3D GAME DEVELOPMENT CLUB

DESIGN AND CREATE YOUR OWN 3D COMPUTER GAMES

CRIMSON | Global Academy

CGA CLUBS

What is the 3D Game Dev Club?

The 3D Game Development Club is a school-led club at CGA that allows students with an interest in gaming to further learn how to develop their own video games and apps.

As part of the club's programme, members learn to use Unity, the world's most popular game development platform to build fun and engaging 3D computer games.

They also learn C#, one of the most powerful and useful coding languages for future careers. The club gives a chance for students with varied interests to come together.

"The game development club is a great resource for any student who is obviously interested in gaming, but also those interested in mathematics and art."

Dr. Andrew Daniel, Club teacher

The club also allows students from different parts of the globe to come together and discuss their passions and ideas. The collaborative approach helps students develop better apps and games through the course of the club.

Games and apps created by students in the club are impressive additions to their college application portfolios.

Why join?

IMAGINE. LEARN. CREATE.

At CGA we encourage students to develop their interests outside the classroom by offering a variety of extracurricular activities. Through the CGA community, students can communicate and collaborate with like-minded students around the world.

But what if you wanted to take your passion for gaming to the next level? What if you could develop your own games, apps or websites that could be later monetised? If those are your interests then the 3D Game Development Club is for you.

What tools will you learn?

> *"The advantage of this club is that students get to learn about Unity – the most powerful game engine in the world – that uses C Sharp, one of the three great C languages that is a powerful, professionally-used tool."*
>
> **Dr. Andrew Daniel, Club teacher**

One of the main objectives of the course is to train students on Unity and C#.

There is a massive scope for students to use these languages in the future both for game and app development.

UNITY GAME ENGINE

Unity is the world's most popular platform to build computer games. Unity was used to build popular games like Escape from Tarkov, D.R.O.N.E. and Fall Guys.

Each month 2 billion copies of Unity games are downloaded worldwide.
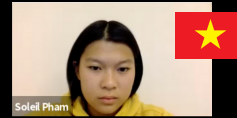
THE C# LANGUAGE

C# is one of the most powerful and useful coding languages for students to learn for future careers.

It is also easy to learn – within an hour you will have code running to control simple computer games.

Student showcase

Score: 2   Health: 4

PLAY THIS GAME

Soleil Pham

PLANE SHOOTER

Created by Soleil Pham (student from Vietnam), this is the first CGA student created app to be published independently.
Soleil is now instructing other students in Game Dev.

SCORE = 0   PLAYER HEALTH
                   ENEMY HEALTH

PLAY THIS GAME

GAME DEV CLUB STUDENTS

TANK BLASTER

A classic shooter game, created with the first ever group of CGA Game Dev students to learn coding.

SCORE = 117   HEALTH = 81

Quit!

PLAY THIS GAME

GAME DEV CLUB STUDENTS

DEATH STAR ATTACK

An initial project with some of the Game Dev groups to explore transformations in 3D The maths gets quite intense - rotations in 3D can cause a few headaches - but our students aced it!

CGA.SCHOOL

> *"At CGA we are taking state of the art technology into the classroom to create amazing opportunities for students anywhere in the world."*

Dr. Andrew Daniel

Associate Principal,
Mathematics teacher
and Game Dev teacher at CGA

MEET YOUR TEACHER

The club is led by Dr. Andrew Daniel, CGA's Associate Principal and mathematics teacher based in the UK.

Across his career Dr. Daniel has taught in five different schools, in the UK and overseas, and also been involved in areas such as university preparation and extra-curricular programmes.

At CGA he teaches International GCSE and AS Level Mathematics. A good number of Dr. Daniel's former students are now studying at Oxford or Cambridge, or the Ivy League universities in the US.

Dr. Daniel has a Master's degree in education, and a PGCE in Mathematics.

His particular area of interest is technology and IT in education and early in his career he was shortlisted as a finalist for the National Teaching Awards to recognize his work in technology.

He was involved in some of the original projects in the UK to trial interactive whiteboards for classroom teaching, and has been working to develop software to support mathematics teaching. More recently, he has been involved in training with American universities in areas such as the mathematics of 3D computer game design, and artificial intelligence.

He brings all this knowledge to the game development club.

Club info

No previous knowledge of Unity, computer game design, or C# needed to join the club

- You'll need to install personal copies the Unity Game Engine software and Visual Studio (for C# coding) on your computer

- Both are free to install, and instructions to install will be given

- The club will support your studies and knowledge of maths –we will use vectors, transformations, trigonometry, algebra, and other topics to write our computer games

- All are welcome to join us

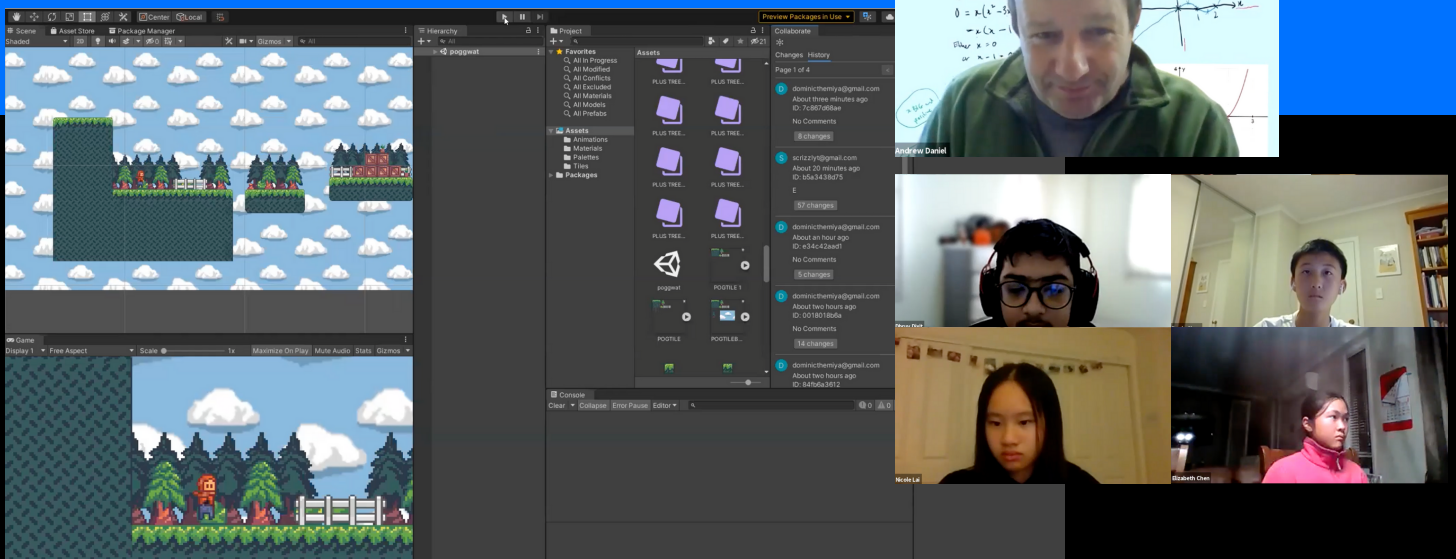## When do we meet?

Every Thursday at 2pm-3pm UK time.

Available spots?

The maximum amount of members for this club is 16.

Why web dev?

Computer coding is the literacy of the 21st century.

Course Schedule

Part 1: Introduction to Computer Game Development

WEEK	TOPICS
0	Setting up: installation of Unity and Visual Studio
1	The Game Engine interface: objects, cameras, lighting. Introduction to C# coding
2	Object control: creating, controlling and destroying game objects. Controlling a game camera
3	Physics: rigid body objects, collisions between objects. Variables and the user interface (UI)
4	Coding: conditions, loops, components. Introduction to audio. The Unity Asset Store
5	Functions and methods in C#. Using web resources to research C# and Unity.
6	Creating a UI: text, buttons, panels, user input. Displaying game variables
7-8	Supervised student project: create your own Unity game

Part 2: Advanced Unity and C# Game Development

WEEK	TOPICS
1	Meshes: creating and manipulating meshes for game terrains
2	Algorithms in C#
3	Building and publishing Unity games
4	Creativity: game genres and design
5-8	Supervised student project: create your own advanced Unity game

"Game development involves a lot of maths. Creating pre-fabs uses very advanced mathematical concepts. Other topics covered include vectors, transformations, trigonometry, algebra, and geometry."

What are some mathematical concepts that can be taught through game development?

Game development uses a lot of concepts of advanced mathematics. In fact, Dr. Daniel says that the second part of the course involves very advanced coding and so challenges the students to use very difficult mathematics.

"Game development involves a lot of maths," says Dr. Daniel. "Creating pre-fabs uses very advanced mathematical concepts." Other topics covered include vectors, transformations, trigonometry, algebra, and geometry.

Which subjects and courses is it good for?

The game development club is of course an excellent addition to the portfolio of any student looking to make a career in video game development or app development. It is also very useful for those students looking to pursue a career in mathematics and its applied fields.

Another really big field of interest where the club is relevant is data science. "Some of our CGA students are really interested in data science and have looked into Harvard's course on the subject," says Dr. Daniel. And you cannot forget about the most happening field today – artificial intelligence and the importance of coding for a career there.

All of the teachings from the club will help students further apply these when they go to university and pursue careers within coding, development or applied mathematics. There are also some students in the club who are interested in pursuing a further career in graphic design as well. Through video game design they will be able to expand their portfolios and learn skills that can help them in their later careers.
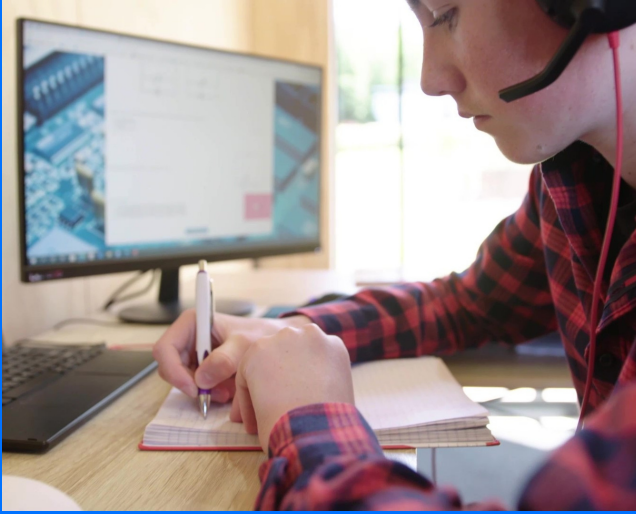
How will game development help students?

According to an analysis of 26 million job postings by job market analytics firm Burning Glass, about half of the jobs paying $57,000 or more per year are in occupations that commonly require applicants to have at least some computer coding knowledge.

This means that coding is a skill that is necessary for most career tracks. The coding languages taught in the club are essential skills for high-paying jobs in data science, information technology, engineering and scientific research.

Even jobs in arts and design require some level of coding knowledge these days. Various school curricula now introduce basic coding by age 5 or 6 and there are tons of coding classes for younger children.

The game development club is a natural extension of these coding classes but with a focus on coding language as well as advanced mathematics.

CGA's extracurricular clubs help build skills that are beyond just academics. These clubs give students an edge by offering them the opportunity to apply academic skills in a real-world context.

CGA.SCHOOL

Career pathways and growth opportunities

Game development will help students construct and develop an app or game.

These then can be showcased as part of a student's portfolio when applying for university.

"Some of our students are already developing products that can be monetised so they will be able to earn while they learn," says Dr. Daniel.

This is a big advantage especially for those students looking for part-time work in school or college as well as those hoping to secure internships within the field.

| Industry	Avg salary p/a	Projected employment growth
Software app developer	$105 590	21%
Web developer	$73 760	13%
Computer systems engineer	$88 550	9%
Database administrator	$93 750	9%
Computer systems analyst	$90 920	9%
Software QA Engineer	$88 550	9%
Business Intelligence Analyst	$88 550	9%

+ Do I need previous experience to join?

No prerequisite knowledge is required to join the club. If you are interested in coding and gaming, the club is for you. Instructions will be provided in the set-up class on how to install free personal copies the Unity Game Engine software and Visual Studio (for C# coding) on your computer to proceed with the course.

+ How do I join the game dev club?

All you have to do is fill out this form and you will be on your way to coding. The class meets once in a week.

+ What are the fees?

The membership fee is $40 NZD per month on a subscription basis (cancel anytime)

CRIMSON | **Global Academy**
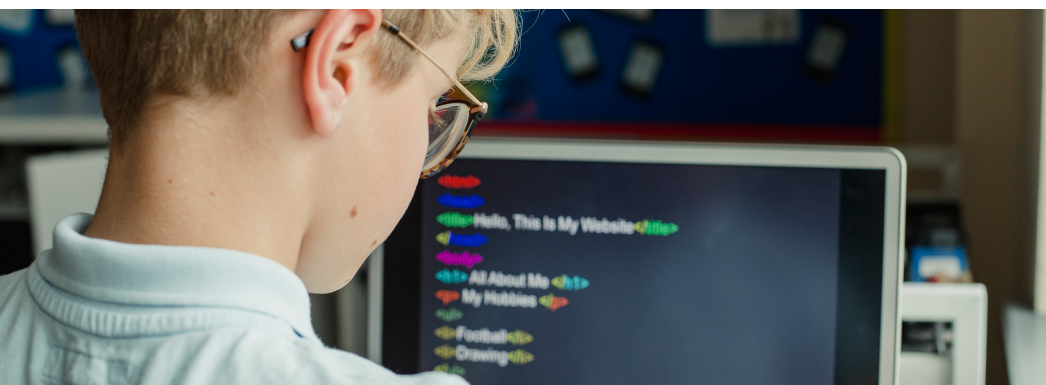
CGA CLUBS

Book a meeting with our Admissions team to find out more. Speak with one of our staff directly who can answer any questions you have.

Crimson Global Academy
An Independent School
New Zealand Ministry of Education registered
CEEB Code: 703001
MoE School Number: 921

Quick links
2022 Prospectus
Meet our teachers
Try an online class

Contact us
E: admissions@cga.school
www.cga.school

IMAGINE LEARN CREATE

AT CGA.

Follow us

Facebook

YouTube

Instagram

LinkedIn