Year 8 Physics Energy Transfer – Objectives and Assessment

Lesson	Range and Content Objective	Skills Objective	Activities	Formal Assessment	Success Criteria
1.	To know the different types of energy		• Energy transfer sheet to identify types of energy • Sankey Diagrams SS7 • Input/output Collins B1		• Must: Define energy and name different types from examples. • Challenge: Explain the energy transfer in common examples.
2.	To understand how light travels	To use models to explain a scientific process	• Identify luminous sources (active book) • Investigation using tubes • Ray diagrams (100 sci lessons)		• Must: Explain the speed and direction of travelling light. • Challenge: Identify the path light takes in an example.
3.	To know what happens to light in transparent materials (refraction)		• Vocab check • Investigation (refraction through a Perspex block) • OUP explanation • Examples		• Must: Discover and state what happens to light as it passes through a transparent material • Challenge: Explain why the light behaves this way.
4.	To understand a special type of refraction (dispersion)		• Practical 'making a spectrum', using prisms. • OUP explanation • Exp sci applications of dispersion sheet.		• Must: State what happens to white light when it is dispersed and give the colours in order.

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					• Challenge: Explain why the light splits into component colours.
5.	To know how we see colour	To use models to explain a scientific process	• Explanation of reflection of primary coloured objects in white light • Iscotland website interactive to show effects of filters. • Filter practical • Spotlight science worksheets.		• Must: Identify the colour of objects in different coloured lights (sticking to primary colours) • Challenge: Extend to secondary colours and give an explanation of the phenomena.
6.	To know what happens when light hits a shiny surface.	To use models to explain a scientific process	• Draw model of current knowledge of law of reflection. • Mirror Practical (seeing behind, to the side etc) • Law of reflection practical • Model up level using findings	Up levelled model in assessment books.	• Must: State the law of reflection. • Challenge: Apply it to a given situation to explain the situation.
7.	To apply the laws of reflection	To use models to explain a scientific process	• Reflection angle sheet. • Mirror maps • SATS questions • Explanation of how a periscope works		• As Above.
8.	To find similarities between light and heat	Drawing conclusions from data and explain using scientific knowledge.	• Shiny/black thermometer investigation • Foil take away containers • Fire proximity suits	Class discussions	• Must: Explain a similarity between light and heat • Challenge: describe

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			•		everyday uses of this.
9.	To understand the direction that heat travels.	Drawing conclusions from data and explain using scientific knowledge.	• Consideration of hot tea/cold can be left in room. • Heat flow graph practical. • Conclusion and questions.		• Must: Describe the direction of heat travel from the results • Challenge: Explain why heat travels this way (in terms of energy transfer)
10.	To understand how heat can travel in liquids and gases	Using models to explain a scientific process	• Feel heat above Bunsen vs. sides. • Convection demos • Exp sci room pic to label particle movement. • Extension questions (fish tank, oven)		• Must: Describe the heat flow in given examples. • Challenge: Explain why hot particles rise.
11.	To understand how heat travels in solids	To use models to explain a scientific process	• Demo of wax and paperclips • Group explanation (ppt) • Comparison of metal and polystyrene cups and explanation.	Group self assessment of answer.	• Must: Explain conduction in terms of particles • Challenge: Use ideas to suggest how particles in an insulator might be arranged.
12.	As above	To use models to explain a scientific process To identify	• Measuring cooling rate of water in polystyrene and metal cups. Explanation of findings. • Snowman in a coat ppt. Class/group discussion.	Class discussion	APP investigation criteria. As Above

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		independent variables and dependent variables in investigations.	• Discussion of investigating 'best insulator' • Individual identification of variables in investigation.		
13.	As above	To be able to carry out a fair test To draw conclusions from data and explain using scientific knowledge.	• Carry out 'best insulator' investigation in groups. • Write conclusion from results.	Class discussion	As above
14.	To understand how heat can travel through a vacuum	To use scientific vocabulary correctly	• Explanation of heat as radiation. • Kinaesthetic recap of 3 methods of heat transfer • Visual onomatopoeia of convection, conduction and radiation.	Peer assessment of work.	• Must: Explain radiation and compare it to other methods of heat transfer. • Challenge: Identify examples of conduction, convection and radiation in action.
15.	To understand the 3 methods of heat transfer	To identify applications of scientific ideas.	• Laminates of applications of reducing heat transfer. Explanations • Take away container task	Class discussion	• Must: Identify examples of heat transfer • Challenge: Explain them in terms of particles.
16.	As above	To use abstract models to explain a	• How does a cup of tea cool down? Assessment task.	Levelled s/c in assessment books	As Above

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		scientific phenomena	• Peer marking of examples		
17.	To understand how sound travels	To use abstract models to explain a scientific phenomena To draw conclusions from data and explain using scientific knowledge.	• Investigate instruments to see how sound is made • Class suggest how sound travels. Conduction vs. radiation. • Test to find out. String telephone, tapping on table, amplification equipment, bell jar video. • Materials worksheet and graph		• Must: Identify how sound travels. • Challenge: Compare this to how heat travels.
18.	To understand the term volume	To use abstract models to explain a scientific phenomena	• Making loud/quiet sounds link to size of vibration (rice on drum) • Oscilloscope pattern of loud/quiet sounds and introduction to the term 'amplitude' (online oscilloscope) • Decibel scale sheet and law on volume and ear damage. • Sound proofing, link back to insulation.		• Must: Identify loud and quiet sounds from oscilloscope patterns • Challenge: Suggest reasons that sound proofing materials work.
19.	To understand the term pitch	To use abstract models to explain a scientific phenomena	• Class make high and low pitch notes on xylophone. Define term. • Demo oscilloscope pattern for high and low and introduce term wavelength. • Wave drawing, combining amplitude and wavelength.		• Must: Identify high and low pitch sounds from an oscilloscope pattern. • Challenge: interpret oscilloscope patterns in terms of volume and pitch.
20.	To understand how	As above	• Wave drawing questions		As Above.

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	sounds can be represented as waves.		• Wave interpretation questions		
21.	To understand how we hear sounds.	To be able to carry out a fair test To identify independent and dependent variables. To draw conclusions from data.	• Labelling of ear. • Problems with ears, reasons we can lose hearing. • Investigation 'why do we need 2 ears?'	Levelled investigation in assessment books. Investigation planner sheet.	• Must: Locate the major parts of the ear on the diagram. • Challenge: Suggest ways that ear damage could be treated. APP criteria on investigations.
22.	To compare heat, light and sound.	Use models to explain scientific phenomena	• Use double bubble maps to compare heat, light and sound. Focussing on energy transfer.		• Must: Compare light or sound to heat. • Challenge: Compare both sound and light to heat, pointing out similarities and differences.
			• END OF TOPIC TEST		