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Year 9 Overview 2023-24 – *Physics*

<table>
<tr><th>Date</th><th>Wk</th><th>Week</th><th>Units Studied & Learning Outcomes</th><th>Key Concepts & Assessment</th></tr>
<tr><td colspan="5">8 weeks (8 Lessons) (38 Days)</td></tr>
<tr><td>Tues 5-Sep</td><td>A</td><td>1</td><td rowspan="8"><u>Overview of Unit/No. lessons</u>
Particles, radiation and density (8 lessons)

<u>Lesson Sequence of Content</u>:
1 – Kinetic Theory (1 lesson)
2 – Conduction (1 lesson)
3 – Infrared (1 lesson)
4/5 – Infrared Required Pracitcal (2 lesson)
6 – SI units and converting (1 lesson)
7/8 – Density + required prac (2 lessons)

<table><tr><th>Prior</th><th>Now</th><th>Next</th></tr><tr><td>Year 7 – Kinetic theory and energy</td><td>Understanding more detail on kinetic theory, thermal energy transfer and calculating density</td><td>Year 11+ Continual application of particle theory</td></tr></table>
<u>Unit Learning Outcomes:</u>
• GW - Draw simple diagrams to model the difference between solids, liquids and gases, Describe the process of conduction in solids, Know that the type of surface can affect the amount of radiation absorbed/emitted, Know how to calculate the density of an object

• BI – Describe the states of matter in terms of the energy of their particles, Explain conduction using particles, Describe which surface is the best/worst at absorbing/emitting, Know how to measure the density of a regular object by an experiment

• EW - Be able to explain the different properties of the states of matter using kinetic theory, Explain why metals are the best conductors, Explain how some things are designed to absorb/emit radiation, Know how to measure the density of an irregular object by an experiment</td><td rowspan="8"></td></tr>
<tr><td>11-Sep</td><td>B</td><td>2</td></tr>
<tr><td>18-Sep*</td><td>A</td><td>3</td></tr>
<tr><td>25-Sep</td><td>B</td><td>4</td></tr>
<tr><td>2-Oct</td><td>A</td><td>5</td></tr>
<tr><td>9-Oct</td><td>B</td><td>6</td></tr>
<tr><td>16-Oct</td><td>A</td><td>7</td></tr>
<tr><td>23-Oct</td><td>B</td><td>8</td></tr>
<tr><td>Half-Term</td><td colspan="3">7 weeks (7 lessons) (34 Days)</td></tr>
<tr><td>6-Nov</td><td>A</td><td>9</td><td><u>Overview of Unit/No. lessons</u>
Density, energy and efficiency (7 lessons)</td><td></td></tr>
</table>

<table>
<tr>
<td>13-Nov</td><td>B</td><td>10</td>
<td rowspan="8"><u>Lesson Sequence of Content</u>:
1 – Factors affecting heat loss (1 lesson)
2 – House insulation (1 lesson)
3 – Energy stores (1 lesson)
4 – Efficiency (1 lesson)
5 – Increasing efficiency (1 lesson)
6 – Calculating Power (1 lesson)
7 – ST1 revision (1 lesson)

<table>
<tr><th>Prior</th><th>Now</th><th>Next</th></tr>
<tr><td>Year 8 – Energy transfers</td><td>Applying thermal energy transfer

Understanding specific heat

Understanding and application of efficiency</td><td>Year 12/13 – Thermal physics

Year 10 – Kinetic energy and work done</td></tr>
</table>

• GW: Recall examples of insulating materials, Know why the insulation is important, Know the different types of energy store

• BI: Plot an accurate graph of your results, Know different methods of insulating a house and calculate their payback time, Be able to give a simple energy transformation and identify pathways

• EW: Write a conclusion based on your evidence, Explain how different methods of insulation work and evaluate which should be installed first, Give a more complex energy transformation

•</td>
<td rowspan="8"></td>
</tr>
<tr><td>20-Nov</td><td>A</td><td>11</td></tr>
<tr><td>27-Nov</td><td>B</td><td>12</td></tr>
<tr><td>4-Dec</td><td>A</td><td>13</td></tr>
<tr><td>11-Dec</td><td>B</td><td>14</td></tr>
<tr><td>18-Dec</td><td></td><td></td></tr>
<tr><td></td><td>A</td><td>15</td></tr>
<tr><td colspan="2">Christmas Holiday</td><td colspan="2">6 weeks (6 lessons) (30 Days)</td></tr>
<tr>
<td>8-Jan</td><td>B</td><td>16</td>
<td rowspan="6"><u>Overview of Unit/No. lessons</u>
ST1 Prep and feedback (4 lessons)
Energy Resources (2 lessons)

<u>Lesson Sequence of Content</u>:
1/2 – Revision for ST1 (2 lessons)
3 – Sit ST1 (1 lesson)
4 – ST1 Feedback (1 lesson)
5/6 – Energy Resources (2 lessons)

<table>
<tr><th>Prior</th><th>Now</th><th>Next</th></tr>
</table>
</td>
<td rowspan="6"></td>
</tr>
<tr><td>15-Jan</td><td>A</td><td>ST1</td></tr>
<tr><td>22-Jan</td><td>B</td><td>ST1</td></tr>
<tr><td>29-Jan</td><td>A</td><td>19</td></tr>
<tr><td>5-Feb</td><td>B</td><td>20</td></tr>
<tr><td>12-Feb</td><td>A</td><td>21</td></tr>
</table>

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			<table><tr><td>Year 8 – Energy transfers Year 8 – How power stations work</td><td>Understanding of *what* specific heat capacity is and *how* to calculate it Increasing the efficiency of an object Understanding the advantages and disadvantages of energy resources</td><td>Year 12/13 – Thermal physics</td></tr></table> • GW: Calculate the specific heat capacity of a material, Know what is meant by efficiency, Know the equation for power, Know the different types of energy store, Know the 2 main types of energy resource • BI: Know the definition of specific heat capacity, Calculate the efficiency of a device, Use the power equation to answer questions, Know some advantages of renewables sources • EW: Explain every day examples of specific heat capacity, Rearrange the efficiency equation, Explain how the efficiency of a device can be improved, Understand different devices transfer different amounts of energy in the same time, Explain the advantages and disadvantages of fossil fuels, Explain which type of energy source would be most suitable in a given area •	
Half-Term			5 weeks (?? lessons) (24 Days)	
26-Feb	B	22	**<u>Overview of Unit/No. lessons</u>** Waves (5 lessons) **<u>Lesson Sequence of Content</u>:** 1/2 – Wave basics (2 lessons) 3/4 – Waves required practicals (2 lessons) 5 – EM spectrum (1 lesson)	
4-Mar	A	23		
11-Mar	B	24		
18-Mar	A	25		
25-Mar*				
	B	26	**Prior** | **Now** | **Next**	

			<table><tr><td>Year 8 – Energy transfers Y8 – sound as a longitudinal wave</td><td>Understanding the advantages and disadvantages of energy resources Knowing types of waves, mathematical calculations and applying it practically</td><td>Y12/13 Thermal physics</td></tr></table> • GW: Know the 2 main types of energy resource, Be able to label wavelength and amplitude, Know the equipment needed for one of the waves practicals • BI: Give definitions for the two types of energy resource, Know some advantages of renewables sources, Know the different types of waves, Be able to correctly calculate the wavelength/frequency using the wave equation, Be able to describe how to measure the wavelength of a wave • EW: Explain the advantages and disadvantages of fossil fuels, Explain which type of energy source would be most suitable in a given area, Be able to explain the difference between the different waves, Know when to substitute in prefixes in equations, Be able to describe how to measure the wavelength and frequency of a wave in both practicals •	
Easter Holiday			6 weeks (6 lessons) (29 Days)	
15-Apr	A	27	**<u>Overview of Unit/No. lessons</u>** EM spectrum and refraction (2 lessons) **<u>Lesson Sequence of Content</u>:** 1 – Uses of the EM spectrum (1 lesson) 2 – Refraction (1 lesson) 3 – Mass and weight (1 lesson) 4 – Contact and non-contact forces (1 lesson) 5/6 – ST2 revision <table><tr><td>**Prior**</td><td>**Now**</td><td>**Next**</td></tr></table>	
22-Apr	B	28		
29-Apr	A	29		
6-May*	B	30		
13-May	A	31		
20-May	B	32		

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			<table><tr><td>Y8 – Sound as a longitudinal wave Wave properties</td><td>Knowing types of waves, mathematical calculations and applying it practically Know the properties and uses of EM Waves</td><td>Year 12 – Photon model of electromagnetic radiation Gamma as part of the EM Spectrum</td></tr></table> • GW: Know some parts of the EM spectrum and their uses • BI: Know the correct order of the EM spectrum, describe the features of different types of wave • EW: Know which part of the EM spectrum has the longest wavelength, explain the different properties of EM waves. Recall and apply knowledge, use equations to calculate data, carry out practical, interpret and explain data. •	
Half-Term			7 weeks (7 lessons) (35 Days)	
3-Jun	A	ST2	**Overview of Unit/No. lessons** **Lesson Sequence of Content:** 1 – ST2 revision (1 lesson) 2 – Sit ST2 (1 lesson) 3 – ST2 feedback (1 lesson) 4/5 – Hooke's Law and required practical (2 lessons) <table><tr><th>Prior</th><th>Now</th><th>Next</th></tr><tr><td>Y7 – Concepts of mass, weight and forces Y8 – refraction (in *light* topic)</td><td>Further understanding of mass Greater detail on what is happening in refraction</td><td>Year 10 – Calculating GPE Applications of refraction</td></tr></table> • GW: Be able to draw a diagram showing refraction of light through a glass block,	
10-Jun	B	ST2		
17-Jun	A	35		
24-Jun	B	36		
1-Jul	A	37		
8-Jul	B	38		
15-Jul	A	39		

			Know the difference between mass and weight, Know the type of energy stored in a spring • BI: Be able to explain why refraction occurs, Know the difference between contact and non-contact forces and give examples, Know what the limit of proportionality is • EW: Be able to describe and explain an example of where we "meet" refraction, Understand the difference between a scalar and a vector quantity, Use the equation linking force, extension and spring constant •	
(Total: 190 Days)				

* Bank Holidays

Prompt Questions

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Please revisit the prompts from last year:

- What are the Key concepts for this unit?
- How will it link to wider disciplinary knowledge/cultural capital: history, culture, authentic artefacts, music, art, literature?
- How does it build on prior knowledge and link to other units, concepts, years, GCSE?
- What is it intended students will have learned?
  - For each Unit? By the end of the Year?
    - GW: ; BI: ; EW
- Is it worth summarising in a knowledge organiser?
- **Assessment: how do you know they have learned the foundational concepts, curriculum and wider disciplinary knowledge? Does assessment look like GCSE light? Should it?**
- Skills used/learned
- Tier 2/3 vocabulary ((Etymology e.g. of Greek/Latin)