**Summary of Required Practicals for A-level Biology**

**Biology Year 1 (Paper 1)**1. Investigation into the effect of a named variable on the rate of an enzyme controlled reaction.

2. Preparation of stained squashes of cells from plant root tips; set up and use of an optical microscope to identify the stages of mitosis in the stained squashes and calculation of a mitotic index.

3. Production of a dilution series of a solute to produce a calibration curve with which to identify the water potential of plant tissue.

4. Investigation into the effect of a name variable on the permeability of cell surface membranes.

5. Dissection of animal or plant gas exchange system or mass transport system or of an organ within such a system.

6. Use of aseptic techniques to investigate the effect of antimicrobial substances on microbial growth.

**Biology Year 2 (Paper 2)**

7. Use of chromatography to investigate the pigments isolated from leaves of different plants e.g. leaves from shade-tolerant and shade-intolerant plants or leaves of different colours.

8. Investigation into the effect of a named factor on the rate of dehydrogenase activity in extracts of chloroplasts.

9. Investigation into the effect of a named variable on the rate of respiration of cultures of single celled organisms.

10. Investigation into the effect of an environmental variable on the movement of an animal using either a choice chamber or a maze.

11. Production of a dilution series of a glucose solution and use of colorimetric techniques to produce a calibration curve with which to identify the concentration of glucose in an unknown ‘urine’ sample.

12. Investigation into the effect of a named environmental factor on the distribution of a given species.

**Biology Paper 3 – any of the 12 required practicals, especially those not already assessed in Papers 1 and 2.**

Apart from practicals 2, 5 and7 **:** being able to complete a table similar to the one below would be very sensible preparation:

Keep the words in bold for each practical.

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| **Practical No**….. **Title:** …………………………………………………………………. |
| **Independent variable (IV) and how to change it** (include key apparatus) | Aim for at least 5 values of IV, you don’t have to state them, just say you would use five and how they could be achieved e.g. “moving the lamp closer to the pondweed”.Remember – you will not actually have to do the investigation you describe. |
| **Dependent variable and how to measure it** (include key apparatus) | This may need to be inferred from other observations. e.g. number of bubbles per minute can be used to estimate rate of photosynthesis. |
| **How the results should be interpreted/used** (if not direct observation) | e.g. “the more bubbles released/greater volume of gas collected each minute the higher the rate of photosynthesis”. |
| **Key control variables** (especially those which could otherwise significantly affect the dependent variable) | Not every last factor, e.g. you can probably ignore atmospheric pressure. It is to show you know the main factors e.g. temp, pH and concentration of substrate and enzyme for enzyme reactions. Usually time features here somehow. |
| **Repeat** and **identify anomalies** before calculating a **mean** | Often overlooked but worth marks – but make sure you state ‘*at least 10 times’* and that you make it clear that removing anomalies will make your ***mean*** (not your *results*) more ***reliable*** (not *accurate*). |
| Carry out a **statistical test** | Easiest mark there is – but often overlooked.You **don’t** need to say which test, just that one should be done to find out if any difference/correlation was **significant**. |