



A Career in Game Development

Keith O'Connor
CTO & Technical Director
Romero Games



BAFTA

**INTO
FILM**

ROMERO GAMES

John Romero
Creative Director



Brenda Romero
Studio Director



Keith O'Connor
Technical Director



Romero Games - **Galway** - ~23 people

John: Creative Director - Designer, Doom, Wolfenstein 3D, Quake

Brenda: Studio Director - Designer, BAFTA, Wizardry, Jagged Alliance, Dungeons & Dragons

Me: Technical Director - will talk more about my career path



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

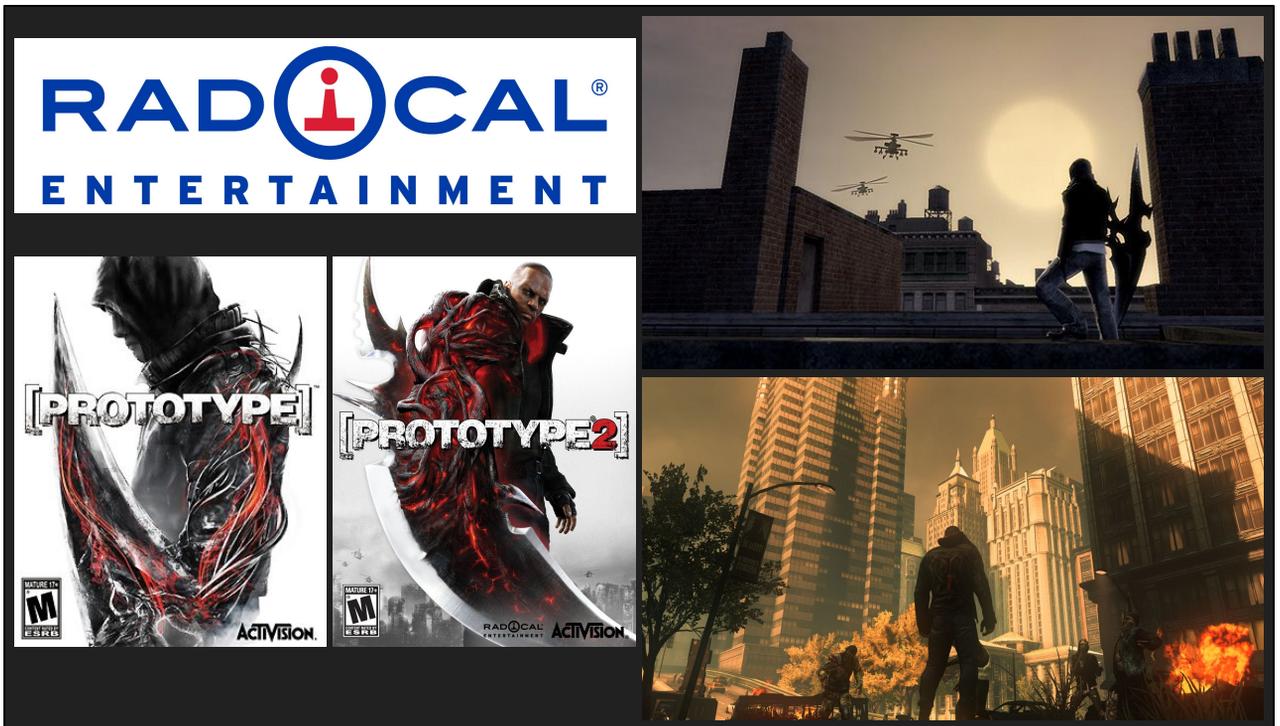


Did degree in **Trinity** - Information & Communications Technology
Graduated in 2001

No real game **jobs in Ireland** at the time, outside **middleware**

Continued on to do **Ph.D.** in computer graphics, graduated in 2006

Still no game jobs, so we moved to **Canada** with an under-35s Usit visa



First games job! Radical in **Vancouver**

Prototype & P2 as **graphics programmer**

300 developers at its peak, on four different game teams

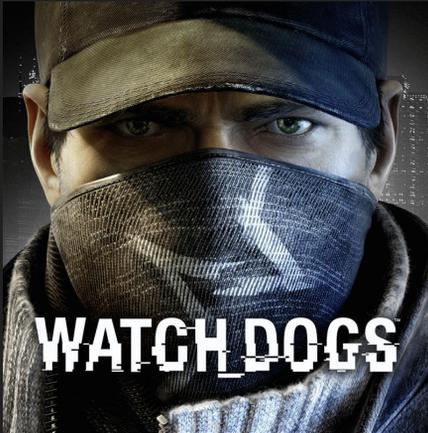
When Vivendi (owner) merged with Activision, they **cancelled two of the games** in 2008

Then **another** game in 2010

P2 **shipped in 2012**, and ATVI effectively **shut down** the studio

Started interviewing at various companies

Looking to move **closer to Ireland** (too much travel)... **Montreal!**



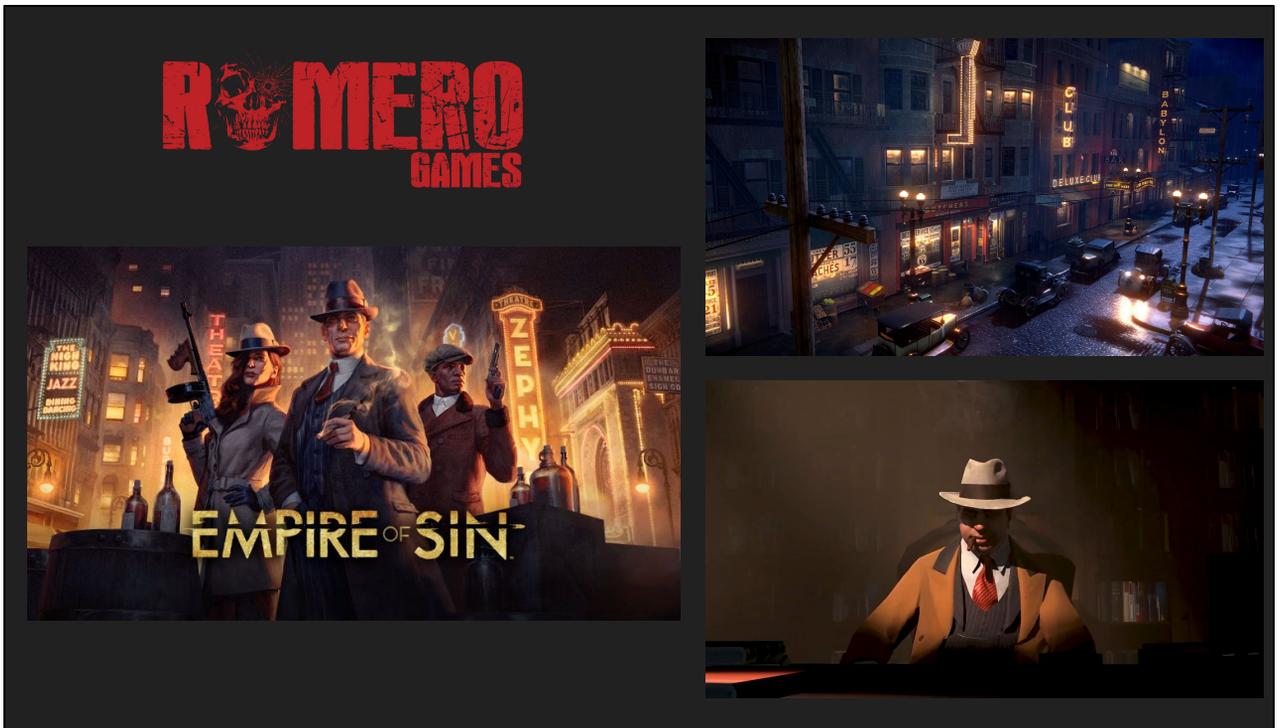
Moved to Montréal, and Ubisoft

Big **change in culture** - from <100 developers to **over 3000** in one building

Worked as **3D Technical Lead** on **Watch_Dogs** for PS3 & 360

Move to **Far Cry** team, shipped **4, Primal, 5**

Had **first baby girl**, wanted to move back to family



Good timing - John and Brenda just starting up studio in Galway

First contact through **IrishGameDev Facebook** group, and **blog post**

Moved home to be the **CTO** of the company, and **Technical Director** on our first major title, **Empire of Sin**

Shipped in December 2020, now on early pre-production on next game (unannounced)

Game development disciplines



Design



Art



Code



Audio



Production



QA

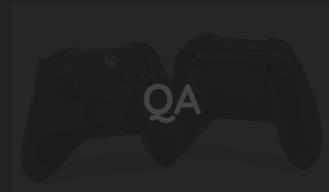
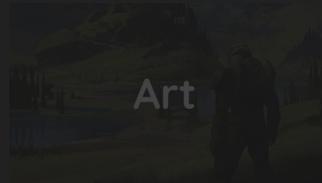
I'll go through each discipline and some of the **common roles** found in each one

Games can be made by just be **one developer** (eg. Vampire Survivors, Minecraft, etc.) - but the **big games** take **teams** of developers

But **every team does it differently** - there's no "one size fits all"

This is just to **give you an idea** of how a team might break down

Game development disciplines



We'll start with design, because that's the part **most people think of** when they hear "game developer"

And with good reason - in general, designers are the ones who decide **how the game works** in all aspects.

And more importantly, what **makes the game fun**.

Not just general feel - **specifics**. For some of production, a lot of a designer's work is spent writing **design documentation**.

Because there are lots of **decisions** to be made at every turn...



Example: the character can **CAST A FIREBALL**.

How **fast** does it go?

How much **damage** does it do?

If you can **level up**, does the fireball change?

Can it damage **multiple enemies**?

What happens when it **hits a wall**?

Can it go through **enemies**?

Can it **hurt the player**?

Does it **set things on fire**?

Each decision has knock-on effects - just the question "how much **damage** does it do" has a huge amount of **implications**

How much **damage can different enemies** take? How **difficult** does that make the game?

Designers spend a lot of time in **SPREADSHEETS** working this out, and balancing the game.

These **decisions** affect every other **DISCIPLINE**

With great **power** comes great **responsibility**!

Everything takes **TIME**, and designers need to balance what they **need** with what they can **get in the time available**

Design

Creative director

Game designer

Level designer

Narrative designer

UI/UX designer

This would be a **typical game designer's job**, but there are lots of **other types of designers...**

They're in charge of making sure the player is **having fun**, and is **engaged**

[different roles]
Level designer - next slides

WANT TO BE a designer? English, any discipline (art, code). Make up new games - pen & paper - play other games - be a DM in D&D



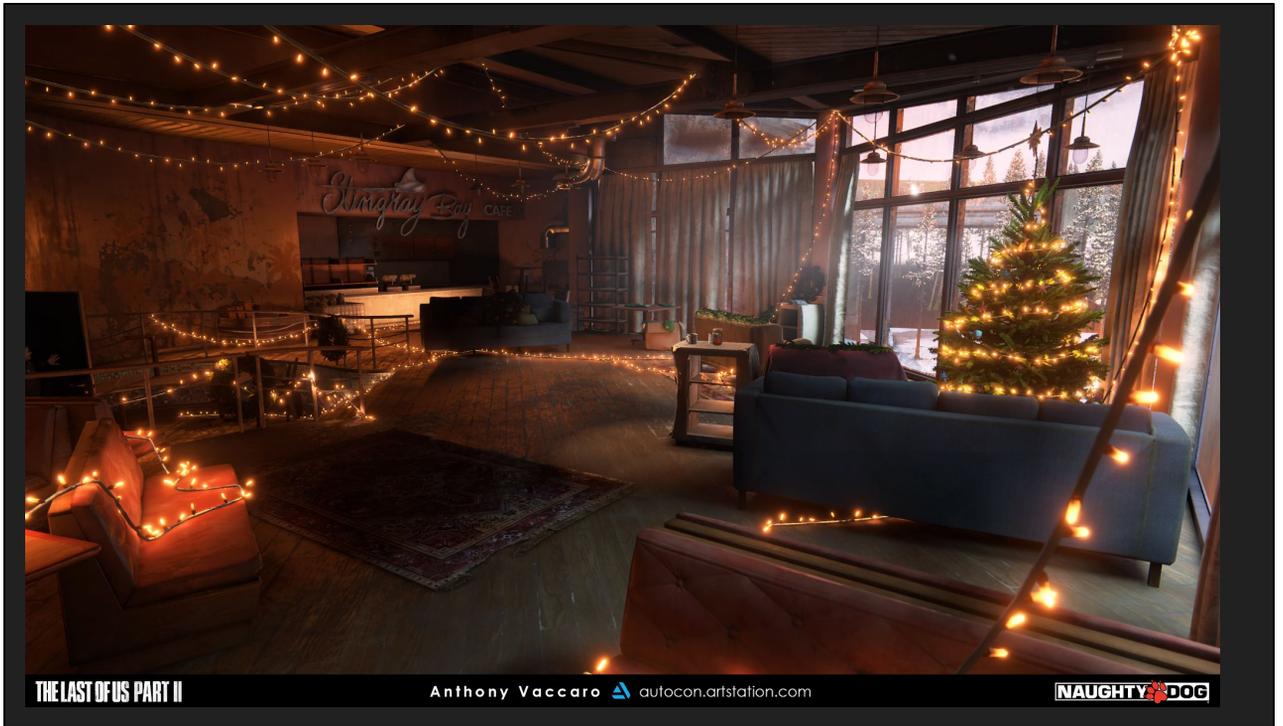
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Design

BEHOLDER
Large humanoid, lawful evil

Armor Class 18 (natural armor)
Hit Points 160 (10d10 + 70)
Speed 40 ft., fly 20 ft. (hover)

STR	DEX	CON	INT	WIS	CHA
19 (6)	14 (2)	16 (4)	17 (2)	15 (2)	12 (3)

Saving Throws int +8, Wis +2, Cha +4
Skills Perception +12
Condition Immunities poison
Senses darkvision 120 ft., passive Perception 22
Languages Deep Speech, Undercommon
Challenge 11 (10,000 XP)

Artmagic Cone. The beholder's central eye creates an area of artmagic, as if the *artmagic field* spell, in a 150-foot cone. At the apex of each of its arms, the beholder directs which way the cone faces and whether the cone is active. The cone works against the beholder's own eye rays.

ACTIONS

Eye. Melee Weapon Attack: +5 to hit, reach 5 ft., one target. Hit: 14 (4d4) piercing damage.

Eye Rays. The beholder shoots three of the following magical eye rays at random (roll d10s), choosing one to three targets it can see within 120 feet of it.

- 1. Charm Ray.** The targeted creature must succeed on a DC 16 Wisdom saving throw or be charmed by the beholder for 1 hour, or until the beholder harms the creature.
- 2. Blinding Ray.** The targeted creature must succeed on a DC 16 Constitution saving throw or be blinded for 1 minute. The target can repeat the saving throw at the end of each of its turns, ending the effect on itself on a success.
- 3. Fear Ray.** The targeted creature must succeed on a DC 16 Wisdom saving throw or be frightened for 1 minute. The target can repeat the saving throw at the end of each of its turns, ending the effect on itself on a success.
- 4. Fire Ray.** The targeted creature must succeed on a DC 16 Dexterity saving throw or take 25 (5d10) fire damage.
- 5. Disintegration Ray.** The targeted creature must succeed on a DC 16 Dexterity saving throw or be disintegrated into a pile of fine gray powder, its body becoming a pile of fine gray powder. If the target is a large or smaller creature, a creature of magical force, or a disintegrated object, the target disintegrates into a pile of fine gray powder. If the target is a Huge or larger object or creature, it is reduced to rubble. If the target is a Huge or larger object or creature, it is reduced to rubble. If the target is a Huge or larger object or creature, it is reduced to rubble.
- 6. Displacement Ray.** The targeted creature must succeed on a DC 16 Dexterity saving throw or take 25 (5d10) radiant damage. The target also, if the ray reduces it to 0 hit points, is displaced to a random location within 100 feet of the beholder.
- 7. Sleep Ray.** The targeted creature must succeed on a DC 16 Wisdom saving throw or fall asleep and remain so for 1 minute. The target awakens if it takes damage, if a creature takes an action to wake it. This ray has no effect on constructs and undead.
- 8. Displacement Ray.** The targeted creature must make a DC 16 Dexterity saving throw. On a failure, the creature is displaced to a random location within 100 feet of the beholder. The creature is displaced to a random location within 100 feet of the beholder.
- 9. Disintegration Ray.** If the target is a creature, it must succeed on a DC 16 Dexterity saving throw or take 25 (5d10) fire damage. If the target is a large or smaller creature, a creature of magical force, or a disintegrated object, the target disintegrates into a pile of fine gray powder. If the target is a Huge or larger object or creature, it is reduced to rubble. If the target is a Huge or larger object or creature, it is reduced to rubble.
- 10. Sleep Ray.** The targeted creature must succeed on a DC 16 Wisdom saving throw or fall asleep and remain so for 1 minute. The target awakens if it takes damage, if a creature takes an action to wake it. This ray has no effect on constructs and undead.
- 11. Displacement Ray.** The targeted creature must make a DC 16 Dexterity saving throw. On a failure, the creature is displaced to a random location within 100 feet of the beholder. The creature is displaced to a random location within 100 feet of the beholder.
- 12. Disintegration Ray.** If the target is a creature, it must succeed on a DC 16 Dexterity saving throw or take 25 (5d10) fire damage. If the target is a large or smaller creature, a creature of magical force, or a disintegrated object, the target disintegrates into a pile of fine gray powder. If the target is a Huge or larger object or creature, it is reduced to rubble. If the target is a Huge or larger object or creature, it is reduced to rubble.

LEGENDARY ACTIONS

The beholder can take legendary actions, using the Eye Ray action between its own turns only once regardless of whether it is on its turn.

DISPLACER BEAST
Large monstrosity, lawful evil

Armor Class 13 (natural armor)
Hit Points 83 (10d10 + 30)
Speed 40 ft.

STR	DEX	CON	INT	WIS	CHA
18 (4)	15 (2)	16 (4)	8 (1)	12 (3)	8 (1)

Senses darkvision 60 ft., passive Perception 11
Languages —
Challenge 1 (100 XP)

Artmagic. If the displacer beast is subjected to an effect that allows it to make a saving throw to take only half damage, it instead takes no damage if it succeeds on the saving throw, and only half damage if it fails.

Displacement. The displacer beast projects a magical illusion that makes it appear to be standing near its actual location, causing attack rolls against it to have disadvantage. If it is hit by an attack, this magic is disrupted until the end of its next turn. The magic is also disrupted while the displacer beast is incapacitated or has a speed of 0.

ACTIONS

Multitask. The displacer beast makes two attacks with its tentacles.

Tentacle. Melee Weapon Attack: +4 to hit, reach 10 ft., one target. Hit: 1 (1d4 + 4) bludgeoning damage plus 3 (1d6) piercing damage.

Pitied Guards and Pets. Intelligent evil creatures

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Game development disciplines



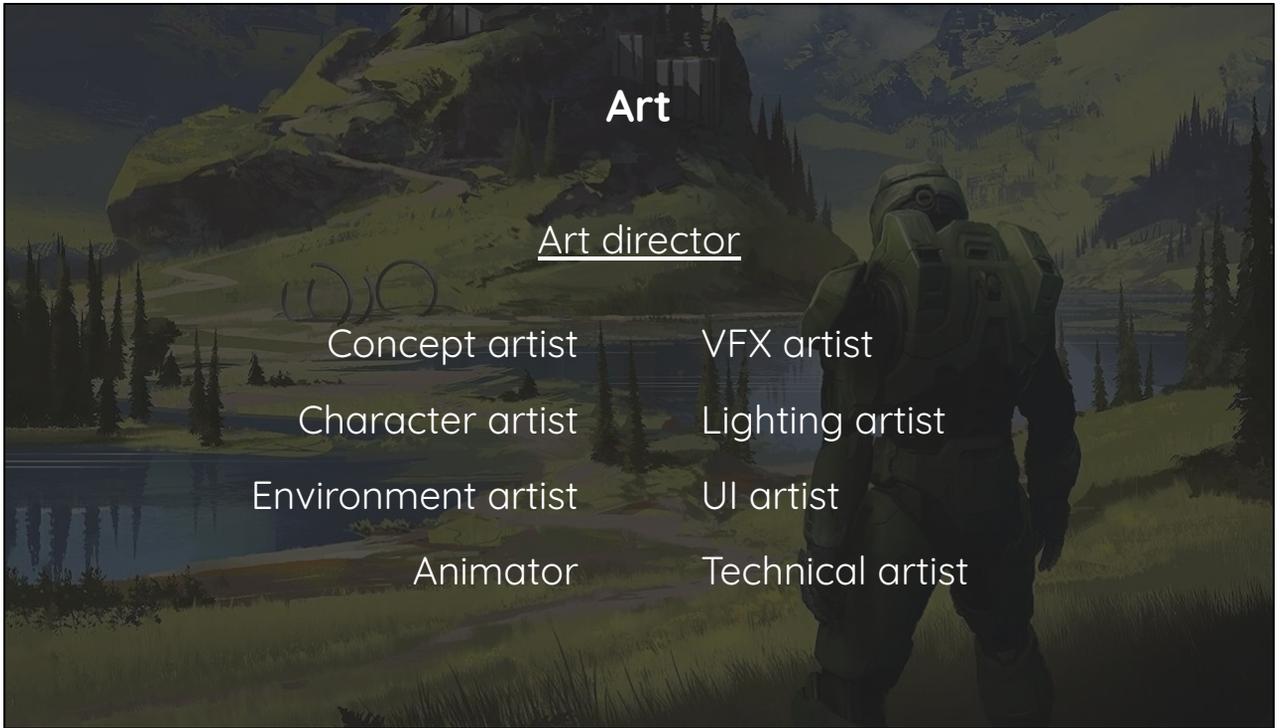
Art is an **obvious** one - this is all about **how the game looks**



Art needs to make new **visual effects** for the fireball - fire and sparks

Need to **animate** the character's **hands** as they cast the fireball

They need to add **lighting** - fire lights up the room



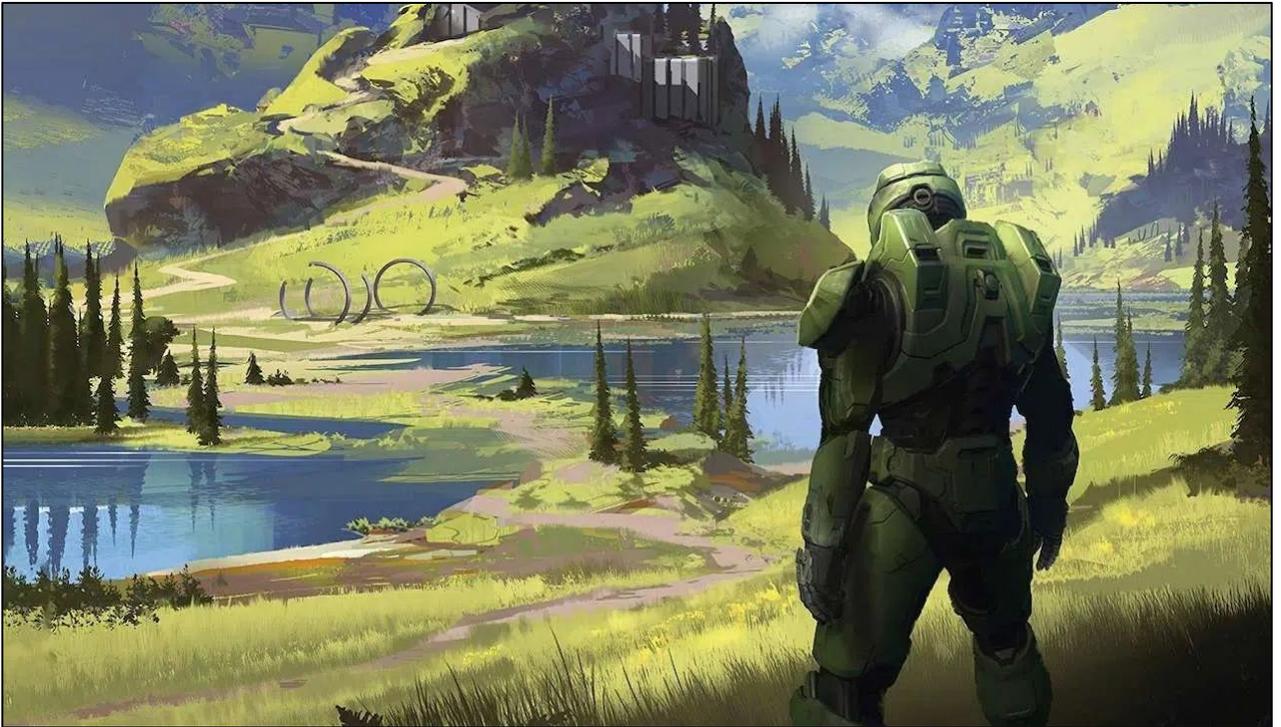
Art director in charge of the 'look' of the game

Pre-production - art **director** and **concept** artist

[Other roles]

A good route to this is obviously **art class**, but also **technical drawing**

Artists don't necessarily need to be **able to draw** (except concept artist), but have a good eye for **what looks good**



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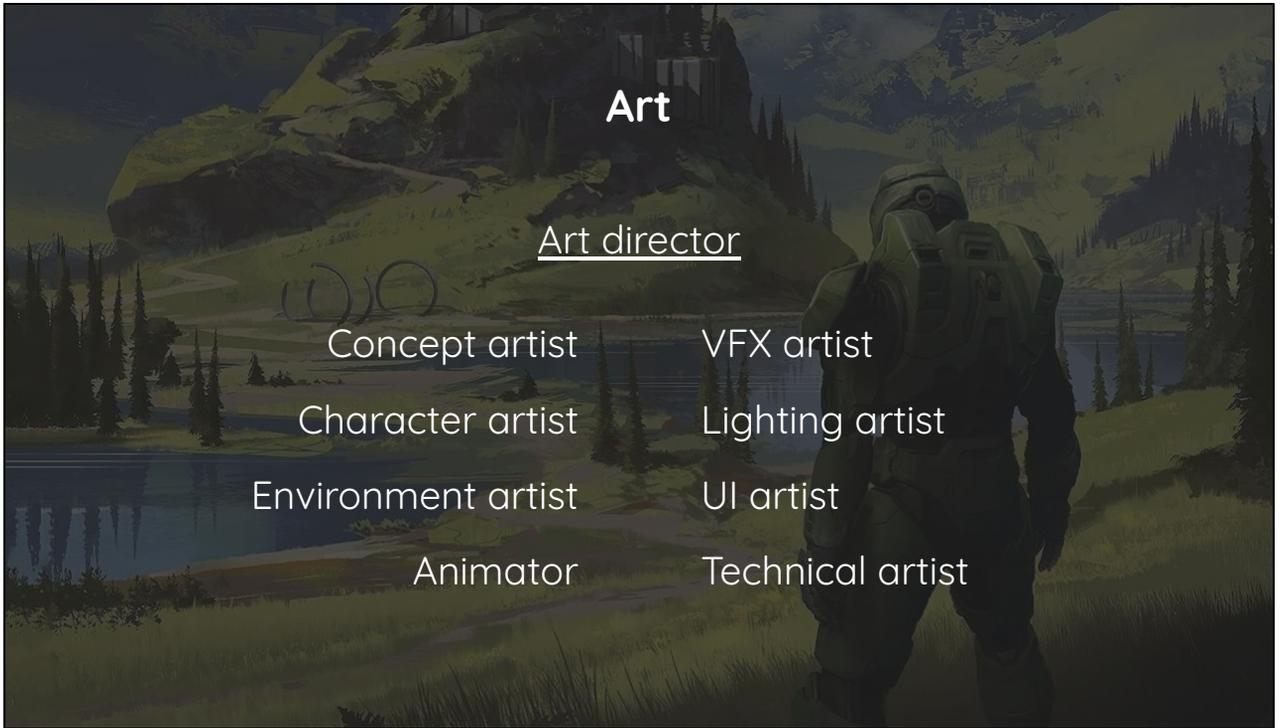
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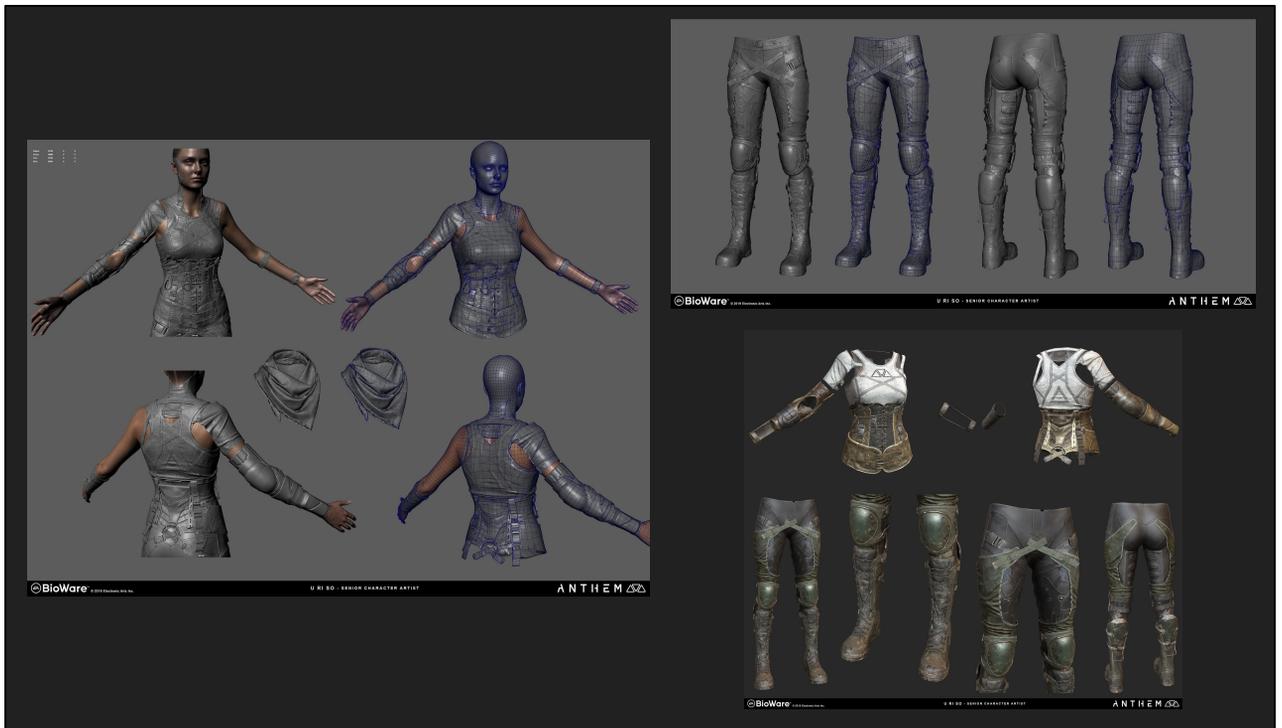
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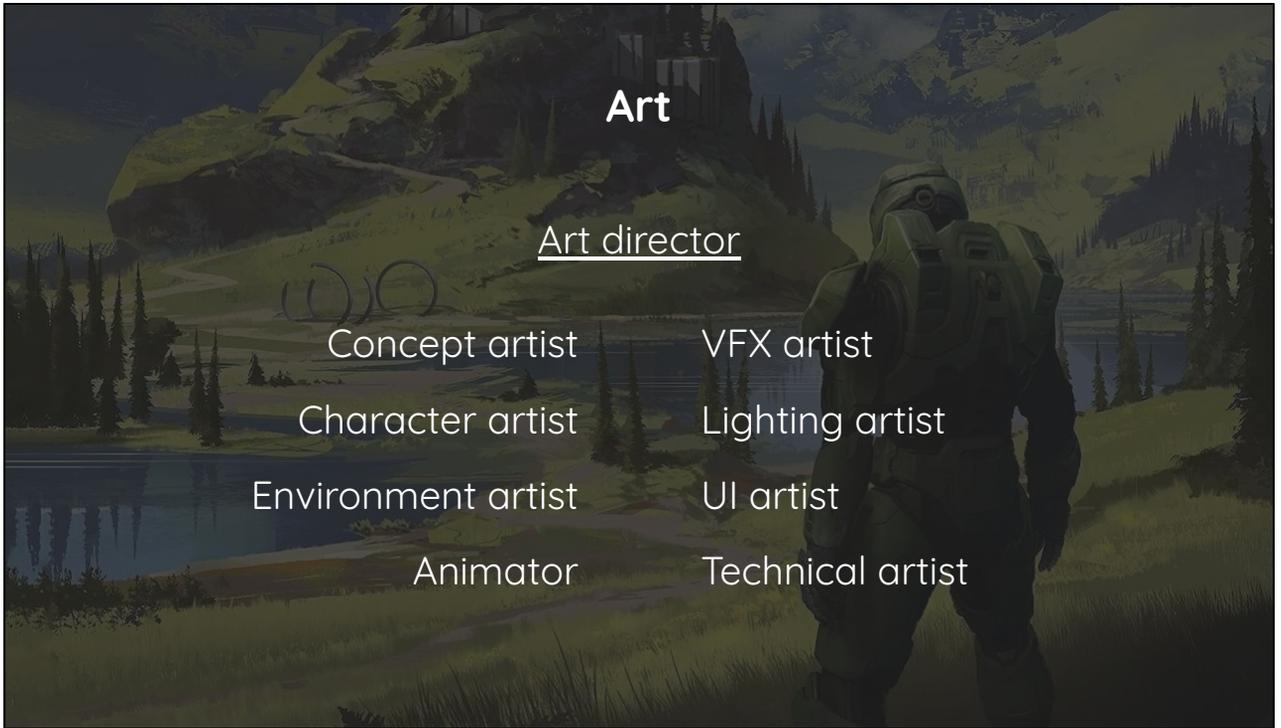
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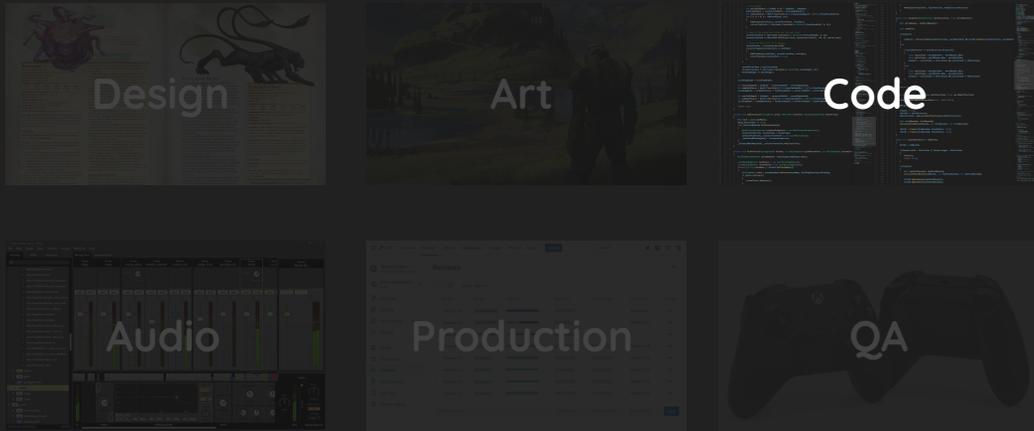
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Game development disciplines



Programmers are responsible for **everything technical**

As games are essentially **just programs**, programmers touch every part of a game

Design relies on them to make things **work the way they want**

Art relies on them to make their art **show up in the game**

And they need to always understand how to make things happen **fast**

At **60fps**, each frame can only take **16 milliseconds** to compute. A blink lasts around **100** - that's over 6 frames!

In general, programmers are **problem solvers**



Code needs to be written that lets the fireball get **cast**

Detect a **button press**

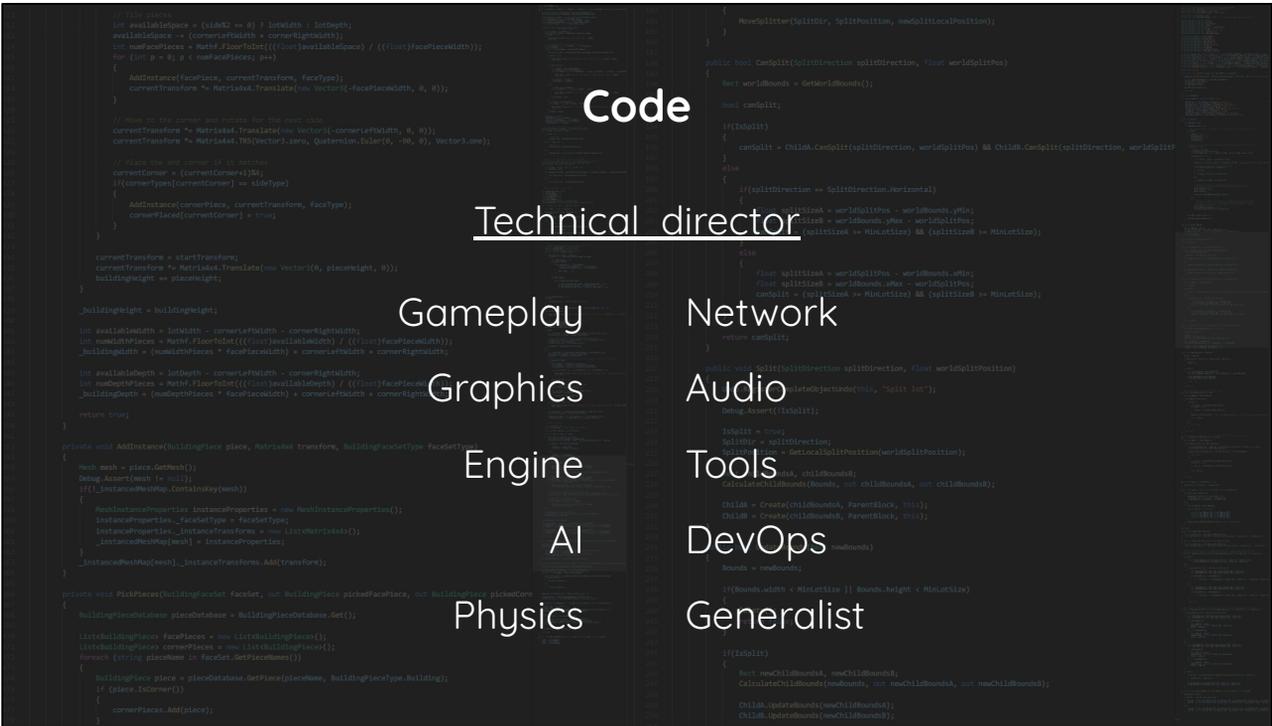
Trigger **cast animation**

Create fireball

How it travels

Detecting when it **hits things**

If there are enemies about they might **decide to try and dodge** - artificial intelligence

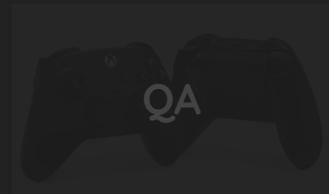


There are roles for every different part of the game

Maths class is an obvious one for this, as it's all about structured thinking and solving problems

But also **physics** and **applied maths** understanding can be very useful

Game development disciplines



Audio is an **extremely important** part of every game

The game's audio is usually the first point of **feedback** to the player on what's going on in the game world

It can make the difference between a **dead and lifeless** environment, and an **immersive and engaging** world



Audio needs to be **designed** make the fireball sound **hot** and **fast** and **dangerous**

An explosion in a **great cavernous hall** is going to sound a lot different to one in a **small tight room**



Audio

Audio director

Audio engineer

Audio designer

Composer

Game development disciplines



TIME is the most valuable asset to any game team, and producers are in charge of that - the game's **SCHEDULE**

They are there to make sure the game ships **on time**, and **on budget**.

They manage **dependencies** - make sure who knows what needs to be done and when in order to **hit deadlines**

Example: fireball feature, **playtest** in two months' time, design -> code -> art & audio

And they make sure that everyone on the team **communicates** with each other

It's easy for people to **work in isolation** without talking to each other, only to discover **someone forgot something**, or **plans changes** and someone got left out of the loop

Responsible for lots of other things - staffing, outsourcing, and so on

Game development disciplines



And finally, QA - **Quality Assurance** - are the **unsung heroes** of game development. They are there to ensure the game ships without any bugs... or **as few bugs as possible!**

It may seem like an easy job - **play games all day** - but it's actually quite hard work. You're required to play the **same parts of the same game** - many times a day, every day.

It requires good **attention to detail**, **patience**, and being able to **think through** every game system to figure out where it might break.

QA can be a **common route** for people to get a foothold in the industry, and then **move on** into **production** or **design**, or even art or code.

Getting into game development



www.thepixelmill.com/news



www.intogames.org

The **Pixel Mill** - development space in Belfast

Courses, workshops,

Currently running a course **Girls Make Games**, for girls aged 10-13

Into Games - loads of good information about a career in game development

Events

Mentoring

Just start making games!



www.coderdojo.com



www.blender.org



www.audacityteam.org



scratch.mit.edu



www.yoyogames.com



www.unity.com



www.unrealengine.com

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www.fragmentbuffer.com