

Subject	Year	Term
Physics	13	1
Topic		
Topic 7A Electric Fields		
Content (Intent)		
Prior Learning (Topic) Topic 2 (mechanics), Topic 3 (electricity)		
<p>Force between point charges. Coulomb's Law: $F = kQ_1Q_2 / r^2$</p> <p>Electric field strength due to a point charge: $E = \frac{Q}{4\pi\epsilon_0 r^2}$</p> <p>Electric potential, $V = \frac{W}{Q}$ Uniform field : $E = \frac{V}{d}$</p> <p>Force on charge q entering this field is: $F = qE = \frac{qV}{d}$ (compare with projectiles) $V = \frac{Q}{4\pi\epsilon_0 r}$ for a radial field</p>		
<p>Define capacitance, $C = \frac{Q}{V}$</p> <p>Energy stored by a capacitor derived from the area under a graph of potential difference against charge stored</p> <p>$W = \frac{1}{2}QV$ $W = \frac{1}{2}CV^2$ and $W = \frac{1}{2}\frac{Q^2}{C}$.</p> <p>Charge and discharge capacitor through fixed resistor to obtain exponential decay curve $Q = Q_0 e^{-t/RC}$ for capacitor discharge</p> <p>Derive and use related equations for discharge in a resistor-capacitor circuit: $I = I_0 e^{-t/RC}$, and $V = V_0 e^{-t/RC}$ and the log equations</p> <p>Time constant, RC as the time taken for charge to fall to 37 per cent of initial value.</p>		
How will knowledge and skills be taught? (Implementation)	How will your understanding be assessed & recorded (Impact)	
<p>Comparison of electric and gravitational fields</p> <p>Investigate the effect of the time constant on the discharge/charging of a capacitor.</p> <p>Mathematical requirement: Use of the exponential equation and logs.</p>	<p>Homework Booklet 7A marked and written feedback given</p> <p>Test 7A marked, graded and feedback given</p>	
How can parents help at home?		
Check that the homework booklet 7A is completed		
Helpful further reading/discussion		
<p>Reading Advanced Physics for you chapters 21,22</p>	<p>Vocabulary Lists <i>See front of homework booklet</i></p>	<p>Careers Links</p>