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**LANGDON PARK SIXTH FORM**

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| **Subject: Physics** | **Year: Y13** | **Topic: 3.6.2 Thermal Physics** |

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| ***What and Why*** “What is thermal energy? How can we describe this in the atomic world? What is the behavior of gases under certain conditions? This was discovered and developed by scientists such as Joule, Boyle and Charles. Then Boltzmann pioneered the statistical analysis of kinetic theory of gases” |

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| **Key terms**  Avogadro constant  Boiling point  Boltzmann constant  Boyle’s law  Charles’ law | Freezing point  Heat  Ideal gas  Kinetic theory  Latent heat of fusion  Latent heat of vaporisation | Melting point  Molar gas constant  Molar mass  Mole  Molecule  Pressure | Pressure law  Root mean square speed  Specific heat capacity  Temperature  Volume |

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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Home learning** | **Extension – Cultural Capital and Reading** |
| **3.6.2.1:** I can define internal energy and calculate the thermal energy from the equation for specific heat capacity and latent heat.  **3.6.2.2:** I can define the gas laws and the experimental relationships between and the mass of a gas.  I can use the ideal gas equations.  I can recall the assumptions for an ideal gas.  I understand the concept of the Mole and Molar mass.  **3.6.2.3:** To explain what is Brownian motion and the relationship between in terms of the kinetic theory.  I can derive from assumptions of an ideal gas. | Use the Oxford AQA A2 textbook p.40 to 56. Look at other textbooks in the library for alternative ideas, explanations and diagrams.  **YouTube Videos:**  (1) [specific heat capacity explained](https://www.youtube.com/watch?v=5we65e7EOcg)  (2) [Kinetic Molecular Theory and the Ideal Gas Laws](https://www.youtube.com/watch?v=robEY-idcLU)  (3) [Latent Heat](https://www.youtube.com/watch?v=hfeBHx6bD3k)    **Websites:**  [**http://hyperphysics.phy-astr.gsu.edu/hbase/Kinetic/idegas.html**](http://hyperphysics.phy-astr.gsu.edu/hbase/Kinetic/idegas.html)  [**https://www.cyberphysics.co.uk/topics/kinetic\_theory/rms.htm**](https://www.cyberphysics.co.uk/topics/kinetic_theory/rms.htm) | **Practicals:**  (1) Required practical 8: Determination of Absolute Zero using Charles’s gas law  (2) Investigating Boyle’s law of gases  (3) Determine the specific heat capacity of a copper block  (4) Determine the latent heat of fusion of ice    **Assessment**:  Minitest on Thermal Physics (3rd week Sep)  Multiple choice test on Thermal Physics (4th week Sep) | (1) Analyse data from the Boyle’s law investigation. Revision of practical skills  Make notes on each topic and complete the exam style practice questions | (1) Find out why rock salt is  spread over ice during the  winter  (2) The role of specific heat  capacity in industry  **Reading:**  Ludwig Boltzmann: The Man  Who Trusted Atoms  By Carlo Cercignani |

**Pre-assessment content review**

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| I feel secure in | I need to focus on | My action plan |

**Pre-assessment skills review**

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| I feel secure in | I need to focus on | My action plan |

**Post-assessment review**

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| Weaknesses in content knowledge | Skills I need to focus on | My action plan |
| Retest / review – teacher and student comment | | |

**Revision planning**

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| Spec point | Notes complete | Revision materials | Past paper Qs | Timed conditions |
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