Terminology

Term	Definition
Independent variable	The variable for which the values are selected by the investigator.
Dependent variable	The variable for which the values change when the independent variable is changed.
Controlled variable	A variable which may affect the outcome of the investigation and therefore should be kept constant.
Range	The maximum and minimum values of the independent or dependent variables. This should not be too big or too small.
Valid conclusion	A conclusion supported by valid data, obtained from an appropriate experimental design and based on sound reasoning.
Validity of experimental design	Suitability of the investigative procedure to answer the question being asked. Strategies to ensure validity include fair tests and controls that aim to isolate the effect of the independent variable on the dependent variables.
Resolution	This is the smallest change in the quantity being measured by a measuring instrument that can be observed. For example ± 1mm on a 1 metre ruler.
Anomaly	Value in a set of results which is judged not to be part of the inherent variation.
True value	This is the value that would be obtained in an ideal measurement.
Uncertainty	The interval within which the true value can be expected to lie, eg "the temperature is 20 °C ± 2°C".
Measurement error	The difference between a measured value and the true value.
Systematic error	These cause readings to differ from the true value by a consistent amount each time a measurement is made. Systematic errors can include the influence of the environment, the methods of observation or the instruments used. The effect of systematic errors cannot be reduced by increased repeats.
Random error	These occur due to results varying in an unpredictable way from one measurement to the next. The effect of random errors can be reduced by taking more measurements and calculating a mean.
Accuracy	A measurement result is considered accurate if it is judged to be close to the true value.
Precision	This shows the closeness of agreement between measured values. It gives no indication of how close results are to the true value.
Repeatability	The precision obtained when repeat readings are obtained by a single learner/group.
Repeatable	A measurement is repeatable, if repetition by a single learner/group using same method and equipment, obtains the same or similar results.
Reproducibility	The precision obtained when repeat readings are obtained by a different learners/groups.
Reproducible	A measurement is reproducible, if repetition by different learners/groups obtains the same or similar results. This could include using different equipment/ methods. This is a harder test of the quality of data
Hazard	A chemical or piece of apparatus that could cause harm. It is expected that in risk assessments the nature of the hazard is also specified.
Risk	An action involving a hazard that might result in danger.
Control measures	Something that can be done to reduce or prevent a risk while allowing you to carry out the experiment.

Section - A

Prediction/Hypothesis - The affect of the *independent* variable on the *dependent*. Your answer does *not* need to be scientifically correct, however, it *must* link the independent and dependent variables.

Risk assessment - *Your control measure must relate to your risk.* Consult the terminology table for definitions of hazards, risks, and control measures.

Table - Independent variable in the 1st column (minimum value to maximum value). The resolution (decimal places) must remain constant in your table. Means are usually not in the instructions, but they are required if you are doing repeats. The mean should be in a multi-column with the dependent variable.

Section - B

Graphs - Follow LUSH (labels, units, scale, heading). Labels and units must *match your table*. Scale can be any variation of 1s, 2s, and 5s (i.e. 0.1, 20, 5000). A main heading is not required. The graph must fill the most amount of the graph paper as possible, and, for this reason, the origin does *not* have to be (0,0). The line of best fit does not have to go through the origin, even if it's supposed to, and anomalies should be ignored when drawing the LOBF. You should aim for an equal number of points above and below the best fit line, and the line must be neat to be marked.

Experimental Inaccuracies - You may need to theorise any potential limitations with the experiment you conduct, and come up with realistic solutions to those problems. To do this, knowledge of the theory regarding your experiment is essential, and you must also be aware of things such as **repeatability** and **reproducibility** which are used to validate conclusions. A common example of experimental inaccuracies is increasing *sample size*. This can be done by experimenting on different ages, genders, and ethnicities. Clues in the question will provide you with hints as to if the subjects in the experiment represent the whole population.

Rates of Graphs