4PSOW - First Year

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| Description | **PP** | **ICT** | **Topic/option** | **Time****(hrs)** |
|  |
| Speed Trap - clocking cars on Boones ferry road |  | - | 1.1,1.2, 2.1 | 1.5 |
| Plot Matching - matching computer position and velocity graphs |  | 1 | 2.1 | 0.5 |
| **Moving Plots - Calculating the gravitational acceleration of an object** | **👍** | **2,3** | **1.3, 2.1** | **3.0** |
| Measuring the initial velocity of an air rocket - from hang time |  | 4 | 1.2, 2.1 | 2.0 |
| Where Am I - vector exploration |  | - | 1.3 | 1.0 |
| Vernier trajectories - computer simulation of trajectory motion |  | 5 | 1.3, 2.1 | 2.0 |
| Air rocket competition - using the range equation to strike a target. |  | - | 1.3,2.1 | 2.0 |
| Force – Student designed investigation |  | 2 | 2.2 | 3.0 |
| Orbit Lab - computer simulation of |  | 5 | 6.1, 6.2 | 1.0 |
| Energy Lab – Student designed investigation |  | 4 | 2.3 | 1.5 |
| Physics Cannon – momentum calculation based on recoil velocity |  | - | 2.4 | 1.0 |
| Conservation of momentum Lab – momentum analysis of an air track collision. |  | 1,2,3 | 2.4, 1.2 | 2.5 |
| Vector Momentum Lab – Simulation of a 2 dimensional collision |  | 5 | 1.3, 2.4 | 2.5 |
| Gyroscope Lab - Students predict precession using vector cross product |  | 4 | B.1 | 1.5 |
| Center of Mass Lab - Mathematically and Empirically determining the Center of Mass of an irregular solid |  | - | B.1 | 1.5 |
| Force Table – Calculating the equilibrant on a force table |  | - | 1.3, 2.2 | 1.0 |
| **Speed of Sound Lab - Student designed lab** | **👍** | **4** | **4.2** | **1.5** |
| Oaks Park – Amusement park physics |  | 1,2,3,4,5 | 2.1-2.4, 6.1 | 10.0 |

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| Description | **PP** | **ICT** | **Topic/option** | **Time(hrs)** |
| **Determination of absolute zero – Using the pressure at different temperatures.** | **👍** | **-** | **3.2** | **1.0** |
| Newton's Law of Cooling – Computer graph of a cooling object. Students construct a computer model of data |  | 1,5 | B.2 | 1.5 |
| Millikan Prep - Concept of data analysis for oil drop experiment |  | - | 1.1, 1.2 | 1.5 |
| Millikan Oil Drop Experiment - simulated on computer |  | 2,3,5 | 5.1 | 4.5 |
| Electric Field Mapping – Using water to map out lines of equipotential. |  | - | 5.1, 10.1 | 1.0 |
| RC Circuits Lab - Measuring the time constant of a discharging RC circuit |  | 1,2 | 5.3 | 1.0 |
| **Oscilloscope Lab – Measurements of a full wave bridge rectifier circuit** | **👍** | **-** | **11.2** | **0.5** |
| Circuit Spreadsheets – using a spreadsheet to simulate series and parallel circuits. |  | 5 | 5.1 | 0.75 |
| **Light Bulb Lab – How temperature affects resistance** | **👍** | **2** | **5.2** | **1.5** |
| Graphing Lab – Students determine the slope of a set of data and its uncertainty |  | 2 | 1.2 | 1.0 |
| Resistance of a wire – Determining the resistance of a piece of NiChrome wire |  | 2 | 5.1 | 2.0 |
| **Internal Resistance of a battery - Using a graph slope to measure** | **👍** | **2** | **5.3** | **1.0** |
| MagnaProbe Lab – students use a hand held magnetic field directional sensor to map common fields |  | - | 5.4 | 0.5 |
| Magnet Lab – Student planned investigation into magnetism. |  | 2,3 | 5.4 | 3.0 |
| **Specific Heat of Water Lab - determining the specific heat of water with an electric kettle** | **👍** | **-** | **3.1** | **0.5** |
| **Index of Refraction - Student designed lab to measure the index of refraction of water with a laser.** | **👍** | **4** | **4.4** | **0.5** |
| **Decay Lab – Computer simulation of decay – determination of half-life.** | **👍** | **5** | **7.1** | **1.0** |
| **Young's Double Slit Lab - Measuring a diffraction pattern on a wall.** | **👍** | **-** | **9.3** | **0.5** |