Differences between Integrated Programme Science VS Express Science

- IPY1-Y4 Sciences are tested in a pure format with material brought down from O-level to sec1sec2 and A-level to sec3-sec4
- On top of advanced content, the **depth of questioning** is also higher, with a greater **emphasis placed on evaluation and deep conceptual understanding**
- Questions are often presented in a way that looks like it is **out of syllabus**, due to use of **inference and deduction assessment objectives**
- Students often** struggle with recognizing the prompts**, or having a deeper understanding of science **beyond memorization**
- Most tuition centres who use **memorization**, **drilling**, or content designed for mainstream exams fail in addressing the problems in Integrated Programme Science

Example of IPY3 Chemistry Question (from River Valley High):

Observe how the question is phrased to the student (in this case, she is from IP Chemistry olympiad)

- 1. A typical chemical structure question uses a lot of regurgitation
- 2. In this case, the question asks about true/false statement on a deeper conceptual level, with substantiation
- 3. Words such as part of a slice and 3D crystal lattice structure can confuse the student with what is really important
- 4. Sodium ion is only bonded to the chloride ion it donated its ions to is a very specific prompt in this context
- 5. Students who rely on regurgitation will fail to understand this question as there are many variables all linking to one final answer

As NIE/MOE-trained tutors and experts in Integrated Programme questions, we are able to identify the source of the questions and predict future trends

Source of this question: <u>https://edu.rsc.org/resources/chemical-misconceptions-ii-ionic-</u> bonding/1095.article#:~:text=A%20positive%20ion%20will%20be,its%20outer%20shell%20to%20donate.

As you can see, our lesson structure at Eclat also encourages students to continually ask questions to improve their thinking and understanding, as well as a no spoon-feeding policy, but instead nudging the answer out of them by allowing them to exercise their critical thinking skills

Table of comparison for Integrated Programme lower secondaryscience to mainstream

Mainstream Atoms and molecules (ionic) Forces Energy Integrated Programme Atoms and molecules (covalent, ionic, metallic bonds) Forces (vector addition/subtraction) Work done, Energy, Power

und (calculation heavy i.e distance of echoes)
emical reactions (balancing, stoichiometry)
omedical Science
ectricity (effective resistance circuits and equations)
ht (Trigonometric ratio calculations, equations, Lenses)
ids, bases and salts (testing for gases, lab alternative s essment)
essure (fluid)
nematics

Table of comparison for Integrated Programme upper secondary physics/chemistry to mainstream

Mainstream	Integrated Programme
Chemical structure (rutherford's model)	Chemical structure (Bohr's model with energy levels)
	Chemical equilibria
Chemical changes	Chemical energetics/kinetics
Measurements	Errors (random and systematic)
Newtonian Physics	Newtonian Physics (A-level standard)
Variable resistor	Potential divider principle

Schools may pick and choose some of their specialization, but it is obvious there is a huge divide between Integrated Programme and mainstream curriculum since secondary 1-2 that most centres cannot address. In addition, the assessment objective for Integrated Programme differs from the mainstream, choosing to challenge students using more advanced concepts, and interdisciplinary techniques (mostly mathematical)

Here is a IPY2 question (from Raffles Institution) that shows the divide

Notice how much calculation goes into a simple question at the secondary two level on pressure. Most parents/students would think that this is from the O-level exam, but this is just a typical IPY2 science question. Mainstream centres without the specialization are not likely to provide such training or expertise.

Here at Eclat, we have been training students as early as secondary one to prepare for and excel at such questions.

With over a decade of experience from a highly qualified team, we can bridge the gap in education and provide the help your child needs for the Integrated Programme