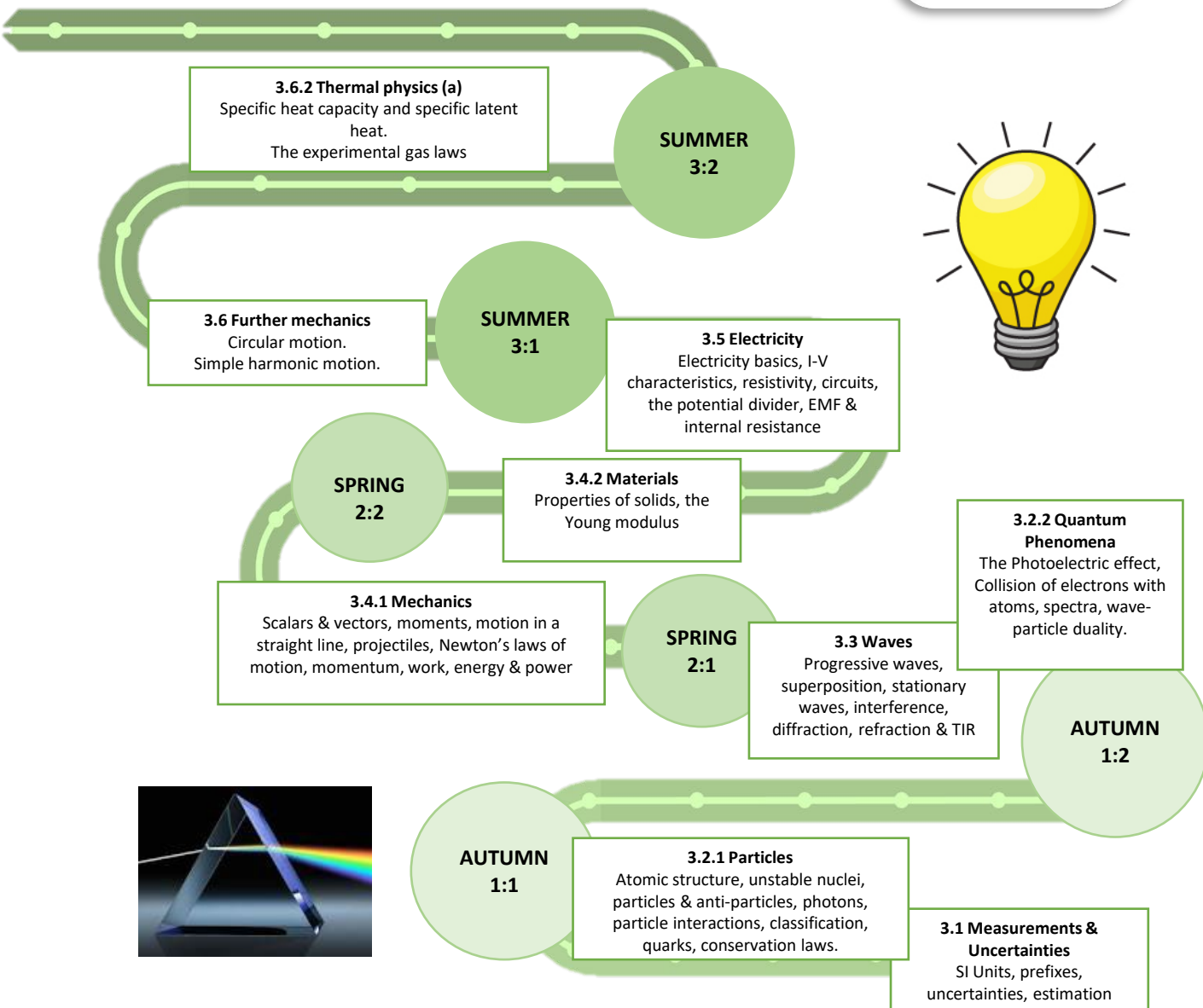


# Physics KS5: Year 12

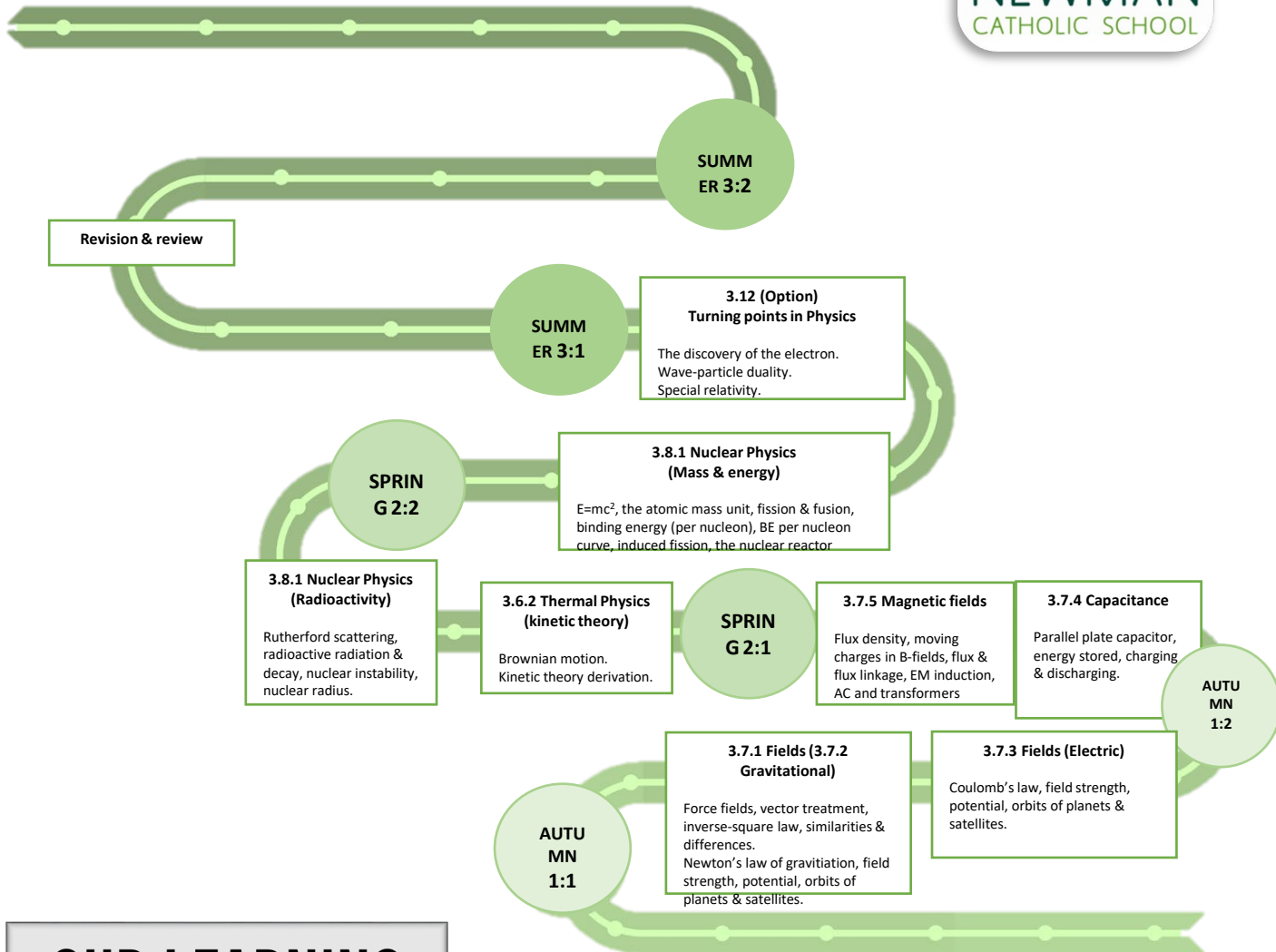
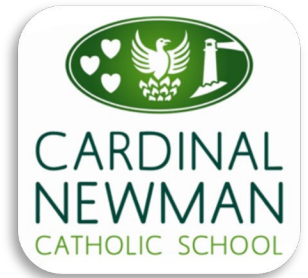


**OUR LEARNING JOURNEY**

## Standard Model of Elementary Particles

three generations of matter (fermions)			interactions (force carriers (bosons))	
mass	charge	spin		
0.2 MeV/c <sup>2</sup>	$+\frac{2}{3}$	$\frac{1}{2}$	<b>u</b> up	<b>QUARKS</b>
1.38 GeV/c <sup>2</sup>	$+\frac{2}{3}$	$\frac{1}{2}$	<b>c</b> charm	
173.3 GeV/c <sup>2</sup>	$+\frac{2}{3}$	$\frac{1}{2}$	<b>t</b> top	
0.5 MeV/c <sup>2</sup>	$-\frac{1}{3}$	$\frac{1}{2}$	<b>d</b> down	
96 MeV/c <sup>2</sup>	$-\frac{1}{3}$	$\frac{1}{2}$	<b>s</b> strange	
4.18 GeV/c <sup>2</sup>	$-\frac{1}{3}$	$\frac{1}{2}$	<b>b</b> bottom	
0.511 MeV/c <sup>2</sup>	0	0	<b>e</b> electron	<b>LEPTONS</b>
105.66 MeV/c <sup>2</sup>	0	0	<b>μ</b> muon	
1.777 GeV/c <sup>2</sup>	0	0	<b>τ</b> tau	
0.17 MeV/c <sup>2</sup>	0	0	<b>ν<sub>e</sub></b> electron neutrino	<b>GAUZE BOSONS VECTOR BOSONS</b>
0.17 MeV/c <sup>2</sup>	0	0	<b>ν<sub>μ</sub></b> muon neutrino	
0.17 MeV/c <sup>2</sup>	0	0	<b>ν<sub>τ</sub></b> tau neutrino	
0.125 GeV/c <sup>2</sup>	0	1	<b>g</b> gluon	<b>SCALAR BOSONS</b>
125 GeV/c <sup>2</sup>	0	0	<b>H</b> higgs	
0	0	1	<b>γ</b> photon	<b>Z boson</b>
91.1876 GeV/c <sup>2</sup>	0	1	<b>Z</b> Z boson	
80.379 GeV/c <sup>2</sup>	$\pm 1$	1	<b>W</b> W boson	

# Physics KS5: Year 13



**OUR LEARNING JOURNEY**