

Olympiad Advice (feat. Applying to university in the UK)!

How I got into Olympiads

I'm from the UK which doesn't have a good Olympiad culture at all for Physics – the UKMT (Maths Olympiad) is all anyone really cares about and most students have already sent university applications before BPhO round 1 (the national Olympiad). The first piece of advice is to research national Olympiads early and ask your teachers or the person who needs to register you early – it would be quite annoying to do all of HRK and then not be able to participate.

I personally began in June of Year 12 (Junior year/Grade 11, I was just under 17 years old when I started) which is quite late compared to a lot of people at IPhO. However, I still managed to get a Top Gold in Round 1, Gold in Round 2, as well as Gold in Astro Round 2. This qualified me for the selection camp where I was added to the team. From there, I got a silver, being a few avoidable errors off of a gold.

How did I prepare for Olympiads

I started with HRK, having already done most C1-C3 A level questions on <https://isaacphysics.org/> which probably put me at a similar level knowledge-wise to the end of AP but with slightly better problem solving. I would definitely recommend it – it won't get you up to IPhO but it will get you up to mid-HRK level and then you can just brush up on topics that aren't covered well in the UK school system (e.g. EM Waves, displacement current stuff, Relativity, Quantum, Thermo) and you'll be in a good place to start Kevin Zhou's handouts. I would personally recommend not giving up on ANY question. Just record the questions you didn't do in an excel spreadsheet and come back to them when you feel like it. The handouts don't really get THAT much harder – we had a question for M1 on the final zoom training session for IPhO. Don't be discouraged if you can't do certain questions, especially early on – there are certainly some questions I would seriously struggle with from the earlier handouts. Something I would recommend though is slightly mix up the order of topics – still bearing the prerequisites in mind. By IPhO, I felt slightly rusty in Mechanics and that was certainly not good considering T2!

After Kevin Zhou, I worked on trying to do every IPhO and APhO paper (I DID!). This was pretty useful in terms of timings – I almost finished IPhO 2025 Theory – I probably could have with 10 more minutes, which is better than most competitors. Also some of these papers have mark schemes – not all of them. But that's better than nothing. Make sure you know roughly how much working is good. You can talk to your TL's when you get selected for IPhO.

Don't feel like you have to sacrifice your social life. From March up to IPhO, I pretty much always went to the gym + had a girlfriend so don't believe anyone when they say you have to give everyone and everything else up to do IPhO – you don't and you shouldn't.

In terms of time, everyone is different, but by virtue of the UK school system only giving us 2 subjects for the last 2 years, I could spend a lot of time on this. I spent about 3 hours a day before my oxford offer in mid-January. Then, it was about 5 until I got the selection for team. Then it went up to 7. Then I did 14 in the month before IPhO.

There are a few caveats to this though – some days I didn't feel like doing any physics. Also, if you start early, you don't have to do this much.

On the UK side, I got a 5 day (realistically 96 hours) selection camp with about 10 hours of practical and theory lectures that covered roughly HRK. I did HRK by August-ish 2024 so this was mainly just a chance to make sure I knew everything and relax from the practical. The theory test was 1 hour. It was pretty simple with the questions being very textbook-y. HRK would be enough to get on the UK team. After that, we had weekly zoom sessions for about 2 months before a 7 day (144 hour) training camp at Trinity College Cambridge. This was joint with the German team and had ~24 hours of past IPhO practical and some theory sessions.

I've been asked a lot about the maths prerequisite. Firstly, doing maths olympiads DID help but not to the extent you think it might have. You can definitely get a gold at IPhO without having done particularly well on national Maths Olympiads. Also, the level of calculus required is: differentiation/integration of standard functions (though they will provide the integrals, its better to be comfortable integrating on your own), setting up integrals as sums of infinitesimal quantities, differential equations, and differentials. Most of this CAN be avoided and you can still do great - but it will be more natural if you can do this stuff without spending a long time.

Is IPhO worth it?

Hmm I was totally questioning this at points in the selection process, especially while walking around oxford at 10pm during the selection camp. But the experience at IPhO is amazing, even if you don't get any medal or a HM, it is really fun.

I got a silver/bronze/HM and feel depressed. What do I do?

IPhO isn't the be all and end all of life. Lots of people mess up on the day. Think about the Chinese competitor who got 76th. They were certainly an excellent physicist because you have to be to get anywhere close to the Chinese team but for whatever reason, he didn't have a good IPhO. And that's just life. When it comes down to 10 hours of exam after thousands of hours of practice, stuff happens. You'll go really far in life if you were able to even get a medal in IPhO or even a HM, especially if you had the perseverance to grind

through hours and hours of work – it's more than a full time job for most of the year! I get this because I had it myself, scoring super high on past papers and then seeing the IPhO 2025 and going "oh no". The important part of life is to keep going. If you enjoy physics, keep learning and getting better. If it wasn't your day in the middle of July in some random country – that doesn't change that you are amazing at physics.

How Much Calculus Should I Do?

Well, if you just care about doing well on IPhO, there are a few key skills you should learn - regardless of where you learn it.

1. Differentiation and Integration of standard functions, chain rule, product rule etc. Note that they will give you integrals in IPhO but it's better and quicker if you know the rules, though this is by no means necessary.
2. Being able to set up integrals (generally you won't have multiple integrals in IPhO, you might have a surface integral for example but if you pick a clever shape like concentric circles, you can make it a single integral)
3. Vector Calculus is **not** necessary at IPhO. You will always use the integral form of equations, like Maxwell's equations. If you want to, go for it, but don't think it's a necessity because it isn't.
4. Differential equations are useful. I would recommend separable + integrating factor + homogenous and non-homogenous second order linear ODEs + 2 simultaneous differential equations in 2 variables. This should cover every IPhO question. They will generally give you the solution to differential equations (e.g. see preamble of 2023 T3 at <https://apohub.pages.dev/ipho/2023/T3.pdf>)
5. It's useful to learn differentials and partial derivatives - but to the extent that you can (1) know that $df = \frac{\partial f}{\partial x}dx + \frac{\partial f}{\partial y}dy + \dots$ and be able to apply this (for example, by comparison to $dU = TdS - pdV$, recognise that $T = \frac{\partial U}{\partial S}$) and (2) replace the d's with deltas and use it to perform linear approximations. This is relatively uncommon in IPhO but has shown up.

This is what you NEED as a bare minimum. Of course, any extra you learn might help you in IPhO and definitely at uni in any STEM course - but the help will be very small for IPhO and I would say that you can definitely get a gold with what I have given.

Applying to the UK

I am definitely biased so take all this with a pinch of salt but I have heard some misconceptions about applying to the UK so I will clear all of that up.

1. The tuition fees ARE a lot. You can look for loans/parental support/scholarships but this is probably the main hurdle to applying to the UK. I won't give specific numbers because it varies a lot but it's quite easy to find this information.
2. You can apply to 5 universities. It doesn't cost anything to apply to more universities so go crazy! You can't, however, apply to oxford AND Cambridge and you can only apply to one course at each of those universities.

3. FOR OXFORD AND CAMBRIDGE, PERSONAL STATEMENT REALLY DOESN'T MATTER MUCH*. *except if you're applying to do a humanity, but I don't know how many geography majors are in this server. O&C and Imperial to some extent mainly care about your entrance test and academics.
4. APPLY EARLY FOR YOUR ENTRANCE TEST!! Lots of the bookings open in August. You don't want a 10 hour trip to a test centre, which is definitely possible in some countries around the world.
5. The entrance process isn't that hard for people doing Olympiads! HRK is enough to get about 90%+ on PAT (oxford engineering and physics) and only about 10-15 people score that high and all of them get an offer (usually). The interview questions are also stuff olympiad students would love. One exception is ESAT (for cambridge and imperial Engineering and Natural Science/Physics/Chemistry courses) which relies more on speed than skill with questions that aren't particularly difficult, and you can look at ENGAA past papers to judge whether this would be to your advantage
6. DON'T DO AN OPEN APPLICATION. You'll end up at the college no one applies to. There's a reason that's true. You can totally apply for an undersubscribed college – but if there's any college you have even a remote preference for, GO FOR THAT.
7. Mock interviews are useful but not essential. They're not seeing how awkward or lack of awkward you are (?) – I got 2 9/9s while being EXTREMELY awkward. They care about your physics (or whatever course you are applying to).
8. Applying to UK universities doesn't cost as much as US universities – even if you can't DEFINITELY afford the fees, it might be worth considering applying.
9. <https://www.whatdotheyknow.com/> - check this out for entrance tests statistics. You can't request anything without being a British citizen/resident (not sure of the specifics) but you can browse A LOT of data. Similarly, there's a wide range of test papers for all tests. PAT also has admissions reports with lots of data.
10. Personal Statement ISN'T for EC's.
<https://www.lucy.cam.ac.uk/supracurricular-exploration> - this is the vibe of the stuff you need to include – not that you ran some high school club.
11. Financial help is honestly not great. Due to a combination of factors, UK universities can't give you the need based scholarships etc. that US universities can. Except for certain specific, exclusive scholarships, you're basically on your own. I would also encourage looking into other European universities. ETH, for example, isn't anywhere near as oversubscribed or hard to get into as US universities - you don't need a fancy essay (side note on ETH in particular: they only let you go to year 2 if you pass year 1 and the pass rate is ~50% so this is their "entrance test" if you will, which is definitely a big gamble). These universities will also have relatively lower fees, even if you are an international. tl;dr consider universities from every country.

More Advice - TSR

A long time ago in a past life (6 months ago) i gave advice to people (procrastinated olympiad prep) on a website called TSR. You can find it at <https://www.thestudentroom.co.uk/> though bear in mind that it is blocked in some countries. You can use a UK vpn if you want to view it though. I would definitely recommend it for advice on BPhO and UK entrance exams, especially because the British community on

PhODS (who are active) is relatively small. Anyways, here are some of my posts that might be particularly relevant to this audience.

<https://www.thestudentroom.co.uk/showthread.php?t=7566351&p=100280029> - ESAT and how to prepare for it

<https://www.thestudentroom.co.uk/showthread.php?t=7576091&p=100400835> - Why I went Oxford over Cambridge for Engineering

<https://www.thestudentroom.co.uk/showthread.php?t=7571232&p=100335266> - Why you don't NEED a tutor for maths, but most subjects at Oxford/Cambridge are similar in that you don't NEED a tutor so a similar message applies (but you can dm me if you still want one vvvv)

<https://www.thestudentroom.co.uk/showthread.php?t=7556955&p=100186537> - Answers to some questions about the logistics of Pearson VUE testing.

<https://www.thestudentroom.co.uk/showthread.php?t=7556051> - Debunking the myths about Oxbridge being prohibitively hard to get into. Some of the responses are... questionable - but the main takeaway from this is that normal people go to Oxford and Cambridge! It's not just posh people sipping tea and wearing top hats!

<https://www.thestudentroom.co.uk/showthread.php?t=7540869> - Good ESAT prep advice.