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| **Lesson Number – 20.1** |
| **Lesson Title – The experimental gas laws** |
| **Specification Reference** | **3.6.2.2** |
| **Learning Objectives** |
| Gas laws as experimental relationships between *p*, *V*, *T* and the mass of the gas.*Work done* = *p*Δ*V* |
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| **Opportunities for Assessment** |
| Page 319 questions |
| **Starter:** | Slide #1 - Recall the particle nature of a gas and try to illicit the fundamental measurements (Volume, Pressure and Temperature) – students should be able to qualitatively discuss the relationships between themSlide #2 – Recap pressure from GCSE and KS3 – especially the units. Pupils may note that Pascal dies aged 39 – he suffered poor health his entire adult life |
| **Main:** | Slide #3 and #4 discuss Boyle’s law. The second slide is designed so that the graph shape can be discussed from the experimental results picture *before* the graph is revealed. Mathematicians should be able to state how to plot a straight line graphSlides #5 - #7 go over Charles’ Law and link to energy changes. The picture of slide #7 is of a gas syringe and can be used to discuss how to perform this experiment – Note that the required practicals include this so do not give too much away depending on what skills need to be assessedSlides #8 and #9 show the pressure law. Note that pupils often cannot see how this differs from Charles’ Law and this needs to be implicitly pointed out |
| **Plenary:** | Slide #10 is a summary, primarily ensuring pupils can recall the three formulae |
| **Homework:** | Page 319 questions – research and write a biography on Charles, Pascal or Boyle |
| **Differentiation / Extension / S&C** |
| Creation of formulae from graphs. Discussion of mathematical relationships. Predictions of relationships based on personal experience (pumping up a tyre) |
| **Numeracy / Literacy** | **SMSC / Fundamental British Values** |
| Homework – writing a historical biography on one of the scientistsUse of formulae | Understanding the history of science and how different people’s work links together |
| **RESOURCES:** |
| None |
| **Risk Assessment** e.g. CLEAPSS card reference |
| None |
| **Working Scientifically (HSW)** |
| Deep sea diving (Page 319) and pressure causing “The bends” |