WGHS. Y12 Physics. Internally Assessed Practical AS91168. Name…………………………………………

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| Item | Achieved Level  Student correctly | Merit Level  As Achievement  Plus the student correctly | Excellence Level  As Merit plus student makes a good attempt at two, or a reasonable attempt at three of (or similar to) the following: |
| 1 | identifies the independent variable | states or implies control of the pendulum by always using the same equipment | Justifies their choice of upper value for the swing by linking swing size with theory |
| 2 | Length | improves accuracy by timing multiple periods and / or by repeating and averaging at least 3 time values for each mass. | Justifies their choice of lower value for the length by explaining that if too small then it is hard to measure the swing |
| 3 | measures a period for each length. Values given with a unit. | transforms values of T by squaring / length by square rooting. Transformed values have appropriate significant figures and units. | Justifies the use of timing multiples by explaining that the time for one period is so short that the reaction time when starting and stopping the stopwatch is significantly large in comparison with the measured time. |
| 4 | plots measured values on a graph; axes labelled with quantities and units; graph line an appropriate curve. | plots appropriate variables to give a linear graph; chooses a scale that allows a gradient with reasonable sf to be found; labels axes with quantities and units; draws a straight graph line that is an appropriate fit to the plotted points. | Justifies the use of repeating and averaging by explaining that each time measurement is subject to a random reaction time error. |
| 5 | states the relationship between is a square root relationship (graph is T against l) / square relationship (graph is length against T squared). | calculates the gradient of the linear graph using a correct method. Gets a slope of about 2 | compares the theoretical gradient with the experimental gradient and makes an appropriate statement about the accuracy of the conclusion. |
| 6 |  | states the mathematical equation is y- axis variable = gradient of graph line × x-axis variable. (Ignore any intercept the graph line might have.) | describes an unexpected outcome (e.g. gradient value significantly different from expected value; graph line has an intercept; impossible to draw a graph line that is close to the plotted points) and gives an explanation that is reasonable for why the outcome occurred. |

Note: For Excellence, the discussion statements given by a student do not necessarily have to be 100% correct but they must be reasonable considering the knowledge the student is expected to have.

WGHS. Y12 Physics. Internally Assessed Practical AS91168. Name…………………………………………

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| Item | Achieved Level  Student correctly | Merit Level  As Achievement  Plus the student correctly | Excellence Level  As Merit plus student makes a good attempt at two, or a reasonable attempt at three of (or similar to) the following: |
| 1 | identifies the independent variable (mass on the spring) and dependent variable (period). | states or implies control of the spring by always using the same spring. | Justifies their choice of upper value for the mass by explaining that if too large a mass is used the spring might be permanently stretched. |
| 2 | uses at least 5 values of mass over a range of 0.3 – 1.0 kg. Values are given with a unit. | improves accuracy by timing multiple periods and / or by repeating and averaging at least 3 time values for each mass. | Justifies their choice of lower value for the mass by explaining that if too small a mass is used it is hard to get make the spring bounce without “jumping”. |
| 3 | measures a period for each mass. Values given with a unit. | transforms values of T by squaring / m by square rooting. Transformed values have appropriate significant figures and units. | Justifies the use of timing multiples by explaining that the time for one period is so short that the reaction time when starting and stopping the stopwatch is significantly large in comparison with the measured time. |
| 4 | plots measured values on a graph; axes labelled with quantities and units; graph line an appropriate curve. | plots appropriate variables to give a linear graph; chooses a scale that allows a gradient with reasonable sf to be found; labels axes with quantities and units; draws a straight graph line that is an appropriate fit to the plotted points. | Justifies the use of repeating and averaging by explaining that each time measurement is subject to a random reaction time error. |
| 5 | states the relationship between is a square root relationship (graph is T against m) / square relationship (graph is m against T). | calculates the gradient of the linear graph using a correct method. (Gradient value should be about 1.1. Accept 0.9 to 1.3) | compares the theoretical gradient with the experimental gradient and makes an appropriate statement about the accuracy of the conclusion. |
| 6 |  | states the mathematical equation is y- axis variable = gradient of graph line × x-axis variable. (Ignore any intercept the graph line might have.) | describes an unexpected outcome (e.g. gradient value significantly different from expected value; graph line has an intercept; impossible to draw a graph line that is close to the plotted points) and gives an explanation that is reasonable for why the outcome occurred. |

Note: For Excellence, the discussion statements given by a student do not necessarily have to be 100% correct but they must be reasonable considering the knowledge the student is expected to have.