

# SCIENCE – PHYSICS



**ALDER**  
Community High School

**Threshold concept lesson**

**KS4**

Triple in red

|                  |                                             |
|------------------|---------------------------------------------|
| Year 10 Autumn   | <b>Topic 1 – Conservation of energy</b>     |
|                  | Energy changes and stores                   |
|                  | <i>Energy Transfers</i>                     |
|                  | Kinetic Energy                              |
|                  | Potential Energy                            |
|                  | Elastic and potential energy prac           |
|                  | Hooke's law exam qa practice                |
|                  | Work done and power and electricity         |
|                  | Specific heat capacity                      |
|                  | Energy Transfer in systems                  |
|                  | Efficiency                                  |
|                  | Energy resources non renewable              |
|                  | Energy resources renewable                  |
|                  |                                             |
| Year 10 Autumn   | <b>Topic 2 – Particle model of matter</b>   |
|                  | <i>Particle model</i>                       |
|                  | Density                                     |
|                  | Investigating density                       |
|                  | State Changes                               |
|                  | Internal Energy                             |
|                  | Investigating water SHC                     |
|                  | Internal energy latent heat                 |
|                  | Particles in gases Temp and pressure        |
|                  | Gas pressure Boyles law Pressure and volume |
|                  | work on gases fire piston + qa              |
|                  |                                             |
| Year 10 Autumn/s | <b>Topic 3 -Radioactivity</b>               |
|                  | Atomic structure (inside atoms)             |
|                  | <i>Atomic Models</i>                        |
|                  | Background radiation                        |
|                  | Types of radioactive decay                  |
|                  | Nuclear decay equations                     |
|                  | Half life                                   |
|                  | Using Radioactivity                         |



|                 |                                            |
|-----------------|--------------------------------------------|
|                 | Dangers and contamination of radiation     |
|                 | Radiation in medicine (uses)               |
|                 | Nuclear Fission                            |
|                 | Nuclear Fusion                             |
| Year 10 /Spring | <b>Topic 4 – Electricity</b>               |
|                 | Circuit diagrams and symbols               |
|                 | Electrical charge and current              |
|                 | Current in series                          |
|                 | Current pd and resistance                  |
|                 | Ohms law core prac                         |
|                 | Ohms law graphs                            |
|                 | Resistors                                  |
|                 | Resistance in a wire                       |
|                 | Resistance LDR Thermistor                  |
|                 | series circuits                            |
|                 | properties of series and parallel circuits |
|                 | Direct and alternating current             |
|                 | Mains and wiring a plug                    |
|                 | Electrical safety                          |
|                 | Power                                      |
|                 | Energy transfers                           |
|                 | Static                                     |
|                 | Electric fields                            |
|                 |                                            |
| Year 10 Summer  | <b>Topic 5 – Waves</b>                     |
|                 | Transverse and longitudinal waves          |
|                 | Properties of waves                        |
|                 | core wave practical ripple tank            |
|                 | Reflection                                 |
|                 | refraction                                 |
|                 | Core practical refraction                  |
|                 | sound waves ears and hearing               |
|                 | detection and exploration ultrasound       |
|                 | seismic waves                              |
|                 |                                            |
| Year 11 Aut     | <b>Topic 6 – EM waves</b>                  |
|                 | Em waves and uses long                     |



|                  |                                    |
|------------------|------------------------------------|
|                  | Em waves and uses short            |
|                  | EM waves and properties            |
|                  | lenses                             |
|                  | colour visible light               |
|                  | colour filters                     |
|                  | blackbody radiation                |
|                  | core practical blackbody radiation |
| 1 Year 11 Autumn | Topic 7 Forces                     |
|                  | Scalar and vector,                 |
|                  | Graphs of motion                   |
|                  | Acceleration                       |
|                  | Motion under gravity               |
|                  | Mass and weight                    |
|                  | Work done and power                |
|                  | Newtons laws                       |
|                  | Core practical N2L                 |
|                  | Stopping a car                     |
|                  | Breaking distance                  |
|                  | momentum                           |
|                  | Changes in Momentum                |
|                  | Resolving forces vector diagrams   |
|                  | Moments                            |
|                  | Fluid Pressure                     |
|                  |                                    |
| Year 11 Spring   |                                    |
|                  | Magnets and Magnetism              |
|                  | Electromagnets                     |
|                  | Motor Effect                       |
|                  | Electromagnetic Induction          |
|                  | Generator and Dynos                |
|                  | Transformers                       |
| 1 Spring         |                                    |
|                  | <b>Solar System</b>                |
|                  | Orbits                             |
|                  | Lifecycle of stars                 |
|                  | Nuclear Fusion                     |



|  |                         |
|--|-------------------------|
|  | The Expanding Universe  |
|  | Origins of the universe |
|  |                         |

Combined – 60 lessons

Triple – 103 lessons