

Why do you want to study this course or subject?

The varying scale of physics study is what most excites me: from the universe down to small scale particle interactions, it fundamentally governs all these areas and the many unknowns still existing, which I find fascinating. I want to develop my knowledge through further study of physics to be part of modern day research, which has such a huge impact on our lives. Overall, I am looking forward to furthering my physics ability at university and believe I display inter-personal and time management skills essential for this challenge, with the prospect of a career in the aviation or space industries adding to my motivation to study the subject.

How have your qualifications and studies helped you to prepare for this course or subject?

Alongside my studies, I have been involved in many projects in and out of school to further my interest in physics beyond the A Level course, most recently on Oxford's UNIQ Physics summer school. In advance of this, I read Feynman's 'Six Not-so-easy Pieces'. While I found many of the concepts discussed initially challenging (mainly time dilation, length contraction and curved space), I enjoyed Feynman's clever analogies to explain these concepts, such as through bugs and hot plates. Study of these topics at Oxford developed my understanding of and interest in relativity, with the opportunity to have intellectual conversations with leading academics being most beneficial and enjoyable. Using the Michelson interferometer to measure sodium emission lines was a session that I particularly enjoyed due to experiencing the university approach to practical work and using equipment that I had only read about, and wouldn't have otherwise had the opportunity to use. I've also read 'The Last Three Minutes', in which I found Davies' links between astro-, particle and quantum physics particularly interesting. However, one of the most interesting points for me in both books was not the content but by how much our knowledge has advanced during my lifetime, with discoveries such as the observation of gravitational waves (which Davies had only predicted), especially as this was performed on a somewhat enlarged version of equipment I have now used.

What else have you done to prepare outside of education, and why are these experiences useful?

This year I was selected to join Project Horizon, my school's near-space programme. Over the year, we planned the launch of a payload into the stratosphere, where I led a small team of engineers building and soldering the flight computer and the payload. We had a number of sensors to capture data including temperature, humidity and UV and IR intensity, which was interesting to analyse and compare to expected trends. The payload reached 37864m, capturing spectacular footage from three cameras, which we are hoping to use in a series of outreach lessons in local primary schools. Over the past year I have also mentored a Y8 pupil in

physics, as well as assisting in one lower school physics class every week as a STEM Ambassador. This opportunity to have my own basic physics knowledge questioned was extremely beneficial, while also giving back to my school community. I've learnt Mandarin Chinese for the last 5 years and see this as a great benefit to my future career prospects due to the global nature of modern science. Playing the piano since infant school, now at ABRSM Grade 6 level, shows my commitment and I am also proven to be a strong leader: being Vice-Captain of School I work with the Senior Leadership Team to ensure the smooth running of the school on a weekly basis, while also leading and organising the largest RAF Air Cadet section in the country as the Cadet Warrant Officer, and being part of a Cub Scout leadership team to run a weekly programme of activities for 8 to 10 year olds. These all show my willingness to take up the leading role of a university society or in the local community, as well as my ability to communicate with all ages, from young children to peers and staff, and to be adaptable and innovative when things don't go to plan: all making me suited for group work and the practical side of the course.

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Purpose for learning is a key difference between animal and human brains; whereas evidence suggests that animal brains have evolved to learn what is useful for their immediate needs, humans have a greater capacity to learn and store information even if it has no obvious use, which allows us to advance as a species. This distinction was my first encounter with Psychology and Neuroscience in an essay competition about animal and human thought. I concluded that the study of Psychology is both paramount to giving us an insight into the human mind and, unquestionably, the subject I wish to study at university. It is fascinating how simple impulses and synapses can cause the complex mental life we experience. The promise that psychological and neuroscientific research can bring us excites me both for intellectual curiosity but also from a compassionate point of view; it is my dearest ambition to contribute to such research in the future. To understand the mind is to understand our world and I am excited by the prospects of studying the mind to undergraduate level and beyond.

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I enjoyed 'Incognito', by Eagleman, addressing free will through the lens of Neuroscience; it supported a conclusion that I had arrived at via other reading, that if who we are is so dictated by our brain chemistry that a minute alteration in neurotransmitters can produce alarming changes to our behaviour, it is questionable whether we are truly free. Having previously only considered this question from a broader, philosophical standpoint, I was excited by the insights that scientific research can bring to issues; I feel that Psychology bridges Science and Philosophy perfectly. I read 'The Brain', by Wenk, which interested me as it allowed me to more fully understand the links between underlying neural mechanisms and behaviour. For example, Wenk addresses the neurological causes of psychological conditions, such as the link between serotonin and depression. To this end, I completed a research Gold CREST project in Chemistry that I extremely enjoyed; this also advanced my abilities in scientific method and experiment-design. Chemistry is especially interesting to me from a psychological angle, as the mind and consciousness are essentially simple molecular interactions.

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Intrigued by consciousness I attended a panel debate at LSE, about what it is and if it is present in animals. I was curious as to where we could draw the line between conscious and unconscious beings. Although I think it simplistic to suggest that neural activity and consciousness are separate entities, it remains indisputable that some actions require more conscious thought than others. Thus Eagleman's observation that the level of consciousness an animal has is 'paralleled to their intellectual flexibility' is a convincing one, and I am inclined to

agree there is a spectrum of different degrees of consciousness. Enthused by what I learnt, I gave a presentation at my school about animal consciousness, language and morality; I was delighted with how many of my peers and teachers engaged with this and the ensuing discussion challenged some of my perspectives and allowed stimulating intellectual debate. I am also interested in memory, both neurologically looking at dendritic spines, but also from a broader perspective with respect to the malleability of memory and the judicial implications of this. Interested by what I had learned, I gave an interactive talk on memory to children. This was also interesting from a psychological angle as the children reacted differently to the same stimuli and it is fascinating to be able to partly understand why that is the case; studying Psychology gives me a new understanding of the world. This was further demonstrated to me when I was volunteering in a primary school, as well as in my roles as Prefect and Head Chorister. I also enjoy leadership and responsibility as Head of Fair Trade and Head Editor of the history magazine. Furthermore, I am doing Gold DofE.

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I have always had a passion for science, but it is only recently that I have discovered how diverse and interesting the study of psychology is, and I would like to develop this at degree level. Growing up around a person with such a complex mental illness made me question its cause. My mother has given me many reasons for her disorder, including her upbringing, so I wanted to see if there was a reliable link between the way she was raised and the disorder she has. I have become interested in research that studies how much behaviour is influenced by nature and how much by nurture. This led me to read 'Nature via Nurture' by Matt Ridley. It is here that Ridley showed how recent research demonstrates that the expression of genes can be affected by the environment and how these controlled genes impact behaviour, thus explaining how the two theories can coexist. I hope to look into similar case studies through research at university.

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Through my EPQ, I was able to look at many methods of research and conduct a meta-analysis titled 'Based on research already conducted is there enough evidence to draw a direct link between the consumption of Excitotoxins, Alzheimer's disease and other small brain lesions?' Although this was not based on a pure area of psychology, it still allowed me to look thoroughly through research, find faults, and question reliability and research methods. Writing an EPQ required me to develop a complex, balanced argument in a discursive essay format. Having taken statistics for AS Mathematics, I am aware of the issues associated with statistical data, and I look forward to applying both my interest in research and statistics at university. Unable to attend psychology classes at school, I sought my own reading. I found Oliver Sacks' witty and insightful presentation of his studies in 'An Anthropologist on Mars' particularly stimulating. His study of Greg F. in 'The Last Hippie' was similar to the case of Phineas Gage in that they both experienced frontal lobe damage, and I found Sacks' exploration of the relationship between cognitive functions, and the roles specific parts of the brain play in memory thought-provoking.

What else have you done to prepare outside of education, and why are these experiences useful?

During the holidays of 2016, I took part in some scientific-based work experiences, including editing for the student British Medical Journal, being a first aider in a refugee camp in Germany, and blogging for an AI event planning group based in London. In addition to realising that it was

possible to take my pure science background and apply it to many areas of a commercial workplace, I became fascinated by how the refugees adapted to new social situations and the impact that AI has on human behaviour. As a mixed-race student who spends time with both Italian and Ghanaian family, I have always been aware that different cultures have different behavioural norms. This summer, I took part in the National Citizenship Service, which allowed me to consider social influence in a much wider context. I lived and worked with people from many different socio-economic and racial backgrounds. We had few norms and had to negotiate common goals and behaviours in order to successfully complete the tasks set. It was after this that I became interested in the dynamics of groups and social psychology. I watched an open Yale course, 'Why are people different? : Differences', where Professor Paul Bloom discusses the varying elements of social dynamics, intelligence, and personality. I found the analysis of social intelligence particularly engaging, and this is something I cannot wait to explore further at university.

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Watching 9/11 and the aftermath of the London bombings unfold live on television is what initially stimulated my desire to know more about the world around me. As I grew up, I wanted to know about different political viewpoints, so that I could understand how and why events in the news played out the way that they did. The story of political evolution over the past 200 years fascinates me, as it explains how and why we ended up where we are today. I find the British system very interesting, and hope to fully understand all its complexity and intricacies. I hope to fully immerse myself in the various political activities and societies which form such a large part of university life. Through my studies at university, I look forward to further understanding how politics works around the world. After completing my degree, I look forward to being active in politics, either through a governmental career or potentially as a parliamentarian.

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Through my A level study of history, I have seen how minor political changes make huge impacts on the world. I have come to understand the deep-rooted connection between politics and everyday life. Having been a keen linguist from a young age, I studied Welsh, French and English to AS level. In English, I have examined speeches by leading politicians such as Tony Blair and Margaret Thatcher and discussed why they are effective. In French, we looked at the political system of France when compared to the UK. However, I have found that the political system which interests me the most is perhaps that of the USA. The system of checks and balances is an interesting model, and the role of the American president as "Leader of the Free World" is one which continues to develop and affect the fabric of global society.

What else have you done to prepare outside of education, and why are these experiences useful?

I have been an elected form representative for the past 6 years and a sixth form prefect, and have also taken the role of Student Ambassador. Through these positions, I have learned how to deal with requests from my peers and present them to staff. I took part in the Young Interviewer competition and represented the school at a national debating tournament at Durham University. This introduced me to the world of political debate. This year I have reached the national final of the Welsh Schools' Debating Championship. Debating has helped me understand different points of view on a variety of challenging political, social and moral issues and has taught me how to present my views and arguments clearly, a skill which I have transferred to my written work. I participated in the election campaign of my local Conservative candidate. I was involved with the Young Conservatives and I attended David Cameron's final

rally in Bristol. Canvassing and leafleting as a team gave me an insight into the vital work that is done in the grassroots of politics. I follow British and international current affairs avidly. I am interested in the present dynamic of the coalition government, its issues and compromises, and ultimately its success or failure. I read the Guardian and have read several political memoirs. Those of Tony Blair and Alastair Campbell interest me most, as they tell the story of the politics which has been most dominant in my life so far.

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I am a product of my generation. Growing up as part of an age acutely affected by the government's policies of austerity, I am only too aware of the inequality that is so prevalent in British post-2008 society. The want to study politics at a higher level is a response driven by the contemporary, adversarial form of debate so freely peddled by the press at the detriment to the forgotten lives affected directly by government policy. Who has the real power - the politicians, the press, or the people? Is there an alternative that can prove effective in providing for all?

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The ability to take Government & Politics at A-Level allowed for ideological debate in accordance with core values across the political spectrum, widening my own socialist perspectives as a Labour party member and encouraging me to join affiliated think tank The Fabian Society. Reading 'Essays on Citizenship and the Social Class' by T. H. Marshall furthered this understanding, introducing the basic notion of social citizenship as an argument for a larger state and welfare expansion in opposition to conservative belief. I enjoyed being able to tackle discussion among a class predominantly falling to the right of the political spectrum with a fresh outlook, with ideas on social contract and socialism in literature demonstrated in 'The Gift Relationship' by Richard Titmuss or flaws in past implementation of austerity policy such as in Kynaston's 'Austerity Britain'. Wider reading played a notable part in my understanding of political culture - from 'Chavs' by Owen Jones examining stigma surrounding the British working class, to the study of totalitarian repression in Atwood's 'The Handmaids Tale' in my English Language and Literature course. History was also a natural choice post-GCSE due to an enduring interest in the people of the past. The analytical lens through which historical debate is dissected is one I enjoy applying to many aspects of my education, and taking a module on Soviet Russia allowed for much independent research and reflection on political cause and effect in society - for example, the requisitioning horrors described in Figes' 'A People's Tragedy', or attending Historical Association lectures on 'Kaleidoscopes of Revolution: Views from the Russian Provinces in 1917' conducted by Professor Sarah Badcock displaying the vulnerabilities of various societies as a result of Soviet totalitarian rule; the urban industrial population or the rural peasant farmers left behind by the hidden upper echelons of the Communist party machinery.

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To better understand the role of Parliament in forming legislation I have partaken in work experience placements in both the constituency and Westminster offices of Labour MP Karen Lee since the 2017 General Election, aiding with casework and parliamentary duties such as drafting questions to the Health Minister, or working alongside the local council on issues including the social housing shortage in Lincolnshire. This work resulted in an invitation to volunteer in office on a regular basis; allowing me a unique outlook with longevity on national and local level current politics. As an English Ambassador I took on the responsibility of writing the Sixth Form Column for the school magazine for two years - honing time management skills with extracurricular responsibility - and I also founded the school's first political discussion group to enable debate in a moderated forum so as to make politics more accessible for the lower years. On weekends I coordinate a distribution team at my local foodbank; and currently as an aspiring polyglot, I am beginning to study Russian Cyrillic, having read advanced French for the past few years. In the future I hope to continue engaging the people with policy and politics - whether that be from the corridors of Whitehall or the four walls of a lecture hall.

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The increasing polarisation of politics in western democracies has fascinated and encouraged me to further my knowledge in the study of this area. Events such as the success of AfD in the German election, the rise of left-wing parties in Europe like Podemos, and right-wing politicians such as Le Pen of the National Front have ignited my curiosity regarding psephology. It is a dynamic area of study that plays an integral role in understanding modern politics. I am most intrigued by the US Presidential Election of 2016 and have thoroughly enjoyed researching voting behaviour. Psephology encapsulates my interest in the intertwined disciplines of political and social sciences, allowing us to infer the different sociological elements such as class, age, and gender manifested in election results to gain an understanding of the relationship between society and politics, which helps governments form policy. Furthermore, I am eager to enhance my understanding of political ideology. Steven Pinker's "The Better Angels of Our Nature" gave me an insight into how ideologies form in relation to politics and sociology.

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I have focused my EPQ on gender studies, looking at it from a sociological and psychological perspective and thus adopting a holistic approach. I became interested in the notion of gender through my study of English Literature. Reading texts such as Thomas Hardy's "Tess of the d'Urbervilles" allowed me to explore the politics and contrast between the sexes throughout history; this then led me to learn more about the feminist movement. In reading texts, I have learned to critically analyse texts, and write about them in essays focused on analysis and evaluation. Kate Millett's "Sexual Politics" enlightened me on how there is a relationship between sex and power in individual relationships that mirrors the distribution of power between the sexes in society as a whole. Learning about psychological and sociological concepts in Pinker's book, such as herd behaviour, confirmation bias, and social conformity made me relate this to my knowledge of 1920s and 1930s Europe gained through my study of A-Level History and further reading. It is interesting to see how the social ideas Pinker refers to contributed to the spread of Fascism by Hitler, Mussolini, and Franco as it became more extreme.

What else have you done to prepare outside of education, and why are these experiences useful?

One of my proudest achievements is founding my sixth form's Politics and Debating Society. I work with younger pupils to facilitate debates, discussion, and reading on topics such as

systems of government, Brexit, and the comparison of uncodified and codified constitutions. Facilitating debate has taught me to evaluate strengths and weaknesses in arguments and to be pervasive yet conscious of the need to adapt when new information is presented that challenges my opinion. I was privileged to undertake an internship recently in the Parliamentary Office of Theresa May. In my role, I prepared research briefs for her constituency engagements that allowed me to utilise and develop my research skills. I have enhanced my time management skills to ensure that debating and other roles and experiences, such as my student representative role and my place in a political discussion group, do not have an adverse effect on my study. I am eager to approach study at university with relish, determination, and an ardent work ethic to ensure that I achieve the best degree of which I am capable.

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Growing up in social housing, I was aware of the many inequalities that exist in society. My family was engaged in activism and I was encouraged to take part in human rights campaigns on a local and international level. Through these formative experiences, I have developed a concern for the distribution of power and justice in contemporary society. My ongoing interest in the law has led me, over the past year, to want to broaden my understanding of justice. I am equipped for and excited about the intellectual challenges that this course presents and I am determined to gain the knowledge and skills that will enable me to embark on a career dedicated towards positive social change.

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My philosophy A-level introduced me to the ethical and historical scope of politics, particularly through the ideas of Locke and Plato. When studying utilitarianism, for example, I became aware of the challenges that face those in positions of power as they try to balance what is morally 'right' with the common preferences of society. This resonates strongly now, with the rise of populism in Britain, in the US, and across many European nations. Through studying drama I became interested in Theatre of the Oppressed, a participatory mode of politicised theatre developed by Augusto Boal, which galvanised and engaged those experiencing military dictatorship. This introduced me to the importance of ideas in shaping the outcomes of political structures and relations. Both A-levels gave me the skills to speak up for my own beliefs and to distil and present complex information and arguments. My analytical abilities have advanced through studying English literature as I explored the different perspectives and historical contexts of a wide range of texts. I also developed an interest in political dialects through studying Machiavelli's 'The Prince'. I read widely, and books which have recently influenced my interest in political theory include E.H. Carr's 'The Twenty Years' Crisis' and Srnicek and William's 'Inventing the Future'. This book reflects on the 'folk' politics of the left which they argue need to be re-cast to effect structural, global change.

What else have you done to prepare outside of education, and why are these experiences useful?

In the past year, I have taken an active role in supporting Anti Raids, who campaign for the rights of businesses who are vulnerable to recent changes in immigration policy. I also volunteer for North London Action for the Homeless, who campaign against the deportation of EU

nationals. Last year, I worked on a research project for a leading art consultant on civil liberties in Syria, which developed my interest in the relationship between international and domestic politics and how the development of social policy can affect a globalised world. Direct contact with those living on the ever-widening spectrum of precarity has raised my understanding of the impact of local, national and international policies and I now have a more immediate grasp of how political, social and economic structures work, especially during this time of increasing turbulence and uncertainty. I take an active interest in local and parliamentary politics through engaging with platforms such as Politics Review, and through a correspondence with my local MP which I have kept up for over three years. This year, away from formal education, I will expand my political contribution and knowledge and engage in debates surrounding ideas of liberty and rights. I have started an internship at the Free Representation Unit, a legal aid charity, where I experience how legislation can be used to encourage the development of societal relations. In addition to this, I will continue to improve my French and to further my interest in food sustainability by supporting NLAH.

