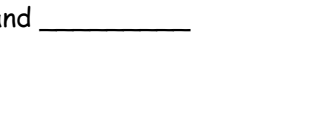


Energy

%	I can …		Prove it!
50%	1. **Identify energy types for different devices (MM1)** 2. **Identify the useful/wasted energy in different scenarios (MM1+2)** 3. **Write a scientific conclusion (MM3)** 4. **Describe where fossil fuels can be used in the home (MM5)** 5. **Identify 2 elements that act as nuclear energy sources (MM5)** 6. **Give a brief description of how renewable energy sources are used to generate electricity (MM5)**		1) In each scenario, identify the input and output energies. e.g. electrical→ TV→ sound and light 2) In each scenario, identify the useful output energy (☺) and the wasted output energy (☹) 3) Hajar used a candle to heat a strip of different materials. He then counted how many seconds it took for the ice cube on the other end to melt completely. Which of these materials is the best conductor? Which is the best insulator? Give a reason for your answer. 4) Aaron fills a lantern with air and heats it with a candle. (a) What will happen as the air starts to warm up? (b) What will happen when the candle goes out? 5) Give 3 places where fossil fuels are used within your home. For each one, identify the name of the fossil fuel and what it is used for. 6) Give the name and symbol for 2 elements that can be used as a nuclear energy source. 7) Choose one renewable energy source. Write a post card to Miss Bowen explaining to her how we could use this method to generate electricity for the school. Make sure you include the energy transfer involved
40%	1. **Recall the unit for energy (G)** 2. **Identify energy types (MM1)** 3. **Define conduction (MM3)** 4. **Define convection (MM3)** 5. **Define "Renewable" and "Non-renewable" energy sources (MM5)** 6. **List 3 fossil fuels and 3 renewable energy sources (MM4)** 7. **Calculate power (MM6)**		1) Circle the correct unit for energy m/s J km s 2) Name the 9 different energy types… The first letter of each is below to help you. (i) K: (ii) C: (iii) T: (iv) E: (v) E: (vi) G: (vii) L: (viii) S: (ix) N: 3) Conduction is when _____ or _____ energy is able to pass easily through a material. 4) a) The two states that convection can happen in are _____ and _____ b) Write your own definitions for Convection and Radiation. 5) Fill in the blanks to complete the definition of renewable energy sources: _____ *energy sources are sources that do not get used up or run out.* _____ *energy sources are sources that will get used up over time.* 6) Name 3 fossil fuels and name 3 renewable energy sources 7) If time is 20 seconds and energy is 50J, what is the power? Don't forget your units!

Input energy	Device	Output energy(s)
	Radio	
	TV	
	Torch	
	Fan	

Material	Time for the ice cube to melt (seconds)
Iron	25
Copper	10
Glass	45
Plastic	60
Aluminium	17



Key Terms:

Non-metal Metal Kinetic Chemical Internal Thermal Electrical Elastic potential Gravitational potential Light Sound Fossil Fuel Combustion Renewable Non-renewable Source Store Equipment Methane Ethanol Efficiency Global Warming Joules Repeatable Reproducible Accurate Valid Independent Variable Dependent Variable Controlled Variable Conduction Convection Radiation Insulator Fluid Particle Bond Vibration