Sets (s): Double award

YEAR 10

SUBJECT Physics

Knowledge Focus: Making use of energy

Ysgol Uwchradd Prestatyn High School

This half term : Skills, Knowledge and Understanding to be developed: This topic explores the idea that temperature differences can lead to the transfer of thermal energy by conduction, convection and radiation. It uses the molecular model of matter to explain the differences in the mechanism of thermal energy transfer by these three methods. Also looks at the efficiency and cost effectiveness of different methods of reducing thermal energy losses in the domestic situation.

Key Terms to be learned this half term:
density, mass, volume, solid, liquid, gas, kinetic theory, conduction, conductors, insulators, convection

Week 1 and 2 Learning Objectives etc: Study the three states of matter in terms of the arrangement of the atoms or molecules. Learn the equation density = mass ÷ volume Explain the differences in density between the three states of matter.	**Objective assessments:** Observe the specified practical on density of solids and liquids and complete calculations.	**Homework:** Question on calculating density
Week 3 and 4 Learning Objectives etc: Understand how energy is transferred by conduction **(Higher tier learn conduction using a model of molecular motion**). Study how energy is transferred by **convection (Higher tier convection in terms of molecular behavior and variations in volume and density).**	**Objective assessments:** Observe the conduction experiment from the student practical book and explain conduction in terms of particles Observe the convection experiment from the student practical book and describe how convection currents are formed.	**Homework:** Question on conduction
Week 5 and 6 Learning Objectives etc: Investigate infrared radiation. Explore how energy transfers can be minimised and how energy losses from houses can be restricted. Compare effectiveness and efficiency of different methods of reducing energy loss from the home**,** compare their effectiveness. Loft insulation and cavity wall insulation reduce heat loss by both conduction and convection. Be able to explain about the importance of "trapped air." Discuss the environmental benefits of house insulation.	**Objective assessments:** Draw a graph from data on the thermometer practical Identify and explain how to reduce heat loss by conduction, convection and radiation. Link method of heat transfer reduction to each method of insulation.	**Homework:** Questions on reducing conduction,convection and radiation

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Week 7 and 8 Learning Objectives etc:	Objective assessments:	Homework:
Methods of insulation and payback times. Considerate the different costs of energy sources of heating and transport.	Calculate payback times Use data to compare the economics of domestic insulation techniques, including calculating the payback time; the economic and environmental issues surrounding controlling energy loss	Question on energy transfers