

# Tonbridge Grammar School

IB Diploma Guide - Entry 2023

# Contents

|   |       |
|---|-------|
| The TGS IB Diploma                            | 3-4   |
| Subject choices                               | 5     |
| Subject entry requirements and previous study | 6     |
| <b>The Core</b>                               |       |
| Creativity, Activity, Service                 | 7     |
| Extended Essay                                | 8     |
| Theory of Knowledge                           | 9-10  |
| <b>Subject Information</b>                    |       |
| English                                       | 11-15 |
| English Literature                            | 14    |
| English Language and Literature               | 15    |
| Languages                                     | 16-23 |
| Modern Languages                              | 16-20 |
| Latin   | 21-23 |
| Economics                                     | 24-26 |
| Geography                                     | 27-31 |
| History                                       | 32-33 |
| Philosophy                                    | 34-35 |
| Psychology                                    | 36-38 |
| <i>Science at TGS</i>                         | 39-43 |
| Biology                                       | 44-47 |
| Chemistry                                     | 48-49 |
| Computer Science                              | 50-53 |
| Design Technology                             | 54-58 |
| Environmental Systems and Society             | 59-60 |
| Physics                                       | 61-64 |
| <i>Mathematics at TGS</i>                     | 65-66 |
| Mathematics: Analysis and Approaches          | 67    |
| Mathematics: Applications and Interpretations | 68    |
| Music   | 69-70 |
| Visual Arts                                   | 71-74 |



## The TGS IB Diploma

Students choose one option from each block, selecting 3 subjects to study at Higher Level and 3 at Standard Level as well as the Core programme.

Each subject attracts a maximum of 7 points, regardless of the level studied, and the Core supplies the extra 3 points to make the maximum mark of 45. The Diploma is awarded to students achieving at least 24 points.

## The Core

**The Extended Essay (EE)** asks students to engage in independent research through an in-depth study of a question relating to one of the subjects they are studying.

**Theory of Knowledge (TOK)** provides an opportunity to explore the commonalities and differences between the knowledge claims across your IB subjects. In this course, students inquire into the nature of how knowledge is produced and accepted by individuals and academic disciplines.

**Creativity, Activity Service (CAS)** involves students in a range of activities alongside their academic studies. Creativity encourages students to engage in the arts and creative thinking. Activity seeks to develop a healthy lifestyle through physical activity. Service with the community offers a vehicle for new learning with academic value.

### **Group 1—Studies in Language and Literature**

English Literature, English Language and Literature

A broad range of texts are studied in a language in which students are competent, engendering a lifelong interest in literature, the nature of Language, and love for the elegance and richness of human expression.

### **Group 2—Language acquisition**

French, Latin or Spanish and ab Initio Languages (SL): French, Japanese and Spanish

The acquisition and use of language in a range of contexts and for different purposes while also promoting an understanding of another culture through the study of its language. Ab Initio courses are for beginners with very little or no previous experience of the chosen language

### **Group 3—Individuals and Societies**

Economics, Geography, History, Philosophy, Psychology

Developing a critical appreciation of human experience and behaviour, the varieties of physical, economic and social environments that people inhabit and the history of social and cultural institutions. Students develop analytical and evaluative skills.

### **Group 4—Sciences**

Biology, Chemistry (HL), Computer Science, Design Technology, Environmental Systems & Societies (SL), Physics (HL)

Exploring the concepts, theories, models and techniques that underpin each subject area and developing understanding of the scientific method. A compulsory project encourages an appreciation of the environmental, social and ethical implications of science.

### **Group 5—Mathematics**

Applications and Interpretation, Analysis and Approaches

Developing mathematical knowledge, concepts and principles, developing logical, critical and creative thinking and employing and refining powers of abstraction and generalisation. Students are also encouraged to appreciate the international dimensions of mathematics and its cultural and historical perspectives.

### **Group 6—The Arts and electives**

Music, Visual Arts - or a second (elective) subject from another group

Understanding the dynamic and changing nature of the arts, exploring the diversity of arts across time, place and cultures.

## Subject Choices

| <b>1: Studies in Language and Literature</b> | <b>HL</b> | <b>SL</b> |
|--|-----------|-----------|
| English Literature                           | Y         | Y         |
| English Language & Literature                | Y         | Y         |

| <b>2: Language Acquisition</b> | <b>HL</b> | <b>SL</b> |
|--------------------------------|-----------|-----------|
| French                         | Y         | Y         |
| Latin                          | Y         | Y         |
| Spanish                        | Y         | Y         |
| Ab initio French               |           | Y         |
| Ab initio Japanese             |           | Y         |
| Ab initio Spanish              |           | Y         |

| <b>3. Individuals &amp; Societies</b> | <b>HL</b> | <b>SL</b> |
|---------------------------------------|-----------|-----------|
| Economics                             | Y         | Y         |
| Geography                             | Y         | Y         |
| History                               | Y         | Y         |
| Philosophy                            | Y         | Y         |
| Psychology                            | Y         | Y         |

| <b>4. Sciences</b>                   | <b>HL</b> | <b>SL</b> |
|--------------------------------------|-----------|-----------|
| Biology                              | Y         | Y         |
| Chemistry                            | Y         |           |
| Computer Science                     | Y         | Y         |
| Design Technology                    | Y         | Y         |
| Environmental Systems & Societies    |           | Y         |
| Physics is offered in Group 6 below) |           |           |

| <b>5. Mathematics</b>          | <b>HL</b> | <b>SL</b> |
|--------------------------------|-----------|-----------|
| Analysis & Approaches          | Y         |           |
| Applications & Interpretations | Y         | Y         |

| <b>6. Arts &amp; Electives</b> | <b>HL</b> | <b>SL</b> |
|--------------------------------|-----------|-----------|
| Music                          | Y         | Y         |
| Visual Arts                    | Y         | Y         |
| Spanish                        | Y         | Y         |
| Economics                      | Y         | Y         |
| History                        | Y         | Y         |
| Psychology                     | Y         | Y         |
| Biology                        | Y         |           |
| Chemistry                      | Y         |           |
| Physics                        | Y         |           |

## Subject Entry Requirements

For some subjects such as Economics or Psychology, where they may not have been previously studied, the entry requirements are listed below. If you have any questions please contact the School.

|   | <b>Subject</b>                               | <b>HL</b> | <b>SL</b> | <b>Recommended prior study (if no subject specific GCSE)</b> |
|---|--|-----------|-----------|--|
| 1 | English Literature                           | 7         | 6         |  |
|   | English Language and Literature              | 7         | 6         |  |
| 2 | French                                       | 7         | 6         |  |
|   | Latin  | 7         | 6         |  |
|   | Spanish                                      | 7         | 6         |  |
|   | Ab initio: French, Japanese, Spanish         |           | 6         | Or meet general entry requirements                           |
| 3 | Economics                                    | 7         | 6         | Mathematics  |
|   | Geography                                    | 7         | 6         |  |
|   | History                                      | 7         | 6         |  |
|   | Philosophy                                   | 7         | 6         | RS or English or History                                     |
|   | Psychology                                   | 7         | 6         | Biology, English   |
| 4 | Biology                                      | 7         | 6         |  |
|   | Chemistry                                    | 8         |           |  |
|   | Computer Science                             | 7         | 6         | Mathematics or Computer Science                              |
|   | Design Technology                            | 7         | 6         | Design Technology  |
|   | Environmental Systems and Societies          |           | 6         | Geography or Science   |
|   | Physics                                      | 8         |           |  |
| 5 | Mathematics: Analysis and Approaches         | 8         |           |  |
|   | Mathematics: Applications and Interpretation | 8         | 6         |  |
| 6 | Music  | 7         | 6         | Or performance equivalent                                    |
|   | Visual Arts                                  | 7         | 6         | Or portfolio (if no GCSE taken)                              |

Creativity, Activity, Service (CAS) gives students real life experiences outside of the classroom and use skills to help others in the local and international communities. CAS is designed to be a break from academic studies that can be tailored to meet personal life choices and supports their Higher Education Application. Students are encouraged to engage with events that can complement their interests and aspiring career choices. CAS enrichment comes in many forms, such as: being a music leader within the school orchestra, volunteering at a local charity shop, listening to children read at the library, organising a student football game with peers, car washing to raise funds for the Alzheimer's society or organising and planning a school production.

Successful completion of CAS is a requirement for the award of the IB Diploma. CAS is not formally assessed but students need to document activities and provide evidence that the 7 learning outcomes have been achieved.

The CAS programme includes documented evidence (via a personal portfolio) of participating in various experiences and at least one long term project (at least 1 month duration) with a good balance between creativity, activity and service. Reflection is the key to understanding, students must reflect upon their experiences, learn from mistakes and develop ideas.

We have excellent links with many outside organisations which allow unique enrichment opportunities. These include working with the service users of the Scott's Project Trust, a local day and residential care home for adults with profound learning difficulties.



*"Today I helped the younger students (5 years old) to practice their taekwondo moves (punches, blocks etc), it's incredibly hard to get them to stay focused and to do repeated movements. In order to get them to practice their movements, my coach has turned this experience into a game, here they are much more focused and are able to do the activity with limited opposition. This experience has allowed me to understand a little more of how they think and how that correlate to their actions and reminded me of how I acted when I was their age." **Aida.***



*" This was the first session at Scott's. The group of us doing the project paired up with a buddy each and taught them/reminded them how to sign letters of the alphabet. They are so friendly and welcoming, and they have some much energy - I loved it! I already knew how to sign the alphabet because I taught myself a couple of years ago, but I learnt how to interact with adults with learning disabilities, which is something I had never done before. I was a little nervous on first arriving, as I was worried, I would not be able to understand them, but I picked up quickly that you just have to have fun! " **Katie.***

*"The CAS component of my IB Diploma has been one of the most rewarding aspects of the whole IB programme. I have enjoyed seeing my skills develop with each of the experiences, building upon the lessons I learnt at every stage and from every angle of the CAS programme." **Benedict***

The Extended Essay gives students the unique opportunity to conduct independent research on a topic in which they have a special interest - it is comparable to a 'dissertation' at university level and is an invaluable asset to an IB student's university application. It is an inquiry-based experience that is guided by students' personal engagement and interest in the topic that they select to explore.

## Course content

Students are guided through this independent project through a series of off-timetable EE Days, culminating in their essay or research project.

Students have real autonomy over their choice of essay. They can either choose one of the subjects they are studying at IB level (a subject specific essay) or a "Global Issue" which can be explored through the lens of two IB subjects (a World Studies essay). For example, how climate change, technological trends or public health issues are displayed in a specific context. Students are able to choose an area they feel passionate about and evidence a genuine interest in a subject they might want to study at university.



After they have chosen their subject or topic they will be allocated a Supervisor who will guide them through the process through regular meetings, providing expertise and feedback along the way. All of the IB teachers at TGS are qualified Extended Essay supervisors with experience guiding students through the process.

The Extended Essay begins in the first term of Year 12 and is completed just after Easter with the submission of the 4,000 word assignment. Students are also offered a support package with additional "check-in" sessions for those who feel they need them.

## Examples

1. To what extent has the third Millennium Development Goal of gender equality and empowerment of women been achieved in Pakistan? World Studies -
2. To what extent was Jane Austen a voice for social change, or for entertainment? English
3. To what extent does boiling time affect the Vitamin C concentration in citrus fruits and vegetables and what are the dietary implications? Biology
4. To what extent are there socio-economic disparities between the South East and the North West of England? Geography
5. To what extent is Psychodynamic Therapy the most effective treatment in helping to relieve the symptoms of Postpartum Depression in mothers? Psychology

## Assessment

The Extended Essay is completed in Year 12 and is a compulsory requirement of the Diploma core. Their essay is externally marked by the IB.

## What do students say?

*Although it seemed like an enormous task at the outset, I have genuinely enjoyed the opportunity to do an in-depth exploration of something which I find very interesting, whilst also developing valuable research, essay writing and organisational skills.* **Danielle**



“The essence of the independent mind lies not in what it thinks, but in how it thinks.” Christopher Hitchens

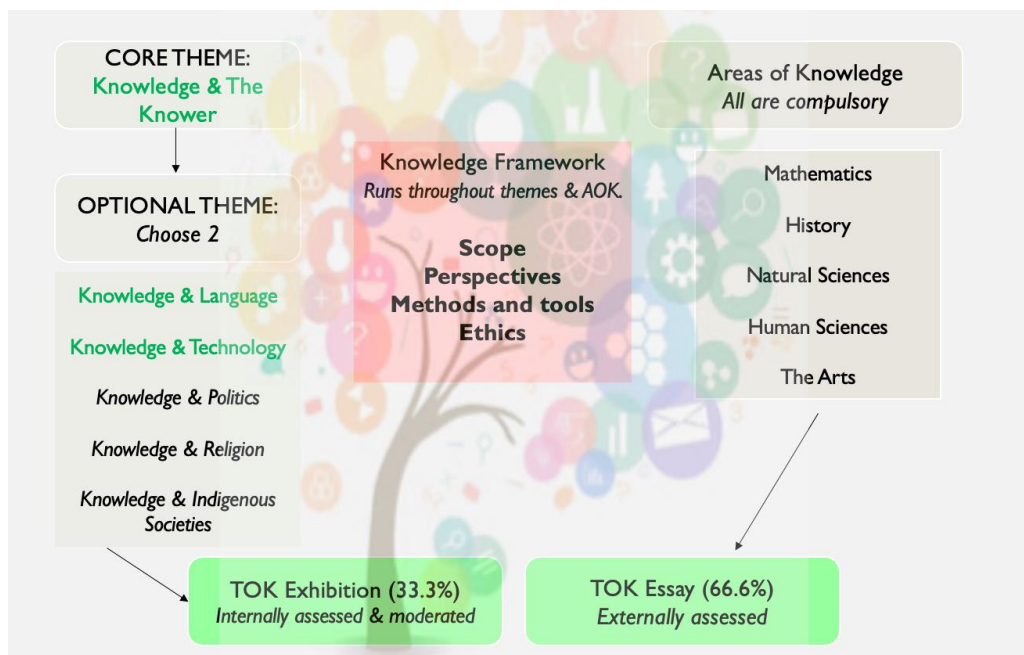


Theory of Knowledge (TOK) is a real “Unique Selling Point” of the International Baccalaureate – there is no equivalent in terms of intrigue and opportunity in other courses.

TOK asks the fundamental question of how we know what we know. This is applied to individuals (can we really trust our senses? Is it possible to be immune from biases?) and disciplines (is certainty possible in the natural sciences? Is the knowledge produced by mathematicians fundamentally different to that produced in art?).

Through the course, students are given the opportunity to critique the knowledge they acquire across the full range of IB subjects and demonstrate unique engagement with subjects they wish to study in further education. This makes TOK an integral aspect to IB students’ university applications.

## Course content



TOK classes involve a mix of discussion, debate and reflective activities.

We begin the course in Year 12 by exploring the Core Theme, Knowledge and The Knower. This involves critically reflecting on the nature of knowledge as a result of individual and collective methods – can we trust our senses? When/should we trust experts? Is it possible to create knowledge as individuals or is all knowledge created in communities?

Following the Core Theme, across the course, we explore the five ‘Areas of Knowledge’ (Natural Science, Human Science, Mathematics, Art and History) and two ‘Optional Topics’ (Knowledge and Technology and Knowledge and Language). In each of these areas we investigate issues

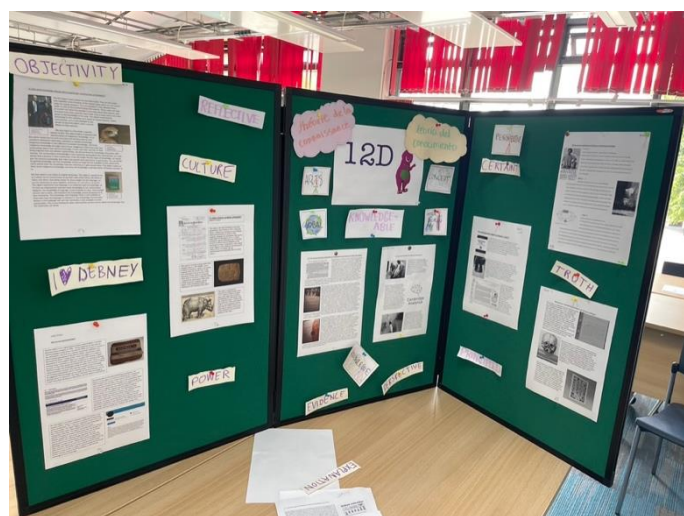
surrounding methodology, conflicts and ethics. Across these units, students have the opportunity to critically reflect on the knowledge they learn in their IB subjects.

**Assessment**

**The Essay:** A 1600 word essay chosen from set of 6 prescribed titles published by the IB. Previous essays have included "Do good explanations have to be true?" and "'We know with confidence only when we know little; with knowledge doubt increases'. Discuss this statement with reference to two areas of knowledge." This is completed in Year 13.

**The Exhibition:**

The TOK exhibition is a unique opportunity for students to showcase their knowledge of Theory of Knowledge. After choosing one of 35 prompts, 3 "objects" are chosen which showcase their response. Students in the past have included the Library of Ashurbanipal to answer the prompt "What counts as good evidence for a claim" and their dad's brake-pads for "what is the role of personal experience in the production of knowledge?"



What features of knowledge have an impact on its reliability?



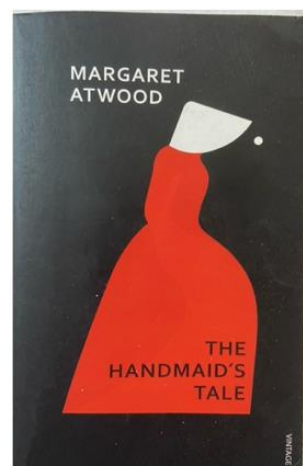
Does some knowledge belong only to communities of knowers?

21. What is the relationship between knowledge and culture?

Object 1: Qipao



Object 2: "Rapper's Delight" by The Sugar Hill Gang



*"I really enjoy TOK because it enables you to engage with the ways in which we know what we know, and it's useful as it links into all your other subjects."* **Jasmine**

## Why study English post-16?

Whether you want to be a journalist, psychologist, cardiologist, or geologist – or you are as yet undecided - effective spoken and written communication lie at the heart of almost every career.

Whatever your plans after leaving Sixth Form, studying English will provide essential skills for life, helping you make sense of the world and your place in it. English demands deep thinking; it challenges and affirms, broadens your perceptions, encourages empathy and aids the development of emotional intelligence.

## Why an IB English course rather than an English A Level?

In a word, *choice*.

Unlike standard post-16 courses, IB English is not restricted to a narrow prescription of texts. With literally hundreds of different writers from around the world to choose from, IB English encourages individual schools to tailor a bespoke curriculum for students. Aside from the obvious advantage of breadth, this means the course is fresher and more exciting: it can be dynamic and responsive to change, quick to respond to new writing, new voices, or world events, and not kept waiting for a syllabus to catch up.

IB English embraces the diversity of text types: alongside more familiar forms such as drama and poetry, you have the opportunity to explore song lyrics, graphic novels, or film.

The IB English course recognises that readers' reactions to texts are subjective, so you choose the texts which resonate most with you, creating an individual selection of works to explore more fully and for assessment.

Unlike A Level, IB English has a fuller understanding of the real-world applications of English: alongside the rigorous development of your writing, you will be honing your speaking skills, with an assessed oral component on two works chosen by you.

IB English also encourages creativity: over the two year course you will document your responses, ideas, questions and reflections about the texts you study, building a Learner Portfolio to capture your individual journey. How you do this is entirely up to you: as well as more traditional written entries, past students have chosen to compose music, make collages, write parodies and poetry, even bake!

## Why study IB English at TGS?

The IB English team is almost as diverse in background as the texts you will study. As subject specialists, avid readers and lovers of English, we each bring our own particular expertise and interests. Educated all over the world from London, Oxford, Cambridge, York and St Andrews to Germany, France, Russia and Hong Kong, and with additional qualifications in American Literature, Creative Writing, Comparative Literature, Art History, Philosophy, Law, Modern Languages and English as a Foreign Language, we are uniquely equipped to bring literature and language to life in our classrooms.

## Where can an English IB qualification take me?

The variety of career pathways taken by students of English reflects the versatility of the subject and the highly transferable nature of the skills acquired through its study. Aside from those areas of employment often associated with English (journalism, marketing, the creative industries, law

and education), substantial numbers of those with post-16 English qualifications can also be found working in less traditionally expected areas such as business, finance, information technology and welfare.

**Sarah Waters, novelist**, explains the subject taught her “how to be a critical reader: how to understand that novels and stories are conversations we have with ourselves about the world, about what life means and how we should live it. It taught me that narratives of all kinds needn’t be taken at face value: that they can be relished but also challenged, rewritten, overturned.”

Of her English degree, **Dame Karen Jones, business executive and Chancellor of the University of east Anglia** says: “I treasure it daily for the worlds it allowed me to enter and the characters I met there. It taught me how to bring strands of thinking together and write succinctly. The ability I acquired to skim read has also proved extremely handy!”

For **Alexandra Chesterfield, behavioural scientist**, studying English was “a lesson in empathy, feeling what it is like to be someone else and living their reality. A source of wisdom on human behaviour and culture that is richer, deeper and more realistic than any mathematical model. Pure joy.”<sup>1</sup>

### What choices do I have?

First, you need to choose whether to take the English Literature route for your Diploma, or if the English Language and Literature course is more suitable for your particular interests. After making this decision, you need to work out whether you want to take English at Standard (SL) or Higher Level (HL). If you are thinking about studying any form of English course at University, then you will definitely want to take the subject at HL. If you are considering taking one of the more traditional English degrees, you will probably find that the English Literature course is the best fit for you. If, however, you are considering a more vocational or media related English course, then you will probably find that the content of the Language and Literature course is more directly relevant. For careers such as law, either HL course would be appropriate.

### What does the Extended Essay option in English look like?

The Extended Essay in English offers limitless possibilities for independent exploration of a topic of your choice, under the supervision of an enthusiastic and supportive member of the department.

To give a flavour, past essays have considered issues such as

- The Gap between Law and Morality in Charles Dickens’ ‘A Tale of Two Cities
- The Significance of Sleep in Shakespeare
- The Physicality of Satan in Dante’s ‘Inferno’ and Milton’s ‘Paradise Lost’
- The Erosion of Identity in ‘1984’ and ‘V is for Vendetta
- Insanity in William Golding’s ‘Pincher Martin
- Fertility, Pregnancy and Childbirth in the Poetry of Sylvia Plath
- The changing representations of female androids in film explored through the character of Ava from *Ex Machina*
- An exploration of the rhetoric used in American debates on gun violence
- How newspapers vary in their reporting methods of racist incidents in English football
- How newspapers vary the way they convey their political views in editorials
- How the portrayal of men in male grooming products changed since the 1980s.’

<sup>1</sup>Boakye (2022) [online [www.theguardian.com/education/2022/aug/14/what-an-english-degree-did-for-me-earning-sunak-arts-humanities](https://www.theguardian.com/education/2022/aug/14/what-an-english-degree-did-for-me-earning-sunak-arts-humanities)] [Accessed 14 October 2022].

## What enrichment opportunities are there in this subject?

The range of activities offered to complement the formal study of English continues to grow. You will have opportunities to develop your knowledge and response to additional literary texts through regular meetings of the TGS Literary Society. You will also have the chance to attend after school screenings of films and theatrical productions with the newly formed Literary Film Club. Other opportunities include working on the relaunch of the English department magazine, theatre visits and creative writing groups.

This year we are also starting a Writer-in-Residence programme: students will be offered opportunities to attend workshops with Dan Abnett, English graduate, seven-times New York Times bestselling author and an award-winning comic book writer. He has written over fifty novels including the acclaimed Gaunt's Ghosts series and volumes of the million-selling Horus Heresy series. In comics, his 2008 run on *The Guardians of the Galaxy* for Marvel formed the inspiration for the blockbuster movies.



You will also have the chance to join the highly popular and successful TGS debating society. The society holds sessions 4 times a week and conducts regular friendly in-school debates. It also enters students into a range of national competitions including the University of Cambridge Schools Competition, the University of Oxford Schools Competition, the Warwick Schools competition, the English Speaking Union's Mace Competition and the ESU's Churchill Public Speaking Competition. In recent years, the TGS debating society has gone from strength to strength, gaining national recognition: first, by winning through to the Cambridge Schools Finals Day where the school team represented the whole of the South East, and then by winning last year's ESU's Mace competition which is the oldest debating competition in the world.

## English Literature Course

| <b>Overview:</b> Students will focus exclusively on literary texts, adopting a variety of approaches to textual criticism. Students explore the nature of literature, the aesthetic function of literary language and literary textuality, and the relationship between literature and the world. |  |  |
|---|--|--|
|   | <b>Standard Level</b>  | <b>Higher level</b>  |
| <b>Texts</b>  | <p><b>A total of 9 literary works will be studied.</b></p> <p>The students will choose only <b>5</b> of these texts to take forward as part of the assessments outlined below.</p>   | <p><b>A total of 13 literary works to be studied.</b></p> <p>The students will choose only <b>6</b> of these texts to take forward as part of the assessments outlined below.</p>  |
| <b>Components</b>   |  |  |
| <b>Internal assessment: the individual oral</b>   | <p>This component consists of a prepared individual oral. Students choose two of the texts studied and discuss in relation to their own choice of global issue. The student's 10 minute presentation is followed by 5 minutes of questions by the teacher. 30%</p> | <p>This component consists of a prepared individual oral. Students choose two of the texts studied and discuss in relation to their own choice of global issue. The student's 10 minute presentation is followed by 5 minutes of questions by the teacher. 20%</p> |
| <b>Written essay</b>  | <b>N/A</b>   | <p>This component consists of a 1200–1500 essay written during the course. Students develop a line of inquiry of their own choice in relation to one of the works studied. 20%</p>   |
| <b>Paper 1</b>  | <p>The paper consists of two passages, from two different literary forms, each accompanied by a question. Students will be asked to choose one of the passages and write an analysis of it. 35%</p>  | <p>The paper consists of two passages, from two different literary forms, each accompanied by a question. Students are asked to write a separate analysis of each of the passages. 35%</p>   |
| <b>Paper 2</b>  | <p>The paper consists of four general questions. In response to one of those questions, students will be asked to write a comparative essay based on two works studied during the course. 35%</p>  | <p>The paper consists of four general questions. In response to one of those questions, students will be asked to write a comparative essay based on two works studied during the course. 25%</p>  |

## English Language and Literature Course

**Overview:** In this course, students study a wide range of literary and non-literary texts in a variety of media. Approaches to study in the course are meant to be wide ranging and can include literary theory, sociolinguistics and media studies.

|   | <b>Standard Level</b>  | <b>Higher level</b>  |
|---|--|--|
| <b>Texts</b>                                    | <p>Students will study 4 literary works and an equal amount of class time studying a variety of bodies of work.</p> <p>A body of work is an extended, full-length non-literary text or a group of shorter non-literary texts that are of one same text type and that share the same authorship. For example, a whole film could be a body of work. Another body of work could be a series of advertisements for the same product or brand.</p> | <p>Students will study 6 literary works and an equal amount of class time studying a variety of bodies of work.</p> <p>A body of work is an extended, full-length non-literary text or a group of shorter non-literary texts that are of one same text type and that share the same authorship. For example, a whole film could be a body of work. Another body of work could be a series of advertisements for the same product or brand.</p> |
| <b>Components</b>                               |  |  |
| <b>Internal assessment: the individual oral</b> | <p>This component consists of a prepared individual oral. Students choose one non-literary body of work and one of the studied literary works and discuss in relation to their own choice of global issue. The student's 10 minute presentation is followed by 5 minutes of questions by the teacher. 30%</p>  | <p>This component consists of a prepared individual oral. Students choose one non-literary body of work and one of the studied literary works and discuss in relation to their own choice of global issue. The student's 10 minute presentation is followed by 5 minutes of questions by the teacher. 20%</p>  |
| <b>Written essay</b>                            | <b>N/A</b>   | <p>This component consists of a 1200–1500 essay written during the course. Students will be asked to develop a line of inquiry of their own choice in relation to one of the bodies of work or works studied. 20%</p>  |
| <b>Paper 1</b>                                  | <p>The paper consists of two non-literary passages, from two different text types, each accompanied by a question. Students will be asked to choose one of the passages and write an analysis of it. 35%</p>   | <p>The paper consists of two non-literary passages, from two different text types, each accompanied by a question. Students will be asked to write a separate analysis of each of the passages. 35%</p>  |
| <b>Paper 2</b>                                  | <p>The paper consists of four general questions. In response to one of those questions, students will be asked to write a comparative essay based on two literary works studied during the course. 35%</p>   | <p>The paper consists of four general questions. In response to one of those questions, students will be asked to write a comparative essay based on two literary works studied during the course. 25%</p>   |

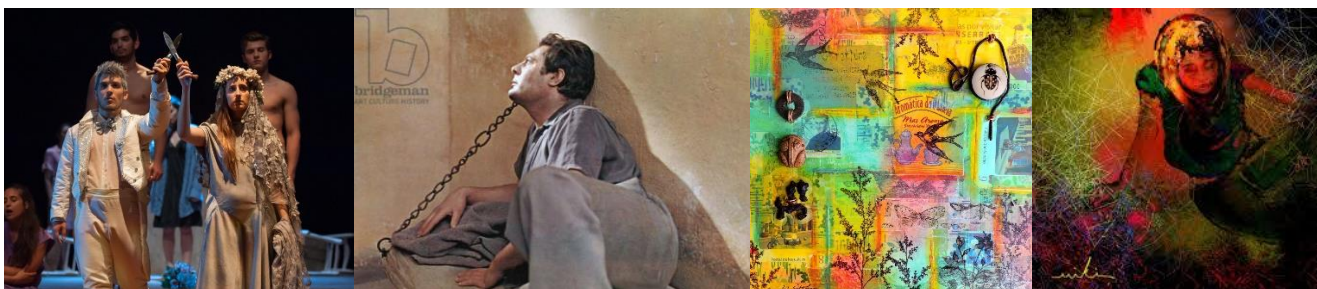


*My journey at TGS was almost defined by languages. Studying French and Spanish all the way through to IB at Higher Level, I developed so much, as a linguist and a person. In Year 11 we visited Cantabria on a Spanish exchange, and I met a group of life-long friends that I visit annually. The Languages Department supported me from when I didn't know a single word of Spanish through to being accepted to study it at the University of Exeter. What is distinctive about the language teaching at TGS is its intercultural view and its inclusion of the entire hispanohablante population worldwide, exposing us to new ideas and cultural phenomena. Since moving to Exeter there have been several challenges, from teaching strikes to the pandemic to Brexit, but the resilience that I learnt at TGS has helped me to overcome all of them. Last year I moved to Spain for 9 months to teach in a school in Asturias, and I was able to immerse myself in the culture fully, making friends with locals and travelling the country. I have a lot to thank TGS and its languages department for in getting me to the point that I am at today. **Daisy, TGS alumna***

## Why study Modern Languages?

*How does language reflect culture? How does language influence knowledge? How does language broaden horizons? How does language affect power? How does culture affect language? How does language change? How does language change affect communities? How does language allow us to be creative?*

The study of Modern Languages in the IBDP allows us to consider these questions, and many more, while viewing the world around us, with all of its beauty and, at times, horror, through an alternative lens. We discuss five main themes: **Identities, Social Organisation, Human Ingenuity, Sharing the Planet** and **Experiences** as a way of viewing a variety of geographical, political and economic viewpoints on issues that affect people the world over. The challenge of language study at IBDP level is one that will bring great rewards: a desire to see the world, to meet new people and to understand our own lives better as a result of varied and shared experience.



## Why study languages at Standard Level? (French and Spanish)

This is not a GCSE – gone are the days of vocabulary lists and unoriginal texts. This is a radically different chance for you to delve into the French and Spanish-speaking worlds and to really understand what makes them different from our own experiences. We use the strong linguistic



foundation from GCSE to build complexity and greater understanding into our approach to written texts, audio and a variety of methods of communication, but we do so in a way that considers perspectives from all over the world and will link to your other areas of study. So perhaps it's looking at how non-traditional medicines are used in parts of South America, or how immigration has shaped the French approach to the national football team and Belgian theatre, or maybe even looking at how Costa Rica is at the forefront of the international fight against climate change – whatever you look at, you will understand the world in a different, exciting way.

### **Why study Languages at Higher Level? (French and Spanish)**

For lovers of language and literature, the HL course is a way of extending your historical, political, social and emotional understanding of the French and Spanish-speaking worlds through literature as well as the main themes of study from the SL course. Through the study of specific texts in both French (such as Camus's *L'Étranger*) and Spanish (Lorca's *Bodas de Sangre*), HL languages students will dive further into some of the key themes and ideas which run through the rich cultural histories of the French and Spanish-speaking worlds. These themes include morality, isolation, the role of women in society, the passage of time, and fate, to mention but a few. Viewing these themes through the cultural lens of foreign literature will lead to you deepening your understanding of the psyches of the people in the relevant countries and regions, as well as their shared histories.

### **Why study an Ab Initio language? (French, Spanish and Japanese)**

If you want to extend your linguistic and cultural knowledge with a language you've never studied before and you want to challenge yourself with a fast-paced, quick-progress, intensive language course, then Ab Initio French, Spanish or Japanese is for you. Whether or not you want to take a plunge into East Asia to study how the character-based writing system of Japanese works or use your knowledge of Spanish from GCSE to improve your French (or vice-versa), this is a course in which communication is placed at the forefront of study. Using the same five main themes of study as the Language B courses you will boost your confidence in a brand new, exciting language. The level of progress is fast and furious, however, and you will feel delight at the pace at which you are working and the achievements you are making.



### **Enrichment**

TGS's International Society is where all of our language enrichment activities have a home, along with many other opportunities. Through the International Society, you will get a chance to earn CAS credit by directly running and organising events and club activities in School. We have a huge range including, but not limited to, the Foreign Film Club to the Team East Asia and Global Affairs club, in all of which you can see the direct involvement of languages, language learning and cultural understanding in the wide array of enrichment opportunities for yourselves and others. Students also regularly take part in writing competitions from the University of Oxford and we are involved in the United Kingdom Linguistic Olympiad (UKLO) competition.



## Language Support Assistants

Our three Language Support Assistants provide a vital and welcomed role: building confidence and bringing wider, more varied viewpoints and experiences to our large, international team. They regularly complete small group work to build on the skills required for the IA Orals and help to expand your horizons to different ways of using and appreciating the languages we offer. Your work with the Language Support Assistants will be different to that in our lessons, much more relaxed and in smaller groups, building confidence on the skills that you feel you need to practise.

## Visits

Practising and learning a language without the opportunity to use it in the real world is similar to training for a marathon without running the race. At TGS we are passionate about real-world opportunities for our life-long language learners, which is why we have a number of opportunities available, from pen-pal links to online language schools right through to our cultural trips to France and Spain. In these trips we mix language learning in dedicated language schools with cultural activities including museum visits, stadium tours, theme park visits, food tours, sports activities and, of course, shopping. All of these things will allow our students not only to learn and use your languages of study but also see the cultural relevance of the languages all around you.



## Careers

With estimates that 60% to 75% of the world's population are speakers of more than one language, ensuring that the literacy and intercultural understanding that comes from language study is at the forefront of your educational progress will help you to put your mark on the world. A broad educational background which builds in the multiple perspectives of a language learner will ensure that you are able to be an understanding member of a team with brilliant interpersonal skills and a valuable comprehension of a range of global issues. These are skills which are vital in any field of work, including those which don't yet exist. These are also skills which, according to the Confederation of British Industry, are currently lacking in the UK job market (<https://www.cbi.org.uk/media/1341/helping-the-uk-to-thrive-tess-2017.pdf>). Building on all of them will help you to be an attractive prospect to employers.

## Universities

| LAW       |  |
|-----------|--|
| <b>HL</b> | English<br>Philosophy<br>History               |
| <b>SL</b> | ESS<br>Ab Initio Spanish<br>Maths Applications |

| BUSINESS  |   |
|-----------|---|
| <b>HL</b> | Economics<br>Psychology<br>Maths Applications |
| <b>SL</b> | English Lang. & Lit.<br>French B<br>ESS       |

| ENGINEERING |  |
|-------------|--|
| <b>HL</b>   | Physics<br>Maths Analysis<br>Design Technology |
| <b>SL</b>   | English Lang. & Lit.<br>Spanish B<br>Geography |

| MEDICINE  |  |
|-----------|--|
| <b>HL</b> | Biology<br>Chemistry<br>Philosophy             |
| <b>SL</b> | ESS<br>Ab Initio Spanish<br>Maths Applications |

| LANGUAGES |   |
|-----------|---|
| <b>HL</b> | French B<br>Spanish B<br>English Literature |
| <b>SL</b> | History<br>Maths Applications<br>ESS        |

| CREATIVE  |  |
|-----------|--|
| <b>HL</b> | Visual Arts<br>Design Technology<br>English Literature |
| <b>SL</b> | Maths Applications<br>Ab Initio Japanese<br>Psychology |

The interpersonal and critical thinking skills that learning languages affords students are incredibly beneficial. Continued language study at university provides everything we offer at TGS and more. More opportunities to travel; more opportunities to meet new people; more opportunities to find new points of view and more opportunities to understand them. The MFL Department's Languages at University Programme is a fantastic way of understanding the usefulness and importance of language study at university. Considering studying a joint honours degree with a language can open up new fields of potential study and add a valuable skill to your repertoire. But it doesn't end there. Studying a language at IBDP level opens a whole new way of being successful across a wide range of fields. The table below sets out some past TGS students' university/career choices and the IBDP language choices they made which helped to get them there. Languages play a huge part in a successful career in any field ranging from a language-based university choice to engineering and law. Picking a modern language at either Standard or Higher Level will make you a more rounded learner and, we believe, more valuable in the jobs market in the future.

## Assessment

|                                       | <b>Ab Initio<br/>Standard Level<br/>French/ Spanish/<br/>Japanese</b><br>(No prior study of the<br>language)   | <b>Language B<br/>Standard Level<br/>French / Spanish</b>  | <b>Language B<br/>Higher Level<br/>French / Spanish</b>   |
|---------------------------------------|--|--|---|
| Internal<br>assessment<br>(IA) (oral) | <b>Speaking (25%)</b><br>A description of a photo,<br>inextricably linked to the<br>target language culture<br>and student experience<br>followed by a conversation<br>based on at least two of<br>the five themes of study. | <b>Speaking (25%)</b><br>A description of a photo,<br>inextricably linked to the<br>target language culture<br>and student experience<br>followed by a conversation<br>based on at least two of<br>the five themes of study. | <b>Speaking (25%)</b><br>A detailed description of an<br>extract from one of the<br>literary works studied and<br>analysis of the key themes<br>of the piece followed by a<br>conversation based on at<br>least two of the five<br>themes of study. |
| Final<br>examination                  | <b>Reading &amp; Listening<br/>(25% each)<br/>Writing (25%)</b>  | <b>Reading &amp; Listening<br/>(25% each)<br/>Writing (25%)</b>  | <b>Reading &amp; Listening<br/>(25% each)<br/>Writing (25%)</b>   |

## **What's been going on in the MFL Department recently?**

Another 30 TGS Languages students take part in our bi-annual Online Language Schools, in partnership with the Iria Flavia Academy in Santiago, Spain and the Academie LSF in Montpellier, France. In these events, students work in Spanish and French with native speakers, practising the content we study at in lessons in a dynamic and different way, putting speaking at the forefront of their work.

Anne-Marie, a TGS alumna who completed her IBDP two years ago recently returned to School to deliver a fascinating look at her experience at university studying languages. Students from Years 9-13 took part in a Q+A with Anne-Marie and gained a valuable insight into what language study at university could look like for them.

The 22-23 Academic Year for the International Society got going with a bang. Enthusiastic Year 12 students signed up to get involved with and organise a number of fantastic co-curricular opportunities for students of all year groups. Japanese Club, as ever, is popular with students across the age ranges, but Foreign Film Club is hot on its heels!

## **What do students say?**

*Studying a higher-level language has enabled me to further my linguistic skills through an eclectic range of topics, varying from literature to global politics. I have found this particularly enriching, as it allows you to learn the language in context, while constructing your own arguments on relevant issues. **Lucy***

*I have always found languages interesting, describing them as the doorways to the rest of the world. At TGS, I have been exposed to a wide range of languages, from Latin to Japanese to Spanish, and have adored learning about the different cultures, especially due to the constant encouragement and support of our wonderful language department. And thanks to the IBDP, I have been able to continue my studies in two languages: Spanish B (at higher level) and Japanese (at ab initio). **Mia***

*Languages fascinate me. Knowing more than one language has not only opened up a world of opportunities but has also allowed me to see things in multiple perspectives, giving me an entirely different outlook on life. I love being challenged and stretched by the IB Diploma, which has encouraged me to pursue my interest to university. **Rosalie***

**"historia vitae magistra" - "History, the teacher of life" Cicero**

Latin in the Sixth Form is very similar to studying at GCSE with translation, literature and source work, so students who enjoyed GCSE will find even more enjoyment in the Diploma and there will be no scary surprises!

Studying Latin is about so much more than translating though. Exploring the Classical World and the very origins of western society encompasses thinking and discussion from many perspectives and subject disciplines including History, English, Philosophy, Politics, and Law. An education in Latin is always an advantage, with lawyers, doctors, scientists, writers and politicians all making use of the related linguistic skills in their day-to-day work. Also, as English speakers, we can exploit our knowledge of Latin to further our own expertise in communication, problem solving and complex thought.

At TGS, IB Latin teaching is shared between two experienced members of staff with expertise across the discipline. The IB course encourages students to learn Latin with a purpose: to use a dictionary well to understand a text and interpret an author's intent. It's not a memory exercise and there are no grammar quizzes.

*"Exploring the Classical world through Latin opens up so many opportunities for topical discussion. The collaborative atmosphere in our classroom creates the space for exploration of timeless, yet contemporary issues such as the cost of war, the consequences of human behaviour, the power of politics to influence and how emotional writing persuades and delights our souls. Every lesson is different and it's the students bringing their own experiences to the lessons which makes Latin language and literature such a joy to teach."* Mrs Hindocha

**Course content**

Higher and Standard Level students study together in the same class. Half the lessons are given over to language revision, consolidation and extension. Students are given regular vocabulary and grammar tests as well as working both collaboratively and independently on a variety of prose and poetry translation passages. Dictionary skills are taught to ensure effective use in the final examination. Literature lessons involve working through the texts, translating collaboratively and analysing the style and meaning of the poems.

Higher Level students have some additional separate lessons to work on their additional literature and complete a prose composition coursework task.

*"Latin is one of my favourite Highers as you get more of a chance to actively engage with a wide range of literature and discuss opinions and interpretations in a relaxed and friendly environment. I also enjoy the freedom that the IA provides, allowing me to research topics that I am personally interested in that can relate to other subjects and even what you might want to pursue after completing the IB. I would really recommend taking Latin IB!"*Tara



## Course Content

|                           | Paper 1: Language skills   |  | Paper 2: Literature skills  |   |
|---------------------------|--|--|---|---|
|                           | Standard Level   | Higher Level   | Standard Level  | Higher Level  |
| <b>What will I study?</b> | Grammar consolidation and vocabulary learning.<br>Translation and comprehension of unseen prose & verse from various authors.<br>Some collaborative work and some independent. | Same as SL but with some HL only lessons for further practice of the more detailed analysis questions. | Detailed study of a core verse text – extracts from Vergil’s Aeneid 2. As well as studying the story and characters we will look at the genre of epic poetry and its features such as scansion. | Study of two core texts – as well as the Aeneid it’ll be extracts from Cicero’s Pro Caelio. |

| Internal Assessment: Culture   |   | HL Composition   |
|--|---|--|
| Standard Level   | Higher Level  | Higher Level only  |
| A handful of lessons at the end of Year 12 for introducing the research dossier task and undertaking research to find primary evidence for your topic. The rest of the IA work is done outside of lesson time. | Same as SL but you’ll use your HL lessons for research too. | In Year 13 you’ll create a short paragraph in Latin based on a response to an existing piece of Latin literature. There will be lesson time to devise a concept, practice prose composition and then write your final composition. |

*"Whilst many students have preconceptions of how the Romans lived, it is always a delight to delve deeper through discussion, prompted by literary texts or through the students' own research. The research dossier unit of the IB course enables each student to investigate their own chosen area within the Roman world and the discoveries they make are often surprising. Guiding curious minds around these ancient uncertainties is one of the great joys of teaching Latin."* Mr Waters

## Assessment

|                       | Paper 1   | Paper 2  | Research Dossier  | Prose Composition  |
|-----------------------|---|--|---|--|
| <b>Standard Level</b> | External exam (1hr30mins)<br>30 marks, 35% of grade | External exam (1hr30mins)<br>32 marks, 35% of grade  | Internally marked but externally moderated.<br>28 marks, 30% of grade | n/a  |
| <b>Higher Level</b>   | External exam (2 hours)<br>40 marks, 30% of grade   | External exam (1hr30mins)<br>32 marks, 30 % of grade | Same as SL but makes up 20% of grade                                  | Completed during lesson time in Year 13 but marked externally.<br>25 marks, 20% of grade |

## Extended Essays in Classical Languages

- To what extent can the decline of Greek Tragedy be explained by Nietzsche’s *Birth of Tragedy* and Aristotle’s *Poetics*, using the examples of Aeschylus’ *Prometheus Bound* and Euripides’ *Bacchae*?
- How influential was Emperor Constantine in the transition from paganism to Christianity in the Roman Empire?
- Virgil: the intentions behind the epic. To what extent is Virgil’s pessimism identifiable within the Aeneid?

## Enrichment

### CLASSICS COMPETITION 2021

Every year, the Lytham St Annes CA holds a Classics Competition for students aged 11-18 to produce and deliver a presentation in 15 minutes or less in response to a particular question about the ancient world.

The 2021 Classics Competition, by virtue of being conducted entirely online, was open to students not only across the UK but internationally too! Our special thanks to teachers, parents and supporters who helped students get involved during Lockdown and well done to all the entrants who shared their answers to our 2021 question:

'If you could travel back to one day in the ancient past, which would it be and why?'

Weekly Ancient Greek club, biannual visit to Pompeii, Oxbridge reading, translation, and essay competitions, university talks and theatre visits.

TGS student beats hundreds of students to reach final of public speaking competition. [Read more here.](#)

We also have a "Meet a Classicist" programme with events throughout the year. Read more [on the TGS website](#)

### 'Meet a Classicist' event

HOME > NEWS

Last week the Latin department was delighted to welcome three alumni back to TGS for a "Meet a Classicist" Q&A event.

Katharine (2014), Anita (2017) and Charli (2017) returned with great enthusiasm to share their IB and university experiences with students from every year group who were curious to know more about studying Classics, Classical Civilisation, Ancient History and Archaeology at degree level.



## Further study

Latin students have aspirations to study a variety of subjects at university including English, History, Philosophy, Law, Film, Art, Sciences and Languages; as well as Classics. All find having studied Latin they stand out from the crowd and can use either the skills, content or both directly in their studies. Every year students apply to universities for classical related degrees, including Oxbridge.

| <b>Student A</b>  | <b>Student B</b>   | <b>Student C</b>  | <b>Student D</b>   |
|---|--|---|--|
| <b>HL Latin</b><br>HL English<br>Literature<br>HL Philosophy<br>SL Chemistry<br>SL Maths<br>SL French | HL Biology<br>HL Chemistry<br>HL Geography<br><b>SL Latin</b><br>SL English Literature<br>SL Maths | HL History<br>HL English<br>HL Chemistry<br><b>SL Latin</b><br>SL Maths<br>SL Biology | <b>HL Latin</b><br>HL English<br>Literature<br>HL Chemistry<br>SL Maths<br>SL Psychology<br>SL History |
| <b>Degree:</b><br>Classics at Oxford  | <b>Degree:</b><br>Medicine at Nottingham   | <b>Degree:</b><br>World History at Cambridge  | <b>Degree:</b><br>English Literature & Linguistics, York   |
| <b>Current job:</b><br>Trainee solicitor  | <b>Current job:</b><br>Trainee doctor  | <b>Current job:</b><br>Business Analyst   | <b>Current job:</b><br>Grant Proposal Writer   |

In the last 10 years 8 TGS Latin students have successfully gained places at Oxford and Cambridge (with just one unsuccessful application meaning an 89% success rate). A further two students went to St Andrews and others to Bristol, Durham, Kings College London, Warwick, Birmingham, Exeter and Nottingham.

*"I chose to study Classics at Kings College Cambridge because of the strong language focus within the course as well as the freedom to choose other areas of study such as Greek lyric poetry, Greek tragedy and the pre-Socratic philosophers. The best feature of my course has been the attentive and enthusiastic tutors. I intend to go on to further study when I finish my degree."*

Eben

*‘The curious task of Economics is to demonstrate to men how little they really know about what they imagine they can design.’ F.A. Hayek*

Economics is an exciting, dynamic subject that allows students to develop an understanding of the complexities and **interdependence** of economic activities in a rapidly changing world.

At the heart of economic theory is the problem of **scarcity**. While the world’s population has unlimited needs and wants, there are limited resources to satisfy these needs and wants. As a result of this scarcity, **choices** have to be made.

IB Economics at both Higher and Standard Level prepares students for the globalised and interconnected world in which they will live. In comparison with equivalent A-level syllabi the IB course provides students a significantly more diverse course; grounded in real-world economic problems that will be the challenge of future generations. By examining economic issues and policy interventions at local, national, and global levels; students are empowered to use their knowledge and understanding of economics to seek solutions to issues that matter to them. The course encourages students to think about the role that Economics plays in individual **well-being** and promoting **sustainability**. Students are also encouraged to think about their role in driving and delivering **change** as responsible and open-minded global citizens.

## Higher Level course content

- **Introduction to Economics** – students learn about the key concepts that underpin economic analysis, the basic economic problem, economic methodology and modelling as well as the history of economic thought.
- **Microeconomics** – considers allocation in competitive markets, the role and methods of government intervention, market failure, and the role of equity in markets. Higher level students also look at the emerging field of behavioural economics, as well as consider the analysis surrounding the theory of the firm.
- **Macroeconomics** – looks at macroeconomic policy objectives, policy methods, and the economics of inequality and poverty.
- **The Global Economy** – focuses on trade and protectionism, exchange rates, economic development, and sustainable development.

Higher Level Economics allows students to explore the subject to a greater depth and breadth than standard level, in particular there is a greater focus on quantitative skills.

## Standard Level course content

- **Introduction to Economics** – students learn about the key concepts that underpin economic analysis, the basic economic problem, economic methodology and modelling as well as the history of economic thought.
- **Microeconomics** – considers allocation in competitive markets, the role and methods of government intervention, market failure, and the role of equity in markets.
- **Macroeconomics** – looks at macroeconomic policy objectives, policy methods, and the economics of inequality and poverty.
- **The Global Economy** – focuses on trade and protectionism, exchange rates, economic development, and sustainable development.



## How Economics combines with other subjects

*“Studying Economics is great because you see issues in the news like the cost-of-living crisis and through your studies you can understand what is happening and what the potential impacts could be.” Hannah*

Economics combines well with several subjects and future career paths that students may wish to choose. Within individuals and societies, it provides students with a course grounded in both mathematical and analytical skills allowing students to practice and develop their skills developed across their other core

courses. Students interested in scientific careers, particularly medicine, may be interested by how the course considers the role of healthcare in the economy and the economic challenges that surround the funding and provision of healthcare globally. The impact of economic forces drives societal change; students who study Economics can see these impacts reflected in the texts they study in English as authors contextualise the economic challenges they face through their literature. Similarly, economic forces drive changes whose impacts can be seen in History, Geography, or Environmental Systems and Societies; Economics helping to develop and deepen student’s analysis in these subjects.

### Extended Essays in Economics

Students have used the skills and interests developed in Economics to complete Extended Essays on a variety of subjects, recent examples include:

- Subsidies on heat pumps in Ireland
- Facebook’s monopoly power
- How Chinese currency manipulation impacts on the US
- Toyota and Japan’s economic recovery
- Demonetisation in India

### Assessment

|                     | <b>Standard Level</b>  | <b>Higher Level</b>   |
|---------------------|--|---|
| Internal assessment | Portfolio of 3 commentaries: students explore current economic news through the lens of economic theory considering micro, macro, and global issues (30%)  | Portfolio of 3 commentaries: students explore current economic news through the lens of economic theory considering micro, macro, and global issues (20%)   |
| External assessment | An extended response paper: students are asked to explain and evaluate economic theory in relation to real world issues (30%)<br>A data response paper: qualitative and quantitative analysis of a real-world scenario (40%) | An extended response paper: students are asked to explain and evaluate economic theory in relation to real world issues (30%)<br>A data response paper: qualitative and quantitative analysis of a real-world scenario (40%)<br>A policy recommendation paper: students use their economic theory to discuss solutions to national and global economic issues (30%) |

## Enrichment

A student run Politics, Economics and Current Affairs Society in which students present and discuss topics that interest them. An external speaker program including individuals such as development economist Dr Will Ruddick founder of 'Grassroots Economics.' Students are also offered the opportunity to compete in the London Institute of Banking and Finance Student Investor Challenge. There have been visits to the London Financial district and the Annual PolEconUK Economics Students' Conference in Central London.

*"I think that studying Economics is a very applicable subject to the real world and it has allowed me to understand concepts spoken about in current affairs that I wouldn't have understood unless I studied Economics. Don't be put off the subject if you haven't studied it before as most people are in the same position and learning a new subject is always exciting."*

**Jemima**

## Universities

Students go on to study Economics and related courses such as Business, International Relations, Politics and Philosophy at university. Destinations include LSE, Cambridge, Durham, Warwick, York, and Leeds.

## Careers

Students who study Economics go on to pursue a variety of careers as the course provides students with a grounding in widely transferable analytical and problem-solving skills; popular industries include: banking and other financial services, accounting, consulting, the civil service and international organisations, NGOs and the charity sector.

*With the growing importance of issues such as climate change, migration, environmental degradation, spatial epidemiology and inequalities, geography is one of the most relevant courses you could choose to study.*

*Along with the multitude of specialisms within geography, it can also be a fantastic supporting subject. We learn and practice transferable skills such as quantitative analysis and qualitative evaluation. If we are to make the world a fairer and more sustainable place, we all need to know more about the world in which we live! **Royal Geographical Society, 2022***

As the world develops, global issues arise and geopolitical tensions fester, there is no other subject more relevant to the modern world than Geography.

The IB Geography course strives to develop an understanding of the dynamic interrelationships between people, places, spaces and the environment at different scales through critical analysis and evaluation with sustainable development at the core. In response, students develop a strong foundation of understanding and awareness of critical global systems, interactions and conflicts, applicable to any future career paths.

In addition to the relevant and globally important content, the geography department is staffed by teachers with a range of specialisms and experience in numerous fields including environmental science, geology, climate science, resource management, geopolitics, financial systems and law. The geography department have a history of outstanding results and consistent applicant success with Oxbridge, Russell Group and other universities.



OCEANS AND  
COASTAL  
MARGINS



GEOPHYSICAL  
HAZARDS



URBAN  
ENVIRONMENTS



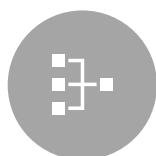
CHANGING  
POPULATION



GLOBAL CLIMATE  
VULNERABILITY  
AND RESILIENCE



GLOBAL  
RESOURCE  
CONSUMPTION  
AND SECURITY



POWER, PLACES  
AND NETWORKS



HUMAN  
DEVELOPMENT  
AND DIVERSITY



GLOBAL RISKS  
AND RESILIENCE



FIELDWORK

## Standard Level course content

| Paper                       | Topics Studied   |
|-----------------------------|--|
| Paper 1 - Geographic themes | Oceans and coastal margins<br>Geophysical hazards  |
| Paper 2 - SL and HL core    | Geographic perspectives—global change <ul style="list-style-type: none"> <li>• Population distribution—changing population</li> <li>• Global climate—vulnerability and resilience</li> <li>• Global resource consumption and security</li> </ul> |
| IA Fieldwork (SL/HL)        | Fieldwork, leading to one written report based on a fieldwork question, information collection and analysis with evaluation.   |

## Higher Level course content

| Paper                       | Topics Studied   |
|-----------------------------|--|
| Paper 1 - Geographic themes | Oceans and coastal margins<br>Geophysical hazards<br>Urban environments  |
| Paper 2 - Core              | Geographic perspectives—global change <ul style="list-style-type: none"> <li>• Population distribution—changing population</li> <li>• Global climate—vulnerability and resilience</li> <li>• Global resource consumption and security</li> </ul> |
| Paper 3 - HL core extension | Geographic perspectives—global interactions <ul style="list-style-type: none"> <li>• Power, places and networks</li> <li>• Human development and diversity</li> <li>• Global risks and resilience</li> </ul>                                     |
| IA Fieldwork                | Fieldwork, leading to one written report based on a fieldwork question, information collection and analysis with evaluation.   |

Human Geography underpins all HL content and there are numerous links to other subjects including Economics and Psychology.

- In unit 4 we study how transport and communication networks have changed over time enabling some places to become super powerful.
- In unit 5 we explore the processes that lead to social and economic development. We also consider the elements of culture and the factors that lead to either homogenisation or hybridity.
- In unit 6 we debate the emerging challenges that are facing our global community and potential strategies to increase resilience.
- We choose to study option G for the optional module. In this unit we explore the variety of urban environments and how their function and structure changes over time. Understanding these social and environmental challenges is essential to building sustainable communities for the future.

## Skills development

Geography to an academic is what the Swiss Army Knife is to a survivalist. A wide and varying array of skills are developed and applied throughout the course and beyond.

- critical thinking and analysis, synthesis
- researching, processing and interpreting data and information, and the subsequent synthesis and evaluation of their knowledge and understanding.
- Interpret and analyse evidence from data, maps, graphs and images
- construct tables, graphs, diagrams, cartographic material and images
- undertake statistical calculations to show patterns and summarize information

## Extended Essays in Geography

- Is Gentrification a 'Necessary Evil' in the area of Lingfield?
- To what extent are carbon emissions of a commute from Headcorn to London reduced by the use of public transport?
- To what extent can political participation across the UK be explained by social and economic disparities?
- To what extent does altitude impact glacial ablation in Switzerland?
- Has reform to the Hukou system or improvement to transport infrastructure been the most significant factor in causing rapid urbanisation in China
- To what extent has the Climate Change Act 2008 been successful at reducing greenhouse gas emissions in
  - the UK?
- To what extent has the movement towards sustainability driven changes in British diets between 2000 and 2020?
- To what extent can agricultural settings be used to increase biodiversity in the UK?

## Assessment

| <b>Paper</b>                       | <b>Exam Timings</b>                               | <b>% of grade</b>    |
|------------------------------------|---|----------------------|
| <b>Paper 1 - Geographic themes</b> | SL - 1 hour 30 minutes<br>HL - 2 hours 15 minutes | SL - 35%<br>HL - 35% |
| <b>Paper 2 - SL and HL core</b>    | SL - 1 hour 15 minutes<br>HL - 1 hour 15 minutes  | SL - 40%<br>HL - 25% |
| <b>Paper 3 - HL core extension</b> | HL - 1 hour                                       | HL - 20%             |
| <b>IA Fieldwork (SL/HL)</b>        | SL - 20 hours<br>HL - 20 hours                    | SL - 25%<br>HL - 20% |

## University Destinations September 2022

|  |   |
|--|---|
| University of Oxford   | Earth Sciences                                    |
| London School of Economics and Political Science, University of London | Environment and Development                       |
| University of Cambridge  | Geography   |
| University of St Andrews   | Geography   |
| University of Cambridge  | Geography   |
| University of Oxford   | Geography   |
| UCL (University College London)  | Geography   |
| University of Leeds  | Geography   |
| University of Exeter   | Geography   |
| University of Exeter   | Geography   |
| Durham University  | Geography   |
| University of Manchester   | Geography   |
| Aberystwyth University   | Geography (with integrated year studying abroad)  |
| Loughborough University  | Geography and Sport Science (with placement year) |
| Loughborough University  | Geography with Economics (with placement year)    |
| University of Manchester   | Geography with Professional Placement             |
| University of Birmingham   | Geography with Year Abroad                        |
| University of Bristol  | Geology   |
| University of Bristol  | Politics and International Relations              |
| SOAS University of London  | Politics and International Relations              |
| University of Bath   | Politics and International Relations.             |

## Enrichment

- Debate Club delivered by staff from the English and Geography departments, which leads to many topical discussions.
- Termly newsletters to signpost students to interesting Geographical content from the wider world. Great for EE inspiration and to support academic aspirations.
- Reading list of recommended reads from the school library.
- School membership to the Royal Geographical Society which provides access to the digital edition of the Geographical Magazine along with live lectures, academic resources and student events.

## Visits

Fieldtrip to coast to collect data for the internal assessment.

## Careers

*According to UCAS, Geography is one of the broadest subject areas with one of the highest employability rates of all undergraduate degrees and some of the most varied career paths of any subject.*

*Employers are readily attracted to the skills geographers bring, including communication and critical thinking, confident use and analysis of data, practical field experience, teamworking and of course spatial thinking, which is often accompanied by expertise in Geographical Information*

*Systems. Additionally, employers value the global mindedness of staff, who understand inter-cultural differences and who see the opportunities these present for innovation.*

*In the 21st Century, socially and environmentally aware staff are vital to the success of organisations in the private, public and charitable sectors. Geographers look set to remain in high demand for decades to come.*

*Geographical Association, 2022*

| <b>Environmental</b>      | <b>Socio-Economic</b>      | <b>Political</b>           |
|---------------------------|----------------------------|----------------------------|
| Waste management          | TV researcher              | Law                        |
| Surveying                 | Tour guide                 | Ambassador                 |
| Climate science           | Lawyer                     | Diplomat                   |
| Cartography               | Exhibition designer        | Politician?                |
| Oceanography              | Fundraiser                 | Special advisor            |
| Volcanology               | Urban planning and         | Consultancy                |
| Hydrologist               | Development                | Political risk analyst     |
| Meteorology               | Transportation planner     | Diplomatic service officer |
| Geomorphology             | Waste treatment            |                            |
| Environmental consultancy | Teaching                   |                            |
| Ecology                   | Business analyst           |                            |
| Agro-ecology              | Historic conservation      |                            |
|                           | manager                    |                            |
|                           | Sustainable business       |                            |
|                           | consultant                 |                            |
|                           | Architectural technologist |                            |
|                           | Land surveyor              |                            |
|                           | Estate agent               |                            |

“Geography gives you the ability to study and analyse the phenoms of the world around us. Developing you into a curious learner able to understand nuance of topical issues. At TGS you will be exposed to the broad range of perspectives needed to become an effective Geographer.” **Talia**

IB History at Tonbridge Grammar School is intellectually challenging, stimulating and crafts students into inquisitive and insightful historians who develop a range of highly transferable skills. The TGS IB History course effectively combines with the skills gained through ToK to create exceptional students who go on to make an excellent transition to undergraduate study in a range of subjects at Russell Group universities.

## Higher Level

The HL content at TGS uniquely allows you to develop your knowledge and understanding of contrasting Early Modern and Modern units. The topics of the Renaissance, Reformation and Exploration are studied in depth in the period c.1400 - c.1600, alongside an investigation of the establishment and development of Authoritarian States in Germany, Russia and China and the Cold War. This combination allows students to be able to make innovative comparisons in terms of trends and topics which stands them in good stead for studying History and related subjects at degree level. To complement this, we complete a source skills paper looking at the Move to Global War in the early part of the 20<sup>th</sup> century in Japan, Italy and Germany.

| Paper               | Topic  | Length of exam     | Weighting |
|---------------------|--|--------------------|-----------|
| Paper 1             | Move to Global War   | 1 hour             | 20%       |
| Paper 2             | Authoritarian States (20 <sup>th</sup> century)<br><br>The Cold War: Superpower tensions and rivalries (20 <sup>th</sup> century)            | 1 hour 30 minutes  | 25%       |
| Paper 3             | The Renaissance (c.1400 – 1600)<br><br>The Age of Exploration and its impact (1400 – 1550)<br><br>Aspects of the Reformation (c.1500 – 1563) | 2 hours 30 minutes | 35%       |
| Internal Assessment |  |                    | 20%       |

In 2021-2022 29% of students achieved a grade 7 in History at HL, and 33% got a grade 6.

## Standard Level

The SL course has an emphasis on 20<sup>th</sup> century History a context which is so very important for understanding our modern world. A key focus is the establishment and development of Authoritarian States in Germany, Russia and China and the Cold War. To complement this, we complete a source skills paper looking at the Move to Global War in the early part of the 20<sup>th</sup> century in Japan, Italy and Germany.



| <b>Paper</b>        | <b>Topic</b>  | <b>Length of exam</b> | <b>Weighting</b> |
|---------------------|---|-----------------------|------------------|
| Paper 1             | Move to Global War  | 1 hour                | 30%              |
| Paper 2             | Authoritarian States (20 <sup>th</sup> century)<br><br>The Cold War: Superpower tensions and rivalries (20 <sup>th</sup> century) | 1 hour 30 minutes     | 45%              |
| Internal Assessment |   |                       | 25%              |

In 2021-2022 100% of students achieved a grade 7 in History at SL.

### **Internal Assessment (IA)**

The IA provides an invaluable opportunity for students to stretch their historical 'wings' and do a detailed investigation of an area of History of their choice. Past topics have included: the Russian Revolution, Rise of Stalin, American Civil War, Lincoln, Gang Culture in Chicago, Suffragettes, French Revolution, English Reformation, American Civil Rights, Kennedy and Vietnam, Mary Queen of Scots, Spanish Civil War, Elizabethan portraiture, Reconstruction, Glorious Revolution, Indian Independence, and the Cuban Missile Crisis amongst others.

### **Extended Essay**

50% of students who did an Extended Essay in History last year achieved a grade A. Students excelled in the process. Completing a long piece of independent research gave students an extra dimension to their historical skills which they can showcase as they apply to courses post TGS. For example, a student who did HL History successfully gained a place at Oxford to read Law did their EE on the Nuremberg Trials and whether or not they delivered justice. Other EE topics from the last few years have included the Haitian Revolution, French Renaissance, Russian Revolution, Lincoln, Medici Family and Vietnam.

### **Combinations with other subjects**

History complements a whole range of subjects including English, Geography, Economics, Psychology and Latin.

### **Destinations**

Over the last few years IB History has enabled students to gain places to read History at Cambridge, Exeter, Manchester, Durham, Newcastle and Bristol amongst others. It had also helped students gain places to study Medicine, Law (Oxford, Durham, Birmingham), International Relations, Psychology, Liberal Arts, Paramedic Science, English (UCL), Geography (Cambridge), Philosophy (Cambridge) and Classics (Cambridge).

### **Careers**

In a time when many people will have more than one career in their working life History gives students a range of highly desirable transferable skills. The study of History at IB can lead to a career in many areas such as: Academia, Media, Law, Politics, Advertising, Education, Journalism, International Relations, Advertising, Banking, Museum work, Accountancy, Publishing, Civil Service and Marketing.

*"The unexamined life is not worth living"* **Socrates**

We explore all kinds of questions examining the deeper meaning of existence and what it means to be human. We also study key ideas such as whether or not God exists, and why do we act in certain ways? Philosophy completely changes the way you look at every aspect of life. It develops invaluable transferable skills such as critical questioning, logical argument, evaluation, analysis and debating.

This subject is perfect for students who enjoy debating, presenting persuasive arguments and exploring more abstract questions on the purpose of life. These are applicable to various fields such as Politics, Law, Journalism and Medicine. It is also a fantastic option for those looking to study medicine or veterinary medicine at university and will really help with those tricky ethical interview questions!

The course is designed to develop students as Philosophers themselves and not merely be able to regurgitate the ideas of famous scholars. The range of topics is excellent and provides students with the ability to make links between different concepts in this entirely interconnected subject.

## Course content

Philosophy is the study of the fundamental nature of knowledge, reality and existence. All students undertake the topic on the core theme of '**Being human**' exploring different aspects of human nature. As well as the text paper **Plato's 'The Republic'** and '**Theories and problems of Ethics**'. Higher level students additionally study **The Philosophy of Religion** and **The Unseen Analysis**

## Assessment:

|                            | <b>Higher Level</b>   | <b>Standard Level</b>   |
|----------------------------|---|---|
| <b>Internal Assessment</b> | Written assignment (20%)  | Written assignment (25%)  |
| <b>External Assessment</b> | Paper 1: Human nature, Ethics, Philosophy of Religion (40%)<br>Paper 2: Text- Plato's Republic (20%)<br>Paper 3: Unseen Text Response (20%) | Paper 1: Human nature and Ethics (50%)<br>Paper 2: Text- Plato's Republic (25%) |

## Extended Essays in Philosophy

- To what extent can human criminal punishments be applied to artificial intelligence?"
- "Is it better to be ignorant and happy or knowledgeable and free?"
- "To what extent is a utilitarian justification of violence in the pursuit of social justice a philosophically convincing position?"

## **Enrichment**

Past events include conferences run by scholars affiliated with the New College of Humanities as well as Southampton University (including Simon Blackburn and Richard Dawkins), seminars from the Philosophy Foundation, speakers (Michael Lacewing, Nigel Warburton, Stephen Law, Peter Vardy and A.C. Grayling).

### **What do students say?**

*"Learning about a variety of philosophical perspectives that can better inform your opinions and values in a variety of fields, both academic and personal. Philosophy informs other subjects really well."* **Isa**

*"Unlike most other subjects, philosophy allows you to form and challenge your own opinions on a variety of issues, teaching you to effectively construct an argument, whilst exploring engaging aspects of both ancient and modern philosophy."* **Lucy**

Psychology is an exciting field of study which offers insight into human behaviour. We all observe, comment upon, think about and evaluate ourselves and others daily, and psychology allows us to do so in a structured, organized, systematic and scientific way. It aims to understand why humans think, feel, and act the way they do. The core of the curriculum focuses on the interaction of biological, cognitive, and sociocultural systems in determining human behaviour. Psychology is a fascinating subject which supports a range of other subjects, such as Biology, Philosophy, History, English, Geography and Theory of Knowledge.



## Course content

Students learn to think critically and develop their research and writing skills. Students should have an inquiring mind and an interest in human behaviour. We draw upon real-life examples in our teaching and offer engaging and interactive lessons.

| Standard Level  | Higher Level   |
|---|--|
| SL students will study: <ul style="list-style-type: none"> <li>▪ Exploration of biological, cognitive, and sociocultural approaches to explaining behaviours, such as memory, aggression &amp; conformity</li> <li>▪ Research methods in psychology, including conducting a psychological experiment for the Internal Assessment</li> <li>▪ Social responsibility in relationships, looking at helping and bystander apathy</li> <li>▪ Abnormal and/or Health Psychology investigates the causes &amp; prevalence rates of a disorder / health problem</li> </ul> | In addition to the SL content, HL students will study: <ul style="list-style-type: none"> <li>▪ The influence of digital technology on cognitive processes</li> <li>▪ The application of research methods in psychology</li> <li>▪ Psychology of personal relationships, looking at behaviours such as attraction and communication</li> <li>▪ Developmental Psychology – investigating how and why humans grow, change, and adapt across the course of their lives, looking at cognitive development, gender identity &amp; empathy.</li> </ul> |

## Assessment

| Assessment Type                  | Standard Level  | Higher Level  |
|----------------------------------|---|---|
| Internal assessment (Coursework) | Experimental study and write-up of findings (25%)   | Experimental study and write-up of findings (20%)   |
| External assessment              | Paper 1 – Core approaches to Psychology (50%)<br>Paper 2 – 1 x question from Options (Relationships / Abnormal) (25%) | Paper 1 – Core approaches in Psychology (40%)<br>Paper 2 – 2 x questions from Options (Relationships / Health / Abnormal) (20%)<br>Paper 3 - Approaches to research (20%) |

## Extended Essays

Students have used the skills and interests developed in psychology to complete Extended Essays on a variety of subjects; recent examples include:

- To what extent does social media have a negative impact on body image?
- To what extent do secure parent-child attachment styles influence the prevalence of ADHD in children?

- To what extent do oxytocin levels affect mother-child bonding and child development?
- To what extent do situational factors affect aggression levels within prisoners?
- To what extent are empathetic people more susceptible to social engineering regarding cyber security?
- To what extent is virtual reality effective for increasing empathy?
- To what extent is restorative justice effective in reducing stress and anger in victims?

## Fieldtrips

Students participate in two fieldtrips in the course. The Year 12 fieldtrip is to the [Bethlem Museum of the Mind](#), which records the lives and experiences and celebrates the achievements of people with mental health problems.

The Year 13 IB Psychology students recent fieldtrip included visiting [UCL's Centre for Neuroimaging](#), where students saw brain imaging technology in action and spoke to neuroscientists about their research. They also visited [The Wellcome Collection](#), a museum which explores health and the human experience. Here are some of the comments from the students:

*"I enjoyed the visit to UCL, as we got the amazing opportunity to see first-hand the technology used in ground-breaking psychological experiments."* **Daisy**

*"I thoroughly enjoyed the psychology fieldtrip I aim to become a Computational Neuroscientist as Neuroscience fascinates me, and this trip has given me a brilliant insight into the type of research equipment and methodologies used to learn more about the brain and how it can generate behaviour."* **Aditi**



## Enrichment

Students participate in the Oxford High School Psychology Conference, NCH Psychology Essay Competition, and the MASSOLIT Video Essay Competition. In addition, Psychology Department Student Ambassadors organise peer mentoring and activities for lower years. There is a program of visiting speakers and alums who visit annually. Below is a reflection from a student who attended the finals of the competition at the University of Oxford.

*"In my MASSOLIT video essay competition, I discussed the psychology of violence, completing a plethora of research and learning some incredibly fascinating new things. Doing essay competitions is not only a part of me, but it also allows me to look at the world from new perspectives and broaden my horizons on exciting topics. I highly recommend participating in essay competitions as it's something great to put into personal statements and can even lead to a career in a certain field of research."* **Rosalie**

## Further study & careers



Psychology provides a solid platform to launch a successful career in academia or nearly any industry. By studying psychology, you develop soft skills such as teamwork, emotional intelligence, persuasive communication and technical skills in research methods, design and statistical analysis. Psychology is a valuable subject for students to further study in Psychology, Neuroscience, Cognitive Neuroscience, Medicine and Law. Many students continue to study the subject at university, including Experimental Psychology at Oxford, HSPS at Cambridge and Clinical Psychology at Exeter. Psychology is also a good option as a Joint Honours Degree combined with a second subject, such as Psychology & Criminology.

## What do students say about Psychology?

"IB Psychology has given me a deeper understanding of the world I never would've had without studying it." **Alice**

"The real-world applications of psychology make it a subject worth studying. Suppose you have previously been interested in anything from human geography to biology. In that case, psychology might be for you due to its interdisciplinary nature - investigating human behaviour through biological, cognitive and sociocultural lenses." **Sophie**

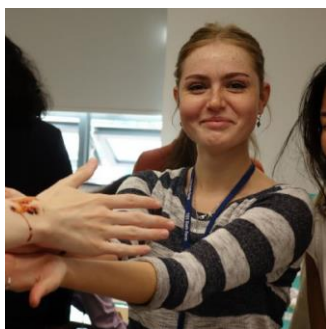
"IB Psychology is a useful subject to study at IB; it links to so many others, like biology, and is fascinating due to how it explains real life. Although it is an essay subject, the discoveries are scientific, which makes it a good opportunity to learn this combination of life skills which you will need for further education." **Francesca**

"I find IB Psychology helps me to be more insightful, understanding and curious about the environment and people around me. This course has broadened my horizons, as everything I learn feels relevant and applicable. I love psychology and would recommend it!" **Jemima**

"Studying psychology is an experience; it takes you one step closer to your mind. While we think it would help us answer questions we didn't know the answers to, it gives us answers to questions we didn't think we had. It is fascinating that every single thing around us is linked to psychology and being able to grasp it and understand it is mind-blowing". **Pooja**

# Science at Tonbridge Grammar School

## The IB Sciences Group Project

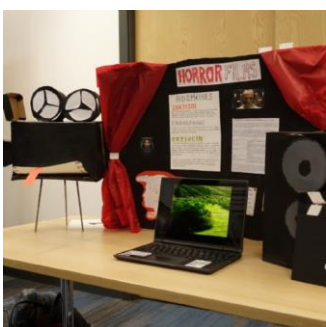


The IB Sciences Group Project is an interdisciplinary and collaborative activity in which students from different Sciences Group subjects work together on a scientific or technological topic.

It is fantastic to be able to involve our entire new cohort of IB Diploma students in the IB Science Group Project so early in the year. From the students' perspective, it means they have already had the opportunity to work with students across the whole of Year 12 and at the same time completing one required element of their IB Diploma course.



Students are placed in groups containing a mixture of those studying Biology, Chemistry, Physics, Design Technology, Computing Science and/or Environmental Systems and Society. They inevitably have the opportunity to meet some new faces and are challenged to employ the IB Learner Profile Attributes to demonstrate that they are thinkers, inquirers, communicators, risk takers, knowledgeable, principled, caring, open-minded, balanced and reflective.



The Project also addresses several of the IB Science Group Aims, including "developing and applying 21st century communication skills in the study of science"; "becoming critically aware, as global citizens, of the ethical implications of using science and technology" and "developing an understanding of the relationships between scientific disciplines".

A previous theme was 'At the Movies' and allowed for concepts and perceptions from across the disciplines to be shared as each group developed the theme as they saw fit. While the two days set aside for the Project are very much about the process, not the product, each group of students produced a presentation before displaying this at the TGS IB Sciences Group Fayre. Following this, students are required to reflect on their experiences, provide feedback and vote for their favourite presentation.



Mr Kennedy, Subject Leader, Biology and IB Sciences Group Co-ordinator: "This is just one of many opportunities the IB Diploma offers to students to use their knowledge, understanding and skills in a scenario that addresses a real-life context. Our Year 12 students certainly rise to the occasion with a wide variety of attractive, engaging and entertaining presentations."



*Working with new people was a good icebreaker to get to know other students as someone joining TGS from another school.*

*I very much enjoyed walking round other people's presentations and striking up conversations with people I hadn't met. I also really enjoyed how each group had at least one interactive element, which made it lots more fun.*

## Supporting Aspiring Medics, Dentists and Vets

Tonbridge Grammar School has a comprehensive programme for aspiring medics, dentists and vets designed to support, inspire and challenge them during their journey from school to medical school.

Curated by a senior teacher with more than 15 years of experience in supporting medical school applications, its success speaks for itself. We have an excellent track record of students gaining places to study medicine (including veterinary medicine) at a variety of universities.

At the heart of the programme are two thriving societies: Medsoc for Years 11, 12 and 13 and Junior Medsoc (Years 7-10).

Medsoc weekly meetings include talks from doctors and medical students, and recent speakers have included a local GP and a brain specialist. Speakers from universities regularly attend and provide briefings on applying to medical school, entry tests, interview skills and entry requirements. Medsoc also provides a forum for discussions on relevant topics such as ethics.

'Junior Medsoc' provides a forum for relevant speakers and debate for younger members of the TGS community who have an interest in medicine.

Bespoke support throughout the application process includes:

- Early support for potential candidates from the start of Year 12
- Training for UKCAT entrance test from April Year 12 (exam Jul-Oct).
- Assistance with personal statements and university choices Jul- Oct Year 12/13.
- Ensuring relevant medical experience and skills are included in UCAS references.
- Training for BMAT entrance test from September Year 13 (exam Nov).
- Interview practice for students in Year 13.
- Medicine links to other subjects such as Philosophy (the exploration of medical ethics), Psychology (Biology of the brain).

"MedSOC has been brilliant throughout the process of my application. It's so useful to have a forum in which to discuss anything and everything related to medicine, and the support provided in terms of the other aspects of the application - anything from admissions tests to interviews - is great." Year 13 Student

### Visit by Dr Pearson, Senior House Officer, Gastroenterology



Lucy and Ellie (Year 12) review her visit:

Here at TGS we have multiple students who are aspiring to go into the medical industry in the future. Year 10-13 were lucky enough to receive a visit from ex-student, Harriette Pearson, who is now a fully qualified doctor, and listen to her talk about her experience so far.

In her lunchtime lecture, we learnt about many aspects of her life as a doctor and what it has taken for her to get this far. She discussed her experience in the sixth form at TGS and how the IB prepared her for university life.

We were all greatly reassured as she emphasised how useful the IB was when managing the workload and the independent learning style that she experienced at university, as well as how it was helpful when adapting to the fast paced, persistent life of a medicine student. She explained that throughout her time in sixth form doing the IB she obtained many valuable skills that set her



aside from other students allowing her to transition and cope with university life better than others.

Dr Pearson also helpfully advised us on the interview process and provided many useful tips that she had used to succeed in them.

Another aspect of her lecture was a diary entry of her day at work the previous day. We found it extremely insightful as she gave a neutral insight into the life of a doctor. As hopeful medical students many of us agreed that it was "refreshing to have an honest unbiased opinion on a doctor's life that hasn't been glorified and unrealistically portrayed". (Ellie, year 12).

She explained to us the highs and lows of the job and highlighted that although being a doctor and helping people can be a highly rewarding responsibility, it can also take a toll on your mental health and that that is something that you as a person will need to learn to manage.

Dr Pearson's answers to all our questions was really helpful and we all really appreciate Dr Pearson giving up her time to talk to us as her information was invaluable and informative.

### Royal Society Funded Research Partnership Project



A STEM project submitted to the Royal Society by Dr Emmanuel, Teacher of Biology and STEM Co-ordinator, was approved providing TGS students with £3,000 of university-standard technical equipment. The project helps students develop skills in applying molecular techniques such as DNA profiling, electrophoresis and Polymerase Chain Reactions to real life situations involving genomics,

bioinformatics, diagnostics, medicine, agriculture, nutrition science and forensics. Students will also see how these techniques are being used by scientists during the current pandemic in the fight against COVID. The Royal Society assessors were particularly impressed by the way the project develops other transferable skills such as problem-solving, independent thinking, critical analysis, teamwork, creativity, communication and digital literacy. The project sets up an academic partnership with Dr Russell Hearn from King's College London who will mentor students, helping with methodology as well as giving career talks to give our students an insight into STEM related careers.

### Competition-winning Periodic Table takes pride of place in the Science Department



A Periodic Table designed by year 12 students Jess, Eloise, Renée and Beth has recently been put on display in the Science Department. It was designed as part of a competition run by the Royal Society of Chemistry in 2019 to celebrate the 150th anniversary of the Mendeleev Periodic Table.

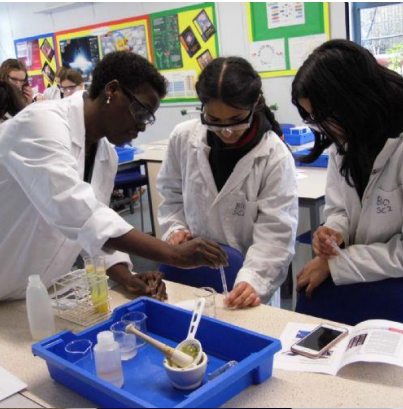
As part of the design, the students researched logos with the same letters as the chemical symbols of the elements, creating a colourful poster featuring brands

from across the world.

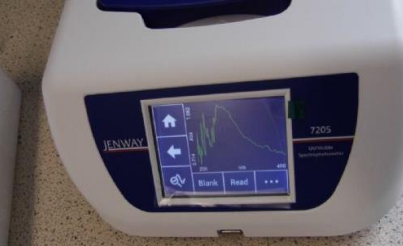
## From detecting DNA to designing a sustainable greenhouse – a celebration of Science



TGS celebrated Science Week with a wide range of activities that included a 'Four Day DNA Technology Series' supported by the Royal Society, measuring trees in the school grounds for the Treezilla research project, designing a greenhouse from sustainable materials as part of our Marvellous Meadows Project, building DNA models from sweets, investigating the carbon footprint of the School and taking part in a wide variety of experiments.



Students also created a video celebrating Science at TGS, that was presented during virtual assemblies throughout the week.



Dr Emmanuel, Teacher of Biology and STEM Coordinator, explains more about the DNA Technology Series: It was exciting for students to use state-of-the-art equipment such as a UV-Vis spectrophotometer, fluorometer and electrophoresis tank to detect and quantitate DNA from various plant samples such as onion, strawberry, kiwi, banana and leek and such joy to see students actively participating, learning and appreciating new advances in science and technology. My thanks to Year 13 scientists Eve, Edie, Ritika, Mahasana and Catherine who assisted throughout the programme".

*"I found the session extremely exciting, interactive and practical, as someone interested in Medicine. It developed my knowledge on DNA and its application in the working world."*

## Picnic Blankets from Recycled Materials



Students have collaborated with a STEM Club in the Bahamas to co-create sustainable gifts to present to the Duke and Duchess of Cambridge and First Lady Ann Marie Davis of the Bahamas as gifts to raise awareness of climate change. The students were contacted by the BIEA judges who had remembered a project that the team had shared alongside their competition entry. The project involved reusing plastic crisp packets by recycling them into picnic blankets.

The judges put them in touch with the students in the Bahamas and the TGS students talked the Bahamian team through how to make the blankets via Zoom.

The main goal was to find ways to help the environment. Students wanted to focus on specifically upcycling plastic. The packets that they found could be easily fused and used to line picnic blankets, making them more durable. Participating in the BIEA project and having the honour of working alongside teammates from FEM STEM Bahamas, has motivated students to continue spreading awareness about the plastic crisis.

## **STEM: the Young Researcher's Club**

Science in schools today is intended to centre around Sir Gareth Robert's recommendations on the need to maintain the flow of transferable skills in the UK job market. To foster sustainability in the UK economy, the need to encourage the young generation towards developing STEM skills becomes mandatory.

### **Aim**

To run real-time research to; provide a functional view of life-long skills as a roadmap to global sustainable development, dissipate misconceptions and mitigate mechanistic approach to understanding the job market.

Students learn rudiments of research in different areas of STEM, explore the interconnectivity between subject areas and discover understandings beyond the curriculum. The expression of our aim is drafted with carefully chosen words to highlight the problems and the probable solutions

### **Objectives:**

Provide skill -based STEM projects that allow students to;

- explore the interconnectivity between academic disciplines
- develop their view of the world
- enrich the nature of their understanding

### **What we have done so far**

- Partnership with the Royal Society and Dr Hearn from Kings College, London to run a Molecular Biology project- **What are the similarities and differences in DNA harvest and profiles of three members of the genus *Allium*?**
- STEM project which incorporated ideas from COP26 was embedded into year 8 curriculum – **How can Science help us understand and save our planet?**
- A workshop on DNA series to celebrate the Science week
- Year 12 STEM activity – **Are soaps designed to kill microbes?**

### **Projects this year**

1. Our current research '**To what extent do humans connect with soil as a living entity? -A case study of TGS meadow**' explores the interconnectivity between Psychology, Biology and Chemistry using a mixed method approach. We are grateful for the expertise of Dr Marshall.
2. Next research is to repeat the Molecular Biology experiment and link the concept to IB Biology curriculum
3. Year 9 STEM Project 1- **How can the interlink between health and the environment enhance sustainable development?**

The club is open to students in Year 7-13. Some projects see students working together in Years 7-13, others are discrete for individual year groups.

“As one of the three Natural Sciences in the IB Diploma Programme, Biology is primarily concerned with the study of life and living systems. Biologists attempt to make sense of the world through a variety of approaches and techniques, controlled experimentation and collaboration between scientists. At a time of global introspection on human activities and their impact on the world around us, developing and communicating a clear understanding of the living world has never been of greater importance than it is today.

Through the study of DP Biology, students are empowered to make sense of living systems through unifying themes. By providing opportunities for students to explore conceptual frameworks, they are better able to develop understanding and awareness of the living world around them. This is carried further through a study of interactions at different levels of biological organisation, from molecules and cells to ecosystems and the biosphere. Integral to the student experience of the DP Biology course is the learning that takes place through scientific inquiry. With an emphasis on experimental work, teachers provide students with opportunities to ask questions, design experiments, collect and analyse data, collaborate with peers, and reflect, evaluate and communicate their findings. DP Biology enables students to constructively engage with topical scientific issues. Students examine scientific knowledge claims in a real-world context, fostering interest and curiosity. By exploring the subject, they develop understandings, skills and techniques which can be applied across their studies and beyond.”

*IB Diploma Biology (IBO, 2022) Subject Brief*

## Course content

Most topics within each of the four **unifying themes** are included in both Standard and Higher Level subjects. At Higher Level topics are generally examined in more depth. Some topics (indicated with an asterisk) are not included in the Standard Level content.

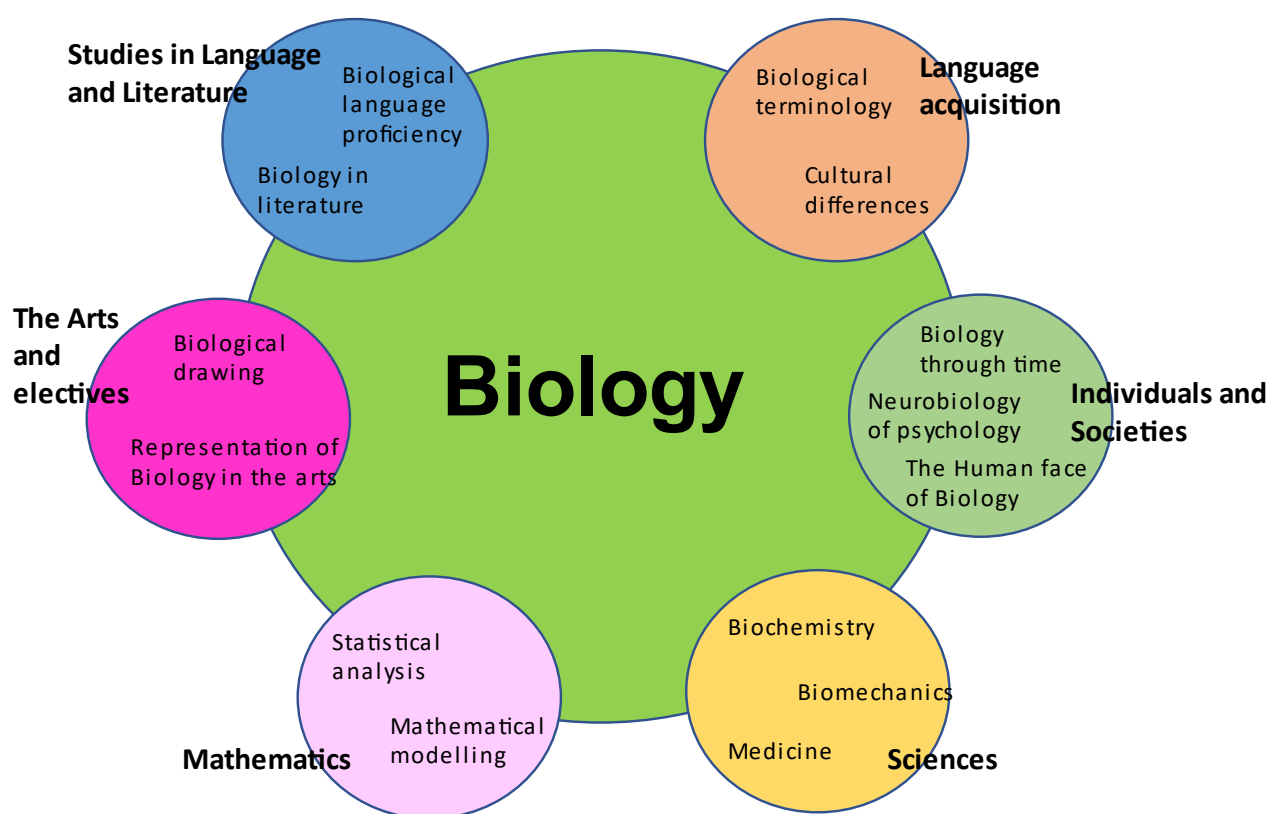
|  |   |
|--|---|
| <p style="text-align: center;"><b>Unity and diversity</b></p> <ul style="list-style-type: none"> <li>• Water</li> <li>• Nucleic acids</li> <li>• Origins of cells *</li> <li>• Cell structure</li> <li>• Viruses *</li> <li>• Diversity of organisms</li> <li>• Classification and cladistics *</li> <li>• Evolution and speciation</li> <li>• Conservation of biodiversity</li> </ul>   | <p style="text-align: center;"><b>Form and Function</b></p> <ul style="list-style-type: none"> <li>• Carbohydrates and lipids</li> <li>• Proteins</li> <li>• Membranes and membrane transport</li> <li>• Organelles and compartmentalization</li> <li>• Cell specialisation</li> <li>• Gas exchange</li> <li>• Transport</li> <li>• Muscle and motility *</li> <li>• Adaptation to environment</li> <li>• Ecological niches</li> </ul>                                |
| <p style="text-align: center;"><b>Interaction and Interdependence</b></p> <ul style="list-style-type: none"> <li>• Enzymes and metabolism</li> <li>• Cell respiration</li> <li>• Photosynthesis</li> <li>• Chemical signalling *</li> <li>• Neural signalling</li> <li>• Integration of body systems</li> <li>• Defence against disease</li> <li>• Populations and communities</li> <li>• Transfer of energy and matter</li> </ul> | <p style="text-align: center;"><b>Continuity and change</b></p> <ul style="list-style-type: none"> <li>• DNA replication</li> <li>• Protein synthesis</li> <li>• Mutations and gene editing</li> <li>• Cell and nuclear division</li> <li>• Gene expression *</li> <li>• Water potential</li> <li>• Reproduction</li> <li>• Inheritance</li> <li>• Homeostasis</li> <li>• Natural selection</li> <li>• Sustainability and change</li> <li>• Climate change</li> </ul> |

## Assessment

The assessment model is similar for both Higher and Standard Level Biology, apart from the different content assessed, the only other difference is the length of the papers, which are logically shorter for Standard level students.

|                     |   |
|---------------------|---|
| Internal assessment | <p><b>Scientific investigation (20%)</b></p> <p>The scientific investigation is an open-ended task in which the student gathers and analyses data in order to answer their own formulated research question. The outcome of the scientific investigation will be assessed through the form of a written report. The maximum overall word count for the report is 3,000 words.</p> |
| External assessment | <p><b>Written examinations (80%)</b></p> <p>There are two written papers. Questions range from multiple choice and databased analysis questions to short and extended response questions (80%)</p>  |

## How Biology combines with other subjects



## Skills in the study of Biology

The skills and techniques students experience through the course are encompassed within a set of 'tools'. These support the application and development of an inquiry-based process, including, but not limited to investigatory work. These tools along with the process of inquiry are integrated into the teaching of the syllabus and can be widely applied in other academic and non-academic situations. They include: experimental techniques; the use of technology; mathematics; exploring and designing; collecting and processing data; concluding and evaluating.

## Examples of Extended Essays Research Questions involving Biology

- To what extent can a balance be achieved between the need for conservation of large mammal species and its impact on economic sustainability on a local human community in Kenya with reference to African elephants (*Loxodonta africana*) and black rhinos (*Diceros bicornis*) in the Ol Pejeta Conservancy.
- To what extent do natural (bovine) and artificial (microbial) sources of rennet differ in their characteristics of coagulation of goat, whole-fat cow, skimmed cow, sheep and lactose free milk as identified by the mass of whey produced and how does this relate to applications in the modern day?

## Enrichment and Visits

- Option of Residential Ecology Field course
- University lectures
- Science or Eco Clubs
- Medical Society
- Young Researchers' Club
- CREST Awards
- Marvellous Meadows Project
- IB Sciences Collaborative Group project
- STEM activities (e.g. Biotechnology)

## The Biology Field Course



The annual field trip to Flatford Mill is a highlight of studying IB Biology at TGS. The centre is set amidst the quintessentially English countryside of Constable Country in Suffolk and sits on the banks of the River Stour.

Students can opt to complete their Internal Assessment on the field trip. IA titles have included:

To what extent does the species of tree, chestnut (*Castanea sativa*) and oak (*Quercus robur*), affect the species diversity of fungi in Grove Wood at Flatford Mill?

To what extent does height above shore affect the percentage cover of *Spartina alterniflora* (cordgrass) at Holbrook Marsh?

To what extent does the abundance of the detritus in open and closed systems in the Gibbonsgate Lake and the Millstream of Flatford Mill affect the levels of the detritivore, Lesser Water Boatmen (*Corixa punctata*)?

## What do students say about the Field Trip?

"I found that practising ecology work really helped me understand what I needed to do on the day of collecting the data for my IA."

"It was fun to see more unique habitats (e.g. saltmarsh)."

"I enjoyed being able to work as a group, working together to collect research data."

## Universities and Further Study

To list a few of the wide range of Life Science-related courses students have moved on to study after taking IB Biology:

|  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Biological Sciences</li><li>• Ecology and Environmental Biology</li><li>• Biomedical Science</li><li>• Biochemistry</li><li>• Medicine</li><li>• Veterinary Medicine</li></ul> | <ul style="list-style-type: none"><li>• Human Sciences</li><li>• Neuroscience</li><li>• Physiological Sciences</li><li>• Sport and Exercise Science</li><li>• Psychology</li><li>• Marine Biology</li></ul> |
|--|---|

## Careers related to Biology

**Medical Practitioner; Dentist; Biologist; Veterinary Scientist; Geneticist; Microbiologist; Pharmacist; Sports Scientist; Physiotherapist; Zoologist; Ecologist; Environmental officer; Science Journalist; Teacher; Lecturer; Nutritionist; Biochemist; Biotechnologist; Forensic Scientist; Virologist; Research Scientist; Neurologist; Molecular Biologist; Immunologist; Pharmacologist; Laboratory Technician; Environmentalist; Zoologist; Palaeontologist; Forensic Scientist; - Conservation Biologist; Epidemiologist; Marine Biologist Food Botanist; Scientist; Data Analyst**

## What do students say about studying Biology at TGS overall?

“I felt that IB Biology teaching at TGS was of a very high standard and the teachers all had a comprehensive understanding of the syllabus and [provided] lots of other related and interesting information.”

“The course is very structured and it is always clear where the lessons are heading and links are frequently made between the different topics, which makes it easier to understand the actual exam papers.”

“I really enjoyed the interactive aspects of Biology like in Year 12 when we showed the steps of mitosis/meiosis on biscuits with sweets because techniques like that really helped me to remember it.”

## Chemistry is Life! Life is Chemistry!

Chemistry is often called the central science as chemical principles underpin both the physical environment in which we live and all biological systems. Apart from being a subject worthy of study, Chemistry is often a prerequisite for many other courses in Higher Education, such as medicine, biological science and environmental science and a great complement to sports and earth science. It sets out to explain how things work on a molecular level which can help us in terms of understanding processes for industry and in the treatment of disease.

### Course content

Chemistry is first and foremost a practical subject, so students are given the opportunities to design investigations, collect data, develop manipulative skills, analyse results, collaborate with peers and evaluate and communicate their findings. Students work independently but also collegiately to mirror the way in which scientific research is conducted in the wider community. We also use Mathematics and technology to help us solve problems.

The topics studied are:

|  |   |   |
|--|---|---|
| <b>1. Models of the particulate nature of matter</b>   | <b>2. Models of bonding and structure</b>   | <b>3. Classification of matter</b>  |
| <ul style="list-style-type: none"> <li>• Introduction to the particulate nature of matter</li> <li>• The nuclear atom</li> <li>• Electron configurations</li> <li>• Counting particles by mass: The mole Structure</li> <li>• Ideal gases</li> </ul> | <ul style="list-style-type: none"> <li>• The ionic model</li> <li>• The covalent model</li> <li>• The metallic model</li> <li>• From models to materials</li> </ul>                                       | <ul style="list-style-type: none"> <li>• The periodic table: Classification of elements</li> <li>• Structure</li> <li>• Functional groups: Classification of organic compounds</li> </ul>             |
| <b>Reactivity 1. What drives chemical reactions?</b>   | <b>Reactivity 2. How much, how fast and how far?</b>  | <b>Reactivity 3. What are the mechanisms of chemical change?</b>  |
| <ul style="list-style-type: none"> <li>• Measuring enthalpy change</li> <li>• Energy cycles in reactions</li> <li>• Energy from fuels</li> <li>• Entropy and spontaneity</li> </ul>  | <ul style="list-style-type: none"> <li>• How much? The amount of chemical change</li> <li>• How fast? The rate of chemical change Reactivity</li> <li>• How far? The extent of chemical change</li> </ul> | <ul style="list-style-type: none"> <li>• Proton transfer reactions</li> <li>• Electron transfer reactions</li> <li>• Electron sharing reactions</li> <li>• Electron-pair sharing reactions</li> </ul> |

Students are also given the opportunity to conduct a detailed investigation (IA) that involves a hands-on approach, use of databases, modelling, simulation or a hybrid. Typical questions are as follows and can be from any area of Chemistry:

- How does the temperature of a water sample affect its purity, investigated through the Winkler Method and Dissolved Oxygen concentrations?
- To what extent is the polarising ability of a glucose solution affected by the temperature and concentration?

Students can also choose to complete Extended Essays in Chemistry such as:

- Does the sugar or the acid in fizzy drinks have a greater effect on the dental enamel demineralisation?
- How does the potential damage that rocket emissions cause to the ozone layer compared to damage from other previously identified sources?



Chemistry is also used for world studies essays where students can link Chemistry with other subjects. We have had essays linked with Psychology looking at drugs and linked with economics researching alternatives to fossil fuels.

### Enrichment

Students participate in the Chemistry Olympiad, Cambridge Chemistry Challenge; STEM Club and get involved in self-guided research projects and Crest Awards, MedSoc, numerous STEM competitions and awards, Nuffield research placement.

### Assessment (There is a new Assessment model for teaching from September 2023)

|                     |  |
|---------------------|--|
| Internal assessment | Individual Investigation (20%)                               |
| External assessment | Paper 1 - Multiple Choice,<br>Paper 2 - Longer answers (80%) |

### Further study

Chemistry students go on to study a range of subjects including Medicine, Chemistry, Earth Science and Biochemically related degrees. The destinations include Oxford and Cambridge and are heavily weighted in favour of Russell Group universities.

|                      |  |
|----------------------|--|
| Chemistry            | Oxford, Liverpool, Nottingham                                      |
| Biochemistry         | Warwick,   |
| Biomedicine          | Dundee, Sussex, Birmingham, Bath                                   |
| Natural Sciences     | Durham   |
| Chemical Engineering | Bath   |
| Earth Sciences/Geog  | Oxford, Cambridge  |
| Medicine             | Imperial, Newcastle, Kings, Quenn Mary x2, Birmingham, East Anglia |
| Veterinary Med       | Cambridge, Nottingham x2   |
| Nursing              | Manchester, York   |
| Physiology           | Newcastle  |
| Sports Science       | Newcastle  |
| Human Sciences       | UCL  |

### What do students say?

"I chose Chemistry because I find it an interesting and dynamic subject. Although it can be challenging academically, it is so rewarding to understand the concepts explored, and this can lead to thought-provoking discussions, which are applicable in a real-world context. The material covered is so diverse that there is something for everyone, and you are given the chance to really understand why something happens the way it does. Don't let the difficulty of Chemistry daunt you - if you love the subject, then you should definitely take it." **Molly**

*Part of what made the Macintosh great was that the people working on it were musicians, poets, and artists, and zoologists, and historians. They also happened to be the best computer scientists in the world. Steve Jobs*

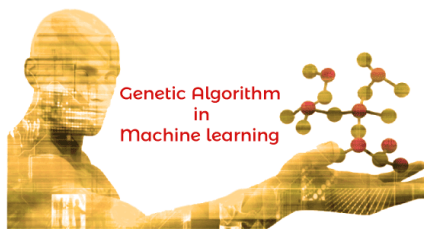
Computer Science is arguably an Art as well as a Science and is for everyone. It is a discipline that promotes thinking creatively, critically, logically; developing reasoning and problem-solving skills. In addition to the initial quote, Steve Jobs also said that "Everybody should learn to program a computer, because it teaches you how to think". Computational thinking is applicable to many subject areas and is traditionally associated with Maths and Physics but there are clear links with many if not all subjects. Music and Language learning is supported when students can identify patterns, and skills in abstraction and decomposition can help students to construct an argument and structure essays. Creative thinking skills link Computer Science to Design Technology and Art leading to animation, gaming, engineering and architecture. The possibilities are endless with a Computer Science qualification.



Computer science is the fastest growing job market and students with programming skills are highly sought-after job applicants. Whilst knowledge of the underlying technology is very important, it's the softer skills of reasoning and problem solving that employers really find attractive. These skills for success are the key to understanding why computational thinking is so valuable.

## Why Study Computer Science at TGS?

This course is very collaborative, students enjoy learning together, making mistakes together and sorting them out together. The challenge of the course is exciting and the feeling of achievement each lesson (well maybe not each lesson!) is invigorating. Students are regularly boosted by small wins and genuinely feel proud of the progress they make from the beginning of the course to the submission of the demanding Internal Assessment. Computer Science teachers are hard to find and we are lucky enough to have 3 subject specialists in school, all passionate about the discipline. The delivery of the course is enhanced by



outside speakers such as George Boukeas who works on the Astro Pi project at the European Space Agency. He was very impressed by the students' questions on Genetic Algorithms and they were excited to hear about his job and the projects he is working on. We also arrange trips such as attendance at the "Computer Science in Action" conference in London and have local contacts to support students with authentic work experience. We extend a warm welcome to the department.

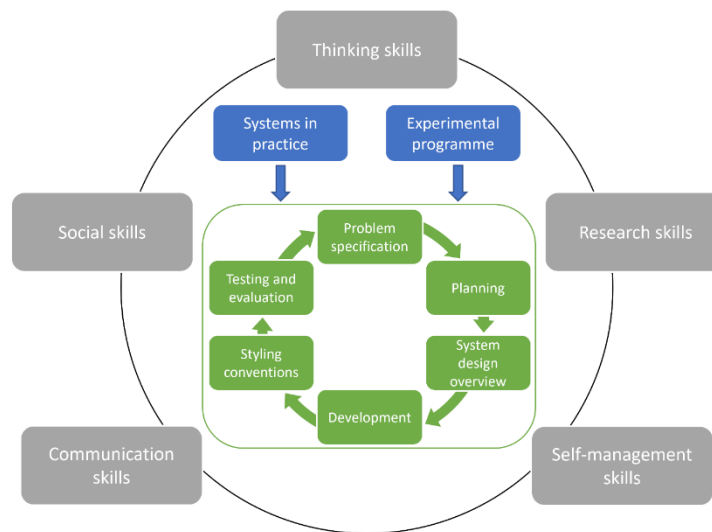
## The Course

Computer Science in the IB Diploma builds on knowledge and understanding gained during the GCSE Computer Science course. However, we assume no prior knowledge and not having studied the GCSE is not a barrier to success on this course.

The Computer Science curriculum is organized into three areas of learning:

- Systems in theory (theoretical underpinnings of the course)
- Systems in practice (the practical application of the theory)
- Systems in context (which connects the theory and practice to real-world scenarios and applications)

In addition, there are four themes: Abstraction, Design, Development, and Evaluation. The course is driven by concepts that underpin learning in the subject and aims to develop understandings that connect factual, procedural and metacognitive knowledge and skills. Learning is therefore non-linear and topics such as Databases, Networks, Vulnerabilities, Operating Systems and Programming are revisited regularly as they are interconnected. Students will enjoy a practical experimental approach to learning with an emphasis on skills development.



## Practical Work

Computer scientists work to understand, model and solve local, national and global problems. In response, computational solutions are developed to address these problems and facilitate the development of a world that is safe and sustainable for future generations. The development of solutions at local, national or global scales lies at the heart of this computer science course.

Students undertake a significant project that is a user-centred investigation into the needs and wants of the client and users, design and develop their solution, and test and evaluate the solution. They submit an individual report documenting their process and understanding of the programming techniques they have used, justifying their decision making in terms of the client's needs. The emphasis of the assessment here is higher-order thinking skills.

## Past Internal Assessments Examples

- A traditional character based 'cave' game or village building game
- A predictor of blood types for grandchildren, given the grandparents blood types
- Timetabling systems for revision or hiring holiday lets
- Card games like Cluedo and Cribbage
- 3D Noughts and Crosses against the computer
- A teaching system for Battleships
- Quizzes that recommend questions to answer/topics to study based on prior attempts
- Game to support students' transition from primary school to secondary school
- A collection of puzzles to help a dyslexic friend with their spelling challenges
- A system for tracking growth of plants in a new vegetable patch with reminders for caring routines
- A system to record and monitor a parent's fitness regime and recommend next steps based on progress

## Assessment

Standard Level:

| Component                  | Overall weighting (%) | Approximate weighting of objectives (%)      |    | Duration (hours) |
|----------------------------|-----------------------|--|----|------------------|
|                            |                       | 1 + 2  | 3  |                  |
| <b>Paper 1</b>             | 40                    | 25   | 15 | 1 ¼              |
| <b>Paper 2</b>             | 30                    | 10   | 20 | 1 ¼              |
| <b>Internal assessment</b> | 30                    | All assessment objectives are tested equally |    | 45               |

Higher Level:

| Component                  | Overall weighting (%) | Approximate weighting of objectives (%)      |    | Duration (hours) |
|----------------------------|-----------------------|--|----|------------------|
|                            |                       | 1 + 2  | 3  |                  |
| <b>Paper 1</b>             | 40                    | 20   | 20 | 2                |
| <b>Paper 2</b>             | 40                    | 20   | 20 | 2                |
| <b>Internal assessment</b> | 20                    | All assessment objectives are tested equally |    | 45               |

## External Assessment

All students will sit two external examinations at the end of the course.

Paper 1 focuses on problem solving and combines syllabus content from the Systems in Theory and Systems in Practice areas of learning. Section B of paper 1 requires students to read, understand, interpret and write code in either Java or Python.

Paper 2 focuses on applying theory and practice to real-world contexts and combines syllabus content from Systems in Theory, Systems in Practice and Systems in Context. Section B of paper 2 is common for SL and HL and is framed by a given technology context.

## Extended Essays in Computer Science

- *To what extent is Dijkstra's algorithm a better or worse solution than the use of Bellman-Ford's algorithm when finding the shortest path between European cities for cost and time?*
- *An investigation into the advantages and disadvantages of legacy systems with a practical comparison between the performance of a modern 2020 Apple MacBook Pro and a Legacy 2010 Apple MacBook Pro*
- *To what extent is the Damerau-Levenshtein distance algorithm more effective than the Longest Common Subsequence distance algorithm in predicting the 100 most commonly misspelt words in the English language?*
- *To what extent is the Blowfish symmetric encryption algorithm more time efficient compared to the RSA encryption algorithm when encrypting passwords?*
- *To what extent are online targeted adverts based on psychological profiling an effective tool of persuasion with reference to the study psychological targeting as an effective approach to digital mass persuasion by S.C.Matz, M.Kosinski, G.Nave, and D.J.Stillwell?*
- *To what extent does the Wing Project in Canberra, Australia demonstrate drone technology to be the most economically efficient solution to the last mile problem?*
- *To what extent does the Singapore autonomous vehicle model represent a safer world where humans are saved from themselves?*

## University Destinations

Last year our Computer Science students went to these Universities:

|                                 |                                      |
|---------------------------------|--------------------------------------|
| Cardiff University              | Computer Science                     |
| Queen Mary University of London | Computer Science                     |
| University of Warwick           | Data Science                         |
| Falmouth University             | Animation                            |
| Falmouth University             | Game Development: Programming        |
| University of Cambridge         | Geography                            |
| SOAS University of London       | Politics and International Relations |

## Alumni stories

**Cat** studied Computer Science at GCSE and IB Diploma. She still struggles to decide between Dance and Computer Science as a Career and as a result has completed Computer Science Degrees and studied at the London School of Musical Theatre whilst working in Tech on the side. Cat has really enjoyed the client facing aspects of her work and says that she is "proud to be a woman in Computer Science. I think it's important to break stereotypes. It's a great subject to study because so much of our lives are infiltrated by tech and so many of us are unaware of the impact of this"

**Megan** also studied Computer Science at GCSE and IB Diploma and has graduated from a degree apprenticeship with ARM. She visits regularly to update us on her progress and inspire other students.

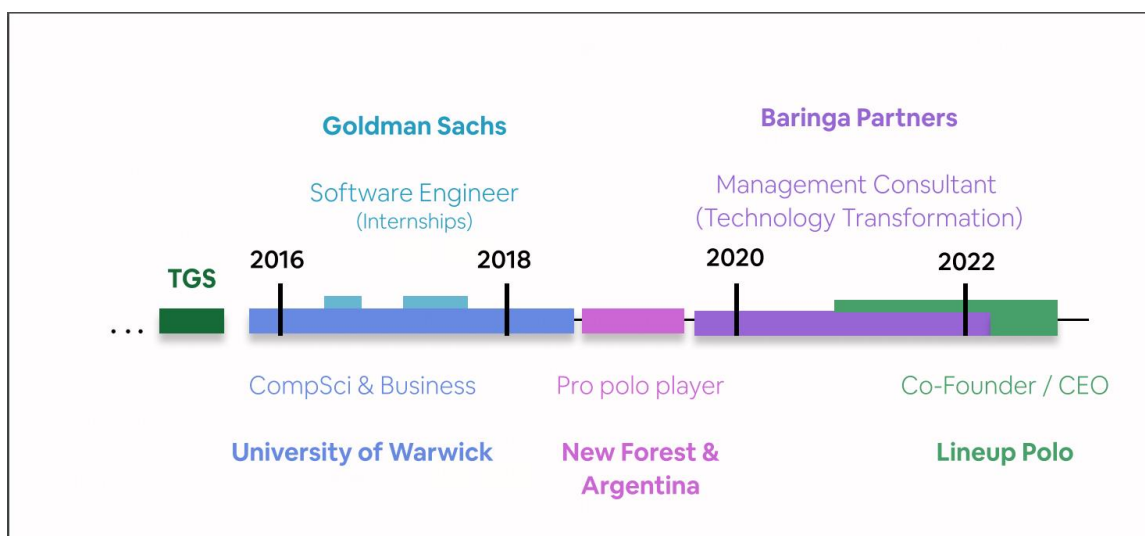
Both Megan and Cat continue to inspire young girls to study STEM subjects as part of their outreach work within their current companies.

**Victoria**, now a PhD student looking at computational models of moral decision making, told us "The best thing about Computer Science? The combination of skills, knowledge and confidence it brings allows you to BE YOUR OWN BOSS! I am currently in Japan working remotely from my laptop for a company in the UK."

We are very proud to learn that **Lucie**, now an Environmental, Social and Governance (ESG) Manager for a courier company has been nominated for Young Businesswoman 2022!

**Abbie** who now works in Real Estate said that "Computer Science has taught me resilience and most importantly to learn to believe in myself. There's nothing better than realising that, actually, you are able to solve that problem you initially thought was impossible"

**Alice's** Internal Assessment Project was a championship organising programme for Polo. She saw a niche in the market for her product and developed it further at university and is now working on it full time as part of a startup with her friend. The product is called Lineup Polo and Alice has travelled to America to raise funding for the project. This is her timeline:





Design Technology is the subject that draws from and relates to all others. It looks at how we function as individuals and societies and helps us to consider how we can change our world for the better.

Knowledge and skills in IB Design Technology are gained through a mix of practical exploration, theory learning and design projects.

We encourage students to identify problems and solve them using whichever materials and processes are most suitable.

## IB Design Technology Topics

01



Human Factors and Ergonomics

Resource Management  
and Sustainable Production



02

03



Modelling

Raw Material to Final  
Production



04

05



Innovation and Design

Classic Design



06

07



User-Centred Design- HL

Sustainability- HL



08

09



Innovation and Markets- HL

Commercial Production- HL



10

## Why study Design Technology at TGS?

We have fantastic facilities for resistant materials and textiles study. Our specialist team of teachers and technician guide you every step of the way to bring your design ideas to life. The open-ended nature of the Internal Assessment provides an opportunity to explore aspects of Design Technology that you are particularly interested in.

As a TGS IB Diploma student you will become a competent Design Technologist learning to pick the right materials and tools for the right job whilst keeping sustainability at the forefront of your thinking. You will understand the ways in which Design can be applied to make the world a better place and this will become central to your personal design philosophy. Along the way you will discover how to create CAD designs, design in 3D and learn sophisticated skills in textiles. You will learn to use a laser cutter and 3D printers for prototyping.

We work together, sharing and building on each other's ideas. This is what some of our students say about the course:

"I like how DT links to so many other subjects and the theory really helps you look at everyday things in a new way"

"DT allows me to create which allows me to express my ideas. It encapsulates so many fun areas of learning, especially in the practical stages"

"I love DT and how it allows me to be creative, design and problem-solve in a really fun way"

"I like DT because its so different to every subject, yet it includes nearly all of them. Designing is my favourite part as it allows you to keep that expressive spark alive whereas other subjects are more theory than practical."

"DT enables me to apply the academic knowledge from all my classes and put it into action. DT is the subject of innovation that balances and brings together all my learning"

"DT links to so many other subject areas and has helped me to approach problems in different ways. It inspires individual thinking and creativity outside of the classroom so we can better understand the products and design all around us"

"DT is one of the only subjects that allows you to do lots of practical work rather than it all being about theory giving you a hands-on learning experience"

## Assessment in IBDP Design Technology

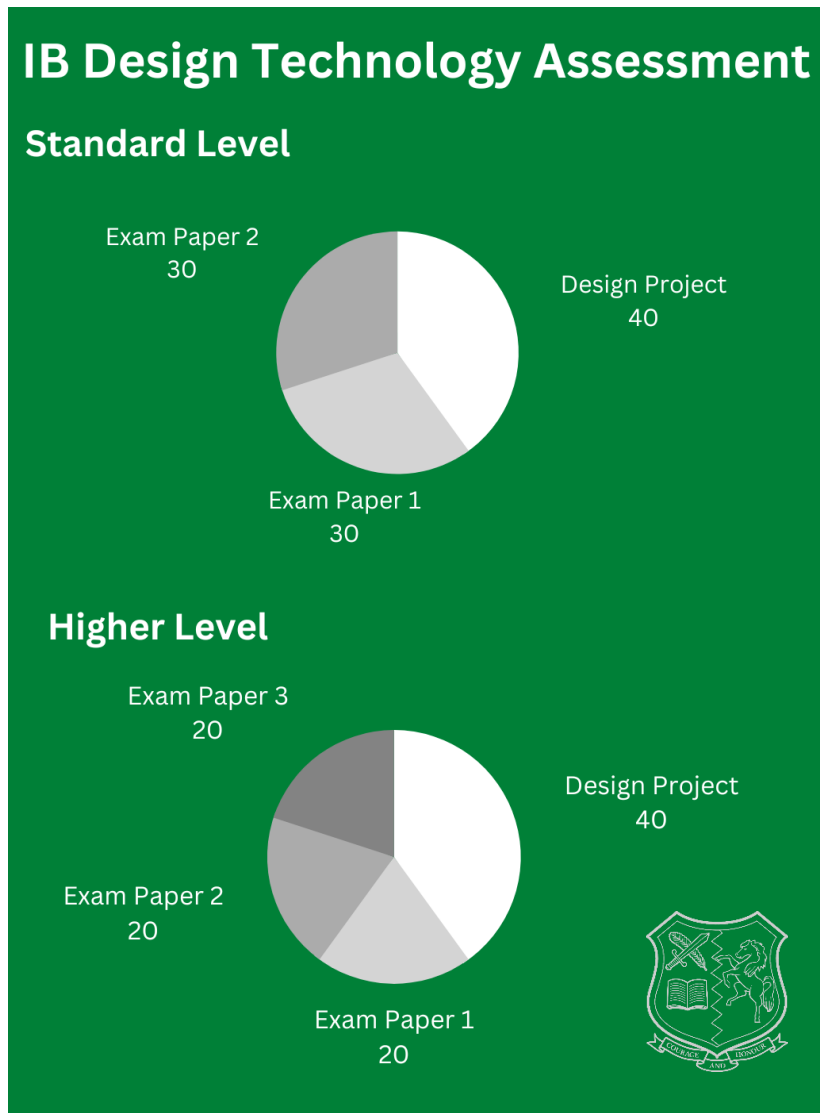
- Formative and summative assessment on your designing and making work
- Peer assessment and critique
- End of unit topic tests and assessments
- Year 12 and 13 assessments and mock examinations

### Examinations

Design paper 1: Multiple choice and short response questions covering all topics studied

Design paper 2: A mix of question types based on given case studies. In paper 2, all of the standard level topics can be used and are a great way of exploring how design relates to everyday products and scenarios

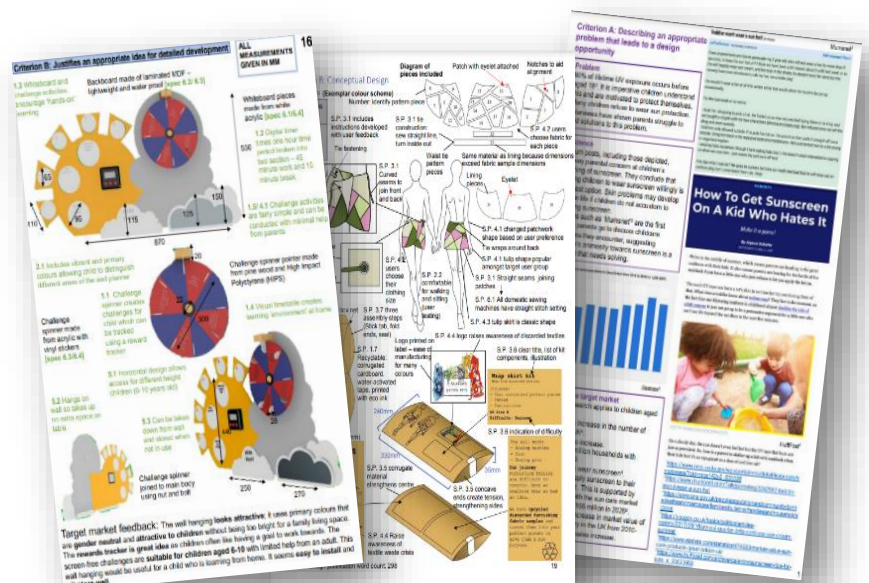
Design paper 3: Case study questions related to Higher Level topics (7-10)



## Internally Assessed Design Project (IA)

The IA project gives students the opportunity to showcase their designing and making skills whilst solving a real-world problem of their own choice.

The project takes students through the design process from initial research to designing for commercial production and asks for a deep understanding of the target user, materials and their properties, and success is determined through rigorous specifying of materials and processes, and the evaluation of those processes.





## Extended Essays in Design Technology

Examples of World Study Essay titles involving Design Technology by our students are:

- To what extent can design and technology be used as a means of improving physical and psychological performance in running: An exploration of the factors impacting the performance of Kipchoge
- To what extent should technology be allowed to influence athletes' progression in sporting activities, with specific reference to Nike Vaporfly® trainers and the LZR Racer® Swimsuit?
- To what extent has the rise and development of intelligent textiles enhanced the medical industry, considering the case studies of Stomatex® and the research conducted by MIT?
- To what extent could the introduction of the recycling of wasted energy from motor vehicles on dual carriageways reduce carbon dioxide emissions?
- To what extent is design for wellbeing in a home-working environment important in enhancing productivity for a United Kingdom employee during the Covid-19 pandemic?

## University Destinations

IB Design Technology can lead to many exciting and diverse degree courses and apprenticeships. Our students have gone on to, amongst others, the following universities to study the listed courses:

|  |   |
|--|---|
| Brunel University London                             | Industrial Product Design                           |
| University of Manchester                             | Fashion Technology                                  |
| University of Sheffield                              | Architecture  |
| Apprenticeship                                       | Interior Design                                     |
| Kingston University                                  | Graphic Design (following an Art Foundation course) |
| Loughborough University                              | Urban Planning (with placement year)                |
| Loughborough University                              | Design (with placement year)                        |
| University of Bristol                                | Mathematics and Physics                             |
| University of Bristol                                | Criminology with Study Abroad                       |
| The University of Edinburgh & The University of Bath | Mechanical Engineering                              |
| Loughborough University                              | Industrial Design (with placement year)             |
| University of Leeds                                  | Automotive Engineering                              |

## Enrichment

Our IB Diploma students attend the 'Product Design in Action' Lectures. This engaging and interactive KS5 Product Design inspiration day shows our students the cutting edge in design. Five renowned speakers from a diverse range of studios give students the inside story. From an in-depth exploration of different materials to discovering how designs develop through sketches, modelling and CAD.

We really love to see our students sharing their skills and to this end

we work with Nexus, an ambitious special school for children and young people with profound, severe and complex needs, many of whom are on the Autistic Spectrum. Our IB Diploma students lead a 6-week course teaching the Nexus students how to work creatively and safely with a variety of tools and materials.

TGS GCSE students benefit from regular peer mentoring from our sixth form students, helping them with skills and portfolio work alongside motivation and organisation skills. Sometimes teaching is the most rewarding form of learning!

In recent years we have welcomed practicing designers such as Bethan- model maker for Foster and Partners, Jonathan- footwear designer and lecturer, and Michelle-Designer and former student to inspire our current students with their work and information on their routes to careers in design.



**“Design is intelligence made visible”**

Why not join us for IB Design Technology at TGS and see where it takes you?

*If we take care of nature, nature will take care of us.*

*Sir David Attenborough 2020*

The Environmental Systems and Societies course brings together emerging fields of global importance through the study and exploration of complex mechanisms and interactions that influence both the natural and human world.

The content develops an acute appreciation of the complexity of the world's natural systems and how society depends on and influences them through an interdisciplinary lens.

With numerous studies estimating that we have 60 years left of farmable soil are the reason that ESS is as applicable to humanists as it is environmentalists, as we seek to find solutions for the deteriorating state of our environment.

## Course Content



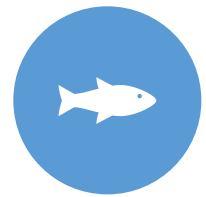
FOUNDATIONS OF  
ESS



ECOSYSTEMS AND  
ECOLOGY



BIODIVERSITY &  
CONSERVATION



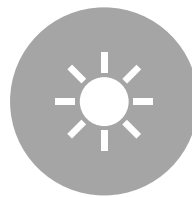
WATER & AQUATIC  
FOOD  
PRODUCTION



SOILS & TERRESTRIAL  
FOOD  
PRODUCTION



ATMOSPHERIC  
SYSTEMS



CLIMATE CHANGE  
& ENERGY  
PRODUCTION



HUMAN SYSTEMS &  
RESOURCE USE

The interdisciplinary nature of the course means it is complemented by a range of other disciplines such as economics, history, geography and science.

ESS is a complex course, requiring a diverse set of skills. As a result, students will become equipped with the ability to recognize and evaluate impact, to perform research and investigations and to participate in philosophical discussion.

## Assessment

| Paper   | Topics Studied            | Options   | Exam Timings | % of grade |
|---|---------------------------|---|--------------|------------|
| Paper 1 – Unfamiliar Case Study               | All topics                | All of the questions are compulsory.  | 1 hour       | 25%        |
| Paper 2 - short answers and structured essays | All topics                | Section A – all questions compulsory<br>Section B – select 2 out of 4 options to answer | 2 hours      | 50%        |
| Internal Assessment                           | Independent Investigation |   | 10 hours     | 25%        |

## Enrichment & Visits

- Fieldtrip to Camber Sands to explore succession and human impact on sand dune systems.
- Termly newsletters to signpost students to interesting content from the wider world.
- Reading list of recommended reads from the school library.
- School membership to the Royal Geographical Society which provides access to the digital edition of the Geographical Magazine along with live lectures, academic resources and student events.

## Careers

| Environmental             | Socio-Economic                  |
|---------------------------|---------------------------------|
| Waste management          | TV researcher                   |
| Surveying                 | Tour guide                      |
| Climate science           | Lawyer                          |
| Cartography               | Exhibition designer             |
| Oceanography              | Fundraiser                      |
| Volcanology               | Urban planning and Development  |
| Hydrologist               | Transportation planner          |
| Meteorology               | Waste treatment                 |
| Geomorphology             | Teaching                        |
| Environmental consultancy | Business analyst                |
| Ecology                   | Historic conservation manager   |
| Agro ecology              | Sustainable business consultant |
|                           | Architectural technologist      |
|                           | Land surveyor                   |
|                           | Estate agent                    |

"Physics is a tortured assembly of contrary qualities: of scepticism and rationality, of freedom and revolution, of passion and aesthetics, and of soaring imagination and trained common sense." Leon M Lederman

Physics is the most fundamental of the experimental sciences, as it seeks to explain the universe itself from the very smallest particles - currently accepted as quarks, which may be truly fundamental - to the vast distances between galaxies.

## Course content

### ***Space, time and motion***

- Mechanics
- Forces
- Energy
- Momentum
- Special relativity

### ***The particulate nature of matter***

- Electrical circuits
- Thermal energy
- Thermodynamics
- Greenhouse effect
- The gas laws

### ***Wave behaviour***

- Simple harmonic motion
- Waves
- Resonance
- Doppler effect

### ***Fields***

- Gravitational fields
- Electrical fields
- Magnetic fields
- Electromagnetism

### ***Nuclear and quantum***

- Quantum Physics
- Radioactivity
- Nuclear Fission
- Nuclear Fusion

The course content highlights the five main areas of physics. The topics take the knowledge and understanding you have of GCSE Physics further and deeper, and you get to learn about some new concepts such as special relativity and quantum physics from scratch as well.

Through the study of these topics, you will be given opportunities to make links between the different areas of the course, as well as your wider studies, to encourage problem solving skills and to develop experimental skills and techniques.

There is a big emphasis on the experimental nature of the subject with the inclusion of practicals throughout the course to encourage your understanding and to develop your related mathematical skills such as graphing, vectors and dealing with uncertainties.

You will also undertake research into an area of your choosing through the IA. This will allow you to practically investigate further an area of particular interest to you, demonstrating your skills in gathering reliable data through the design of a suitable method, data analysis by manipulating the data and drawing graphs, drawing conclusions and evaluating the experiment.

Some students also decide to engage in deeper research in a Physics related application while producing their extended essay. This is usually a World Studies essay, which incorporates another subject of choice as well to discuss something of global significance; for example, windfarms, solar lamps, hurricane warning systems, supersonic flight, jet engines and a planet's moons. This builds your research skills, your essay writing and critical thinking skills. It is really interesting what you come up with!

## Assessment

|                     |  |
|---------------------|--|
| Internal assessment | Individual Investigation (20%)   |
| External assessment | Paper 1 – Part A - Multiple choice, Part B – Data analysis (36%)<br>Paper 2 – Short answer and longer synoptic questions (44%) |

The internal assessments (IAs) in Physics have been chosen by individuals depending on their area of particular interest and are therefore very varied. Here are some examples that have been done. There have been many more!

- Investigating the relationship between the percentage of graphite in pencil leads and their conductivity
- How does the height of liquid in a container affect the rate of flow of the liquid out of an exit hole?
- Investigating the effect of varying pressure on the velocity of a fluid.
- Does the colour of a material significantly affect the amount of light it absorbs?
- The relationship between the length of the second pendulum in a complex pendulum and the time taken for the pendulum to lose kinetic energy
- An experiment to determine the width of the diffraction grating on a CD
- How does temperature affect the rate of diffusion of coffee particles in water?
- How does the concentration of icing sugar in butter affect the flow rate of icing?
- Investigating the relationship between lift produced by a remote-control helicopter and the frequency of the rotor blades
- How does tennis racket string tension affect the efficiency of tennis ball bounce?
- Investigating the relationship between dust build-up and the power output of a photovoltaic solar panel
- How does the thickness of a harp string affect the wave speed at which harmonics are formed?
- How does the mass of cellulose powder affect the motion of a whirlpool?
- To what extent does kinesiology tape extension vary between the vertical direction and the horizontal extension?
- The effects of surfactants on the surface tensions of water

## Extended essays in Physics

Those that chose to do extended essays in Physics or World Studies with one of the subjects being Physics have engaged in a wide variety of topics. Here are some examples of recent essays.

- To what extent do emission spectra and apparent luminosity observed from Andromeda (M31) indicate a potential collision with the Milky Way?
- To what extent should waste-to-energy be included in the solution to sustainability (when regarding the Reppie plant in Ethiopia and the Amager Bakke plant in Denmark)?
- What scientific advances came out of previous attempts at supersonic flight and how can these be implemented or adjusted in the reintroduction of commercial supersonic air travel?
- To what extent does the combination of physics with art to illustrate time within the Special Theory of Relativity, Yayoi Kusama's and Olafur Eliasson's work demonstrate each discipline's place within the other sphere?
- To what extent does the provision of solar lamps improve the quality of life in rural sub-Saharan Africa?
- To what extent are offshore wind farms in the UK environmentally sustainable regarding their construction and the power generated during their first year of operation? With a case study of London Array

## Enrichment

We offer you the chance to participate in Institute of Physics competitions, such as the Physics Olympiad, get involved in self-guided research projects and Crest Awards. Also, to help the younger students in STEM Club as subject ambassadors. You also have the opportunity to attend a series of lectures in London and locally and see how Physics is applied in the real world. Every year a few Physics students choose to enter an essay competition and are awarded places on the CERN particle school in August.

## Further study

Many of the students who study Physics choose related courses, for example Physics, Astrophysics, Engineering (including Mechanical, Electrical, Chemical, General and Biomedical), Aerospace and Architecture at university level. The destinations are varied but are heavily weighted in favour of Russell Group universities. In recent years, some students have also chosen to study Engineering courses abroad.

In 2021 and 2022 these were the destinations and subjects that some of our Physics students chose to study at university. This shows the love of the subject and the diversity of the courses that they can move onto afterwards, including the high number that chose to study some form of engineering.

|                                 |  |
|---------------------------------|--|
| Durham University               | Physics and Astronomy  |
| Durham University               | Natural Sciences   |
| Imperial College London         | Physics  |
| UCL (University College London) | Architectural & Interdisciplinary Studies                              |
| University of Aberdeen          | Philosophy and Physics   |
| University of Bath              | Chemical Engineering (with placement)                                  |
| University of Oxford            | Earth Sciences   |
| University of Oxford            | Engineering  |
| University of Reading           | Architectural Engineering  |
| The University of Edinburgh     | Mathematical Physics   |
| University of Bristol           | Mathematics and Physics  |
| University of Southampton       | Mechanical Eng / Sustainable Energy Syst IPY                           |
| The University of Edinburgh     | Mechanical Engineering   |
| University of Bath              | Mechanical Engineering   |
| University of Cambridge         | Natural Sciences   |
| University of Exeter            | Natural Sciences   |
| University of Leeds             | Physics  |
| Durham University               | Physics and Astronomy  |
| University of Southampton       | Physics with Astronomy   |
| University of Glasgow           | Physics with Astrophysics  |
| Durham University               | General Engineering  |
| Loughborough University         | Civil Engineering and Architectural Engineering with a Foundation Year |
| University of Leeds             | Automotive Engineering   |
| University of Leeds             | Aeronautical and Aerospace Engineering                                 |

## Careers

Careers that use Physics are very broad and physicists have an impact on many areas of modern life. From the medical physicist who is designing new devices and systems to diagnose and treat health conditions, to the chemical engineer who is developing new technology to bring clean energy to our homes. You could find yourself working with the really small, as a nanotechnologist, or the really large, as an astronomer. In addition, the skills you develop through the study of Physics are highly regarded in wider professions such as data analysts, patent attorneys, applications developers and prosthetists.

### **What do students say?**

“At the beginning of sixth form, I was surprised by how much I began to enjoy Physics, leading me to switch from SL to HL, and eventually realising that I wanted to continue with this subject at university. IB Physics introduces you to fascinating concepts throughout the course, and each time you wrap your head around them, you will understand the world in a new and interesting way. Furthermore, aspects of the course such as the IA give you a chance to be creative and conduct your own explorations.” Rosalie, Y13

“Physics is unique in that you find yourself studying something on such a small scale and yet on such a large scale also. Not only does physics help you to build upon your mathematical skills it also, in my experience, makes you a more naturally curious person. There are many extracurricular opportunities outside of school to take part in, such as lectures at other schools or essay competitions, which is a great way to explore the subject outside of the classroom. Physics has links with both maths and parts of chemistry, so I often find myself learning about the physics aspect of a topic that I recently learnt in chemistry, which makes understanding it a whole lot easier!” Connie Y13

“Physics has captured me from a young age. It explains the underlying principles that govern the entire universe. The classes enable me to express my views freely and I can clear up any queries or obtain individual support. The department also offers many extra-curricular opportunities such as helping with the STEM Club for KS4 students. Studying Physics not only allows me to progress into Higher Education but it is also a useful subject to have.”

Si Ling – went onto to do Engineering at Cambridge



Mathematics can be seen as a well-defined body of knowledge, as an abstract system of ideas, or as a useful tool. For many people it is probably a combination of these, but there is no doubt that mathematical knowledge provides an important key to understanding the world in which we live.

Mathematics can enter our lives in a number of ways: we buy produce in the market, consult a timetable, read a newspaper, time a process or estimate a length. Mathematics, for most of us, also extends into our chosen profession: visual artists need to learn about perspective; musicians need to appreciate the mathematical relationships within and between different rhythms; economists need to recognise trends in financial dealings; and engineers need to take account of stress patterns in physical materials. Scientists view Mathematics as a language that is central to our understanding of events that occur in the natural world. Some people enjoy the challenges offered by the logical methods of mathematics and the adventure in reason that mathematical proof has to offer. Others appreciate Mathematics as an aesthetic experience or even as a cornerstone of philosophy.

This prevalence of Mathematics in our lives, with all its interdisciplinary connections, provides a clear and sufficient rationale for making the study of this subject essential for all students.

As part of the courses offered, students explore the mathematics of an area of personal interest. Internal Assessment titles have included:

- Can we Mathematically Show How 'Pleasing' Sounds are?
- Finding the area of glass needed to create the 'The Gothic Eye' stained- glass window
- An Investigation into Different Methods of Wrapping Presents, Exploring How to Produce the Least Waste
- An investigation to approximate the surface area to volume ratio of a nanoparticle
- Using Voronoi Diagrams, how can the number and accessibility of libraries be improved in my local area?

## Choosing the right course

There are two Mathematics courses on offer in the Sixth Form – Applications and Interpretations is offered at both Higher and at Standard level, whilst Analysis and Approaches is offered at Higher level. Sometimes students find it difficult to choose the right course for them. The guidance below is based on our experience of teaching the IB for over 10 years at Tonbridge Grammar School. If you are not sure, talk to our Mathematics Team.

|                       | <b>Applications and Interpretation</b>  | <b>Analysis and Approaches</b>   |
|-----------------------|---|--|
| <b>Higher Level</b>   | I enjoy Mathematics, particularly when using it to solve problems in real life contexts and statistical analysis. I have grade 8 at GCSE.   | I love algebra and abstract Mathematics, working on problem solving tasks for the love of doing Maths. I have grade 8 at GCSE. |
| <b>Standard Level</b> | I do not wish to pursue a career directly related to Mathematics but the statistical analysis would really benefit my further study. I want to achieve the highest points possible. | n/a  |

## University study

It is important to look to future study when choosing your Mathematics course. The table below looks at further study in general terms – there will be variation to entry requirements between the universities. It is important that you do some research, especially if you have your heart set on a particular course. If you are not sure, talk to our Sixth Form or Mathematics Team.

Medicine/Dentistry/Veterinary Science: Standard Level Applications and Interpretations is acceptable for most courses. It is important to check the mathematics requirements for the course you want to study because it will vary from university to university. The above is only a very broad guideline

|                       | <b>Applications and Interpretation</b>                            | <b>Analysis and Approaches</b>                                       |
|-----------------------|---|--|
| <b>Higher Level</b>   | Most Engineering, Computer Science, Chemistry, Economics courses. | Mathematics. Some Physics, Computer Science and Engineering courses. |
| <b>Standard Level</b> | All other courses   | n/a  |

## Enrichment

### UKMT Maths challenges



Students will have the opportunity to take part in the Senior Maths Challenge towards the beginning of the year. It encourages mathematical reasoning, precision of thought, and fluency in using basic mathematical techniques to solve interesting problems. The highest performers will then be invited to compete in the British Mathematical Olympiad and Senior Kangaroo follow on rounds. We also take part in the mathematical Olympiad for Girls competition.

### Primary Maths Challenge



Students will be able to demonstrate leadership and organisational skills as we host a primary Maths challenge for local primary schools. Sixth form students will be creative in designing the questions for the challenge and running the entire event independently, working as a team.

### Maths Challenge in the Netherlands



A select number of students will have the opportunity to visit Utrecht, Netherlands in order to host a Mathematics competition for 40 schools nationwide. This challenges the students' ability to organise a huge event including introducing the rounds, managing difficult situations and rewarding success.

Students will also take in the culture of the nearby city of Utrecht.

# Mathematics: Analysis and Approaches



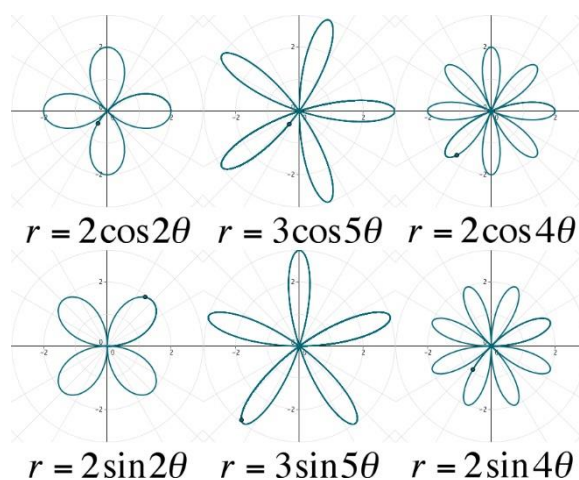
Studying the Mathematics: Analysis and Approaches course provides students with the opportunity to explore a familiar subject in greater depth and with greater rigour. It allows students to develop an appreciation of the elegance and power of Mathematics by fostering their skills of abstraction and generalisation, and by enhancing their skills to apply Mathematics to unfamiliar real-life situations.

All of the Mathematics teachers at TGS have excellent subject knowledge and a lot of experience of teaching the IB. We all love Maths and want share our passion for the subject with you!

## Course content

The course aims to introduce and develop important mathematical concepts and techniques in a comprehensible and coherent way using proofs, with more emphasis on calculus, algebraic manipulation and trigonometry.

The course will include an in depth look into topics such as differentiation, integration, proof, trigonometric functions and identities, complex numbers and the Maclaurin series.



Snapshot of an Analysis and Approaches Higher internal assessment

## Assessment

|                     |   |
|---------------------|---|
| Internal assessment | Exploration (20%)   |
| External assessment | Paper 1: Non-calculator (30%)<br>Paper 2: Graphical display calculator required (30%)<br>Paper 3: Problem-solving (Graphical display calculator required) (20%) |

## Further study

Higher Mathematics students go on to study, amongst many other courses, Engineering at Cambridge, Physics at Imperial and Warwick, Economics at Durham, Bristol and Cambridge, Computer Science at Durham, Material Sciences at Oxford and Mathematics at Warwick and Edinburgh.

## What do students say?

*"The Higher Analysis and Approaches course has been challenging but in a very rewarding way. It has been fascinating to broaden my understanding of Mathematics further, and I have particularly enjoyed the differentiation topic, as well as discovering imaginary numbers. It has also been very useful to apply my knowledge in other subjects, and I often use elements of the course in Chemistry doing calculations. I was unsure of my university intentions when I began Sixth Form, and Maths allowed me to keep my options open, so that when I eventually settled on engineering, I already had maths available for my application."* **Alice**

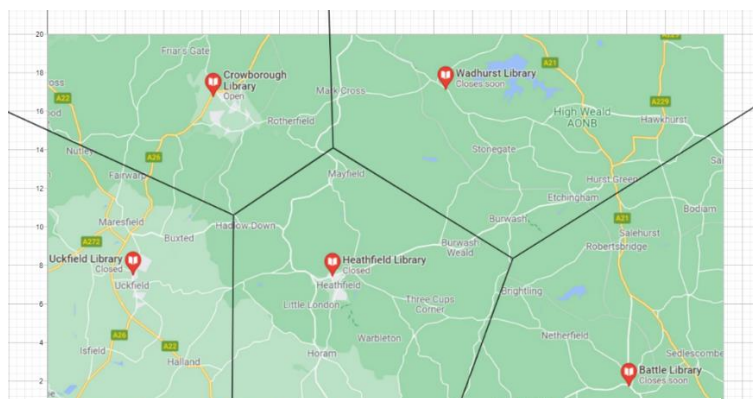
# Mathematics: Applications and Interpretation

Mathematics: Applications and Interpretation is aimed at students with a wide variety of mathematical backgrounds. It allows students to develop a more sophisticated understanding of Mathematics and has a particular focus on its application to real life problems. A significant part of the course is concerned with statistical techniques to understand and interpret data.

## Course content

The course aims to develop an understanding of how mathematics is applied to describe the world and how technology can be used to explore mathematical models.

The Higher Level course will include topics such as calculus, graph theory, matrices and a large focus on statistical techniques such as probability distributions and hypothesis testing.



Snapshot of an Applications and Interpretations Standard internal assessment

The Standard level course will incorporate topics such as functions and modelling, financial mathematics, Voronoi diagrams and thorough statistical analysis which would complement any university course.

## Assessment

|                     | Standard Level   | Higher Level  |
|---------------------|--|---|
| Internal assessment | Exploration (20%)  | Exploration (20%)   |
| External assessment | Paper 1 Short response questions (Graphical Display Calculator required) (40%)<br>Paper 2 Longer, multi-step questions (Graphical Display Calculator required) (40%) | Paper 1: Non-calculator (30%)<br>Paper 2: Graphical display calculator required (30%)<br>Paper 3: Problem-solving (Graphical display calculator required) (20%) |

## Further study

At Higher Level, this course is ideal from students who want to study courses with applied Mathematics content, for example, Computer Science, Economics or Biological Sciences. Students find the mathematical techniques and logical reasoning they have learnt to be particularly useful, for example in Geography, Law and Philosophy at Durham; Economics at Leeds and Nottingham; Law, History and PPE at Oxford; Psychology, Classics and Music at Cambridge.

## What do students say?

*"I have found IB Standard Maths much more enjoyable than GCSE Maths. As a humanities student, the idea of doing maths at IB Level seemed daunting, but the teachers are incredibly supportive and explain the content in a way that communicates the concepts to everyone in the classroom, so no one is left behind struggling with new or challenging units. The maths itself has been interesting and the skills you learn in terms of understanding financial mathematics and being able to do professional statistics are so invaluable for IAs and any academic paper where data analysis is required. I thought it would be a tough ride, but I have been pleasantly surprised."* **Isa**



IB Musicians perform music from La La Land in the Contemporary Music Maker Concert December 2021

*'Studying IB Music has opened up so many doors for me. It has helped me make lots of new friends, travel to amazing places and develop really useful skills such as teamwork, dedication and time management, which has really helped me to succeed at university.'* **Lydia (Economics at Durham)**

Music is a key part of the IB curriculum at TGS. Higher Level suits those with a real passion for the subject – the new folio-based curriculum is amazingly open and allows you to work to your strengths as a researcher, performer and creator: perfect for all those heading for a modern portfolio-based musical career.

Standard Level is for those who want a sixth subject that offers something completely different from the other IB subjects. Suitable for all those with a real interest in music.

Universities love musicians – the IB Music curriculum offers something special. It offers students a real experience and shows them to be independent learner as performers, composers/creators and researchers. It builds confidence, communication and creative skills as well as showing discipline and independence.

Music IB will enhance your enjoyment of the whole diploma. It also links well with Maths, English, Languages and Science and universities offer courses combining Music with all of these!

**Enrichment**

Perform (for example: Senior Choir, Orchestra, Chamber Orchestra and Swing Band), lead groups (such as Ukulele Orchestra, Guitar Club and Music Theatre Club) or mentor other students, learn with TGS specialist private music tutors.

**Course Content**

|   |   |
|---|---|
| <p><b>Higher Level</b><br/> <b>Exploring Music in Context 20%</b><br/>                 Students research and present varied musical examples from different styles as written work, performed adaptations and compositions. Areas</p> | <p><b>Standard Level</b><br/> <b>Exploring Music in Context 30%</b><br/>                 Students research and present varied musical examples from different styles as written work, performed adaptations and compositions. Areas</p> |
|---|---|

of inquiry include protest music and classical instrumental music.

**Experimenting with Music 20%**

Students perform and compose in a variety of genres and write a short, written report. Areas of inquiry include music technology, music for film and musical theatre.

**Presenting Music 30%**

Students perform and compose pieces of their own choice from all areas of inquiry above.

**Contemporary Music Maker 30%**

A collaborative musical project with music and other art subjects. Students submit a narrated multi-media presentation containing evidence of the process, planning and outcome with written, audio and video content.

of inquiry include protest music and classical instrumental music.

**Experimenting with Music SL 30%**

Students perform and compose in a variety of genres and write a short, written report. Areas of inquiry include music technology, music for film and musical theatre.

**Presenting Music SL 40%**

Students perform and compose pieces of their own choice from all areas of inquiry above.



Year 12 IB Music student Megan conducting her own film music composition *Vinteressa* at Tonbridge School chapel in the 2022 Spring Concert

**Further study**

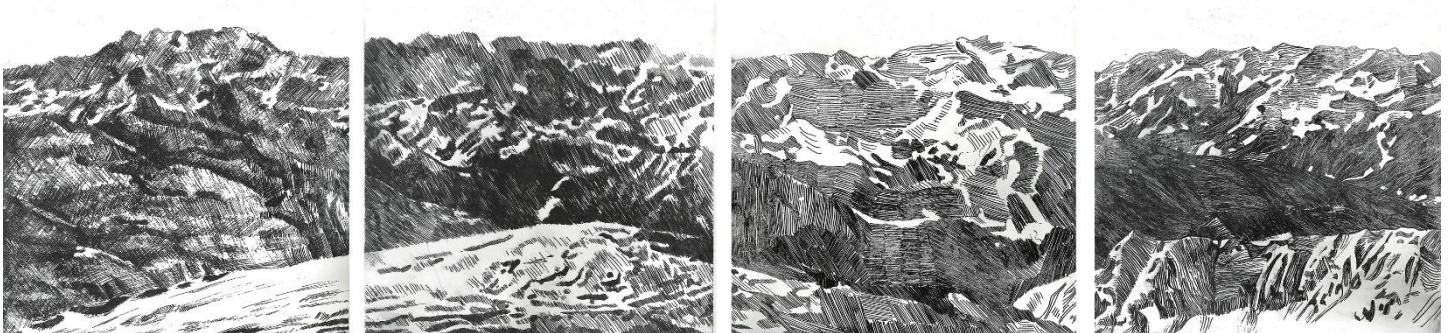
Students continue their Music studies at university including: Bristol University, Durham, King's College London, Cambridge, Royal Holloway, Guildhall School of Music and Drama, BIMM Institute (Song-writing & Music Production) and Bournemouth University (Music & Sound Production). Others continue their music whilst studying for other courses including Economics (Durham) and Marketing (Bradford)

*'Studying Music IB at TGS gave me the opportunity to study a diverse range of styles and genres and exposed me to music that I've grown to love and that has influenced me significantly in my continuing study of music.'*  
Daniel (Guildhall School of Music and Drama)



**The Visual Arts course at TGS provides thoughtful, meaningful and harmonious balance to complement academic pursuits by encouraging students to investigate and gain inspiration from the world around them.**

**Through exploring and developing ideas and engaging with the creative process, students aim to locate their ideas within personal and international contexts. Through individual inquiries inspired by cultural art forms, students form their own viewpoint of personal expression.**

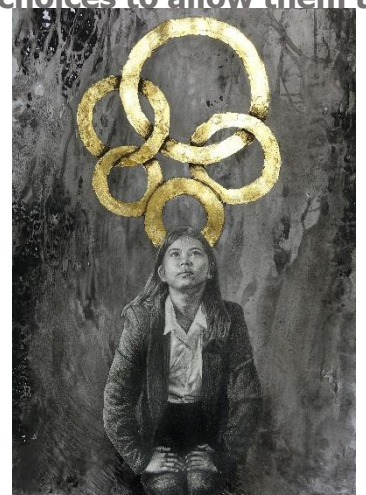


## **A Creative Journey - Course content**

**From an introduction to new skills, techniques and processes, students begin a personal journey of self-discovery and are encouraged to comment visually on the world in which they live. The initial workshops embed skills and give greater confidence within drawing, painting, printmaking, photography, digital media, sculpture and mixed media. Over a period of time, students identify strengths and make personalised choices to allow them to develop their own vision as an artist.**

**All students keep a sketchbook, to track their ideas, interests and influences. The key points are selected to create the Process Portfolio which becomes evidence of their sustained experimentation, exploration, manipulation and refinement of a variety of art-making activities.**

**At the end of the course, the resultant art works are hung to form an Exhibition with an accompanying written rationale. During the entire process, students will have been inspired by and responded to art works, 3 of which are then considered in more detail to form the Comparative Study.**



## Course overview



### Exhibition 40%

**SL:** The Exhibition is formed by a selection of 4-7 completed artworks.

Curatorial Rationale- max 400 words

**HL:** The Exhibition is formed by a selection of 8-11 completed artworks.

Curatorial Rationale- max 700 words



### Process Portfolio 40%

**SL:** The Process Portfolio of 9-18 screens.

**HL:** The Process Portfolio of 13-25 screens



### Comparative Study 20%

**SL:** The Comparative Study of 15 screens.

**HL:** The Comparative Study of 15 screens (Higher Level students will make connections to their own creations in an additional 3-5 screens).

## Enrichment

Participation in regional and national competitions, Students run clubs for younger students, involvement through CAS projects with Nexus School.





## Extended Essay

Students have the opportunity to write their extended essay with a Visual Arts focus or incorporate Visual Arts into a World Studies essay

Recent titles include:

*To what extent are the ideological, political and social changes of the Spanish enlightenment reflected in the artwork of Francisco José de Goya y Lucientes?*

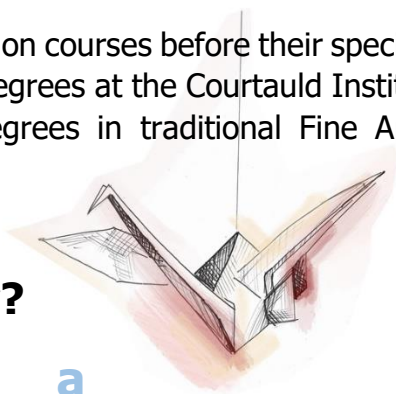
*How is Visual Language used in Spiderman: Into the Spiderverse to convey the characteristics and origins of the Spidermen?*

*To what extent did socio-political and racism issues in 1970's New York, influence Jean-Michel Basquiat's art?*



## Further study

Many students complete foundation courses before their specified degree. Former students have studied History of Art and Architecture degrees at the Courtauld Institute, Cambridge, UCL and Oxford Brookes. Students have also pursued degrees in traditional Fine Art disciplines, Illustration, Animation and Computer Games Design.



## What do students say?

**"Art feels like a complete break from everything else. It is completely unique and stepping into an art room is like a breath of fresh air."** Jessica

**"The Visual Arts course at TGS inspired me to continue my creative studies at university and as a career. The IB course was rewarding - I appreciated the support from the teachers and I enjoyed the range of media we used to create work with."** Arthur, TGS Alumna

## Georgi - TGS Alumna

Studying BA Printmaking at Brighton University

### What did you do after TGS?

"I decided to pursue a higher education in art, inspired by the Art teachers who I admired who had done so, as well as an impassioned alumni who visited to talk about her experience on a BA Fine Art Painting course.

### What do you feel is special about TGS?

"TGS empowers students to honour their true ambitions, through excellent quality teaching that goes above and beyond establishing thorough understanding of content to feeling as though each teacher knows and caters to your needs well, both educational and pastoral. The outstanding memory for me will always be the dedication of the Art teachers to their subject and the way in which they empowered

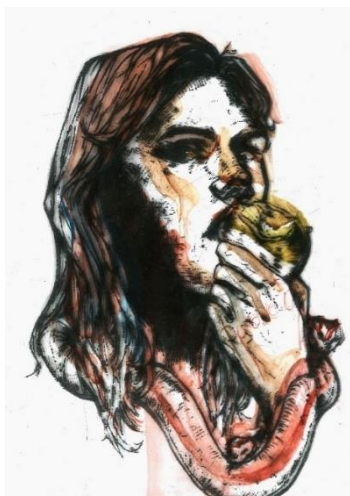
me to excel through genuine investment in my ambition as an artist. The well-being support was also invaluable and unforgettable.”

**Which subjects did you take for your IB Diploma?**

I took higher Art, Philosophy and Spanish (which I continue to speak at an advanced level), as well as standard English, Environmental Systems and Societies (ESS) and Maths Studies.

**Visual Arts combines naturally with other subjects, teaching a range of transferrable skills such as:**

**creative thinking,**                      **risk-taking,**  
**problem solving**                      **resilience.**



**Careers**

**Animation   Architecture   Art Director   Art Therapy**  
**Curator   Fashion Design   Fine Artist   Game Design**  
**Graphic Design   Illustration   Interior Design**  
**Photographer   Spatial Design   Stylist   Textile Designer**  
**VFX Artist**

