



**WYCHWOOD**  
SCHOOL • OXFORD

**STEAM: 'Symmetry'**



# STEAM: 'Symmetry'

**Dates:** 21st - 28<sup>th</sup> July 2024

**Age:** 13-15 years

**Course size:** 24 (split into two groups)

**Residential package**

**English Level:** B2+

**Package fee:** £1495

**Package includes:**

- all meals
- accommodation
- supervision
- course programme
- trips
- excursions
- activities

**Accommodation:** Boarding school accommodation

**What you can expect:**

- **Gain hands on practical experience in the lab** with interactive lessons with Oxford University qualified tutor.
- **Small class sizes** for individual attention.
- **Make lasting friendships** with students from all over the world, creating memories that will last a lifetime.
- **Immerse yourself in British Culture** with exciting excursions to famous British landmarks.
- **Experience the warmth and hospitality** of our welcoming team, ensuring you feel right at home.





## Programme Overview

Go beyond the curriculum to think like an **Oxford Scientist!**

This programme enables you to move beyond the school curriculum using science and mathematical skills in creative ways to explore the concept of **symmetry** in Science, Maths and Art. You will learn from expert teachers whilst collaborating with other students on the programme and discovering **new ways of thinking** in **science, technology, engineering, art** and **mathematics**.

Each day during the week is broadly split into three sections – one **laboratory** based practical session where you will develop your laboratory skills, one **mathematical** session where you will explore the theme mathematically, and one **creative** session where you will produce artwork inspired by the key scientific and mathematical ideas you have encountered.

### About the programme:

- **Discover the concept of chirality** and the relationship between one molecule and its mirror image.
- **Experiment using compounds** by extracting limonene and building and using a polarimeter.
- **Explore** crystalline and amorphous solids.
- **Learn about the mathematics of** symmetry and the concepts behind group theory.
- **Explore the applications of symmetry** to a diverse range of topics from combinatorics to geometry.
- **Investigate** how modular origami can be used to create objects of different symmetries.
- **Create artwork** using mirror images and tilings.

**Programme Tutors:** Abigail Stacey and Andrew Stacey

Abigail is the Academic Deputy Head at Wychwood School, Oxford and has worked for many years teaching science both in the UK and overseas in Norway and the US. She has an honours degree in Chemistry from the University of Oxford and a Master's Degree in Education from Oxford Brookes University where her thesis explored academic buoyancy and students' ability to persist with their learning when things get difficult.

Andrew is the Head of Mathematics at Oxford High School. He has a Master of Mathematics degree from the University of Oxford and a Ph.D. from the University of Warwick. As a teacher, his goal is to enable his students to understand the richness of mathematics, and to experience its depth and beauty for themselves.

## Accommodation

This programme offers you the opportunity to spend time as a boarder in a traditional British boarding school in the heart of Oxford. Staying at Wychwood School is a wonderful experience.

We provide a secure, safe and happy community where students can learn effectively and enjoy relaxed social times with their friends. Our wonderful location enables our students to make the most of Oxford in the form of evening excursions.

Our characterful, cosy, and traditional dormitory rooms are configured in 1- 4 beds. Single rooms will be allocated to older students.

Our caring and supportive house parents make sure that students have a safe and enjoyable stay. Our house parents and staff will be on hand to attend to medical needs when required.

## Airport Transfers

We can arrange individual and group transfers. Please enquire upon booking.

Alternatively, we are well connected by public transport to the major London airports.

Please take a look at the most recent [timetables and routes](#).



## Excursions

- **London:** walking tour of the capital city, to see famous landmarks such as Buckingham Palace, The Houses of Parliament, Big Ben, The London Eye and The Globe Theatre.
- **Walking Tour of Oxford:** explore the spires of Oxford, including the iconic Radcliffe Camera, the Sheldonian Theatre, The University Church of St. Mary's, the Bridge of Sighs and Bodleian library.
- **Wembley Stadium Tour:** Walk in the footsteps of legends and experience the magic of Wembley Stadium with this behind-the-scenes tour! **This trip is on a Sunday for students staying for two weeks or more.**

## Activities

In the afternoons and evenings, you will have the chance to socialise with other students and take part in fun activities. Evening activities will be organised depending on student interest and may include the following:

- Rounders tournament
- Capture the Flag
- 5 a side football
- Basketball
- Just Dance
- Talent Show
- Arts and Crafts
- Karaoke
- Summer Barbeque
- Welcome/Farewell Party



## Sample Timetable

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<b>Breakfast</b>	Arrival Day	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Full Day Excursion to London	Departure Day  Or  Excursion to Wembley if combining courses and staying for another week.
<b>Morning 1</b>		Science 1: Molecule Models and Chirality.	Maths 2: Symmetry as an Action -	Science 3: Microscale Extraction of Limonene - students will extract limonene from oranges and compare it with its mirror image	Maths 4: The Art of Counting - building platonic solids and using structure to count their features	Maths 5 - Counting with Symmetry: investigating how the numbers of symmetries an object has places it in a particular group		
<b>Break</b>		Breaktime	Break time	Break time	Break time	Break time		
<b>Morning 2</b>		Maths 1: Investigating the symmetries of objects through drawings and computer models	Science 2: Building and using a Polarimeter	Maths 3: Investigating fractals with computer programs and iterative drawings	Science 4: Investigating Crystals - growing crystals in the laboratory	Original work		
<b>Lunch</b>		Lunch	Lunch	Lunch	Lunch	Lunch		
<b>Afternoon</b>		Art 1: creating pieces of art using mirrors and kaleidoscopes	Art 2: Escher tiling -creating art using the ideas of Escher	Art 3: Penrose and other aperiodic tilings - creating art using aperiodical tilings	Art 4: Origami - creating a model using modular origami	Original work		
<b>Dinner</b>		Dinner	Dinner	Dinner	Dinner	Diner		
<b>Evening</b>		Welcome Party	Games Evening	Arts and Crafts	Oxford Walking Tour and Treasure Hunt	Summer Barbeque and Farewell Party		



## Staying for longer?

Like all our programmes, our STEAM: 'Symmetry' programme can be combined with other programmes to make a 2, 3 or 4 week stay.

If you are interested in further developing your skills in science, we would recommend combining with the **Introduction to Practical Science** programme or **STEAM: Cracking the code'** programme.

If you are looking to improve your English and experience British culture, we would recommend combining with the **British Culture and Language Programme**.

It is also possible to combine with our **Rowing** programme if something more sporting takes your fancy.

If the stage is more your thing, why not take a look at our **Musical Theatre** programme.

Please see our Programmes page for more information.





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