Biology Extended Essay Questions – Addressed by an EE Examiner

Q1. Should students be encouraged to do an original piece of research, or should they analyze (in a new way) data that someone has collected (e.g., data obtained from a previous research study that perhaps has been published in a journal)? If they use existing primary data, I am assuming that they will still carry out an actual experiment???

Answer: IB allows students to do science extended essays that are of two main 'types'. The first is the literature search type, typically using scientific journals as primary sources mixed with a variety of secondary sources as needed. This is an exceedingly difficult way for students to write a good EE because of the difficulty of showing creativity and a high degree of analysis. The data that will be given in a journal will already be analyzed by the researcher(s). The student then typically reports on this already given analysis (an analysis of an analysis).....which is obviously not the same as showing good analysis. Almost all science EE's written in this style end up being "reports" rather than "essays" and do not meet the requirements of the criteria. The best a student could expect on this style of essay is probably an "average" even if they really do a good job of minding their "p's & q's" regarding formatting and styling of the paper.

The second (and better way) is for students to do original 'lab research' and then the extended essay becomes a lab report written specifically to maximize scoring via the criteria. The criteria fit this style very well since originality and analysis are built into a lab approach.
IB does not expect the questions that are asked to be life-changing, big-time questions. The student needs to ask a reasonably useful, possible-to-do question and approach it (design procedures, etc) from a fairly unique and creative way. I encourage students to ask ecology related questions because they are typically useful and fairly simple to accomplish (as opposed to biochemistry, physiology, etc. topics).
Students should definitely not find a lab and follow the directions as if they were cooking a Paula Dean too much butter recipe.
The teacher acting as the advisor/lab mentor can help a student with experimental procedures, etc. as long as they are doing so in a Socratic way rather than spoon feeding a procedure to be followed. Same goes for the original question—the student must generate the research question.

A major benefit for students choosing the lab based approach is that they will get a great head start in learning the skills graded for their Internal Assessment in the science IB courses.

Q2. If an original study is undertaken, can it be an extension of a lab that was done in class? Maybe the student has a particular interest in a lab and wants to carry out yet another piece of research in the same area—is this possible?

Answer: Yes, the "lab based approach" can be an extension of something done in class. No class grade can be assigned though.

Q3. Is a mixed design possible--by this I mean can a student do their own study and incorporate data from an existing study into their research?

Answer: Yes, this approach is also possible and should be encouraged. Leads to good analysis, etc.

Q4. Is simple, original research that can be completed within the confines of the school/home setting better than "pie-in-the-sky" research that involves outside agencies or research labs? What advice do you give students in making their selection?

Answer: Under typical circumstances, IB scoring punishes students who accomplish their research at summer programs, big time labs, etc. The research the kids do is often times wonderful and should be encouraged for its own benefit, but discouraged as a way to do an EE.

The logic is simple.....the student is being judged on their ability to ask a good question and develop a way to answer that question. In summer programs, etc. they are almost always being given a question and a protocol to follow to answer that question. They may even be given undue help with their analysis (as it is typically very high level and they need help). I have seen cases where students have won high level Intel awards for science research (very rare) but have scored at best average on the EE scoring criteria for the reasons mentioned above.

On the other hand, if a student can be paired with a researcher who will mentor them in a way that encourages the student to do the necessary thinking.....then an outside lab, etc. could work very well.

That outside lab person should write a letter stating their involvement and emphasize the independence that the student showed throughout the process.

NOTE: An IB EE examiner will not believe this if the type of research is above the level that a smart high school kid should be attempting.

If a student chooses to work under the direction of an outside agency, Dr. Vansickle must have the person's name, title, and phone number so she can contact the outside mentor before the student's research can be approved for an extended essay. Outside mentors will be expected to document their involvement.