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EXCLUSIVE

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How the British games industry survived its turbulent early years

Fallout 76

Bethesda, BETA and "spectacular" bugs

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In search of real criticism

Can games be art? Roger Ebert argued that they couldn't. He was wrong. Any narrative medium can produce art. But I'm not sure we're producing many examples that meet that definition. Let's be honest: everyone keeps talking about *BioShock* because it had something to say and said it with competence and style, not because what it had to say was especially profound. Had it been a movie or a book, I doubt it would have gotten much attention.

Part of that is because the industry's economics don't provide fertile ground for auteurs. This begs the question: given the inherent conservatism in the way the industry makes decisions about content, would we be making more art if customers demanded it? Probably, but that's not the core audience for most triple-A games. Besides, very few sources are providing audiences with the tools to even recognise art when they encounter it. I'm speaking, of course, about the lack of genuine criticism in games.

For the past year, when I speak at conventions, I've been asking gamers, and game devs, what a critic does. The only answer I've received is that a critic tells you whether a game is good or bad. Or, worse, that a critic tells you whether to buy a game. Given the corporate entanglements between game companies and many review sites, that last bit is especially chilling.

I die a bit inside, sitting here with a literary criticism degree, every time I hear that. The role of the critic isn't purely that of tastemaker or judge – the critic is a guide, an educator, and an interpreter. The critic makes subtext text, traces themes, and fills in white space. Put another way, the critic helps the audience find deeper meaning in a piece of art. Or: the critic teaches the audience the rules of the games artists play so that they're on a level ground with the artist.

One only has to compare movie or TV reviews in any mainstream publication, in which at least some critical analysis beyond "is this movie worth watching?" is fairly standard, with most of the entries on major game review sites, which tend to focus on specifying what content is in the game and whether it's fun. In an economic sense, such reviews certainly serve consumers, but they're not exactly serving those who consume media. (That's not to say that no one's doing real criticism: there are plenty of brilliant game critics – mostly writing for sites outside the mainstream.)

I read reviews of my favourite TV shows on the A.V. Club and other sites after I've watched the show, because I learn things from those writers. It's part of the digestive process, and I get insight from it. I've rarely had reason to read game reviews after playing the game.

Video games are a geek medium, and the hallmark of the geek is passion and deep engagement. In theory, with an audience primed to devour and pore over every detail, the back-and-forth conversation we have through games should be richer than other media. It's not. And I wonder if that's because very few people are teaching gamers the rules of the critical game.

JESSICA PRICE

Jessica Price is a producer, writer, and manager with over a decade of experience in triple-A, indie, and tabletop games.

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A vintage RPG returns following a 14-year hiatus

WELCOME

One of my most cherished video game memories involves *Skyrim*, some hens, and an angry farmer. While wandering around a village in Bethesda's classic RPG, I accidentally-on-purpose killed a chicken. Seconds later, a farmhouse door crashed open and a screaming woman charged at me, iron dagger held aloft.

It's an example of how complex and surprising games have become in a relatively short period of time, and it's a flavour we're hoping to capture in Wireframe. The games industry has grown and matured to the point where it can offer a diverse range of captivating and sometimes bizarre experiences – from tiny, jewel-like 2D indie games to vast, unpredictable sandboxes like *Skyrim* or *Red Dead Redemption 2*. Behind all those games are artists and programmers with their own ways of working, their own design philosophies, and their own unique paths through the games industry.

That's what we mean when we talk about 'lifting the lid on video games': Wireframe's goal is to uncover more about the making of games and who makes them. With our regular selection of tutorials and tips from veteran developers, we also hope to prove that making games is now within the reach of just about anyone.

So here it is: Wireframe issue one. We hope you enjoy it.

Ryan Lambie
Editor

What dreams may come: hands-on with Gris

We take an early look at Nomada Studio's ethereal platform game, Gris

Info

GENRE
Platformer

FORMAT
PC, Switch

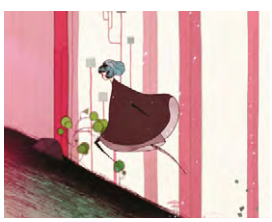
DEVELOPER
Nomada Studio

PUBLISHER
Devolver Digital

RELEASE
December 2018

DRESSED TO KILL

As Gris progresses through the game, her experiences and abilities will be reflected in her dress. Early on, she acquires an adorable 'ground-pound' move, where her dress swells up into a cube, allowing her to smash objects. According to Nomada Studio, this is just one of several abilities Gris and the player will pick up on their travels.



In *Gris*'s surreal world of pen lines and delicate splashes of watercolour, it's possible to see subtle hues from other games. There's the meditative air of *Journey* here, a hint of *Team Ico*-esque melancholy there, plus a dash of *Fez*'s laid-back 2D platforming. At the same time, *Gris* takes all these hues and mixes them up in a way that's all its own. The world its silent heroine inhabits – all crumbling towers, strange foliage, and geometric shapes – looks like something from the pages of a French graphic novel, and the French illustrator/writer Jean 'Moebius' Giraud is one of several artists whose work, *Gris*'s creators admit, influenced the game's look.

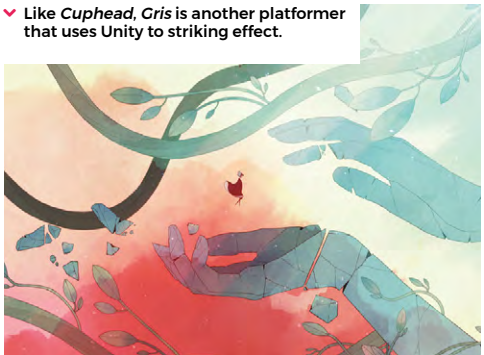
Beguiling in still images, *Gris* looks even more enthralling in motion: its shimmering backdrops and delicate hand-drawn animation is really something to behold. The heroine moves with an ethereal grace, whether she's bounding through deserted colonnades or leaping across angular tree-tops; in a playful nod to *Super Mario*'s ground pound, she even has a quirky move that sees her dress puff out into a solid cube, allowing her to crash down onto objects like a falling anvil. Not that you'll find anything in the way of a Goomba to squish here; the world of *Gris* may look forbidding at times, but its creators have deliberately avoided making the game an exercise in joypad-gnawing precision like *Super Meat Boy* – a conscious design decision on the part of Berlin-based developer Nomada Studio.

"One of the hardest parts creating *Gris* was the design of its puzzles," studio co-founder Adrian Cuevas tells us via email. "From the very beginning, we knew [the titular protagonist] Gris couldn't die in the game as it didn't fit with the story, and we wanted to encourage casual gamers to play it. On top of that, we didn't want to have repetitive mechanics, and we love to add a twist after you have mastered a skill."

A QUESTION OF TIMING

In the brief portion we played, the main challenges we faced were of timing: how best to negotiate a series of platforms that appear and disappear in a predefined order; what path to take in a meandering network of underwater caverns. Elsewhere, it's simply enough to take in the scenery, the gently downbeat piano soundtrack, and figure out how we're meant to interact with this odd new world. *Gris* entirely lacks a HUD, and button prompts are kept to an absolute minimum, so it's up to the player to read the subtle environmental clues about how everything works. Spectral balls of light can be collected and plugged into certain areas to create shimmering bridges; dancing clouds of red, triangular butterflies represent areas that boost our heroine to new heights. These are ideas we've seen in countless earlier platformers, but the fascination of *Gris*

Like *Cuphead*, *Gris* is another platformer that uses Unity to striking effect.



Gris is a journey into the traumatised mind of its protagonist – a haunting landscape of dreams.

is how subtly they're integrated into the game's sumptuous environments, created by Catalan artist Conrad Roset. Platforms that appear and then disintegrate have been around since at least the days of *Jet Set Willy* on the ZX Spectrum, but seldom as engagingly animated as they are in *Gris*. Actually making *Gris* look so bewitchingly hand-crafted was one of the early challenges, Cuevas tells us: work on the game's visuals initially began with traditional brush-and-paper techniques, but these ultimately proved too time-consuming to implement across the game's wide variety of art assets.

"Then we investigated different techniques we could use to make it look as though the game's drawn on paper," Cuevas says. "We tried different pencil strokes, scanned paper textures, scanned watercolour stains, and worked a lot with shaders that could help us make it look as close as possible to traditional hand-drawn animation."

Equally key to *Gris*'s atmosphere is its music, composed by Berlinist, a self-described 'chamber pop' band from Barcelona: Nomada's designers worked closely with the musicians through each iteration of *Gris*'s development, allowing them to better marry the soundtrack with the game's shifting landscape.

"We love their work, and they've been closely attached to the project from the beginning," Cuevas tells us. "To create the music, first we pitched the game to the band so they could start thinking on which type of music they wanted to do and how it would evolve throughout the game. Then as soon as we had a prototype of a level they were able to play it and start composing for it."

Key to *Gris*'s atmosphere is its music, composed by Berlinist, a self-described 'chamber pop' band from Barcelona

Before forming Nomada, Cuevas and co-founder Roger Mendoza worked on such triple-A franchises as *Assassin's Creed* and *Rainbow Six*. This might explain why, behind the arthouse presentation, *Gris* also takes a deceptively mainstream approach to its puzzle design. The demo even provides a dramatic set-piece: a gigantic bird-like creature that, at first glance, looks like a traditional boss battle – but then, like a lot of things in *Gris*, the encounter takes an unexpected and quite delightful twist.

There's still much we don't yet know about *Gris* at this stage – though ultimately, it's the sense of dreamlike mystery that makes it so intriguing.

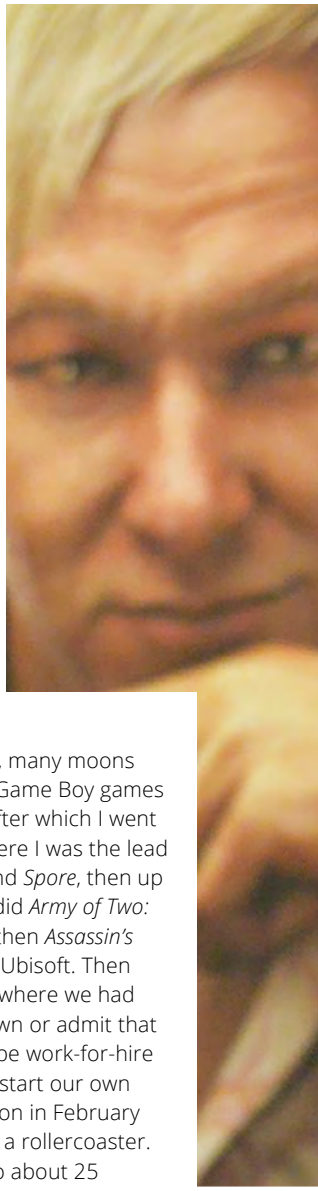
"We don't want to talk much about *Gris*'s story," Cuevas says, "but we can say it is a metaphor of her inner world and her growth through a painful moment in her life. It will become a bit more clear as you play it, but most of the story will be open to interpretation."

DEV FACTS

Nomada Studio

- Based in Barcelona, Nomada Studio was founded by Adrian Cuevas and Roger Mendoza, former developers at such high-profile studios as Ubisoft and Square Enix.
- The artist behind *Gris* is 29-year-old Conrad Roset. This is his first foray into the world of video games, and *Gris* is driven by his personal style and design ideas.
- Both *Gris* and Nomada Studio were born out of Conrad Roset's game concept. Cuevas and Mendoza quit their jobs to form the new studio and work on *Gris*.

Conrad Roset's watercolour and ink artwork dazzles from the opening scene.



The coming storm

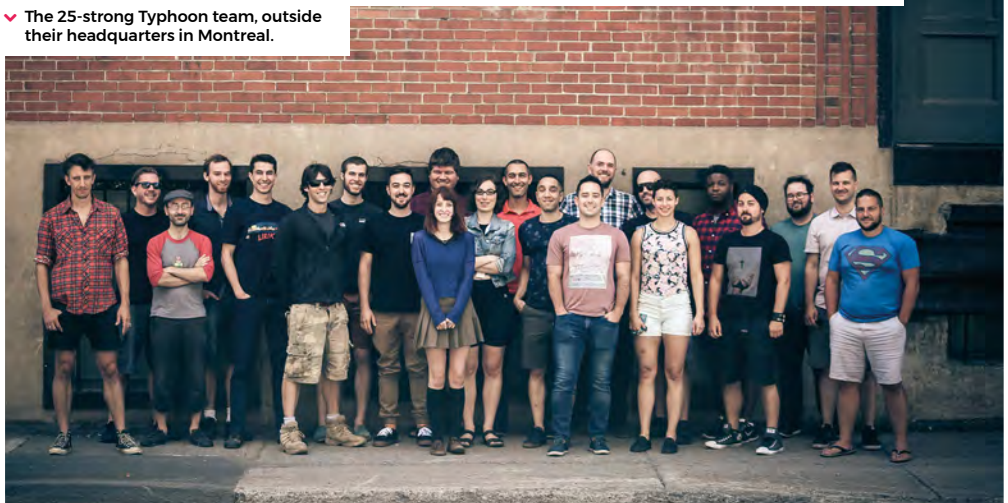
Far Cry 4 director Alex Hutchinson talks exclusively to Wireframe about setting up his new studio, his career, and his "louder, brasher" new game

To an indie developer used to working with one or two collaborators, a studio of 25 people probably sounds huge. But for Alex Hutchinson, co-founder of the brand new Typhoon Studios in Montreal, it's positively tiny; the director of such games as *Assassin's Creed III* and *Far Cry 4*, Hutchinson has spent the last eight years of his career dealing with the pressures of mega-budget titles and vast armies of artists and coders. In his previous role as creative director at Ubisoft Montreal, he was at the helm of a company with as many as 3500 employees.

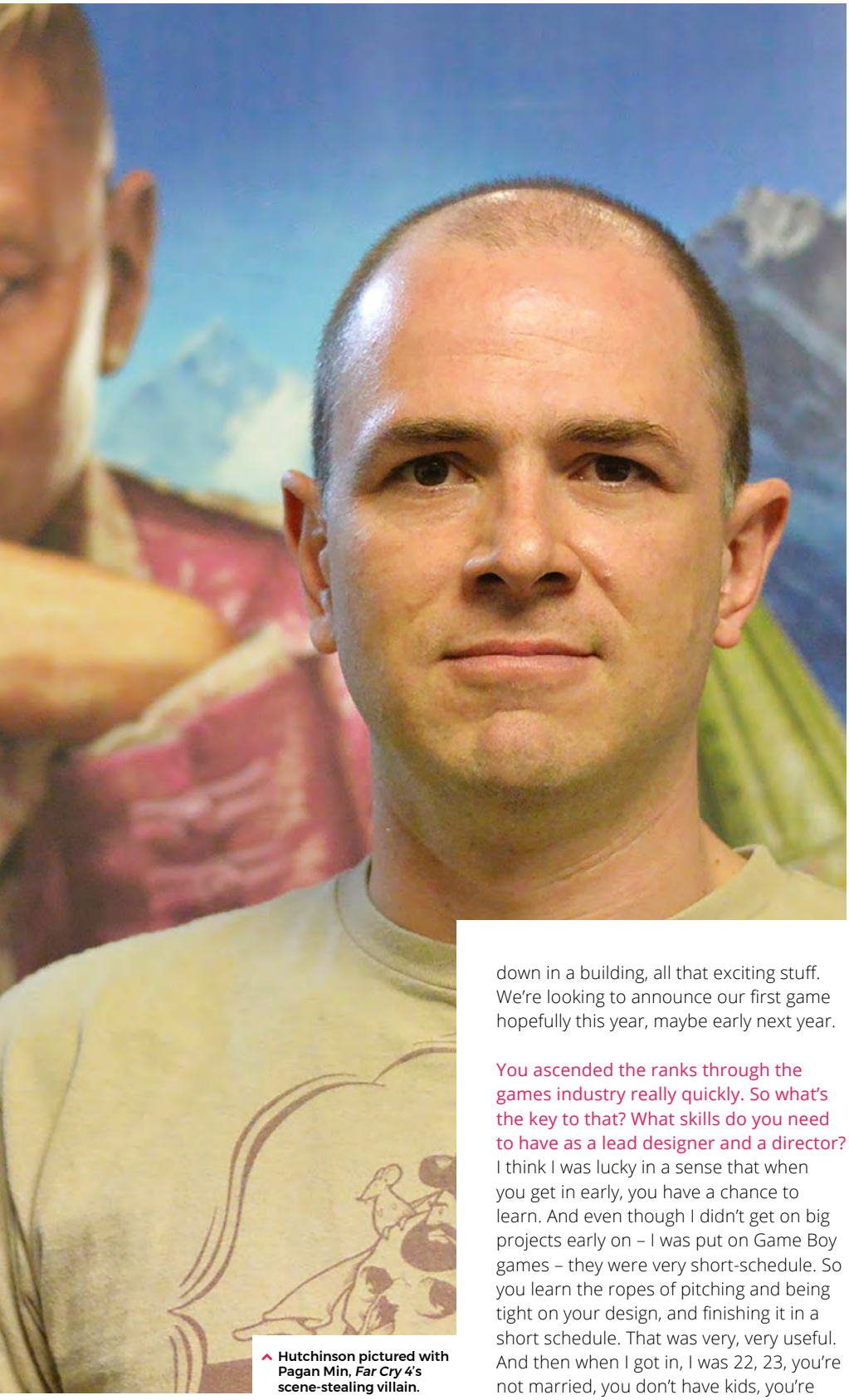
With Typhoon Studios, however, Hutchinson's taking a step back from the expensive sequels and marketing hype. With his co-founder Yassine Riahi and a hand-picked group of designers, he's now at the helm of a game that, he says, "is halfway between an indie and a triple-A". The only trouble is that when we settled down with Hutchinson for a lively interview over Skype one autumn afternoon, the specifics of Typhoon's debut game had to remain firmly under wraps. Nevertheless, Hutchinson still gives us a flavour of what to expect: loud, brash, and with a focus on unscripted events and exploration. Hutchinson is candid, too, about the pressures and minor absurdities of developing huge franchise games, and how his start as a young hopeful from Australia led to a successful career in the US..

Going right back to early in your career, you had a degree in archaeology. So did you always think you'd go into game development?

Um, I did not. I always thought it would be impossible. I grew up in Melbourne, Australia, and I grew up on Amiga Power, my Amiga 500, and early Nintendo stuff. Things that were occurring in London or Tokyo didn't seem very realistic from where I was, aged ten. So I did some stuff I was interested in – I did a lot of writing when I was younger. I got a degree in archaeology. But I didn't think I could get in – it was only when games started to get bigger and the roles started to become more specialised. Studios would hire specialised designers who couldn't code, or hire writers who couldn't code. Those opportunities opened up, and I was able to get in pretty early with that first explosion. I was a designer for a small studio called Torus Games in Australia, many moons ago. I worked on a lot of Game Boy games for Activision, basically. After which I went to Maxis in California, where I was the lead designer on *The Sims 2* and *Spore*, then up here to Canada, where I did *Army of Two: The 40th Day* for EA, and then *Assassin's Creed III* and *Far Cry 4* for Ubisoft. Then we hit that mid-life point where we had to either go out on our own or admit that we were always going to be work-for-hire creators. So we chose to start our own studio. We started Typhoon in February last year, which has been a rollercoaster. In that time we've gone to about 25 people. We've signed with our publisher, 505 Games, after a year of prototyping and experimenting and putting carpet



The 25-strong Typhoon team, outside their headquarters in Montreal.



Hutchinson pictured with Pagan Min, *Far Cry 4*'s scene-stealing villain.

down in a building, all that exciting stuff. We're looking to announce our first game hopefully this year, maybe early next year.

You ascended the ranks through the games industry really quickly. So what's the key to that? What skills do you need to have as a lead designer and a director?
I think I was lucky in a sense that when you get in early, you have a chance to learn. And even though I didn't get on big projects early on – I was put on Game Boy games – they were very short-schedule. So you learn the ropes of pitching and being tight on your design, and finishing it in a short schedule. That was very, very useful. And then when I got in, I was 22, 23, you're not married, you don't have kids, you're willing to move around the world, so being very flexible.

"That was one of the big attractions of starting Typhoon – the idea that we could take something from an idea to finish and keep it a little bit esoteric"

What are the practicalities of starting a studio from scratch? You mentioned choosing the carpet and all that kind of stuff, but what else did you have to consider?
We're in the process of discovering new things we have to take seriously. We obviously knew hiring was going to be a big focus when you begin finding the right people – getting the right team together is the most important thing, in my opinion, of any game, other than having a decent idea. We were fortunate enough to find a good partner early on in Makers Fund, who are a Chinese investment company. They took a stake in the business while we built ourselves up and looked for a publisher. That gave us the time to develop and partner with 505 Games.

I read that at Ubisoft Montreal you had 2500 people working there. So did it feel that you had to step back from that size of business as well?
Yes, for sure. I think Ubisoft Montreal is 3500 people these days – it's a monstrous studio, in three buildings down here in Montreal. It's a fabulous place, and I loved my many years there, but it can become impersonal and very large. It's very hard to sneak in those little individual touches and personal flourishes that you might want to put into a game that a small group of people can completely own. So that was one of the big attractions of starting Typhoon – the idea that we could take something from an idea to finish and keep it a little bit esoteric and a little bit unusual, and give it a flavour that would be too strong to push through in a triple-A release.

Action bromance *Army of Two: The 40th Day* marked Hutchinson's debut as director.

The colour of Connor's sash in *Assassin's Creed III*: the subject of numerous meetings during production, Hutchinson says.

Is there a significance behind the name, Typhoon? Is it a cool-sounding word or is it a hint at the type of games you're going to make?

Hopefully it's a bit of both. It's almost impossible to find a name that somebody else doesn't already have, and that's short enough and punchy enough that people will remember it. So we ended up with the idea that it was a simple word that is basically the same in French and English, which is important here in Montreal. It's short and punchy, and we always liked the idea that we'll make games that are strong-flavoured. There are a lot of companies out there that feel to me like music in the 1950s in a sense – everyone's on the same show wearing the same suit, you know? I think that there's enough room in people's personal tastes to enable all kinds of games.

We think that it's OK if not everyone loves your game. It's OK to have people hate it, as long as you have a core that does actually love it. We want to be polarising. We think the opposite of love is indifference.

You have a line on your website about the creative constraints that come with mega-budget game development. Can you describe what some of those constraints are?

There were two major things. One was the process – making sure ideas get through the pipeline, and that ideas are protected. It's an arduous process: you have to pitch to the team, then you have to pitch it to the management in the studio you're in, then the managers of the company as a whole. It's very hard to stay the course through years and many sets of eyes.

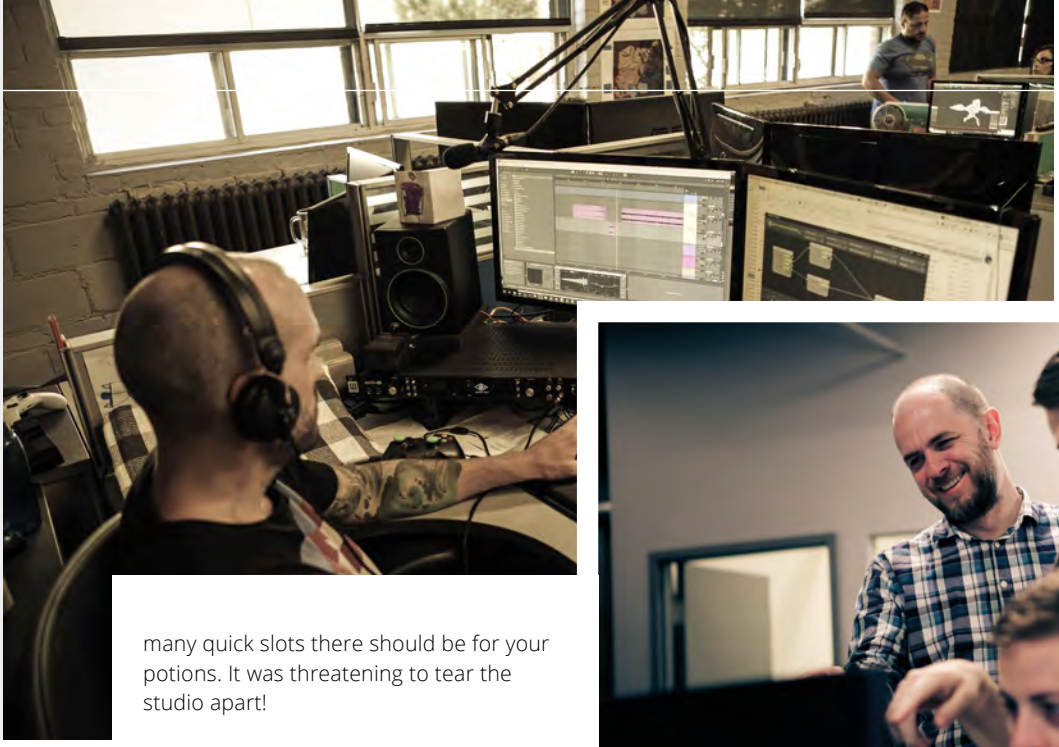
The second thing is, because it's very expensive – a triple-A budget of $50m to $100m plus – [publishers] quite rightly want to protect their investment, so they're not going to allow you to take too many risks in what you're doing.

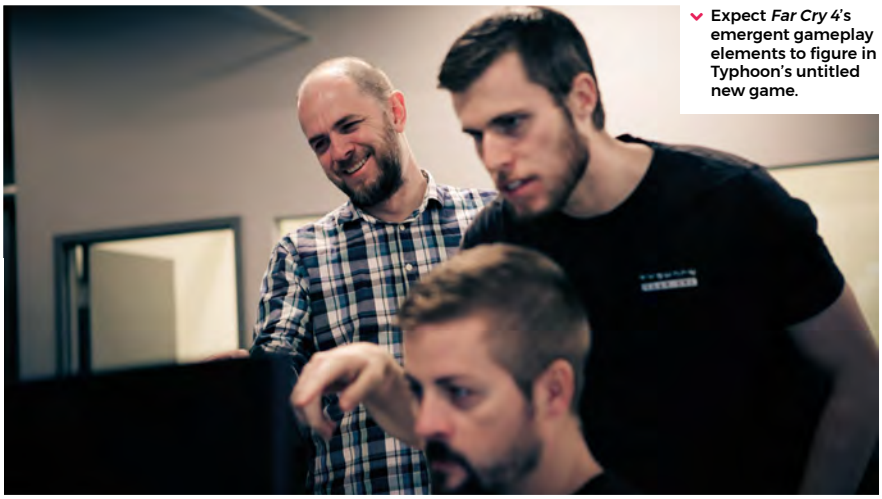
I think I read on Twitter that you had seven two-hour meetings about the colour of the hero's sash in *Assassin's Creed III*. Is that right?

Yes. I mean, the number is arbitrary – it was more of a joke. But we debated that sash for months. Months!

Was that fairly typical of the detail you'd go into in those meetings?

A little bit. That wasn't even external – that was more among the team. I think when you have a franchise that's as fantastic as *Assassin's Creed*, there's a lot of love for it within the team itself. It's hard sometimes to change people; even though some of the things in retrospect are very minor, at the time, people were very passionate. I remember years ago I almost went to Blizzard to work on *Diablo III*, and at the time, when they were still Blizzard North, they were in the midst of an argument that was so big that half the studio wasn't talking to the other half. It was about how





Expect *Far Cry 4*'s emergent gameplay elements to figure in Typhoon's untitled new game.

many quick slots there should be for your potions. It was threatening to tear the studio apart!

You talked about the long hours and the dedication you need to succeed in the games industry, but I wonder whether it's a difficult industry to thrive in long-term, both because of the hours and external pressures like Metacritic and social media.

Yeah, I think that's definitely a part of it. I went through a phase, probably post-*Assassin's Creed III*, where it's pretty relentless. You get into a lot of difficult interactions on things like Twitter and message boards on websites. The unfiltered 14-year-old screaming at you is never particularly fun. Especially when you've worked for a couple of years, 60, 70 hours a week trying to get it done, and you're already exhausted. I don't know that it's necessarily sustainable. But the big studios are getting better at it. It's a lot better than it was. I was at EA during EA's Spouse years [refers to Erin Hoffman's anonymous blog, detailing the gloomy work environment in the mid-2000s].

If you recall, those were really dark days, where it was more of a sausage factory. My experience at Ubisoft was of people pushing really hard to make something good. They were committed to it, which was satisfying. Probably not sustainable in the super-long term, without big breaks, but much healthier.

Having directed *Far Cry 4* and *Assassin's Creed 3*, what do you think you'll take over to the current game at Typhoon?

I think the biggest learning for me was that there's not a direct correlation between the effort of the team and the impact on the player. What I mean by that is, say on *Far Cry 4*, we built an open world that in the end I was very proud of – how the systems interleaved, the opportunities we gave to the player for self-expression, and the way the game can interrupt you with something surprising like a bear on fire, or an unintended consequence. That was easier to build, in the end, and more fun for the player, than many of the scripted missions that cost a lot of money and were very difficult to execute. So the thing we're saying is, "Hey, this slightly lower-cost angle can actually be more fun". So we can make something that is somewhere between a traditional indie, a very small-scale indie, and a triple-A, with a reasonable amount of people.

I suppose the good thing about hitting that sweet spot is the agility to prototype games in a way a big studio doesn't have?

Yeah, and also the sheer weight of a large team and the amount of content that's required. A triple-A these days has to have multiplayer, single-player, probably a level editor, something else that's in vogue like second-screen activity or a connection to Facebook. They're monstrous buffet tables, essentially, whereas an indie is the reverse of that – you can just do one part of that, at a high level of quality. You can really be focused and really make it tight.

"We think that it's OK if not everyone loves your game. We want to be polarising. We think the opposite of love is indifference"

MAKING SPORE

One of Alex Hutchinson's early games as a lead designer was *Spore* – Will Wright's ambitious 2008 life sim and RTS hybrid. Originally titled *SimEverything*, *Spore* became widely known for its protracted development: early work began on the game as far back as 2000. Hutchinson points out, however, that *Spore* was actually quite a small game for much of its production.

"The *Spore* team was only about 80 people," Hutchinson tells us. "And lots of those early years were spent with even less –15, 20 people. So it was never a big production, even though it was a long one."

Preview

Stormworks: Build and Rescue

The flexible build system allows you to make all kinds of vehicles. Getting them to actually work takes skill and patience, however.

Make your own boats and helicopters in a quirky sandbox sim

Info

GENRE
Sandbox / Sim

FORMAT
PC

DEVELOPER
Sunfire Software

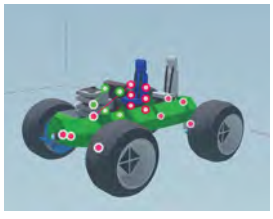
PUBLISHER
Green Man Gaming

PRICE
£10.99

RELEASE
On Steam Early Access now

WHAT'S NEXT

Stormworks first hit Early Access in February 2018, with the full version expected to emerge in 2019. According to developer Sunfire Software, the finished build will contain more islands, vehicle parts, and additional missions to tackle.



The trailer was a bad idea. My mission: take some boxes of supplies to a nearby lighthouse. I looked at my standard issue craft, bobbing happily in my boatyard, and concluded that the boxes of supplies wouldn't fit in the back. Sure, I could stack them up to save room, but then they'd probably fall off within seconds of speeding off into open water.

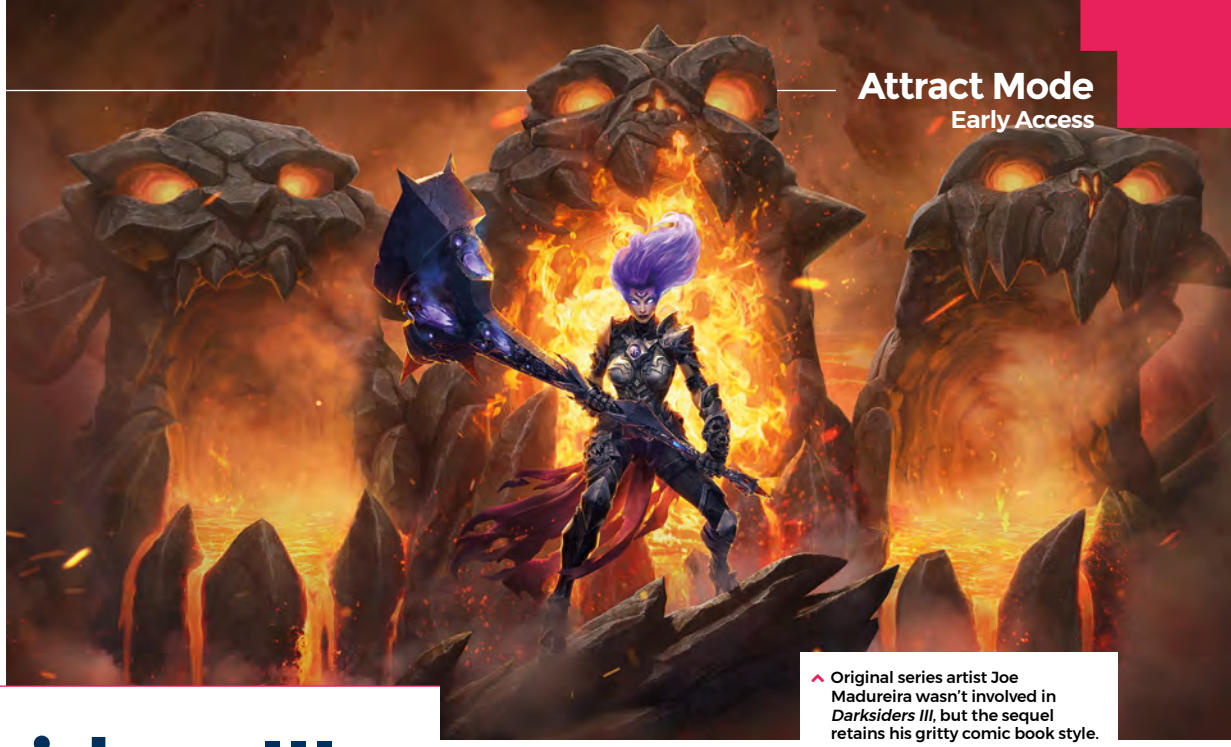
Briefly thinking myself to be an engineering genius, I therefore went to my workbench and constructed a makeshift trailer that jutted out of the back of my boat. It wasn't pretty, but it seemed functional. Seconds later, I realised my mistake: placing the boxes in the trailer left the front of my craft pointing up in the air; attempting to drive the thing accurately was nigh-on impossible, and my supplies soon slipped out of their enclosure and floated off into the sea. To the owner of the lighthouse: I can only apologise.

Such are the pitfalls of dreadful player design choices in *Stormworks: Build and Rescue*, currently in Early Access on Steam. As its name implies, it's a game all about making vehicles and using them to complete rescue missions, whether it's something as mundane as delivering valuable supplies somewhere down the coast or fishing a drowning worker from the roiling sea. You aren't limited to making boats, either; using *Stormworks*' surprisingly deep construction interface, you can bolt together anything from a six-wheeled buggy to a fully functioning helicopter.

Before you can do all that, though, you'll have to figure out how that interface actually works. Building the shell of your vehicle is a simple process: it's a matter of selecting shapes and connecting them up in your 3D workspace. Adding engines, propellers and the like is a bit more tricky: to do this, you'll have to get to grips with the logic system, where you select how the power is distributed through the engine to the wheels and propellers.

There's a certain amount of trial and error involved, not only in designing an effective vehicle (especially one that can carry boxes without spilling them all over the place) but in how it'll react when turned loose in the game world. Some floaty physics can produce some unexpected and mildly frustrating results: even the stock boat the tutorial provided us with is highly vulnerable to tipping over following light contact with a submerged rock. Exactly how much power should be transmitted from the engine to your wheels and propellers can take a bit of fiddling, too – it might be nice to have a function that figures a detail like this out for you.

It's early days for *Stormworks*, though, and even at this stage, it offers an absorbing sandbox to play around in. Completing missions is one thing, but we whiled away several happy hours just tinkering with the design tools and riding around in the results. If developer Sunfire Software can smooth off some of the game's rough edges – it's almost impossible to see what you're doing in your boatyard at night even with the lights turned on, for example, and figuring out where a leak's coming from in your painstakingly built craft can be a chore after a while – then *Stormworks* could provide hours of quirky entertainment on the high seas.



Original series artist Joe Madureira wasn't involved in *Darksiders III*, but the sequel retains his gritty comic book style.

Preview

Darksiders III

The hack-and-slash franchise returns after years in limbo

As supernatural powers go, burning hair's a mixed blessing: a great party trick, but less than ideal if you like going to the cinema. For deadly mage Fury — a relative of the Four Horsemen of the Apocalypse — her flaming hairdo is ideal for illuminating dingy caves and corridors. This is just as well, since the hands-on demo we recently tried takes place entirely in a crumbling, post-apocalyptic subway, complete with giant demon crabs and beasts with giant talons.

It's six years since the last *Darksiders* game, and the passage of time is marked by the franchise's shifting influences. The first two entries were hack-and-slash collisions of *Zelda* and *God of War*; *Darksiders III* feels more like *God of War* mixed with a dash of *Dark Souls*. New protagonist Fury is a capable and nimble fighter, armed with a reticulated metal whip and a range of magic powers that include a giant hammer and a magical fire attack. Enemies appear to be much tougher and aggressive, though, and even with her aerial attacks and dodging abilities (which allow you to inflict greater damage if you perfectly time your feint), Fury is quickly overwhelmed if she's set on by two or more monsters at once.

Sloth is one of the loathsome embodiments of the Seven Deadly Sins you'll have to take down in *Darksiders III*.

Practice and a smattering of tactics are key here, though part of the difficulty comes down, at least in this preview build, to an awkward camera, which often leaves Fury fighting one monster without being able to see that one or two others are sneaking up behind her.

Really, this subway catacomb feels like an odd bit of the game to show off. Gunfire Games has talked about *Darksiders III*'s open world, but the subway we explored felt more like a labyrinthine space akin to one of *Zelda*'s temples. Given that the original *Darksiders*, from way back in 2010, began with a cinematic fight on the streets of New York, skulking around some ruined subway cars and rubble feels a little anticlimactic. Not that *Darksiders III* is a bad-looking game: the creature designs have an appealing baroque style, and there are some decent lighting effects as Fury's flickering hair cuts through the gloom. In a nod to *Metroid*, there are certain areas that will remain sealed off until Fury acquires the right power to unblock the path — purple barriers need to be destroyed with her Force ability, while thick webs can be burned with her flame attack.

The preview ends on a violent note, too, as Fury faces Sloth — one of the embodiments of the Seven Deadly Sins she hunts down on her quest. The combat here feels solid enough, and the bloated, insectoid Sloth makes for a worthy opponent. Again, mastering those dodge timings is vital here.

Darksiders III looks and feels like a solid enough sequel, then; we're just keen to see more of those more open apocalyptic spaces Gunfire's been talking about.

Info

GENRE
Action adventure

FORMAT
PC / PS4 / XBO

DEVELOPER
Gunfire Games

PUBLISHER
THQ Nordic

PRICE
£10.99

RELEASE
27 November 2018

TALES FROM THE DARKSIDE

The 2013 bankruptcy and closure of publisher THQ left the *Darksiders* series in limbo -- not least because its creator, Vigil Games, was owned by THQ and wound up as one of several studios fatally affected by its demise. In 2014, Vigil founder David L Adams set up Gunfire Games, and work on *Darksiders III* finally began.

"With *76*, we feel we have not finished, but reached a starting line," says Bethesda.

Bethesda's Buggy B.E.T.A Admission

Making online games isn't as easy as it used to be – and it's never been easy

Bethesda's letter: honest, open, and bug-free.

Bethesda's early B.E.T.A (Break-It Early Test Application) sessions for the upcoming *Fallout 76* were preceded by an uncharacteristically candid warning, of sorts, from the publisher about bugs in the game. It may be common knowledge that Bethesda's games tend to *feature* bugs at launch – sometimes even into later life – but for the studio to out and out print a letter publicly admitting such is an unprecedented move.

"Usually after years of development, we finally finish, release the game, and take a break," the letter, posted on Twitter, read. "With *76*, we feel we have not finished, but reached a starting line where all new work begins.

"We all know with the scale of our games, and the systems we let you use, that unforeseen bugs and issues always come up. Given what we're doing with *76*, we know we're opening everyone up to all new spectacular issues none of us have encountered. Some we're aware of, such as areas where performance needs to improve with lots of players. Others, we surely don't. We need your help finding them, and advice on what's important to fix. We'll address all of it, now and after launch."

Early reports from players in the *Fallout 76* beta have largely been on the positive side of things – perhaps this act of softening the blow by Bethesda had its intended impact. But there are still issues being reported ahead of the ambitious MMO's launch, not least of which an issue with the PC client causing the entire beta to be deleted should you click *any button at all*. The beta's playing time has been strictly controlled, so there's just not been a huge amount of time for people to break things.

BUCKING TRENDS

All the same, reports of lengthy loading times and frame rate drops – sometimes to single digits – are the other worst offenders. Connection drops related to the former and sudden, unexpected deaths attributed to the latter have been causing dissent in the fandom ranks. Beyond that, there have been minor issues: freezing and stuttering; slow rendering of the world; login issues... but, by and large, this has been Bethesda actually *bucking* the trend.

***Red Dead Online* is coming after the main event.**

Blasting robots together has been relatively bug-free so far.

Despite its backronym-tastic name, the *Fallout 76 B.E.T.A* is an actual, 'proper' beta – it's being used by the firm to stress-test servers and help with pre-launch balancing, as well as to discover any hitherto unknown game-breaking issues. Whereas other titles tend to launch their betas in the form of glorified demos, Bethesda's approach is both allowing those who pre-ordered its latest *Fallout* to get into the action early, as well as exploiting its eager fan base to iron out the kinks. In a nice way, that is.

So it is we've entered this peculiar world where, before launch, Bethesda is acknowledging bugs – some 'spectacular', no less – but at the same time has (pre-)released a massive, open-world MMO that doesn't appear to be suffering terribly from the usual problems associated with its games. The learning process has been a long one for Bethesda, but if *Fallout 76* holds up at launch, it could well be the beginning of a new era for the ZeniMax-owned publisher/developer.

A more open, honest approach regarding multiplayer gaming may well be the flavour of 2018: not only is Bethesda offering an advance warning of bugs, Treyarch is acknowledging how things are progressing under the hood in *Call of Duty: Black Ops 4*, and even Rockstar has said a few words to temper expectations surrounding *Red Dead Redemption 2*'s still-to-come online component.

"A more honest approach to multiplayer gaming may be the flavour of 2018"

REFRESHING HONESTY

A rep from Treyarch acknowledged ongoing issues with *Black Ops 4*'s online component (that being the entire game), writing: "Now that we're past the initial launch of the game, we are focusing on fine-tuning network performance around the globe, using the real-world data that we have collected... As we have always said, launch is just the beginning, and we're committed to making *Black Ops 4* the best-supported game we've ever delivered. This is a journey that will involve constant adjustments, improvements, and additions. We appreciate your continued support and patience – thank you!"

Meanwhile, ahead of its November launch, Imran Sarwar, director of design at Rockstar North, commented on *Red Dead Redemption 2*'s online component in an interview with IGN: "As we have learned from experience when launching online games at this scale, there are bound to be a few issues and we want to ensure that we have time to gradually roll out the game and make the experience as smooth as we possibly can for everyone. We believe this way of rolling out will give people the best overall experiences with both single-player and multiplayer."

It all goes to show the path to multiplayer dominance is plagued with really rather irritating potholes. There's no point in couching language around these issues in marketing speak, and transparency from these usually unimpeachable giants of the development and publishing world is refreshingly honest. Long may it continue.

Fallout 76 releases 14 November on PC, PS4, and Xbox One. It's fair to assume there will still be bugs present, but the hope is as many as possible will be quashed through the testing sessions. After all, the only good bug is a dead bug... or one that makes things ragdoll hilariously.

UNITING SHOOTERS

Unity has launched its first game development project, titled FPS Sample Game. The project is freely downloadable and meant to act as a starting point for developers new to the Unity platform, or a source of inspiration for those of a more veteran persuasion.

The sample project includes everything needed to get up and running with a basic – and surprisingly pretty – FPS game. A full level with high-quality HDRP assets is included, along with two fully rigged character models and four weapons. You even get deathmatch and assault game modes as standard.

Support for PC is included out of the box, and console support is set to be introduced at some nebulous point in the future. Additional assets and future developments on the project will be introduced, and all will remain free to use for those who want to tinker with the project.

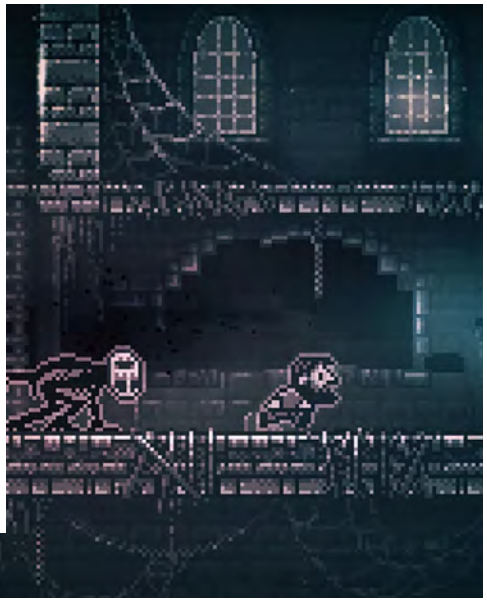
You can find the thrillingly named FPS Sample Game over on GitHub: **wfmag.cc/WWWgyr**

Incoming

Disco Elysium

Maybe it's the murmuring soundtrack by British Sea Power, or perhaps it's the dystopian setting, but there's something about *Disco Elysium*'s uneasy mood that really burrows under the skin. It's an isometric RPG about an amnesiac detective who's in the midst of solving a murder case and battling his own inner demons. The fantasy world created by developer ZA/UM is brought to life with grubby hand-painted graphics, while the dialogue and skill system is extraordinarily comprehensive.

Release date: TBA



Inmost

Created by Lithuania-based Hidden Layer Games and published by Chucklefish, *Inmost* is a 2D platform-puzzler served with a splash of Gothic horror. Its bearded protagonist pokes around the grounds of a windswept castle, uncovering its various melancholy secrets. The pace is measured and intimate; the pixel graphics and low-key score full of delicate detail. Even the hero's beard is lovingly animated.

Release date: 2019

My Friend Pedro

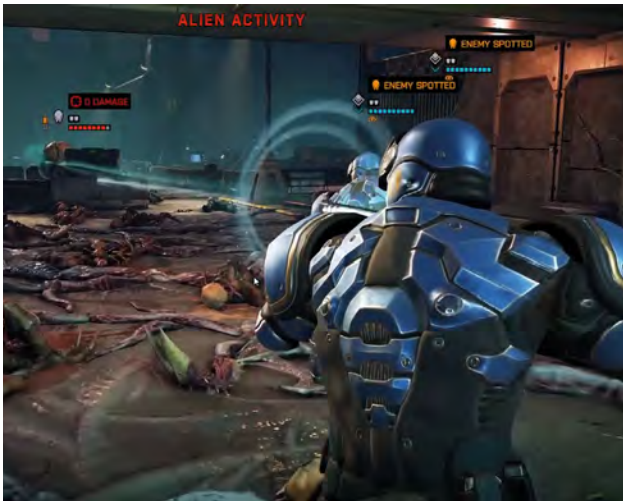
Splicing the violence of *Hotline Miami* with the slow-motion acrobatics of *Max Payne*, *My Friend Pedro* is a 2D shooter in development at DeadToast Entertainment. Its masked hero specialises in rolling, spinning, and shooting multiple enemies at the same time, and there are bonus points to be earned for successfully ricocheting a bullet off a frying pan into a bad guy's face.

Release date: TBA

Phoenix Point

If you're a fan of the original *X-COM* or any of design veteran Julian Gollop's earlier games, you'll probably know about *Phoenix Point* already. It's another turn-based tactics game in which squads of armoured soldiers gear up to fight a race of alien invaders; as well as coordinating ground assaults, you'll also have to construct bases and deal with other human factions vying for resources.

Release date: June 2019



Beyond Blue

With 2014's BAFTA-winning *Never Alone*, developer E-Line Media created an atmospheric 2D platformer steeped in the myths and legends of Native Alaska. The studio's delicately informative approach clearly impressed the BBC, who approached E-Line with the idea of making a game loosely based on the documentary series, *Blue Planet II*. The result is *Beyond Blue*, an undersea adventure game that, like *Never Alone* before it, will offer an additional layer of educational content – video clips, facts about aquatic life – should players want to dig into it. E-Line boss Michael Angst tells us that the BBC gave his team of developers access to dozens of hours of documentary footage, still photos, along with scientists who could advise on the game's near-future technology.

All that material has gone into an open-world adventure in which you play Mirai, a scientist leading a fact-finding expedition on the ocean floor. In her high-tech diving suit, Mirai's job is to study the behaviour of whales, sharks, and other marine life, all while managing resources and her own energy levels. It's a gentle, even soothing experience, and we spent several minutes simply swimming around and admiring the differing ways E-Line's assorted creatures interact. There's a broader story, too, and one that will be greatly affected by the player's choices and relationships with the game's other characters, both aquatic and human.

Release date: early 2019 (on Steam)

Untitled Goose Game

This one features what might just be the finest strapline in the history of gaming: "It's a lovely morning in the village and you are a horrible goose." And sure enough, that's what the game involves: taking control of a mischievous goose as it terrorises various gardeners and shopkeepers. You can steal hats. You can honk obnoxiously. This looks quite, quite wonderful.

Release date: 2019

The Endless Mission

Also from E-Line, *The Endless Mission* is an ambitious sandbox game creation title that is clearly in its early stages, but already has a certain batty charm about it. At launch, you'll be able to choose from three genres: platformer, RTS, or arcade racer. The twist is that all three genres can be mixed up randomly, and then the experience can be modded further by heading into the menu options and fiddling with such parameters as jump height, speed, and scale of both player characters and enemies. Done right, it could provide a playful introduction to the nuts and bolts of game design.

Release date: autumn 2018

Staying alive:

The turbulent history of British game development

A new frontier opened up as the British games industry exploded in the 1980s. Careers were born and classic games made, but few companies survived that turbulent decade

WRITTEN BY
Kim Justice

It's said that Clive Sinclair never predicted that his little black computer, the ZX Spectrum, would become such a popular games machine. Some even say Sinclair never wanted people to play games on it at all – launched in 1982, the Spectrum was designed to be used in homes, schools, or small businesses. Computer games, quite simply, were never part of the equation. But for many people, young and old, the Spectrum and machines such as the Commodore 64 and Amstrad CPC became the leading sources of electronic entertainment in the 1980s. And for the people who created the games, it was an opportunity to start a revolution from their bedrooms – and, if they were lucky, make a rather pleasant sum of money.

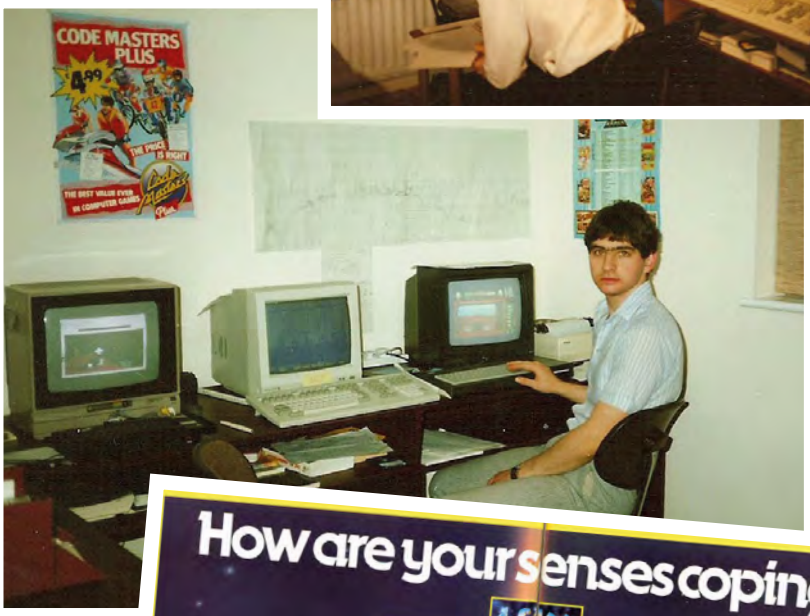
The 1980s growth of the British software industry was explosive. It moved so quickly, from hobbyists who fell into making games almost by accident, to coders who were barely out of secondary school, and as of yet there was no corporate image to live up to. In no time at all, a cottage industry that survived on mail orders had graduated to high street shelves as people decided they needed a computer for their home – with magazines, marketing, and distribution sectors quickly springing up to meet the massive demand. Even the mainstream press couldn't ignore the impact computer games were having – not just on their largely youthful audience, but on the people who were making them. For many future coders, such as Ocean programmer Jim Bagley, what could have been seen as a misspent youth in the arcades led to a craft which could be learnt during school hours.

"I got into games because of the enjoyment arcade games gave me, then when I started high school they had computers," Bagley tells us. "Six Sharp MZ80Ks were sitting there doing nothing, and they had the BASIC manual with them, so I started to have a play with the Sharp computers by typing in the BASIC programs in the manual and then breaking them down and changing bits as I was learning what the instructions were doing – all for the purpose of making my own games."

For this generation of programmers – fondly dubbed the 'bedroom coders' – a similar story would play out every time. Matthew Smith, a 17-year-old programmer from Wallasey, spent eight weeks coding a game called *Manic Miner*. Released in 1983, it was an immediate hit – and made Smith an unexpectedly rich young man.

The Oliver Twins, makers of the *Dizzy* series, were another success story.

"Our dream was always to make games good enough that people would want to play them," says Philip Oliver, co-creator of such hits as *Super Robin Hood* and the *Dizzy* series. "We knew it wasn't going to happen overnight and knew the route was to get published first, and build on the quality. We were always so excited and proud to walk into shops and see our games on sale. We often moved them into prominent



positions – like the number one slot on the charts area."

In the case of Liverpool's Imagine Software, an operation which had started in one of the country's nascent microcomputer shops would, thanks to a couple of hits, be catapulted into a plush office building where the executives drove to work in Ferraris and there was a helipad on the roof. Nobody at Imagine actually owned a helicopter yet – but then again, why not plan for the future?

Up and down the country there were similar stories – in cities such as Sheffield, which had been hurt by the fall of their primary industries, the rise of a computer game studio such as Gremlin was something to shout about. In the Thatcher era, when the role of the entrepreneur was an aspiration, the booming software

"Nobody at Imagine actually owned a helicopter yet – but then again, why not plan for the future?"

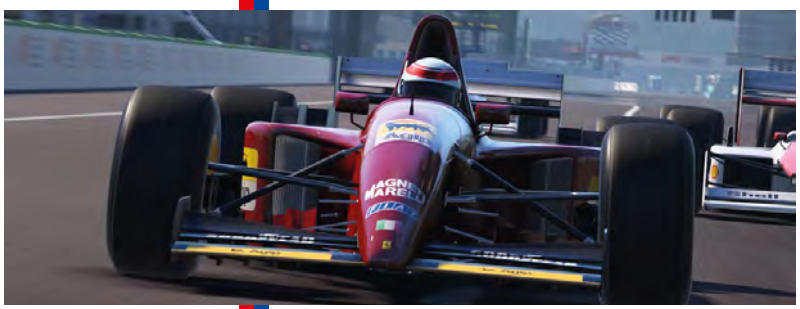
industry was something to be celebrated, if not understood by those in power – enough that Clive Sinclair was awarded a knighthood in 1983. It was a glorious time, one that people thought would never end – and while some may have entertained the thought that things weren't going to be this good forever, what did it matter when the profits were so appetising? ➔

› **Imagine Software was among the first companies to invest heavily in marketing; this is one example of the eye-catching ads it placed in magazines in the early 1980s.**

The games themselves are their own representative of these times – the coders, raised on a diet of arcade games from Japan and the US, were now ready to make their own indelibly British mark on the scene. Games such as educational romp *Skool Daze* and *Trashman* – the epic story of a refuse collector's attempts to clear rubbish without being run over – couldn't have come from anywhere else. There was an idiosyncrasy to these games – a touch of British humour and irreverence that set them apart, although they certainly played well too; classics such as dark infiltration drama *Saboteur* and everyone's favourite series of egg-'em-ups, the iconic *Dizzy* games, enjoyed brisk sales. And the cheap price of entry – as little as £2 for a budget game – meant that kids could persuade their parents to pick up a new experience whenever they went to the local corner shop.

At a time when games usually arrived on cassettes and software was seldom officially licensed before release, it was a challenge to track all the new titles emerging each month – but the nascent British gaming press tried its best. Magazines such as Sinclair User and Crash vied for readers' attention – the former could rely on a healthy stream of exclusives, whereas the latter traded on honesty and spectacular covers painted by fantasy artist Oliver Frey. There was no end of barbs thrown by one magazine at the other, along with the occasional bit of controversy – one Crash cover, which featured a half-naked sorceress taking a man as his slave, saw no end of hand-wringing and people wondering just what these games were exposing their innocent kiddies to.

It wouldn't be long before mainstream media saw computer games as a target – the television and its four channels were no longer the only game in town. As such, the exploits of the 'bedroom coders' were covered in a rather mocking, antagonistic way – almost as if because these people dealt in a fantasy world, the business they were in wasn't real either and they were playing at being flash businessmen. This rivalry between old and new media wasn't something that was going to go away, no matter how unreasonable it was.

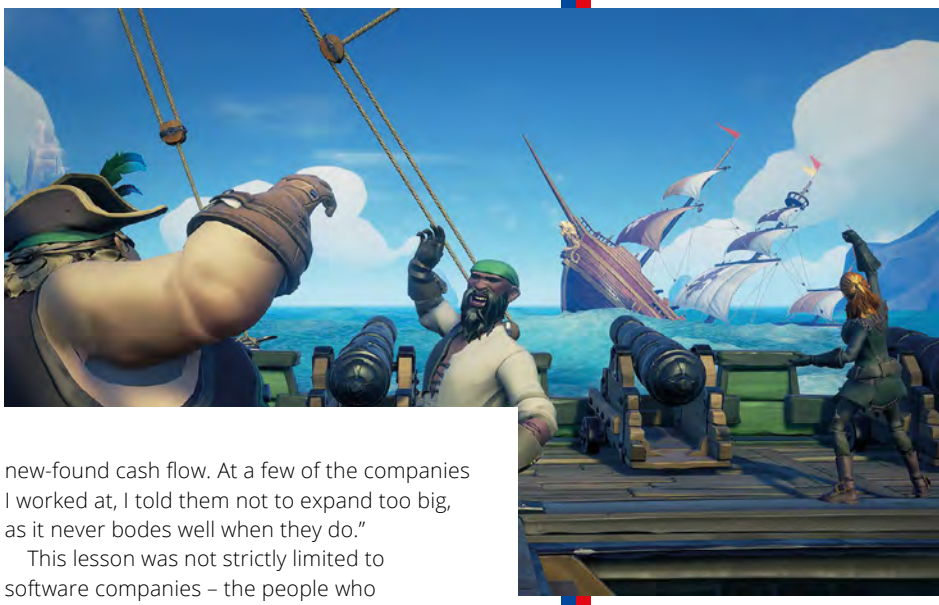


Founded in 1986, Southam-based Codemasters is still going in the 21st century. Today, it largely focuses on racing games like *F1 2018*.

BANDERSNATCH

Inevitably, the good times couldn't last forever. In 1983, a video game crash occurred on the other side of the pond, but the industry in Britain was making money hand over fist. The following year would, however, see a slowing of the market – one that many companies were not prepared for. This was unwittingly documented by a BBC TV programme called *Commercial Breaks: The Battle for Santa's Software*, which covered the changing fortunes of both the aforementioned Imagine and Ocean Software – the latter a studio from Manchester.

The resulting stories couldn't have been more different. Imagine was the free-wheeling face of the new industry, and the money which came with it – the directors drove around in sports cars, they'd changed offices twice in a year, and the programmers looked like they were rolling in cash. An attempt to create a much-publicised, self-described 'mega' game called *Bandersnatch* would, however, be the firm's undoing. Packaged with add-on hardware, the game would have pushed the capabilities of the Spectrum far beyond its limits, but to offset costs, Imagine wanted to sell it at £30 – more than four times the going rate for a full-price game in 1983. Understandably, this was something software buyers weren't keen to take on. And then suddenly, a whole army of creditors descended; it turned out that, despite all the sports cars and helipads, no one had been keeping an eye on the accounts. It was too much for the company to take, and in July the publicity-hungry firm would go bust in spectacular fashion. On the day the bailiffs came to wind Imagine up, Mark Butler



– one of the firm's founders – had to be called to the office from the Isle of Man, where he'd had a crash while riding for Imagine's TT Racing Team.

Ocean, on the other hand, struck a more modest image – its offices weren't as plush as Imagine's, but the company was consistent with its releases. It rode out attempts by Imagine to suffocate the competition by block-booking pressing plants during the 1983 Christmas rush (which inevitably resulted in Imagine attracting more creditors), and it was developing a studio of young, hungry, and creative people like the late, great Jonathan 'Joffa' Smith. Company founder David Ward was more philosophical about problems such as software piracy, and as Imagine played with their TT bikes, Ocean got their heads down. As a result, the company survived a tough year for the industry and, in a fitting epilogue for the documentary, ended up acquiring the rights to the Imagine label.

Ocean was hardly averse to spending large sums of cash, but in the end it was more reserved than companies like Imagine, which seemingly threw money everywhere in the pursuit of press inches while ignoring the myriad causes of their explosive demise. Being creative and producing excellent games was one half of the equation, one that was enough for a short time – but a harsh reality soon emerged that, in order to survive, you had to be good at business, too.

"The downfall of the big software houses was always when they got too big," Jim Bagley tells us. "An expensive development cycle on a game that flopped could cripple a company and even make them go bust – which happened quite a lot – or excessive spending from the bosses and their new-found cash flow. At a few of the companies I worked at, I told them not to expand too big, as it never bodes well when they do."

This lesson was not strictly limited to software companies – the people who made the computers would also be in for a rude awakening.

Sir Clive Sinclair, the man credited with the spark that set off the software boom, would see his company falter – in no small part thanks to the high-profile flop of his electric pedal vehicle the Sinclair C5, but also due to the failure of his latest computer: the Sinclair QL, another machine aimed at the business market. Acorn, maker of the government-backed BBC Micro, would fall hard in a doomed pursuit of a share in the US market.

"As Imagine played with their TT bikes, Ocean got their heads down"

Meanwhile, while its UK wing continued to perform well, American firm Commodore had its own problems at home, as the computer crash continued to bite hard. These major hardware platforms would survive in one way or another – the rights to the ever popular ZX Spectrum would be bought by Alan Sugar's Amstrad, a company that thrived in hard times through all-in-one deals and a strong presence in the rest of western Europe. Smaller computer makers such as Dragon Data and Tangerine (maker of the Oric Atmos), on the other hand, would end up cashed out of the game altogether.

"There were many factors [in the downfall of these companies]," says Philip Oliver: "greed, disorganisation, poor decisions, piracy, international games with higher investment, and the arrival of consoles."

These times could also be hard on the creators themselves. *Manic Miner* creator Matthew Smith would achieve further success with 1984's spectacular sequel *Jet Set Willy*, but he and his company, Software Projects, were never able to follow it up, and he eventually ended up living in a commune. Not that such ➔

The founders of Ultimate survived the 1980s and flourished as Rare; pirate-themed action-adventure *Sea of Thieves* emerged in March 2018.

The Oliver Twins made numerous games for Codemasters in the 1980s, but are best known for the *Dizzy* series of budget-priced adventure titles.

Ocean Software's success hinged on the brand recognition of its licensed games. *RoboCop* was one of the biggest-selling games on the ZX Spectrum.

excess was overly common (party animal Philip Oliver says, "We're programmers! We were too busy working... if you do the maths of the number of games we wrote, it's evident we didn't get out much!") but some coders would find their overnight success tough to deal with, for a multitude of reasons.

People displaced by the collapse of companies like Imagine would mostly find their way back in with others, but any high-profile collapse would bounce several talented names out of the industry. Even Ultimate: Play The Game, one of the most high-profile developers of the 1980s, wasn't safe – despite the huge success of titles such as *Knight Lore*, *Jetpac* and *Sabre Wulf*, when sales fell even slightly it would find itself in a precarious position. Company founders Tim and Chris Stamper ended up selling the label off to U.S. Gold in 1985 and began to look overseas, forging a relationship with Nintendo through their new company, Rare. This was another important key to survival – the ability to look at the big picture and see where things were eventually going.

RISE OF THE CONSOLES

For the longest time, dedicated games consoles were seen as a poor investment by the average British gamer – not only were cartridges a great deal more expensive, but the systems themselves could only play games. Sure, most gamers probably didn't do their word processing on the Speccy like the adverts said they could, but it was nice to know that the feature was there. Because of this, the ageless micros held firm against consoles like the NES that were dominating worldwide through the middle of the 1980s – the reinvigorated Spectrum and C64 remained healthy through the entire decade, with companies like Ocean at the top releasing spectacular arcade conversions and popular licences such as *Midnight Resistance* and *RoboCop*, while other firms like Codemasters – home of the Oliver Twins – were successful in the budget market. At the end of the decade, the runaway success of the Commodore Amiga 500 and, to a lesser extent, the Atari ST, ensured that the microcomputer would, at least in Europe, still have a role to play in the 16-bit era.

The 1990s saw the continued success of several companies covered so far, alongside new names like Bullfrog, Sensible Software, and Psygnosis. These developers often thrived on a small, creative-driven setup, with only a handful of core employees in charge of design, art and programming. In the 16-bit era, when 2D still reigned, this was fine – operations had long since migrated from the bedroom to a small office building, but the hours were loose, people played as much as they worked, and there'd be enough boxes of half-eaten Chinese takeaway dotted around the desks to make it look like a bedroom. These new names, coupled with the established likes of Ocean, Codemasters, and U.S. Gold, helped to create a healthy climate – but still, something was coming that would not only tighten the industry further, but would fundamentally change a playfully British way of working.

"By the end of the 1990s, once ubiquitous names had either been sold off or vanished altogether"

When the 32-bit era came around, polygon graphics were the order of the day and few publishers wanted to sell a 2D game any more. A lot of British companies struggled to make the transition, and some simply couldn't; 3D development required more of everything. Whereas it was easy enough to make a quick proof of concept in a couple of weeks in order to sell a 2D game to a publisher, the same process could take anything from several months to a year in 3D – not to mention the demands of money and manpower.

Studios like Sensible, that operated on a dozen or so people, could scarcely afford this transition, and even the likes of Ocean found

themselves struggling, since not only did the cost of making games greatly increase, but so did the cost of the movie licences through which it had made its name. Many of those who survived did so by truly becoming a business and embracing corporate practice, whether by themselves or through a high-profile owner such as Sony or EA. This was, perhaps, the true end to the so-called bedroom coder as anything more than a hobby.

By the end of the 1990s, names that were once ubiquitous in British games magazines had either been sold off or vanished altogether; Ocean Software merged with French publisher Infogrames in 1996, and quietly faded out two years later. U.S. Gold was acquired by Eidos Interactive (formerly Domark Limited) in 1996, and the brand was retired. A small number of studios – most notably Rare – survived the turbulence of the 1980s. But for so many companies that had found success in the British games industry's first flush, it was the end of an era.

THE BEDROOM CODER IS BACK

What, then, is the legacy of the bedroom coder? To this day, some of their best exploits are still remembered, and their old games celebrated. But then, many of those coders are also still working: Julian Gollop, Jeff Minter, and Peter Molyneux are just a few of the names whose careers thrived well into the PlayStation era. In the 21st century, digital distribution means that such games as *Undertale*, *Celeste*, and *Superhot* can succeed with small teams or even a single individual at their helm – you don't need to make a deal with a publisher or be capable of printing thousands of copies of a game in order to prosper. As a result of this, many veteran developers are going independent again. Some, like Jim Bagley, are attempting to push the computers they worked so hard on into the present. "Thirty-three years later, I'm now involved in making the ZX Spectrum Next... it'll be like the good old days, although the games won't be for sale in retail shops, sadly."

In the end, it seems that nothing ever truly dies in the world of video games – it simply lies dormant, ready to emerge once again when the conditions are right. Then, before you know it, someone's once again sitting in their bedroom, energy drinks and fast food to hand, with the makings of a smash hit on their screen.

5 INCREDIBLY BRITISH GAMES

The Monty Mole Series

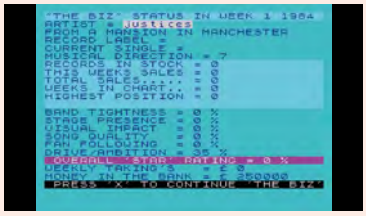
Gremlin / multi-platform

Monty Mole was a game born of its time, right in the middle of the miners' strike. The creator, Peter Harrap, cast this brave mole as a miner looking to collect coal and escape the pit, besting the disembodied head of Arthur Scargill in the process.

Cobra

Ocean / ZX Spectrum

Cobra was made by one of the more playful minds of the era, Jonathan 'Joffa' Smith. He turned Stallone's film into a strange yet hugely imaginative side-scroller filled with exploding pushchairs, damsels in distress, and rubber ducks.



The Biz

Virgin / ZX Spectrum

Coded by Chris Sievey (also known as Frank Sidebottom), *The Biz* gives you the opportunity to form a band and play to 20 people in grimy pubs. Such games are usually aspirational in nature; *The Biz* is laced with dark, very British cynicism.

Skool Daze

Microsphere / ZX Spectrum

Games probably don't get more British than this. Our hero, Eric, must find the code to unlock the headmaster's safe and steal his school report while attending classes and avoiding teachers. A comprehensive education has never been so much fun.

Technician Ted

Hewson / Amstrad, ZX Spectrum

If you think that you're overworked at your job, then you haven't met Technician Ted. Our hero must perform 21 tasks over the course of a full eight hours' work – unfortunately, his boss hasn't told him anything about the jobs he has to do, and there's a bunch of rogue filing cabinets, disembodied heads, plant pots, and Newton's cradles that want to kill him for some reason. Like most British games, *Technician Ted* only cost a few quid, but it was phenomenally hard and kept you busy for ages.

Interactive

Portal reimagined for the Commodore 64

Ever wondered what Portal might have looked like in the 1980s? **Jamie Fuller's** Commodore 64 demake gives us the answer

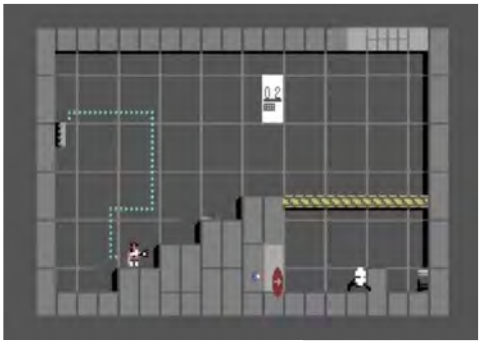
Are you a solo developer working on a game you want to share with Wireframe? If you'd like to have your project featured in these pages, get in touch with us at wfmag.cc/hello

It's one of the most absorbing 3D puzzle games ever made. Released in 2007, *Portal* is a masterpiece of stripped-down design; its central mechanic, a gun that essentially allows players to instantly forge entrances and exits in 3D space, is both mind-bogglingly complicated and fascinating to simply tinker around with. *Portal*'s spatial puzzles and instantly quotable dialogue ("The cake was a lie") have made it something of a cultural touchstone: plush Companion Cubes became an unlikely bit of merchandising not long after its release; there are fan-made movies based on *Portal* on YouTube; and now there's an unofficial demake coming out for the Commodore 64.

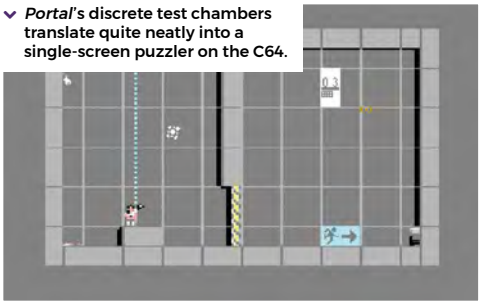
The new, 8-bit demake is the work of Jamie Fuller, who's spent the past five months figuring out how to make this most three-dimensional of games work in a 2D playfield. All things considered, it's looking highly impressive so far: it now takes the form of a traditional platformer, starring a smaller, more blocky Chell designed by graphic artist Del Seymour. Each chamber is laid out on a single screen and, as in the original game, the aim is to avoid the deadly traps and get to the exit. Jamie's had to rework the level designs considerably to fit in the new format, but the portal gun is present and correct; Chell runs and jumps via keyboard inputs, while the gun's aim is shifted around with the mouse. As in the original game, the gun is used to create entry and exit points that can be used as paths to otherwise unreachable places. Don't expect quite the same level of detail in the physics engine, though – this is the C64, after all, so there won't be any of those dizzying long jumps – but all the same, you'll find a number of the elements that made *Portal* such a classic. The Companion Cube is still vital for blocking lasers and operating switches, and the terrifying supercomputer GLaDOS – Chell's nemesis throughout the game – will be a familiar background presence.

"Speedy thing goes in, speedy thing goes out": released in 2007, *Portal* was an instant classic thanks to lines such as this.

Yes, the old Companion Cube is present and correct.



Portal's discrete test chambers translate quite neatly into a single-screen puzzler on the C64.



"Each chamber is laid out on a single screen and, as before, the aim is to avoid the traps and get to the exit"

While Jamie is developing *Portal 64* on a PC, he's using a Tom2 C64 adapter, which allows him to quickly test the code on the original Commodore hardware. It is, he says, a return to the C64 programming days of his youth, when he spent hours coding small games and demos in his bedroom – and fitting a relatively complex game into the 8-bit machine's tiny memory is, of course, all part of the challenge. *Portal* is still a work in progress, with Jamie currently putting the finishing touches to an HTML5 level editor and other back-end tools so other collaborators can help put together the game's environmental puzzles. "Otherwise," he says, "the levels would be rubbish if I made them all myself."

Jamie's *Portal* is an unofficial tribute to the real thing, so he'll be making it available for free at the Commodore Scene Database (**csdb.dk**) when it's finished later this year. So a decade on, is the cake still a lie?

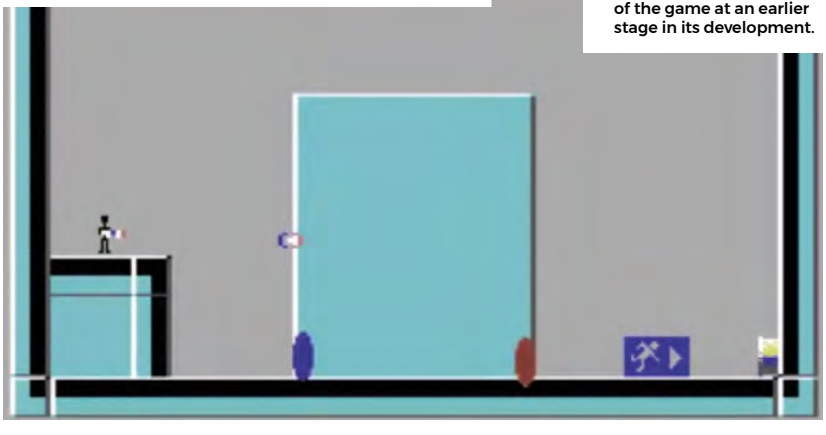
"The cake is 100% not a lie," Jamie says. "Honestly, would a robot lie? Only those who complete the game will find out for sure..."

You can keep up to date with Jamie's progress on *Portal* over on his Twitter feed: twitter.com/jamie30dbs

The proto-Portal

Before there was *Portal*, there was *Narbacular Drop*, a prototype released online for free in 2005. Although the look was very different, the ingenious spatial puzzles were all present; Valve head honcho Gabe Newell famously liked the game so much that he hired the team behind it, a group of students from the DigiPen Institute, pretty much on the spot. *Narbacular Drop*'s producer was Kim Swift, a young designer whose impact on Valve was immediate: as well as *Portal*, such hit franchises as *Half-Life* and *Left 4 Dead* all bear her creative stamp.

Narbacular Drop **served as the rough-edged prototype for *Portal*.**



Del Seymour's simple yet effective 8-bit graphics help lift Jamie's *Portal* demake. Here's a glimpse of the game at an earlier stage in its development.

Standing on the shoulders of genres

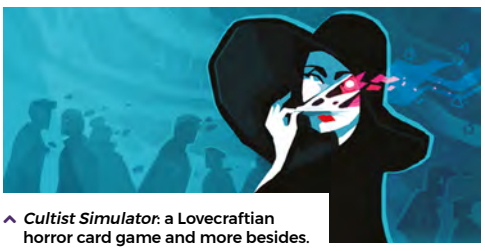
LOTTIE BEVAN

Lottie Bevan is a producer and co-founder of the experimental narrative microstudio Weather Factory, known for its Lovecraftian card game *Cultist Simulator*. Before founding Weather Factory, she was producer at Failbetter Games where she worked on *Fallen London*, *Sunless Sea*, *Zubmariner*, and *Sunless Skies*.

"What once were paths leading you to fertile ground are now deceptive tracks with many slip-roads and few signposts"

Indie devs know they need a punchy elevator pitch. 'X meets Y' is the classic formula, but the significance of genre is often overlooked. Genre is the path that leads many players to your game in the first place – only then can you hit 'em with your Wildean 'X meets Y'. Players who liked *RollerCoaster Tycoon* are liable to try management sim *Two Point Hospital*. LucasArts fans are likely to enjoy point-and-click *Unavowed*. But what do you do when there isn't a clear fit? My own game, *Cultist Simulator*, certainly struggled to belong: it's a Lovecraftian horror card game! It's a roguelike narrative simulator! With cards! It's... oh, it's only £15, please just buy it.

Genres are used as marketing touchstones, conveying significant information economically to players. Some are tight, functional labels: visual novels and racing games set clear expectations. Some are larger, contested groups: roguelikes are numerous and multiform and wrestled into apparent submission by the Berlin Interpretation, a crowdsourced manifesto. But others are wide, woozy things: RPGs cover everything from *Skyrim* to *Stardew Valley*, no manifesto in sight. By the time you get to horror you're wedged on a sofa with *Amnesia*, *Detention*, and *The Evil Within* and it all gets a bit uncomfortable. What once were paths leading you to fertile ground are now deceptive tracks with many slip-roads and few signposts.



***Cultist Simulator*: a Lovecraftian horror card game and more besides.**

Cars meet football in the genre-defying *Rocket League*.

And since one of the biggest dev pitfalls is setting the wrong expectation (please see *No Man's Sky*), not playing nicely with traditional genre is a real problem.

In reality, devs label games with multiple genres. *Hob* is an 'action-adventure puzzle platformer'; *Rocket League* is a 'physics-based sports-action game'. But we're now up to 200 weekly releases on Steam. Never before has it been so important to do something new and distinguishable. Taglines like 'Lovecraftian horror card game' are useful because it's not just another Metroidvania, but they're also useless as they don't immediately convey what the game's actually like to play. Therein lies the issue: indies have an increasing need to make games that break moulds, but the more moulds we break the fewer moulds we have to shape our games into pleasing forms for the passer-by.

Alternatives to genre as indie filters include curation, nicher stores, better algorithms, crying. Newer, more specific genres may seem a solution, but they're a perpetuation of the issue, not a fix. We're seeing attempts at all of these (in order: the App Store; itch.io; Steam; myself), but nothing yet has really cracked it. Genres remain godlings, and indies are polytheists laying offerings at one or two of their altars. But year on year their power shrinks, and all we can do is await the apocalypse when a new god comes. Who that god is, I don't yet know. But I hope they like card games.

Toolbox

The art, theory, and production of video games

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An Atari veteran on the philosophy of game design

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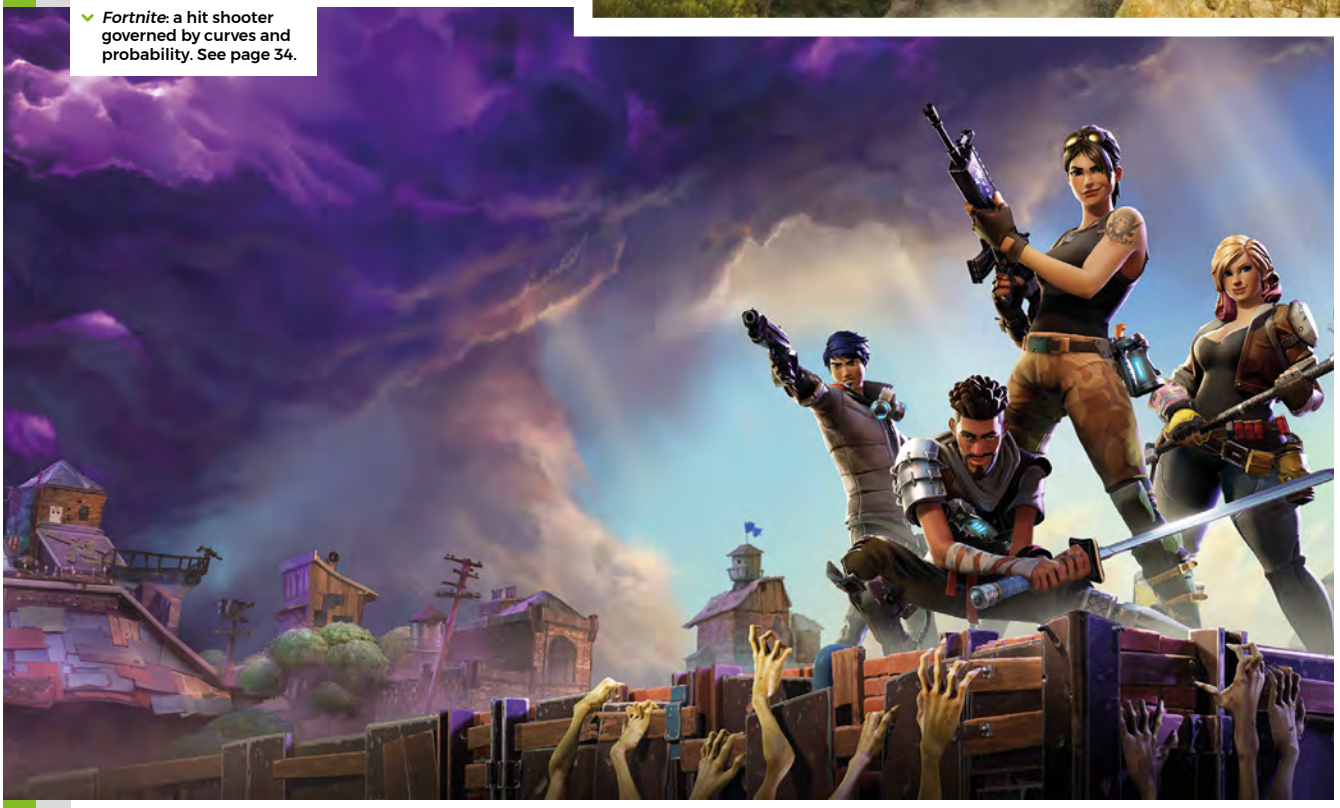
Find training courses and collaborators

Find out more about what makes an effective video game city on page 30.



Fortnite: a hit shooter governed by curves and probability. See page 34.

The principles of game design

Ex-Atari designer Howard Scott Warshaw shares his tips for making great games

AUTHOR
HOWARD SCOTT WARSHAW

Howard is a video game pioneer who authored several of Atari's most famous and infamous titles. **onceuponatari.com**

Oscar Wilde, pictured shortly before the release of the Atari 2600.

"Talent borrows, genius steals." When Oscar Wilde said this in the late 1800s, his medium was the written word. He said many new things, but his medium was firmly established and didn't change that much during his lifetime. He stood on the shoulders (and picked the intellectual pockets) of prior authors, and others in turn would come to stand on his. I believe the quote demonstrates his awareness of this continuum.

Here's something that never appeared during his lifetime: a new medium. Radio, television, and desktop publishing were still decades away at the time of his death. What's the point of going on about Oscar Wilde? Well, have you ever tried to invent a game? Kids do it constantly. Making up silly ways of passing the time is easy as a child. Have you ever tried to do it as a grown-up? And instead of doing it for your own entertainment, have you tried doing something others will enjoy? And then try doing it so someone will bet millions on your idea? And what if it's not just a game, but a video game? Suddenly the game concept isn't enough – you must also be able to realise it within the bounds of current technology. It's an interesting challenge.

Of course, the easiest way to meet this challenge is to take an existing game that works well and make some minor tweaks to it. This is called a 'knock-off,' and it explains the lion's share of human endeavour.

To create something fresh and new, to actually innovate – that's hard to do. Consequently, it doesn't happen very often (as we've seen countless times in the video game industry over the last four decades). How many truly new games do you see, and how many knock-offs?

Here's the point: before there are knock-offs there must first be originals. Back in the 1970s and 1980s, they were pretty much all originals, because they had to be. The video game was a new medium. The concept of a knock-off didn't exist yet. In this medium, Oscar's quote raises a question: if talent borrows and genius steals, who innovates? In the world of video games, who creates the fodder for all this talent and genius?

The pioneers, that's who. The designers of my generation were defining a new medium. It was our job to make the originals before there was any basis upon which to build. One way to view our job was as software engineers programming microprocessors. Another way to see it was as entertainers inventing games. Some of

Yars' Revenge, a high point in the Atari 2600's library.

us focused more on the tech, others on the entertainment. The best of us used the interplay of the two in hopes of producing the maximal player experience. We were product designers and implementers, much like engineers in other disciplines – except for one all-important distinction. Video games face a requirement you rarely find in the tech world: in addition to working, they must also be fun.

It's a balancing act. We're constrained by an extremely limited hardware and lacking an existing canon of standards, while trying to keep pace with the idealised entertainment demands of bored teenage minds: now that is a hugely challenging design problem.

"To create something fresh and new, to actually innovate – that's hard to do"

I believe design is what it's all about, and it's about design that I plan to opine. This column is about revealing the thinking behind the foreheads of people who attempt to solve this problem time and time again. OK – predominantly one forehead, but I've spent a lot of time chatting enjoyably with other foreheads.

Who am I to tell you? Well, I'm Howard, known by many as HSW. Known by some as HSWWSH. I was a game engineer at Atari in the early days. If you're familiar with the Atari 2600 console, then you've probably come across my work. I made *Yars' Revenge*, *Raiders of the Lost Ark*, *E.T.*, and the eventually released *Saboteur*. I've also worked in the later days at places like 3DO and Blue Shift, making games for a variety of more modern consoles. I've been in and around games for 40 years. I know, I can hardly believe it myself.

I'm going to talk about the theory behind the practice, and how they interact. I'll share stories of the inception and development of each of my games, as well as insights into what I consider to be significant design innovations in video gaming over time.

Every one of my games had a major distinction. I'll tell you what it's like to make one of the best games of all time. I will also share the creation of what is widely held to be the worst game of all time. I will share with you the concepts, goals, and trade-offs which made them what they came to be.

To do this, I'm going to answer questions like these:

- What are you trying to do with your design? In other words, where is your focus?
- What are suitable (or reasonable) design goals? Are you trying to make a game or a contribution?

I'll explore fundamental issues like...

- What is a game? What is a video game? And what's the difference?
- Is your video game merely a labour-saving device for an existing game (chess, Monopoly, and so on) or is it something that couldn't exist in any other form but video?

We'll explore the difference between designing action and adventure games, about how a game tends to reflect the personality of its designer (and its players, too). Modern games frequently separate design talent from programming talent; at Atari they both resided in the same brain, which created both advantages and disadvantages.

I'll also tell you about how making games for Atari led to my eventually becoming a psychotherapist. It's the first thing I've found since Atari that's given me the depth of joy and satisfaction I first experienced making video games in a dawning industry.

I'm writing this column to help you understand games more deeply and pursue your gaming dreams more intensely. Inspiring your talent or genius: that's my hope.

Next time

As with any new medium, the first thing to do is reproduce prior hits from other media. In the first radio shows, performers simply read plays or stories aloud. The first TV shows were simply televised radio programmes. It takes a while to figure out how to use a new medium uniquely, to find the killer app. But there is one commodity which always seems to blaze the trail: pornography. It's usually among the first profitable endeavours in a new medium. And why not? The demand never seems to run out. And for suppliers, the profits are obscene...

A later edition of the Atari 2600, fondly dubbed the Darth Vader.

CityCraft: building better game cities

There's more to a city than tall buildings. Here's an introduction to designing your own metropolis

AUTHOR
KONSTANTINOS DIMOPOULOS

Konstantinos Dimopoulos is a game urbanist and author of the forthcoming *Virtual Cities* atlas.

Cities have been a staple of video games from the very beginning. From the stylised cities of *Missile Command* in 1980 to the primitive open world of the ZX Spectrum's *Turbo Esprit* later in the decade, urban spaces have been a constant throughout the medium's evolution. And as technology has evolved, we've reached a point where complex, three-dimensional cities both ancient and modern are both commonplace and sometimes disturbingly believable. Even when reduced to a simple backdrop, a well-thought-out city is key to a game's storytelling and atmosphere. At the very least, making sure a setting doesn't break a player's immersion is an important thing to consider.

Unlike the London or New York of the real world, game cities are essentially abstractions – their goal is to maintain a convincing illusion of a city, and designers therefore have take into account a myriad of details and systems that we take for granted in a real urban landscape. Unlike the cities in movies or books, game cities are unique in that the player is often free to explore them. In movies, the director gets to choose the camera angles; modern video games often put that power in the hands of the player. In video games, we can only partly direct a player's viewpoint, merely suggest the hustle and bustle of a larger city, and hope that players won't notice what we've been forced to leave out.

What we have to do as designers, then, is to make sure our cities are intriguing, convincing, functional, and worth exploring. With that in mind, let's start by looking at the very foundations of game city building.

Every city has to make sense. This is the bedrock of solid design. A game city doesn't have to be realistic, but it must hold its own internal logic. Even if you plan to build a fantastical metropolis populated by talking eagles, or your game is set in a space town orbiting a tiny moon, the design should both be consistent and follow certain rules. All cities, for example, have to contain the everyday things residents need to survive. What kind of apartments would those eagle people live in? Where would they eat? These are all things you need to bear in mind while designing a convincing game city.

Always create a plan of the whole city. Even a vague, crude sketch is crucial. Know where downtown is, where the poor live, where the industrial areas are, and you'll know where to place a cosy bar or a rich socialite's apartment. Know where the noisy, massive, and hard-to-maintain air purifiers of the vast space station are located, and you'll have your working-class district placed for you.

Sketches don't need to be much more detailed than this one, at least initially.

Useful tools

Few cities can be built without sketching something on paper first, so pens, pencils, notebooks, and rulers should be a part of any planner's toolset. Tracing paper is also an excellent way of adding layers to your plans and trying out different ideas, while Lego (or similar) bricks can be used to quickly edit and model volumes. As for software, we'd advise against purchasing expensive CAD and GIS (geographic information systems) software: try the freeware LibreCAD, and the open-source QGIS instead. GIMP can help with most of your image editing needs, while the Fantasy Map Generator is also worth a look.

The Witcher 3's Beauclair is worth studying as an example of smart city design.

Think beyond the architectural scale. Try to approach city building as an urban planner. Architecture is an important consideration in a game city, but so too is what goes on among the buildings: the traffic flow, how land is used, and the relationship between, say, urban and suburban areas.

Allow your city to inspire your narrative and gameplay. Don't treat your setting as an afterthought – let it influence, and be influenced by, your mechanics and plot. Just as Sherlock Holmes was a child of the modern metropolis, the city crafted for your game can and should shape characters, stories, professions, needs, and, of course, gameplay. Besides, researching

"A game city doesn't have to be realistic, but it must hold its own internal logic"

the place you're building is bound to provide you with a lot of fresh ideas.

Research is crucial. Good urban design and planning practices can and should be applied to virtual cities, while researching how urban planning can go wrong can be very useful for horror or dystopian settings. Researching the specifics of your particular city will help solve problems you already had and some you never knew existed. Sewers, for example, sound like a boring subject and are easily overlooked, but they're an important part of a functioning city. They also need thinking about carefully if you're about to make a game based on, say, *Les Misérables*.

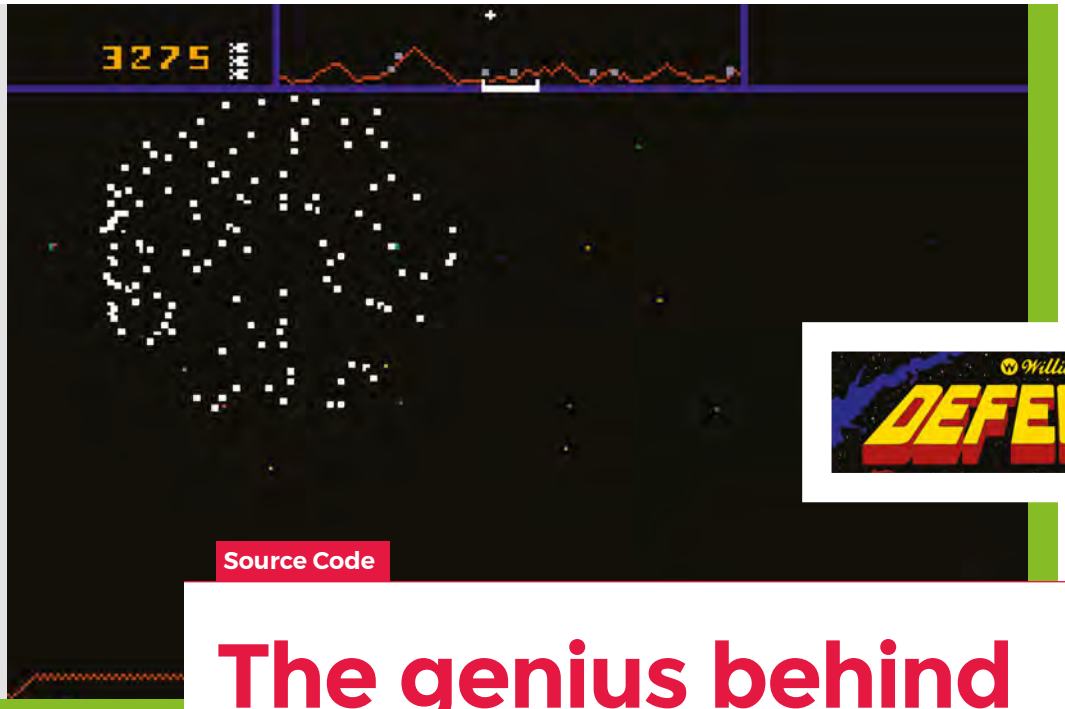
Don't focus exclusively on the built environment. A city is not the sum of its roads, buildings, and infrastructure. It is much more than its towers and landmarks. A city is everything that happens within it. A city is a huge, complex, dynamic stage for human life, activity, and drama. It is its economy, its rumours, monuments, sounds, flora, fauna, power structures, religions, and a myriad of other things. Above all, a city is defined by its functions.

Cities: Skylines simulates a metropolis's complex infrastructure.

Unavowed really puts the rich setting of New York to excellent use.

Google Maps is your friend

Real and historical cities can be an immense source of inspiration, and offer countless examples and solutions. Google Maps in particular is a fast, free, and very simple way of getting quick hints on the ways cities are laid out in each region, and even a glimpse at local architectural styles. It will handily also allow you to measure distances, though a trip to your local library might be needed if you are to study the rich and often unexpected history of urbanism.



Source Code

The genius behind Defender's explosions

It was one of the most celebrated games of the 1980s arcade era. We take a closer look at the secrets behind Defender's eye-catching explosions

AUTHOR
CRAIG GRANNELL

Defender is mostly remembered for its sadistic difficulty level and dazzling pyrotechnics. In a video game era when obliterating an enemy spacecraft usually 'rewarded' you with a frame or two of animation, *Defender* instead opted for a spectacular fireworks show.

This arrived from a desire that no two games would be alike. With a background in pinball, the *Defender* team enthused about algorithms, not scripting. Also, as co-creator Eugene Jarvis remembers, ideas were "driven by us having no artists – programming was the one thing we could do".

Sam Dicker, a teen at the time, recalls wanting to impress his boss, and this heavily influenced *Defender*'s revolutionary particle effects: "Eugene needed an explosion graphic, but didn't want to overwhelm me. So he said to make something like *Galaxian*'s three-frame fireball animation. But this was my first opportunity to really contribute and show I could do something no one had seen before. So I thought: what if we took a ship's pixels and scattered them across the screen?"

This basic effect was jaw-dropping for the time, but Dicker wasn't done: "When enemies didn't have enough pixels, we'd explode a different piece of art, so we had more pixels to work with. Then I started playing with scattering pixels away from where an object was hit, further affected by how deep the bullet went. After all, the game mostly had you watch things blow up, and so why not make that as varied as possible?"

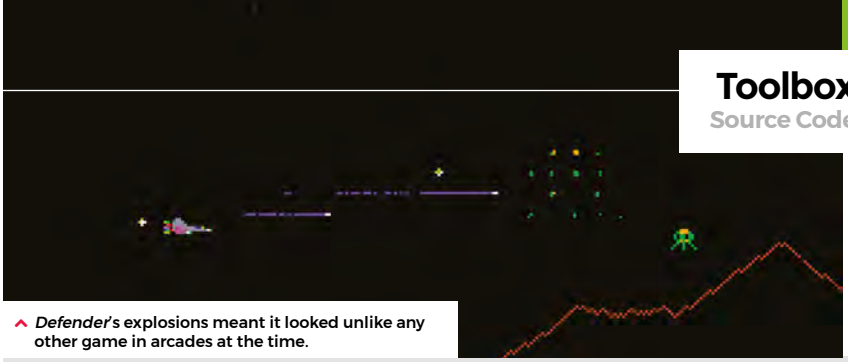
"That's the beauty of *Defender*'s algorithmic world – it became so much more than what we'd planned"

These explosions, notes Dicker, were twinned with a cleverly designed arcade cabinet: "Because we created these things simultaneously, we could use the cabinet like an amp. Through headphones, you just don't get the same effect. Back then, the whole cabinet would vibrate and rattle as you flew about, blowing things up."

For Jarvis, *Defender*'s explosions instantly gave the game an "otherworldly and amazing feel", captivating players who would be "mesmerised by the ballet of destruction". It was a world away from anything else at the time, and provides a useful lesson for modern-day game creators: "Back then, it was all canned animation, and you still see that. It's so boring, because whenever you kill something, you always see the same thing."

VISUAL OVERLOAD

He suggests there's no way an artist could have created pre-canned artwork along these lines; indeed, it would still be impossible. And yet through working with algorithms, this group of non-artists could create something rich and beautiful, offering interaction and feedback to the player. "The explosion choreography was almost like watching the surf," says Jarvis, "and it



Defender's explosions meant it looked unlike any other game in arcades at the time.

DEFENDER 101

Released in 1981, *Defender* was the brainchild of Eugene Jarvis and Larry DeMar. The basic premise is to protect humans on a planet, under threat from being snatched up by aliens. Should a Lander UFO grab and consume a human, it becomes a rabid Mutant, hell-bent on hunting you to destruction. Should all humans be killed, the entire planet explodes, hurling you into a manic survival challenge against waves of ferocious enemies.

If that sounds tricky, it was. *Defender* was a world away from the clockwork simplicity of *Space Invaders* – more a contained chaos, not least when you factor in the controls. The joystick was used only for elevation – buttons were needed to reverse the ship, thrust, fire, set off a smart bomb, or trigger hyperspace.

For dedicated gamers, though, this meant nuance and optimisation, rather than shoe-horning the game into a 'joystick and fire button' setup. So, despite the stern challenge, *Defender* became one of the top-grossing arcade games in history.

really allowed us to leverage our lack of artistry. We used physics as art. It *became* art. And the great thing is, it became greater than what we could have conceived of. But that's the beauty of *Defender*'s algorithmic world – it became so much more than what we'd planned, and much more than what we put into it, because it was a living, breathing thing."

Dicker adds that the effects offered one final twist – when your own ship exploded, you got a massive spherical particle effect that was so eye-popping, it almost removed the frustration at having lost a life. "This was the big one. Because the rest of the animation had stopped at that point, I effectively had a dedicated machine to create that one effect," he says. "So you got to see this massive firework, with dozens of particles."

The very last thing you saw in any game was therefore a dazzling piece of visual overload – and it made you want to go back for more. "Compare that to your death in *Space Invaders*," says Dicker. "That game just kind of stops. It's not very satisfying!"

EXPLOSIONS in PYTHON

Here's a code snippet that shows a *Defender*-style particle explosion working in Python. To get it running on your system, you'll first need to install Pygame Zero – you can find full instructions at **wfmag.cc/XVIIeD**

Download the code from GitHub: **wfmag.cc/wfmag1**

```
import random
import math
WIDTH = 800
HEIGHT = 600  # the size of the screen
DRAG = 0.8 # how much a particle slows down by each second
# the colour of each particle in R, G, B values
PARTICLE_COLOR = 255, 230, 128
MAX_AGE = 3  # the time in seconds for which a particle is displayed
particles = []  # an array to hold the details of the explosion particles
def explode(x, y, speed=300): # Creates a new explosion at co-ordinates
    age = 0     # these are new particles, so set their age to zero
    for _ in range(100):    # generate 100 particles per explosion
        # for each particle, generate a random angle and distance
        angle = random.uniform (0, 2 * math.pi)
        radius = random.uniform(0, 1) ** 0.5
        # convert angle and distance from the explosion point into x and y velocity:
        vx = speed * radius * math.sin(angle)
        vy = speed * radius * math.cos(angle)
        # add the particle's position, velocity and age to the array
        particles.append((x, y, vx, vy, age))
def draw():
# This function redraws the screen by plotting each particle in the array
    screen.clear()  # clear the screen
    for x, y, *_ in particles: # loop through all the particles in the array
        # for each particle in the array, plot its position on the screen:
        screen.surface.set_at((int(x), int(y)), PARTICLE_COLOR)
def update(dt):  # This function updates the array of particles
    new_particles = []  # to update the particle array, create a new empty array
    # loop through the existing particle array:
    for (x, y, vx, vy, age) in particles:
         # if a particle was created more than a certain time ago, it can be removed:
        if age + dt > MAX_AGE:
            continue
        drag = DRAG ** dt  # update particle's velocity - they slow down over time
        vx *= drag
        vy *= drag
        x += vx * dt
        y += vy * dt  # update the particle's position according to its velocity
        age += dt   # update the particle's age
        # add the particle's new position, velocity and age to the new array:
        new_particles.append((x, y, vx, vy, age))
    particles[:] = new_particles  # replace current array with the new one
def explode_random(): # creates an explosion at random location
    x = random.randrange(WIDTH)
    y = random.randrange(HEIGHT)  # select a random position on the screen
    explode(x, y)  # call the explosion function for that position
# call the random explosion function every 1.5 seconds:
clock.schedule_interval(explode_random, 1.5)
```

The mathematics of balance: part 1

Behind every game, there's mathematics. **Will Luton** looks at the curves, probabilities, and formulae that shape the games we play

Maths is the fundamental language of games: strip away the audio, the visuals, and the story and you're left with only numbers. This is true of every game, big and small. The numerical exchanges in Yahtzee or poker may be well above surface, but the maths at play in a game like *Fortnite* is far less obvious.

Yet *Fortnite*'s designers consider thousands of different values: how many players should be in a match? How big should the map be? How quickly should the storm move in? How frequently should each weapon rarity drop? How do we set clip size, reload time, and rate of fire for each weapon? How much damage should a bullet cause? How many life points should a player have?

Mathematics is the wheels and cogs that make any game work: behind the scenes, numbers are changing every second. In fact, it's helpful to think of your game as a machine in which players exchange resources in pursuit of a win. For example, *Hearthstone* has you exchange mana and cards to reduce your opponent's life, whereas in *Half-Life* you exchange ammo to down enemies in order to preserve your own HP.

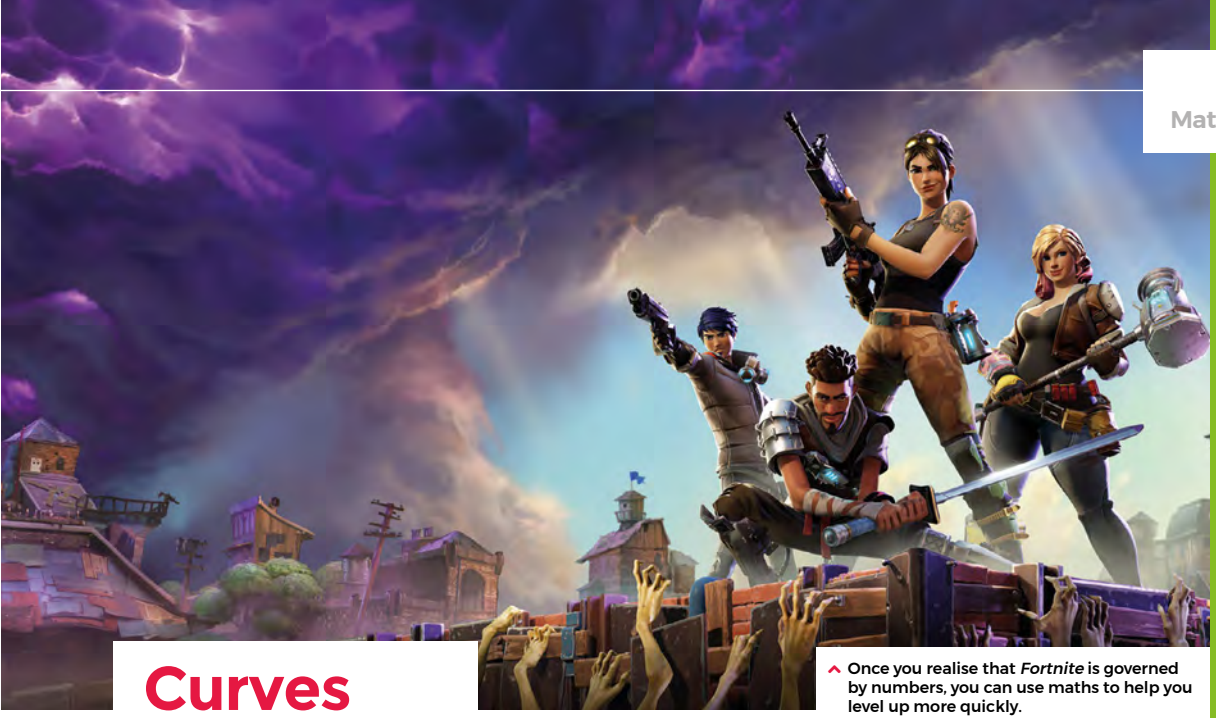
It's our job as game designers to make exchanging resources evoke an emotion in our players. Taking a knight with a pawn in chess is exciting, but being low on ammo and health in *Resident Evil* evokes anxiety. Fortunately, we have a wealth of research to help us: from Gestalt psychology's definition of the pattern-seeking mind to the behavioural economics study of emotional decision-making.

"Mathematics is the wheels and cogs that make any game work"

If you are the ideal game designer then you'll have a PhD in mathematics (as well as psychology), but for all practical purposes all you need are curiosity and an understanding of where to start. This two-part article will give you those jumping-off points by explaining some essential concepts to add to your designer's toolbox. Part one will cover curves and probability, while next month we'll look at economics and matchmaking.

Throughout, our focus will be on the nuts and bolts of balance rather than academic complexity. As such, this article is far from a complete reference on the meeting of maths and game design, but if you learn and practise the tools in both parts, I guarantee that you'll become a more insightful and confident game designer. So, let's get started!

The success of *Fortnite* is largely thanks to careful mathematical balance.



Once you realise that *Fortnite* is governed by numbers, you can use maths to help you level up more quickly.

Curves

WHAT ARE THEY?

Curves are the various shaped lines that represent the relationship between two values when plotted on a graph. For example, the speed of a car accelerating from a stop over time is represented by a logarithmic curve.

WHY ARE THEY IMPORTANT?

In any game studio you'll see whiteboards covered in curves. That's because curves are a quick and clear way to describe the relationship between values that can be easily understood and applied.

A curve is the slang term game designers use to describe a line two values make when plotted on a graph. You can also think about curves as mathematical functions: algebraic formulas that relate two (or more) varying quantities.

That description might seem a bit bewildering, but let's look at the simplest possible curve (which really isn't curved at all): linear. When saying two values have a linear relationship it means that one increases proportionally to the other, creating a straight line when plotted (see **Figure 1**).

We can also think of a linear curve as a mathematical function:

$$y = mx + c$$

...where m is the steepness of the graph and c is where the curve will intercept the y axis.

If we said to a programmer "levels grow linearly with XP", she already knows that each level requires the same amount of XP plus how to create the relationship in code. This makes talking in curves a super-helpful way to get your ideas across.

However, linear curves generally suck: they rarely appear in nature, they're predictable, and games that use them can feel grindy. So let's ➔

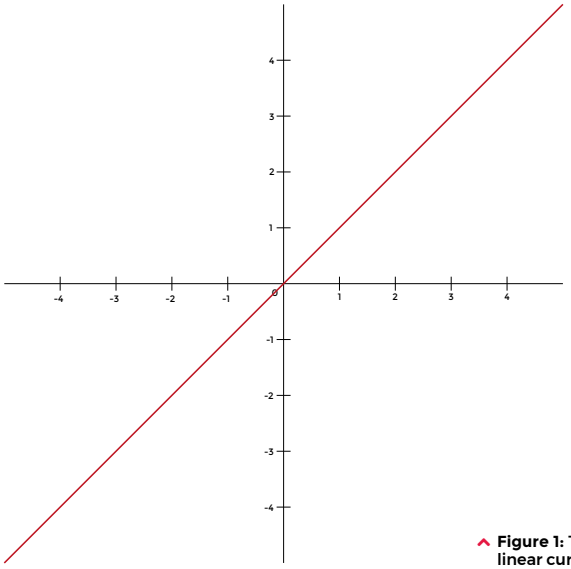


Figure 1: The simplest linear curve is y=x.

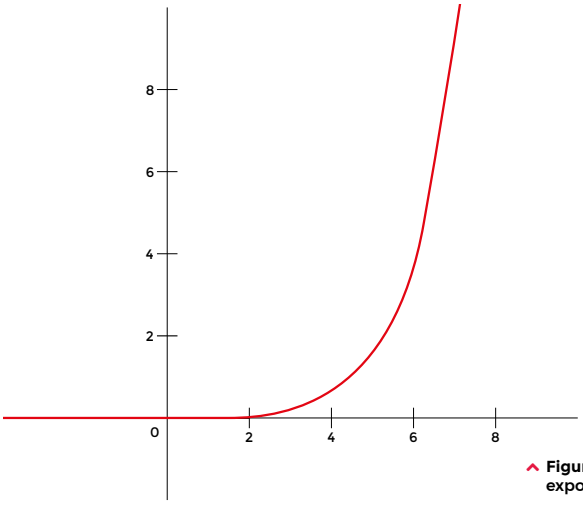


Figure 2: An exponential curve.

instead look at two much more exciting and useful curves: exponential and logarithmic.

THE EXPONENTIAL CURVE

You'll find exponential relationships everywhere in nature: from the acceleration of a falling object to the population increase of plants and animals. An exponential curve is characterised by a constantly increasing rate of growth (see **Figure 2**).

The mathematical function for an exponential curve is:

$$y = b^x$$

...where ***b*** is the base and defines how quickly the curve grows.

Exponential relationships are as frequent in games as they are in nature because they feel kick-ass rewarding: a player's expectation is constantly exceeded by this feeling of rapid acceleration. Have you ever lost hours to an incremental game? If so, you've been suckered in by this little curve making you feel like your resources are growing quicker and quicker over time. That's hard to step away from.

However, there are clear downsides to the use of exponentials. Uncapped exponential costs or gains in games are hard to comprehend, as numbers get so big they lose all sense of relativity. Designers often combat this by resetting players (prestige mechanics) or switching to a more reasonable linear progression at some point.

THE LOGARITHMIC CURVE

Like exponential relationships, logarithms appear frequently in nature. For example, logarithmic spirals are found in the shell of the deep-sea dweller the nautilus. This isn't surprising, as a logarithmic curve can be considered the inverse of a exponential one (see **Figure 3**).

The mathematical function for a logarithmic curve is:

$$y = log_b(x)$$

...where ***b*** is the base and acts much in the same way as the base of the exponential curve.

Logarithmic relationships appear in games where there is a rapid growth followed by diminishing returns. One example is slow car catch-up in a racing game: your speed boost

Table 1: Player Level vs XP Required

Player Level	XP Required
1	4
2	5
3	6
4	7
5	9
6	11
7	14
8	18
9	24
10	33

Table 2: Player XP vs Player Level

Player XP	Player Level
1	0
4	1
5	2
6	3
7	4
9	5
11	6
14	7
18	8
24	9
33	10

OTHER USES OF CURVES

Curves can be used for more than just planning progression or explaining concepts in design. They're also used to interpret player behaviour. Looking at analytics software, you'll have access to hundreds of graphs about how players have been using your game. Recognising the shapes of the curves will allow you to quickly understand the underlying relationships they represent. This will give you a powerful mental model of how your game is played and whether it correlates with your intentions when designing it.

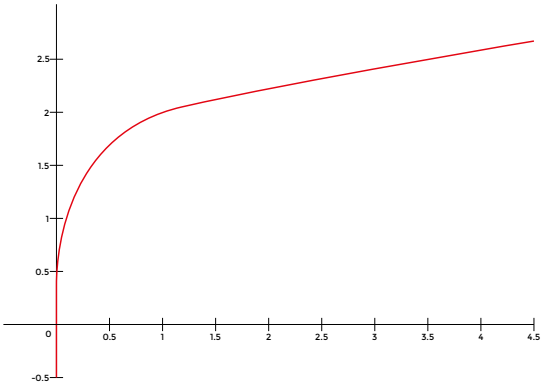


Figure 3: A logarithmic curve

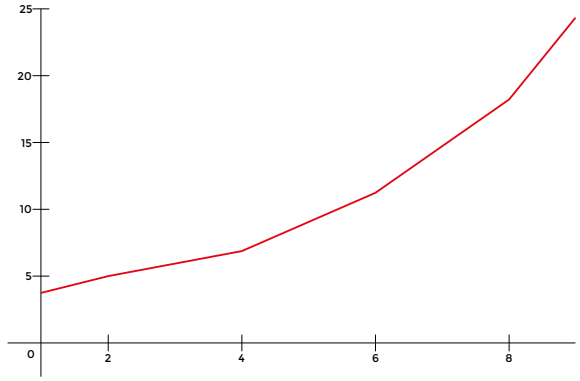


Figure 4: Player Level vs XP Required is an exponential relationship.

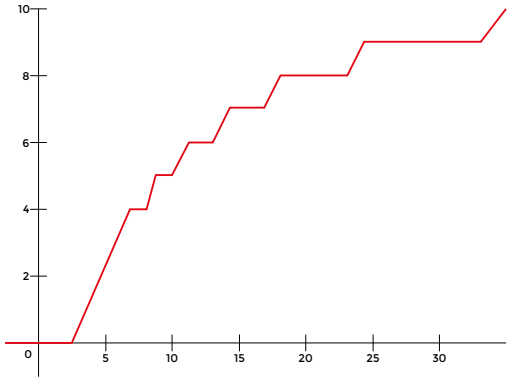


Figure 5: XP vs Player level is a logarithmic relationship.

has a logarithmic relationship to your distance from first place. In other words, as you're far away from the race leader you have a speed advantage that moves you up the ranks. But as you close in to first, your advantage rapidly diminishes. This kind of relationship results in much more exciting races where first place is always in contention – if you've ever played *Mario Kart*, you'll likely recall how addictive this can be.

The strength logarithmic relationships have over exponential ones is also the relationship's weakness: the diminishing returns of a logarithmic progression can be discouraging. Something that was once highly rewarding is now less so. For example, as you overtake other cars, your slow car advantage drops.

Very often we see logarithmic relationships in between XP and player level in RPGs: the first few levels are quick to gain but progressively they become more grindy. Assuming a flat XP gain then a logarithmic XP vs level relationship is the inverse of a level vs XP required, which is in fact exponential (see **Figure 4** and **Figure 5**). An example is shown in **Table 1**.

Often when we see an exponential or a logarithmic relationship in a game, we can expect their inverse to be found in some other relationship: when XP required per level is exponential then we know our level growth will be logarithmic (see **Table 2**).

We have logarithmic relationships to thank for the tense races in *Super Mario Kart*.

"Exponential relationships are as frequent in games as they are in nature because they feel kick-ass rewarding"

OTHER CURVES

Exponential and logarithmic aren't the only curves you'll find in games. You can also expect to see:

Step: This curve has repeated jumps in values, which gives the appearance of a set of steps when plotted.

Sawtooth: A repeating pattern of linear increases followed by instant decreases that looks like teeth on a saw blade.

Square: A repeating pattern represents a tick-tock between two values that creates the look of an archers' parapet.

Parabola: A symmetrical curve that can be thought of as a large dip. When rotated 180° the curve represents the path of a thrown projectile (or a jumping platform sprite).

Bell: Often found representing distributions of values, a bell curve looks like the side view of a bell, or rise and drop of a rollercoaster track.

Sinusoidal: Sine curves appear frequently in nature, from the tops of pond ripples to sound waves. A sine looks like a perfect wiggly line and can be used to 'ease in' and 'ease out' between two values repeatedly.

Sigmoid: This looks like an exponential curve moving into a logarithmic one, creating an S shape.

TRY THIS:

The best way to learn is to experiment. Open up a spreadsheet or head to **desmos.com** and start building and modifying functions. What happens if you plot the following two functions together?

$$y = \sqrt{1 - (|x| - 1)^2}$$

$$y = -3\sqrt{1 - \frac{\sqrt{|x|}}{\sqrt{2}}}$$

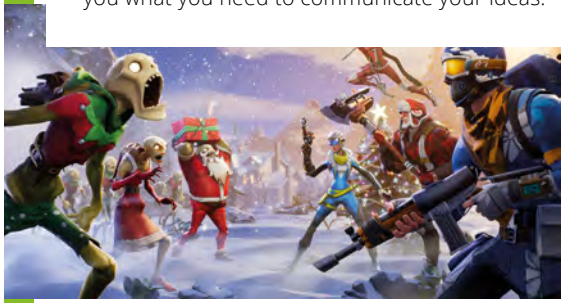
Beneath *Hearthstone*'s mana and magic, you'll find bubbling cauldrons of maths.

You may find when designing that you want to use different parts of curves to get your desired result. You can do this with a piecewise function that lets you define different functions for specific intervals. A piecewise function would allow you, for example, to build a curve that starts exponential but becomes linear before values get too high.

You can also set about modifying functions to achieve different curve varieties. For example, you can modify a sine function with modulus ($y=|sinx|$), so that y is an absolute value (i.e. always positive), thus creating a curve that looks like the path of a ping-pong ball skipping over a table.

Additionally, you can experiment with the product or sum of different functions to see what results you get. The sum of a linear function and a sine function ($y=x+2sinx$) might be a good model for difficulty progression.

Be it how XP relates to levels or how your character should jump, curves are everywhere inside your games. So thinking in curves lets you build up a powerful mental model that not only will help you design and balance, but also give you what you need to communicate your ideas.



Entire websites have sprung up around *Fortnite*, dedicated to listing every item and the probability of finding it.

Probability

WHAT IS IT?

Probability is the mathematical definition of how likely something is to happen. For example, how often a dice will land on a six.

WHY IS IT IMPORTANT?

Most games are non-deterministic, meaning that there are random events that impact the course of play. These random events add excitement, but if they happen too frequently (or too infrequently) they will ruin a player's experience.

Games are full of random elements, from weapon drops to dice rolls. But just because they're random doesn't mean that we can't or

"Be it how XP relates to levels or how your character should jump, curves are everywhere inside your games"

shouldn't quantify them. In fact, good game balance relies not just on the chance of an event but the value of it and all of its permutations. Very rare but highly valuable events can put a game out of whack as quickly as an event that's too common.

Let's start by looking at the simplest example of a probability: a coin flip. On a given flip, what is the probability (or chance) a coin will land heads up? As there are two outcomes (heads and tails) which are both as likely, we can say the chance is 50%, or 0.5 or ½. All of which say the same thing: we expect heads to land on half of all coin tosses and so tails to land on the other half.

What now if someone makes you a wager: you toss a £1 coin, and if it comes up heads they keep your coin, if it comes up tails they

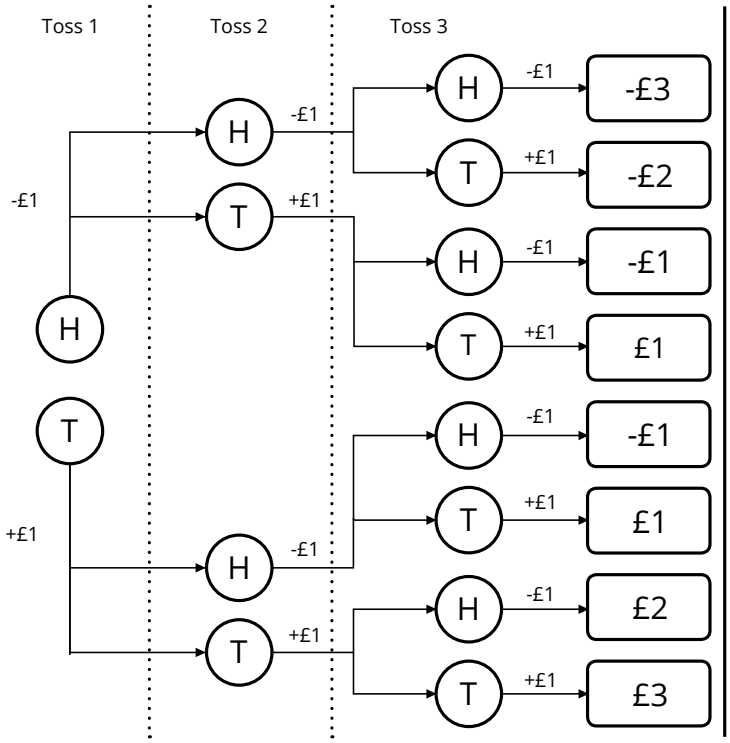


Figure 6: Probability tree for three coin tosses

give you another £1 coin. Is that a fair bet? In half the tosses we expect to lose a pound and in the other half we gain a pound. **Table 3** shows how we can calculate an average winning by multiplying the chance with the benefit to give us a contribution (the value we can expect from that outcome). When summed, our contributions give us our average expected winnings.

We can see that this bet is fair because nobody comes out ahead on average. However, this doesn't mean that every toss we make will result in £0 winnings, but over many tosses we'd expect to see regression to the mean. Regression to the mean is the phenomenon where the more often the same random event happens, the more likely that the outcome will match the average.

We can plot the same coin toss wager as a probability tree over three tosses (see **Figure 6**).

A probability tree maps the probability space – that's to say all potential outcomes of a series of linked random events. Over our three coin tosses, we can see there are eight outcomes and each is as likely as the other to occur, so we can say any given outcome has a ⅛ (or 0.125 or 12.5% chance) of occurring. Another way we can calculate the ultimate outcomes' chances is with the product of each event's probability:

$$0.5 \times 0.5 \times 0.5 = 0.125$$

Or

$$0.5^3 = 0.125$$

We can see that for the three tosses we never reach our calculated average outcome of £0, because there's no way to give and take £1 three times to reach £0. Instead, we see a range of outcomes with winnings from -£3 to £3, but not all winnings are as likely to happen.

Table 3: Winnings table for coin toss wagering

Outcome	Chance	Winnings	Average Winnings Contribution
Heads	0.5	-£1	-£0.50
Tails	0.5	£1	£0.50
Average Winnings			0

TRY THIS:

For our gold reward example (see **Table 4** overleaf) we could say that the outcome is rather 'spiky'. Spiky random events are ones where the outcomes have high variance and so create a value graph with lots of spikes.

Build a spreadsheet and rebalance the loot table so that the reward variance is reduced from 100x (100 gold to 10,000 gold) to 10x keeping the average gold per day the same.

Which loot table do you think players would prefer and why?

Loot tables define what items will appear and how often in all kinds of games, including *World of Warcraft*.

We can link all of the coin toss outcomes by their winnings into events. Events are sets of outcomes that have their own probability – in our example, we can say that -£3 is an event comprised of one outcome and so ⅛ (0.125) probability, whereas the £1 event has two outcomes and a probability of ⅜ (0.25).

As our coin toss probability space grows with more tosses, the number of winnings events increases, but the extreme outcomes become less and less probable. For example, it's possible for us to flip the coin 20 times, land only heads, and end up with -£20, but it is highly unlikely. We can calculate the probability of a -£20 run as:

$$0.5^{20} = 0.000000953674316 = \frac{1}{1{,}048{,}576}$$

Let's now look at a common game scenario: You would like to give players 500 gold every day. You could simply add 500 gold to their balance, but wouldn't it be more exciting if they opened a chest that had a random amount inside? Let's look at how you might balance that using a loot table.

A loot table is a list of rewards from which only one is chosen based on a 'roll' (a random number generated in code) which is checked against the probability. Our loot table (see **Table 4**) makes use of the same average winnings contribution from our coin toss example which can be summed to give us an average gold reward per day.

This process is the basis of balancing most random events in games. All we need is the chance and the outcome of each event to create an average outcome. From this, we can balance our values such that events happen frequently enough (and no more) and are rewarding enough (and no more) to be exciting without breaking anything. We can easily

Table 4: A loot table calculating average gold winnings based on a random reward.

Reward	Chance	Gold	Average Gold Contribution
Common	0.7	100	70
Uncommon	0.2	150	30
Rare	0.075	2,000	150
Epic	0.025	10,000	250
Average Winnings			500

scale up the method to build loot tables with thousands of items or balance complex combat procs (programmed random occurrences) for multiple classes.

However, as your game gets bigger and lots of random events have an impact on multiple systems, then you'll become less certain about a player's path. In this case, there's another tool we can use: Monte Carlo simulations. Monte Carlo simulations can be made in a spreadsheet using scripting or with modified game code. Either way, the basic premise is always the same: simulate the game being played, including random events, multiple times and analyse the outcomes by looking at averages and ranges.

"As your game gets bigger and random events impact multiple systems, you'll become less certain about a player's path"

Monte Carlo simulations, although a lot of work to make, are super-helpful when your game gets complex and playthroughs take a lot of time. Running some kind of script that simulates a playthrough lets you quickly modify values and see their impact within minutes. These simulations can also let you catch edge cases, like a player getting a super-rare drop early and racing through the game.

Keep in mind when working with chance in your games that humans are not naturally good at thinking in probability, so don't worry if you struggled to follow some of this section on your first read. This probability irrationality leads to all kinds of interesting behaviours, such as superstition and belief in luck, but most importantly, the right rewards and probability ratios can lead to very strong compulsions to play. This makes mastery of probability a super-powerful game design tool.

Let's recap

In this first part we've added two very useful tools to our game design belt: curves and probability. Within the curves section we looked at how mathematical formulas can give a relationship to two values that when plotted on a graph give specific shapes; while during the probability section we looked at how chance and outcome can allow us to think about average outcomes which are helpful for balancing.

These two topics make up a large portion of the low-level design you will encounter in your career making games. In the next part of this guide, we're going to expand your toolkit with two more concepts: economics and matchmaking. Economics will equip you with some ways to think about the flow and interaction of currencies and items in your games, while matchmaking will give easy ways to bring the right players together.

TRY THIS:

Can you build a game where using a dice you create an exponential growth curve? Play the game multiple times and record your results to create your own Monte Carlo simulation. Did you manage your exponential curve?

The *Fortnite* phenomenon is such that some teachers are using it to teach students about its underlying mathematical principles.

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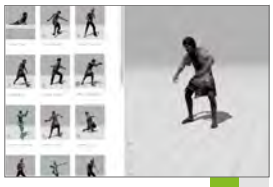

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ARTFUL AVOIDANCE

Fog the mirrors, stop the clocks: Gone Home environment artist Kate Craig shares some of the tricks that indie devs use to keep their games on time and within budget

While at a wedding a few weeks ago, idly chatting about video games with a fellow guest, I was asked a question that surprised me in just how astute it was. "Does the technology you work with inform the kinds of narratives you can write?"

It was a wonderfully in-depth question and the answer for those who haven't had the misfortune of making a game themselves is: yes. A yes so emphatic it could be written out in five-foot letters and it still wouldn't convey how intertwined the two elements are. Coming from Fullbright, a small independent studio in Oregon that focuses almost exclusively on storytelling and character pieces, it's not just a question about game development, it's the ultimate question.

▲ *Everybody's Gone to the Rapture*'s eerie stillness also helped save a fortune on character models.

Firewatch was a masterclass in economical world-building.

Making a game, from early preproduction to the last frantic, bleary hours, is all about picking the battles you have a chance at winning. And choosing which elements to push to the forefront while sweeping others under the rug is an everyday tug of war.

Do I make the doors swing on hinges, for instance, or is there a convincing reason I can make them pocket doors instead? Can I completely nuke doors altogether and put a hall in the same space without sacrificing any of the flow or aesthetics? It's not a big deal on my end – as an environment artist a door is, in its simplest form, a tall rectangular box – but for a programmer and level designer it's the difference between a player getting pinned into a corner, or forcing the door to awkwardly swing in both directions. It means strange screen jitters as the camera figures out how to navigate around it, or setting up physics objects to respond to being smacked by an opening door. We have a meeting next week and the only subject we're discussing is doors. Including seemingly innocuous, everyday elements like these can have massive implications on your game.

When I consider the last few years of walking simulators (stroll-playing games, first-person snoopers, exploration games – take your pick), they all share a sense of loneliness that stems from both technological limitations and sticking to a project's financial scope. *Firewatch*, *Gone Home*, *Dear Esther*, *Everybody's Gone to the Rapture*, *Tacoma* – at their core they face a similar conundrum: how do I make a game without or with minimally detailed characters, and what does it mean for the story and world if I do?

Why wouldn't you want characters in your game? Honestly, I would love to, and some of my favourite moments from the games I've played include NPC characters, but making a game with fully animated characters, or even just a single animated player character, changes absolutely everything, and this is best illustrated through mirrors.

DIRTY MIRRORS

Mirrors and reflective surfaces can, like doors, be a whole to-do. They're a simple in-world object that creates a cascade of smaller problems. If you have a mirror in your bathroom, it has to reflect you, the player – and presumably you as a player are controlling a model of some sort, which means the developers have to hire a talented character artist to sculpt that model, then retopologize/optimise it so it can deform in a convincing way when it moves. Then a rigger or technical artist comes along to put in a skeleton (an animatable framework) so it can actually be moved about, then an animator is hired to create a series of animations and all the facial expressions, and by the time you've done all that and hired or contracted all those people and done all that work, your indie studio is out of money and you all have to go back to working on Margaritaville tie-in games for Facebook, which is absolutely not a part of my career path whatsoever.

Besides sheer difficulty and cost, there are a multitude of other reasons you might opt to exclude something from your project. In the *Gone Home* house I'd originally modelled a pair of flip-flops and placed them in the closet, but as the August deadline drew closer and my sleeping pattern grew more and more erratic, creating additional shoe models become impossible within the allotted time. I could place the flip-flops around the house, sure,

SLIDING DOORS

In *Gone Home*, a story game we released in 2013, we used both pocket doors and standard hinged doors. Despite the house in the setting being a Victorian manor and a perfectly plausible location to put sliding pocket doors, the thought didn't occur to me until halfway through production – which is why you only find them in the last half of the game.

The best walking sims incorporate the limitations of their budget into their storytelling.

but they would be the only genre of shoe in the entire home, and the narrative implications of that – that the family was a beachy party time family who spurned the idea of boots or running shoes – ran counter to the thoughtful atmosphere we were trying to cultivate. The solution was straightforward and brutal: we deleted all flip-flops from the house and the game shipped with absolutely no footwear whatsoever.

(On a related note, if you find yourself pausing at the use of 'running shoes and flip-flops', regional terms for assets are something I regularly think about when naming game assets. As a Canadian working alongside an American team, I would often rename objects to fit a different regional standard. The number of Us and REs I've left out of named assets is in the tens of billions by now, except for one notable case where an errant 'u' caused a lore change: the *Gone Home* mom Janice was edited to be a Canadian living abroad and we included a citizenship document in the basement.)

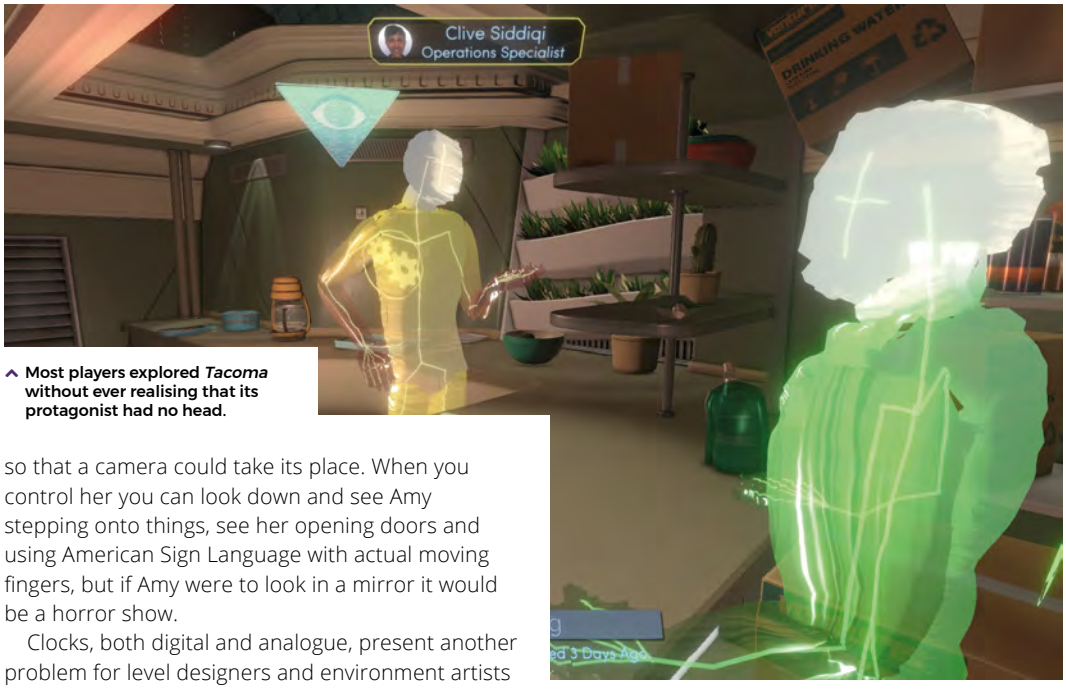
"Making a game, from early preproduction to the last frantic, bleary hours, is all about picking the battles you have a chance at winning"

While on the subject of *Gone Home*, the player, in the completely non-extant shoes of Katie, is depicted as – well, nothing. Behind the player camera she's simply an invisible capsule collider that moves through the house picking up objects. And by picking up objects I mean levitating them in front of her. The girl's got no hands.

In *Tacoma* we pushed harder, and the main player character Amy has feet, and legs, hands, and everything you might want from a person except a head. She was modelled in this decapitated way

EXPLORING THE WALK 'EM UP

Although subject to a curious backlash from some gamers in the late 2000s, the roots of quietly dramatic, non-violent storytelling of games like *Gone Home* and *Dear Esther* can be traced right back to the earliest years of the medium. Text adventures were, after all, about soaking up the details of a world and figuring out how to interact with it – violence and combat were rare occurrences. The so-called 'walking sim' may not be for every hardened shooter fanatic, then, but the genre's mode of storytelling is arguably as old as gaming itself.



Most players explored *Tacoma* without ever realising that its protagonist had no head.

"If you have a microwave and a player can push objects inside it, why can't they turn it on and melt things?"

so that a camera could take its place. When you control her you can look down and see Amy stepping onto things, see her opening doors and using American Sign Language with actual moving fingers, but if Amy were to look in a mirror it would be a horror show.

Clocks, both digital and analogue, present another problem for level designers and environment artists to puzzle out. In all the games I've worked on, we either haven't included them, or try to present an elegant narrative reason for them being out of commission, like a thunderstorm that's knocked the power out and caused all digital clocks to flash 12:00, or a battery running low that causes analogue clock hands to tick back and forth endlessly.

They'd be doable enough to implement, I'm sure, but adding a working clock in world creates a number of distracting questions that we don't really care to answer, with the biggest being lighting. A developer would have to tie the time of day to the scene's lighting scheme, which would have to change over time and possibly wipe out any of the artfully arranged lighting cues. Since we're usually more interested in creating a considered narrative moment than being rigidly faithful to what time of day it is, by banishing all clocks from an environment you can effectively freeze a moment in time. Time is only implied in Fullbright games.

ROCOCO'S A NO-NO

Hopping from the difficulties of single assets to something much grander in scale, art direction is hugely influenced by the tools and technology available. I suspect the reason you don't see many game stories set in rococo period Bavaria or art nouveau Paris is also down to technology. Polygons can be expensive in great numbers and the more organic and flowing a model is, the more expensive it'll be. Rococo and art styles akin to it are all curves and ornate detail, flowers and foliage, while art deco, with its repeating geometric elements and love of sharp corners, lends itself to working with 3D modelling programs in the way the others don't. *BioShock* and *Grim Fandango* hit on something beautiful when they chose the architecture that they did, but they also chose something flattering to their tools.

THE FULLBRIGHT COMPANY

Designer Steve Gaynor cut his teeth on some impressive games early in his career – including *BioShock 2* expansion *Minerva's Den* and *BioShock Infinite* – before the creative freedom of independent development caught his eye in 2012. So began The Fullbright Company, which Gaynor founded with programmer Johnnemann Nordhagen and artists Karla Zimonja and Kate Craig. *Gone Home*, a first-person exploration game set in the 1990s, put the team on the map with its intelligent storytelling and contemplative style.

THE HORROR OF LIFTS

I've had the good fortune of never having worked on a game that required enclosed elevators, but I've been told they're up there with doors in the pantheon of pain. Putting a player inside a small box with a camera and then moving that geometry up and down in the world is one of those things that seems straightforward on its face, but, like a single pull-up, can be unexpectedly tough.

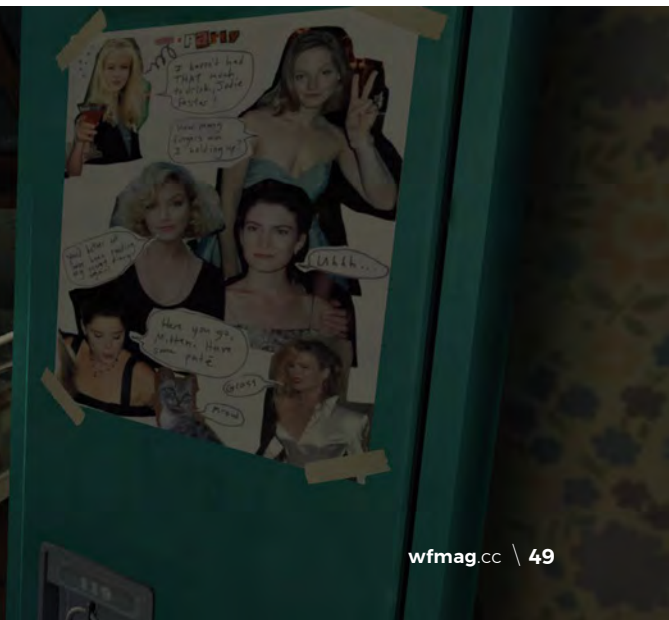
If there's a through line here, at least in the games I've worked on, it's artful, hopefully invisible avoidance, and trying not create situations you can't pay off in a satisfying way, either from a visual point of view or something more mechanical. If you only have limited resources, try not to include doors a player can't open, or taps that don't turn on, unless you have a reason for it. If you have a button, it should be pressable; if you have a microwave and a player can push objects inside it, why can't they turn it on and melt things?

These are questions that are important to me for working on story-focused games, but not every game will or even should be dwelling on things like flip-flops and microwave mechanics. I don't question the way the doors open in *Overwatch* because I'm more concerned with other things, like trying not to fall off the edge while playing Tracer or sobbing when I play Mercy.

While it didn't strictly affect the narrative of our games, in both *Tacoma* and *Gone Home* the team ran into the problem of objects falling through the world. Thin items like books and pencils, when tossed by the player, would often vanish beneath the floorboards, never to be seen again. Falling through the world is hardly a new bug in games, and we eventually tackled it by making the collision thicker, but I wish we'd solved it as elegantly as the *Dragon Age: Inquisition* team, who created a pie-owl-creature in a top hat, and when and if the player fell through the world, they were suddenly faced with a pastry monster while calliope music played.

With each game being so different from one another, I'm always reluctant about offering anything like black and white advice, but based on personal experience, the battles you choose to fight as a developer should be the ones that best serve your game. If you truly want a particular element, there are workarounds and solutions to getting there and it's just a matter of digging in or asking around to see if others have dealt with it before. If you wanted to include a mirror, maybe it would be fogged over, cracked, dirty, or fallen on the ground. Maybe you'd have to write your entire story from the perspective of a vampire, or maybe you decide characters are something you want to invest in and so, instead of sidestepping the issue, you drop that character modeller a line.

Current technology does detour us when it comes to the kind of stories we're able to tell, but it doesn't cut us off entirely. And, as most people with creative jobs or hobbies likely know all too well, borders and limitations force a person to really think about what they want out of their project and how thoughtful they can be when they approach it, and perhaps makes them better for it.



Developer Profile

25 Years of Treasure

Founded in 1992, Treasure made its name thanks to a string of technically astonishing 2D action games

Some studios take years to establish their signature style; Treasure, founded in Tokyo in 1992, emerged fully formed. Set up by Masato Maegawa and a handful of other former employees from Konami, then one of the biggest developers in Japan, Treasure quickly became known for its fast, aggressive games, featuring bold graphics and surreal dashes of humour. *Gunstar Heroes*, its first release, featured an area boss called Curry and Rice. Hectic shooter *Bangai-O* interspersed its action with weird and faintly disturbing comic book images.

In its early years, Treasure largely confined its attention to the Sega Mega Drive – a console that, thanks to the dominance of Nintendo and NEC's rival systems in Japan, had a relatively small following. In turn, Treasure's first few titles were doomed to remain in relative obscurity, but the sheer quality of their design and programming meant that their fame long outlasted the Mega Drive's production. *Alien Soldier*, which stripped the 2D run-and-gun platformer down to a string of explosive boss battles, was an extraordinary display of technical fireworks – the results are all the more remarkable considering it was developed largely by one artist and programmer, Hideyuki Suganami.

Although rarely straying from the 2D perspective of early 1990s games, Treasure's titles always took risks within established frameworks. *Dynamite Headdy* upturned the rules of the *Sonic*-era mascot platformer by introducing an almost bewildering array of abilities for its titular hero. *Guardian Heroes* added RPG elements and branching paths to the traditional scrolling beat-'em-up.

ACTION HEROES

Had Treasure vanished with the 16-bit era, its cult following would have remained assured. But unlike so many independent developers that rose up around the 1990s console market, Treasure survived: by keeping its team to a slight 20 to 30 developers, it has carried on making its own quirky games on a variety of platforms over the past quarter of a century. Such shooters as *Radiant Silvergun*, *Bangai-O*, and *Sin and Punishment* were launched to great acclaim on 32-bit consoles; *Ikaruga*, originally created for the arcade and

^ Yasushi Suzuki's spectacular artwork for *Sin & Punishment: Star Successor*.

Lens flares abound in the *Radiant Silvergun* art.

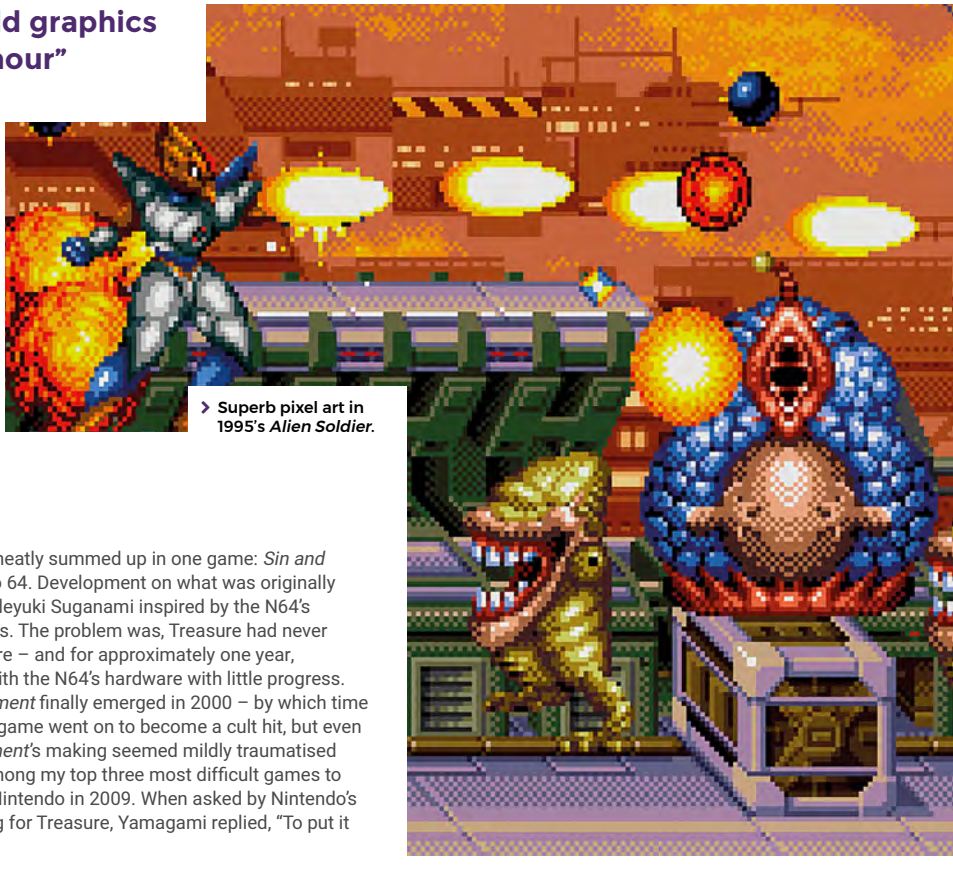
ported to the Dreamcast and GameCube, remains one of the most innovative 2D blasters ever made.

On occasion, Treasure has taken on licensed work for other, bigger companies, and even here the quality of its work rarely dimmed. *Astro Boy: Omega Factor* turned a much-loved Japanese mascot into one of the best platform games on the Game Boy Advance. *Gradius V*, which Konami outsourced to Treasure in order to save costs, ended the mainline franchise in a burst of flashing lasers.

Ikaruga: still going strong on Nintendo Switch.

"Treasure quickly became known for its fast, aggressive games, featuring bold graphics and surreal dashes of humour"

Since 2014, Treasure's once prolific stream of games has run dry; at the time of writing, Maegawa is keeping quiet about what his veteran company's up to behind the scenes. Most recently, Treasure released its classic *Ikaruga* for current-gen consoles – providing a timely reminder of what this diminutive company could do at the height of its creative powers.



Superb pixel art in 1995's *Alien Soldier*.

Glutton for punishment

Treasure's experimental attitude to game design is neatly summed up in one game: *Sin and Punishment*, the studio's first game for the Nintendo 64. Development on what was originally called *Glass Soldier* began in 1997, with director Hideyuki Suganami inspired by the N64's analogue controller and then-impressive 3D graphics. The problem was, Treasure had never attempted to make a 3D, polygon-based game before – and for approximately one year, programmer Atsumoto Nakagawa clashed heads with the N64's hardware with little progress. After a long and painful production, *Sin and Punishment* finally emerged in 2000 – by which time the N64 was already nearing the end of its life. The game went on to become a cult hit, but even a decade later, those involved with *Sin and Punishment*'s making seemed mildly traumatised by the whole experience. "*Sin and Punishment* is among my top three most difficult games to develop," game supervisor Hitoshi Yamagami told Nintendo in 2009. When asked by Nintendo's then-president Satoru Iwata what it was like working for Treasure, Yamagami replied, "To put it bluntly, they were a weird company."

Treasure Trove

10 Essential Games

Our pick of ten Treasure classics from the past 25 years

01

Astro Boy: Omega Factor

GBA / 2003

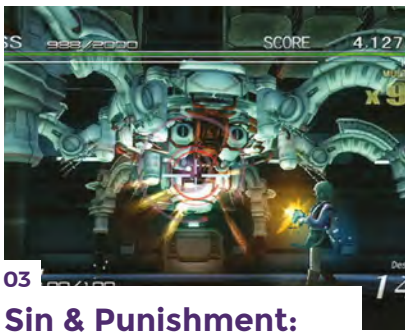
A rare example of a licensed game that's actually worth playing 15 years later, *Astro Boy* is also one of the best titles on the Game Boy Advance. In essence, it's a 2D beat-'em-up, albeit one bursting with run-and-gun sequences and 2D shooting segments. It's a genre mash-up that fizzes with colour and energy.

02

Guardian Heroes

Saturn / 1996

Brawlers like *Golden Axe* and *Final Fight* were out of fashion thanks to the *Street Fighter II* franchise by the mid-1990s, but that didn't stop Treasure from trying to give the genre a renewed boost of energy. *Guardian Heroes* wasn't a huge seller, but the addition of light RPG elements and weird storytelling makes this one of the Sega Saturn's more sought-after games.

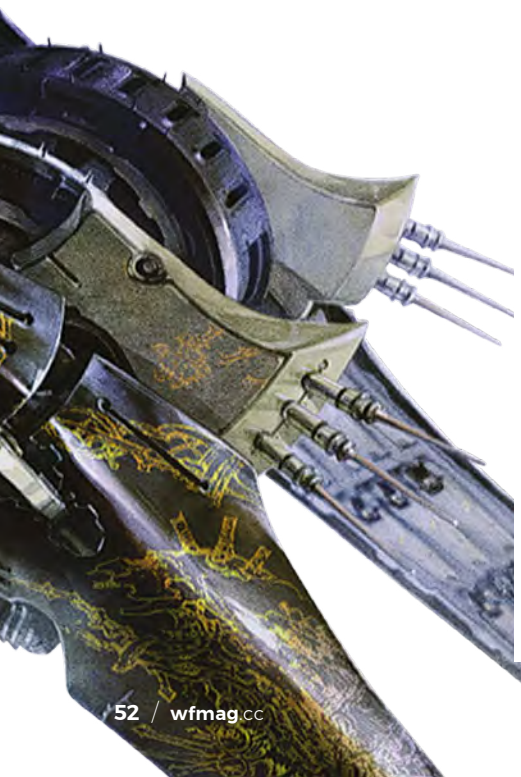


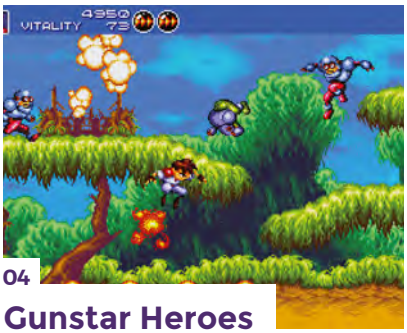
03

Sin & Punishment: Star Successor

Wii / 2009

The original *Sin and Punishment*, a rail shooter akin to *Star Fox* or the more obscure *Cabal* in arcades, was a Japan-only gem. Designed by Masaki Ukyo (director of *Guardian Heroes*) this Nintendo Wii sequel actually made it to the West, and it's a simple yet effective action game that really comes to life when played in co-op mode.



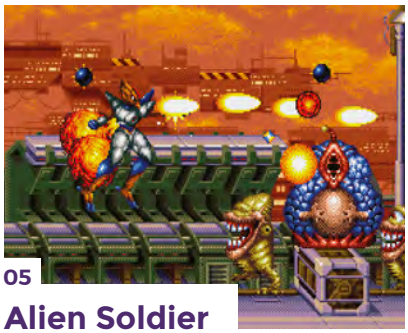


04

Gunstar Heroes

Mega Drive / 1993

Treasure's debut game, and the earliest taste of the studio's febrile tastes. It's a side-scrolling run-and-gunner in the mould of Konami's *Contra*, but injected with such manic urgency that it still feels fresh today. The repetition of marching about and shooting things is enlivened by a mix-and-match weapons system that provides a wealth of explosive results.



05

Alien Soldier

Mega Drive / 1995

Another take on *Contra*, this time focusing on 31 increasingly frantic boss battles. A wealth of weapons even the odds a little; all the same, *Alien Soldier* is relentlessly tough, even by Treasure standards – if you've played the sublime 2016 indie game *Cuphead*, a title partly inspired by *Alien Soldier*, you'll know what kind of oddly addictive punishment awaits.

06

Dynamite Headdy

Mega Drive / 1994

The platformer genre was horribly overstuffed following *Sonic the Hedgehog*, but true to form, Treasure came up with its own spin on things. The title hero, Headdy, is a puppet whose range of switchable heads give the player a wealth of bizarre powers, ranging from a vacuum that sucks up nearby enemies to a dispenser of flaming bullets.

07

Gradius V

PlayStation 2 / 2004

Several members of Treasure developed the original *Gradius* when they were still working at Konami. Fitting, then, that the break-away studio would be given the chance to develop *Gradius V* – to date, the final numbered entry in Konami's side-scrolling shooter series. And what a game it is: challenging, polished, and full of inventive spins on long-established ideas.

08

Ikaruga

Arcade / Dreamcast, various, 2001

To the traditional horizontal shooter, *Ikaruga* adds an ingenious twist: the tap of a button flips the player's ship between light and dark modes. In light mode, the ship can safely absorb white enemy bullets, but is vulnerable to black bullets, and vice versa; It's a tricky system to learn, but put in some practice and you'll discover one of the most rewarding blasters ever made.

09

Radiant Silvergun

Arcade / Saturn, 1998

The Sega Saturn was already in its death throes by the time *Radiant Silvergun* showed up, which means this Japan-only release is highly prized by collectors today. Players start the game with all the weapons they'll ever need, ranging from homing missiles to a deadly swinging sword, while a colour-based scoring system makes racking up bonuses endlessly addictive.

10

Bangai-O

N64 / Dreamcast, 1999

Bangai-O distils everything the studio was best at into one explosive package: inventive design, ferocious action, and an overarching sense of fun. It's a free-roaming 2D shooter with a spectacular counter-attack mechanic that sends ordnance flying all over the screen. Quirky, exhilarating, deceptively smart, *Bangai-O* is a true classic of its kind.

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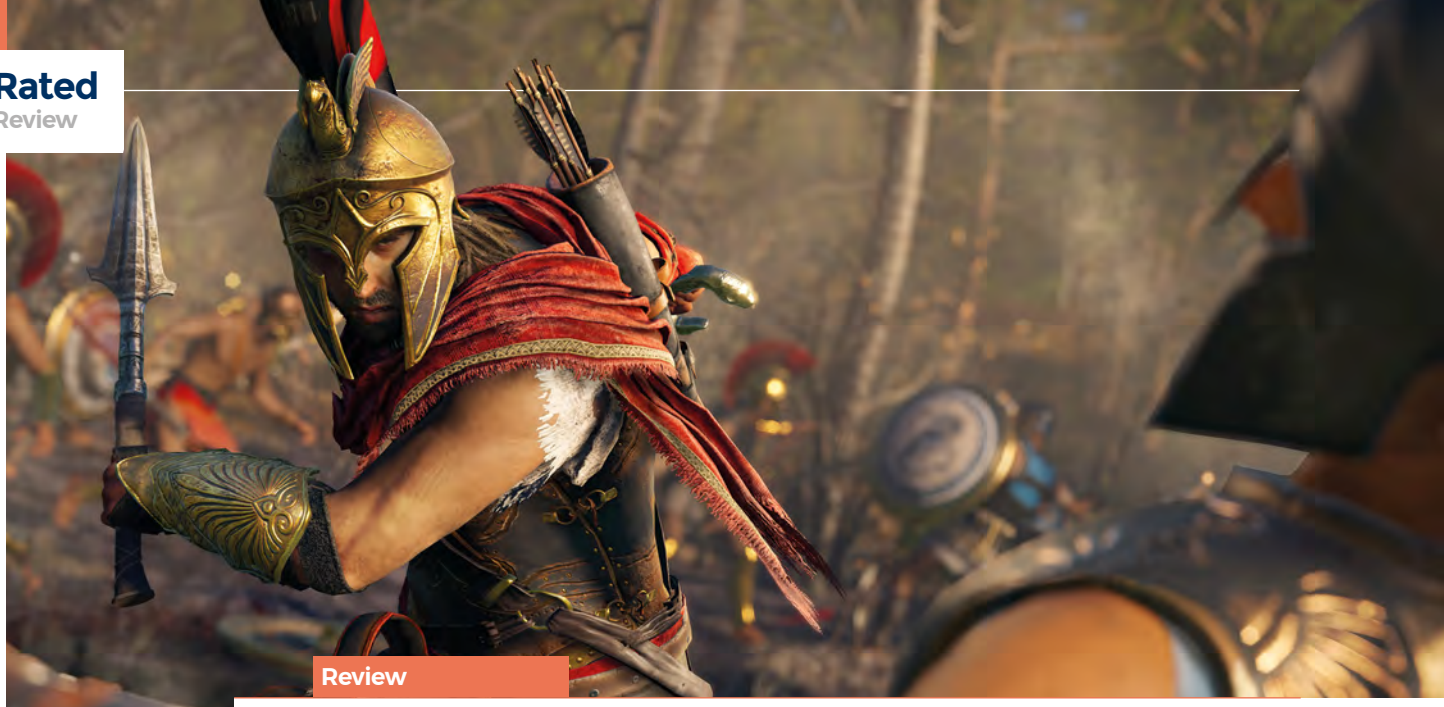


Review

Assassin's Creed Odyssey

Ubisoft's biggest franchise gets its best entry yet

Info

GENRE
Action, Stealth, RPG, Open-world

FORMAT
PC (tested) / PS4 / XBO

DEVELOPER
Ubisoft

PUBLISHER
Ubisoft

PRICE
£49.99

RELEASE
Out now

REVIEWED BY
Joe Parlock

It's not often a series has its best entry eleven years and almost a dozen games in, and it's even less likely when it's the direct successor to an already great game. Franchise fatigue, fixing things that aren't broken, and creative leads leaving almost always get the better of a series before it reaches double digits.

And yet, here we are with *Assassin's Creed Odyssey*. It isn't only the high point of Ubisoft's flagship series, it's also – without a hint of hyperbole – an easy competitor for the greatest open-world game ever made. Sorry, *The Witcher 3*.

Odyssey ditches *Origins*' Ptolemaic Egypt and rolls the clock back about 400 years earlier to the birthplace of Western civilisation: Ancient Greece. Putting you in the sandals of one of two siblings, Kassandra or Alexios, the story follows your Spartan as they explore the Greek world, meet famous historical faces, and investigate the mysterious Cult of Kosmos that is hunting you down.

This being an *Assassin's Creed* game, there's also a modern storyline: a continuation of Templar-turned-Assassin Layla Hassan's story from *Origins*. If you've been away from the series for a while, the modern segments have become much less prevalent since Desmond Miles's exploits, giving a few hints into the ongoings of today's Assassins and throwing some nice nods to previous games, but otherwise acting as bookends for the meat of the story set millennia ago.

At the centre of *Odyssey* is the sprawling world of Ancient Greece itself – chock-full of beautiful vistas, glistening seas, bustling cities, deadly forests, and perilous cliffs, all teeming with interwoven history and mythology. The Greek world is mind-bogglingly massive, and even dozens of hours in you're not likely to have seen much more than a fifth of the map, and even that fifth probably hasn't been fully explored yet.

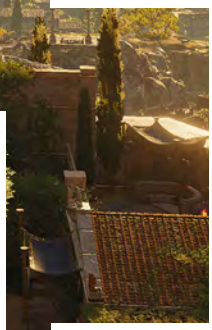
"It's about climbing tall things, jumping from them, stabbing people, and then meeting a few famous faces from history"

Getting around the islands can be tricky, but finally making its full return after a handful of missions in *Origins* are the ships of *Black Flag* and *Rogue*. While it was a popular feature, ships always felt sluggish in previous titles, which is something *Odyssey* manages to improve on effectively. Ships are faster but less sturdy than *Rogue*'s icebreakers or *Black Flag*'s galleys, resulting in fights feeling more frantic and deadly. Building your crew is crucial, too, as lieutenants can be hired from just about anywhere to give the ship bonuses in combat whilst bolstering your boarding party when the time comes to get up close and personal. While *Black Flag* gave the perfect pirate fantasy,

The Greek world is huge and full of beautiful scenes such as this.

HIGHLIGHT

Whether it's looking out over a city, or watching the dolphins bound through the waves alongside your ship, this game constantly provides beautiful and surprising things to take in. It's a nice treat at the end of a hard day ramming a spear through someone's pancreas.



There's almost always a sneakier option than going in sword drawn.

Odyssey is by far the most refined and fun iteration of *Creed*'s ship gameplay to date.

Continuing the series' shift to full-blown RPG status, *Odyssey* takes *Origins*' multitude of side quests, loot, and skill trees, and adds to it a whole branching dialogue system that can change the course of the whole game. Your Spartan can talk with the great and the good of Greece, and many missions can be influenced by the way you communicate, threaten, question, and flirt. For example, intimidating a character might get the job done quicker, but it could have an impact on your reward.

Another great change is the introduction of Exploration Mode. Your eagle, Ikaros, works as your eye in the sky, scoping out enemies, objectives, and loot for you, much like *Origins*' Senu. However, *Odyssey* tweaks how missions play out to better balance the sheer amount of information Ikaros can give you. Gone are direct waypoints to objectives, and instead map-reading and exploration are required to hunt down your next goal. It gives the environment a bigger role than just being a stage for the action, especially when you run out of leads chasing down a single target.

Working in tandem with the Exploration System is a whole investigative mode dedicated to wiping out the Cult of Kosmos. Each member has clues – such as a letter or the dying word of a subordinate – that help uncover who and where they're to be picked off. For a game that technically predates the Assassin Order by several centuries, it's worth noting that no other entry has gone to these lengths to let you feel like a true Assassin.

The game feels a lot more stealthy than its Egyptian older brother, thanks to the combination of the much denser foliage to hide in and a few fancy abilities. It turns *Assassin's Creed* into something more akin to *Middle-earth: Shadow of War*: staying unseen until the last, brutal moment, with a few supernatural tricks such as bending arrows and teleporting to enemies killed at range. It works to give *Odyssey* a much more solid stealth foundation than the series has seen for a while, which is greatly appreciated.

Ultimately, *Assassin's Creed Odyssey* is still an *Assassin's Creed* game. It's about climbing tall things, jumping from them, stabbing people, and then meeting a few famous faces from history. What makes *Odyssey* special, though, is how it follows *Origins*' already stellar example in how to make a dizzyingly huge world, and then refines everything else to within an inch of its life. Stealth is better, combat is better, ships are better, dialogue is better; the list of improvements *Odyssey* makes to the series is as vast as its world.

Ships and nautical warfare make a big comeback.

VERDICT

Quite simply, this is the best *Assassin's Creed* has ever been.

93%

Managing your resources is just as important as assembling a good army.

HIGHLIGHT

8-Bit Armies strips away a lot of the complexities associated with the genre, offering an experience that is easy to pick up but difficult to master. Soedesco and Petroglyph Games have done a great job with the port, adapting the controls for console perfectly.

8-Bit Armies

An uncluttered RTS that's perfect for consoles – well, almost

Info

GENRE
RTS

FORMAT
PS4 / PC / XBO / Switch

DEVELOPER
Petroglyph Games

PUBLISHER
Petroglyph Games, Soedesco

PRICE
£24.99

RELEASE
Out now

REVIEWED BY
Jack Yarwood

VERDICT

8-Bit Armies **is a decent RTS port, but quickly runs out of ideas.**

68%

A good real-time strategy game on consoles is hard to find – there's just something about the genre that works far better with a mouse and keyboard than a controller.

Surprisingly, though, *8-Bit Armies* is an extremely accessible RTS, with a simple, well-designed control scheme that works with the player, rather than against them. Assigning units is surprisingly easy, letting you tie troops to one of the three buttons before using that same input to move them around the map or to order them to attack. It isn't the most in-depth system, but it is one that still encourages you to play strategically, splitting your units up into separate columns, as opposed to moving forward as a single block.

The game's single-player campaign allows you to choose between two different factions, the Renegades and the Guardians. Both have their own unique tech trees to unlock, with the Guardians having more tactical units like snipers and drones while the Renegades rely more on heavy firepower and artillery.

Regardless of what you pick, each campaign unfolds roughly the same, however, with every map having a main objective to complete and two bonus goals that you can try to accomplish in the allotted time. To complete these, you will need to make money from harvesting natural resources, build a collection of structures to produce troops, and efficiently delegate tasks. It is a familiar gameplay loop, but one that can still produce some memorable and exciting moments, as you fight tooth-and-nail for an important resource spot or an access route. It's just a shame that the actual story doesn't live up to the same high standards, with a blink-and-you'll-miss-it text dump occurring in the menu prior to each game.

Map variety is another problem in the campaign mode. You will constantly find yourself fighting on the same maps over and over with only a handful of new units unlocked to change your approach. This makes completing the campaign a fairly repetitive task, which is unfortunate given the promise of the game's intuitive control scheme and mechanics.

If you do find yourself getting bored, it should be mentioned that there are other modes like a co-op campaign and several multiplayer options to explore. These slightly make up for the repetition. But still, it's hard not to feel a little disappointed after such a promising start.

8-Bit Armies is a fairly decent RTS game that feels right at home on consoles. It is simple and easy to control and doesn't overburden the player, like some other RTS games. All of that doesn't change the fact that there are some major issues with the main campaign, however. There's just not enough content to keep a player's interest over the number of hours required to beat it, with the game in desperate need of significantly more maps and a better story to motivate the player to keep coming back to it.

Review

Catastronauts

In space, no one can hear you argue

Plenty of us have dreamed of owning our own spaceship at some point: exploring other planets, shooting stuff with big, meaty laser cannons. Most games that indulge this fantasy are, however, just a bit too dry and complicated. Forget space trading and logistics: what we really want is a game that lets us mess about in spaceships. Right on cue, along comes Inertia Games' *Catastronauts*, a space combat sim that does away with the impenetrable stats and menus and injects some good whole-hearted fun into the mix.

Resembling the galactic cousin of *Overcooked*, it involves you and your crew working together to fight off alien invaders by running around and putting out fires – both literal and metaphorical. Each stage sees you facing off against an invading ship. Enemy attacks will cause damage to your craft and crew, so you have to balance returning fire with dealing with all kinds of stuff going wrong: damage must be repaired, fires extinguished, and bombs disposed of.

Like *Overcooked*, *Catastronauts* eases you in gently, with simple ship layouts and an easy-going pace. But the more frantic it gets, the more obstacles are thrown at you as new elements like transporters are introduced. The beauty of a game like this, though, is that it's so simple to pick up and play. You only have two buttons – pick up and action – but the way small problems can (literally) blow up into bigger problems is where an otherwise simple game comes into its own. Soon enough, you'll be scrabbling for an extinguisher to deal with quickly spreading fires while keeping an eye on a bomb that's just appeared elsewhere.

The key part of *Catastronauts*' appeal is how accessible everything is. New mechanics are introduced by a neat little instruction screen and are designed to be as intuitive as possible, so even when enemy lasers are raining down on you, you never lose sight of what you're doing. But solo gamers be warned: this is a game designed primarily with multiplayer in mind. If you're the kind of social gamer who regularly has friends over for gaming sessions, then you can easily add a few more points to the review score. For everyone else, well, there's always the online mode. Ultimately, though, *Catastronauts* is best enjoyed with four players on the same couch, bashing away at their controllers while shouting encouragement and insults at each other.

It's 'putting out fires: the video game'.

HIGHLIGHT

Catastronauts has a charming, hand-crafted feel – fitting, given that Inertia is also the studio behind a cross-stitch simulator. Like its spiritual cousin *Overcooked*, it has an Aardman-esque quality to its presentation, with its range of grinning characters looking like they've stepped out of an episode of *Shaun the Sheep*.

Info

GENRE
Party

FORMAT
PS4 (tested) / PC / XBO / SWITCH

DEVELOPER
Inertia Game Studios

PUBLISHER
Inertia Game Studios

PRICE
£12.39 Steam
£12.79 XBO
£11.49 PS4

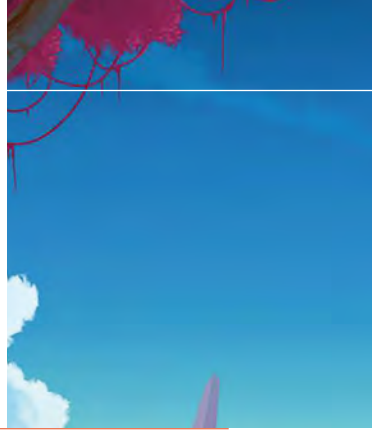
RELEASE
Out now

REVIEWED BY
Jake Laverde

VERDICT

A simple, quirky and fun game that really comes to life in local multiplayer.

82%



Update
Review

No Man's Sky Next

With the Next update, No Man's Sky finally shows its potential

Info

GENRE
Survival

FORMAT
PS4 (tested) / PC / XBO

DEVELOPER
Hello Games

PUBLISHER
Hello Games

PRICE
£34.99

RELEASE
Out now

REVIEWED BY
Harry Slater

There isn't a word in the human language that can really describe how big the universe is. We're not good at comprehending numbers that we can't visualise; there comes a point where size becomes less a specific descriptor and more an amorphous largeness that our metaphors can't describe. Therein lie both the problems and the possibilities of *No Man's Sky* – when you can go anywhere and do anything, in a digital expanse that stretches out far enough that the term infinite can rightly be applied, how can you even start to decide what to do first?

The first promotional images and videos of *No Man's Sky* captured the feeling of stepping bravely into the unknown. The universe was ours again, in all its weirdness and scope. We were going to be adventurers like the ones we saw and read about in sci-fi movies and books, soaring through clouds made of gases we'd never breathe, hurtling through the darkness with our eyes on a prize that was nothing more or less than everything. But when the game came out there was something missing, a sizable hole in the centre of the game that left so many people feeling a little cold.

There were incredible things to see and do in the original iteration of *No Man's Sky*, but getting to them was a lonely and confusing experience that made you feel like you were hurtling uncontrollably towards something without knowing why you were going there. You were too small, too unimportant, to make any sort of meaningful difference to the uncaring, procedurally generated universe that had been made for you.

In a game where size was originally such an important factor, *Next* – Hello Games' far-reaching expansion released in July – shows us that it's the small things that matter far more. The little stories of strange things that happen and how you choose to deal with them. The people in the sci-fi stories that capture our imaginations aren't on their own, but are parts of larger communities, settlements, and groups. They're intrinsically part of something much bigger than themselves, and that means their small actions combine to make a greater impact.

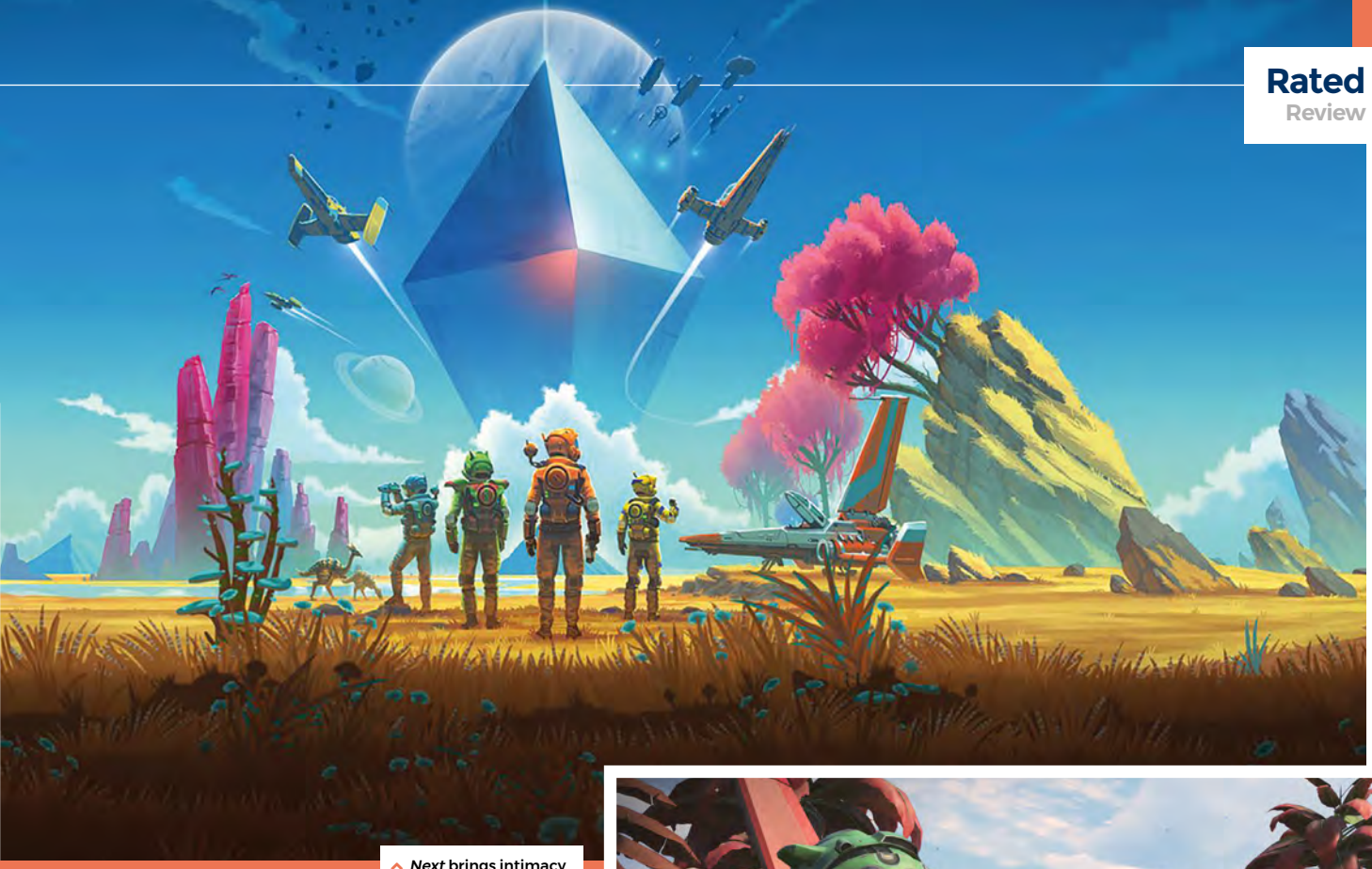
No Man's Sky Next is still enormous, in ways that no other game can even start to offer, but *Next* narrows the focus. Look at a painting by Chris Foss, a sci-fi artist who created book covers in the 1970s and 1980s, and you'll see a snapshot of an exciting universe. But it's tightly framed. Space is out there, enormous and growing, but within that limitlessness are little pockets of adventure and amazement. It's those that *No Man's Sky Next* is all about.

"In a game where size was such an important factor, *Next* shows us that it's the small things that matter"

If we have no one to share in our adventures, is there even any reason to climb that mountain or jump to that next planet? Being able to visit the same place as someone else can be a thrill, but being there when they see it for the first time is something else entirely.

The addition of multiplayer to the game – real multiplayer where you can explore with friends – erases the loneliness. You can build where you want now, creating towering bases on the tops of mountains or sunken fortresses at the bottom of alien seas. Check your social feeds and you'll see your friends posting images like postcards from the new worlds they're stood on. They're a 'wish you were here' message, an enticement to join in, a single frame of wonder from which the possibility for adventures and escapades seems to radiate. Games like *Minecraft* understand perfectly that there's a difference between working towards something to share and creating something that's just for

^ Finally, we can build bases where we like.



Next brings intimacy to a once cold game.

yourself; showing the world what you're doing is an intrinsic part of modern life, from the castles you build from digital stone to the pictures of food you share on Instagram.

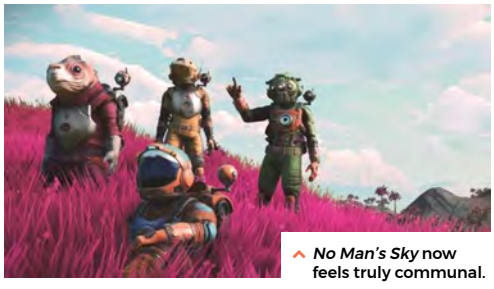
It might have taken a long time for *No Man's Sky* to get to this point, but that journey reflects our own position in the universe. We were isolated, then we looked up and wondered if we could reach out. Those first steps were clumsy, but they showed us that if we can overcome the gulfs of space, there are new rocks for us to stand on. The original version of the game thought that populating a universe with new things to discover was enough, but it was wrong.

Because discovery is immaterial. We know that there's a roiling chaos of dying stars and colliding rocks out there in the cosmos, and we know that there's some chance that in those distant nebulae there might be someone else looking back at us and wondering why we get so caught up in things like video games. These are things that have already captured our imagination, and that will continue to capture the imagination of generations to come. What *No Man's Sky* needed was a reason for you to go there, to take your precious spare time and spend it bridging those distances. The solution was waiting in one of our most famous gaming proverbs: "it's dangerous to go alone." It's not weapons that *Next* adds into the mix though, it's people. And that's how it lets us look at ourselves, our species, and our pale blue dot.

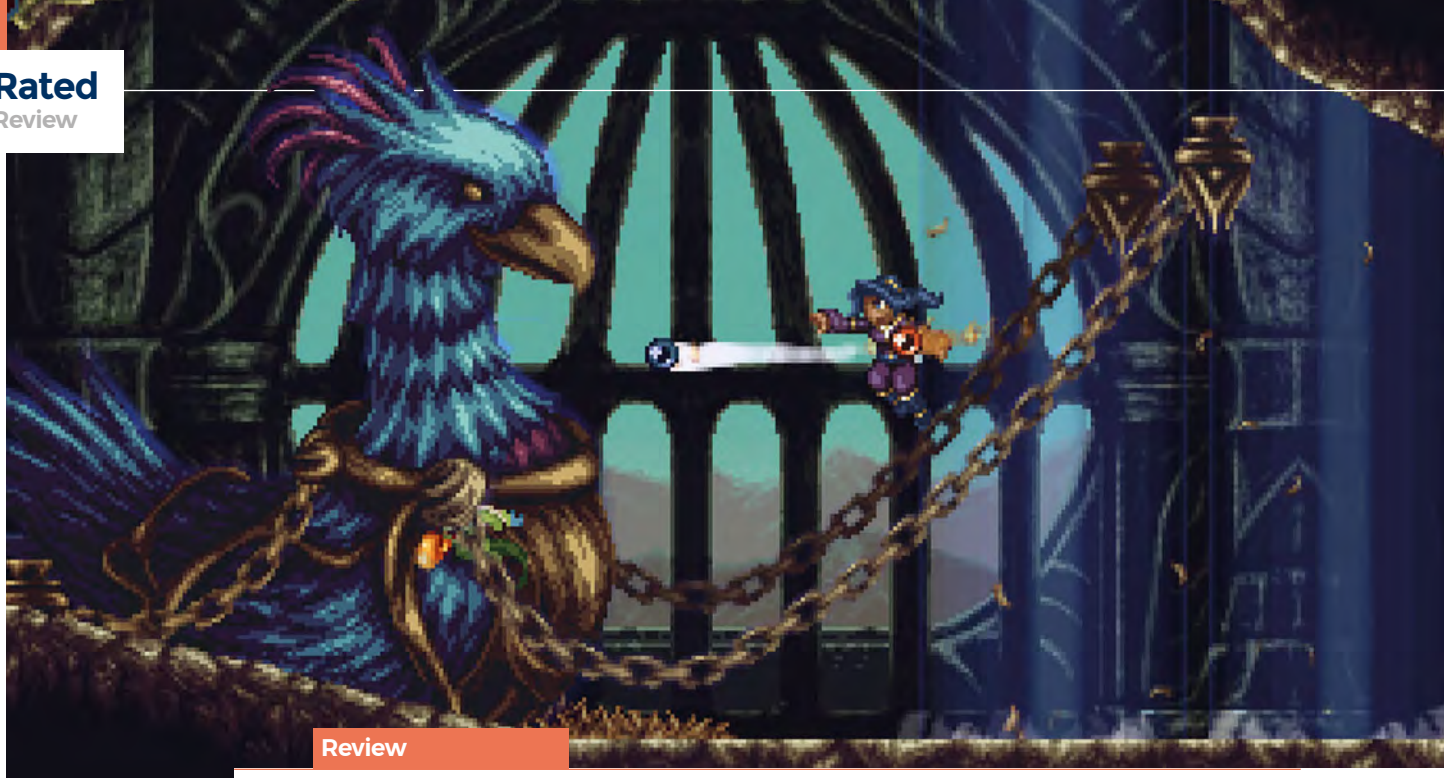
Right away, *Next*'s visual updates are apparent.

UPDATE VERDICT

***No Man's Sky Next* is what the game should have always been – a beautiful, communal adventure into the unknown.**



No Man's Sky now feels truly communal.



Review

Timespinner

The pixel art shines in a flawed yet charming Castlevania tribute

Info

GENRE
Action RPG

FORMAT
PC (tested) / Mac / Linux / PS4 / PS Vita

DEVELOPER
Lunar Ray Games

PUBLISHER
Chucklefish

PRICE
£14.99

RELEASE
Out now

REVIEWED BY
Jake Laverde

Some games become so embedded in the cultural psyche that they come to define entire genres. Back in the 1990s, first-person shooters were popularly known as '*Doom* clones'. Over time this definition has faded, but one portmanteau in particular shows how two games have not only defined but dominated their genre: 'Metroidvania'. It's a term now commonly applied to 2D platformers that require exploration and the acquisition of new powers to unlock new areas; *Ori and the Blind Forest* and *Axiom Verge* are but two games inspired by the template set by *Metroid* and *Castlevania*.

Indie newcomer *Timespinner*, meanwhile, takes huge dollops of influence from Konami's 1997 classic, *Castlevania: Symphony of the Night* – a Metroidvania widely regarded as one of the best of its kind.

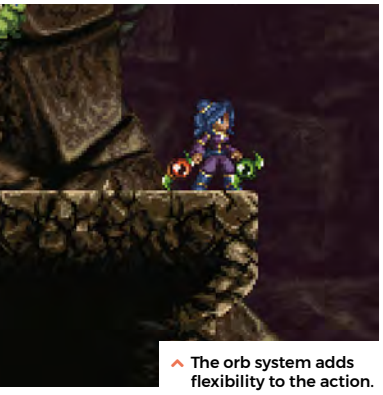
You take on the role of apprentice timespinner Lunais, who, after seeing her mother and entire village wiped out by the fascist Lachiem empire, is hurled back in time on a mission of vengeance. As you progress further, you must travel between two time periods and learn more about the history of your enemy so you can change the past and fix your future.

Having smashed its Kickstarter target way back in 2014, *Timespinner* has taken a while to get here, but it's certainly been time well spent. We aren't short of indie games with pixel art of late, but rarely have we seen one done this well and this lovingly. The wonderful soundtrack really complements the visuals, too, and you really get a sense that a lot of care went into *Timespinner*'s presentation.

A similar amount of effort has also been put into the game feel. Lunais's movement is precise and smooth, and she has the handy ability to grab onto ledges and pull herself up for those jumps she didn't quite make. But *Timespinner*'s main gimmick is Lunais's ability to freeze time, which has two very different uses here. Primarily, you'll be using it to avoid damage by certain boss attacks, but it also has the handy function of turning enemies into platforms which allow you to reach higher levels and various bonus items.

"We aren't short of indie games with pixel art of late, but rarely have we seen one done this well and this lovingly"

Like its spiritual father *Symphony of the Night*, *Timespinner* is a mix of classic platform gaming and RPG elements. The more enemies you kill, the more experience you earn and the higher the level you'll reach. Familiars are another mechanic that *Timespinner* borrows from that *Castlevania* standard – they're floating companions who'll assist you by either attacking enemies or regularly healing small amounts of damage.



The orb system adds flexibility to the action.

A friend can join in as a familiar in local co-op.

HIGHLIGHT

Fittingly enough for a game about time travel, *Timespinner* literally transports you back to the late 1990s in look and feel. Resembling a lost SNES classic, it's clear that a lot of work was put into setting every pixel in just the right place.

Timespinner also has an interesting approach to combat. Rather than finding and equipping just one weapon, Lunais fights back with two orbs constantly rotating around her. Starting with a basic pair of blue orbs, you can collect other types that transform into swords, lightning, and guns. What's really nifty is that you have the ability to mix and match orbs to find which combination works best for your style of play. You can augment your attacks with various types of effects to cause even further damage, though once you've found what works for you, there's not much reason to experiment with other combinations.

Developer Lunar Ray wears its influences on its sleeve, and why not? There's certainly nothing wrong with following in the footsteps of a genre-defining classic. It's arguable, though, that *Timespinner* is so immersed in those *Castlevania* influences that it sometimes struggles to find its own personality: the characters look pretty, as two-dimensional as their sprites; the storyline, by the same token, is familiar, time-worn stuff.

Some uninspired level design also conspires to make *Timespinner*'s universe feel small – it's neither expansive enough to make you want to explore, like *Symphony of the Night*, nor intricate enough to constantly surprise like *Super Metroid*. Really, its structure harks back even further than those classics to vintage games like *Wonder Boy in Monster Land*.

There are some issues with the game's flow here, too. The first couple of hours are way too hard, with enemies taking too many hits to kill and Lunais taking a glaringly long time to level up. Some objectives can also be a little vague as to where you're meant to go next, or simply require you to move to and fro between locations you've already visited. The experience improves vastly after the initial struggle, but *Timespinner* will likely feel unwelcoming to players new to the genre.

Despite all this, *Timespinner* remains a solid, entertaining example of its genre – and really, Lunar Ray is the victim of timing here. Metroidvania is a crowded genre of late, with the likes of *Hollow Knight* and *Dead Cells* being two recent, superb examples.

If you're looking for another perfectly capable action-platformer, though, *Timespinner* offers a perfectly enjoyable trip back to a bygone age of console gaming.

Boss battles aren't ground-breaking, but they certainly look good.

VERDICT

Timespinner **is a well-crafted entry in an overcrowded genre. It's solid, but fails to break new ground.**

72%

Lovely scenery; shame about the bugs.

HIGHLIGHT

Despite the series spanning decades, *The Bard's Tale IV* still has interesting takes on standard fantasy fare inspired by Scottish lore. Dwarves are large and blue, the Trow (ugly, mischievous, usually friendly pixie-types) are a prominent race, and everyone speaks with thick Scottish accents. Bust out the Highland Toffee for full immersion.

Review

The Bard's Tale IV: Barrows Deep

A vintage RPG returns with a belated new entry

Info

GENRE
RPG

FORMAT
PC (tested) / MAC / LINUX / PS4 / XBO

DEVELOPER
inXile Entertainment

PUBLISHER
inXile Entertainment

PRICE
£27.99

RELEASE
Out now

REVIEWED BY
Joe Parlock

VERDICT

Brimming with potential but infuriatingly rough around the edges.

55%

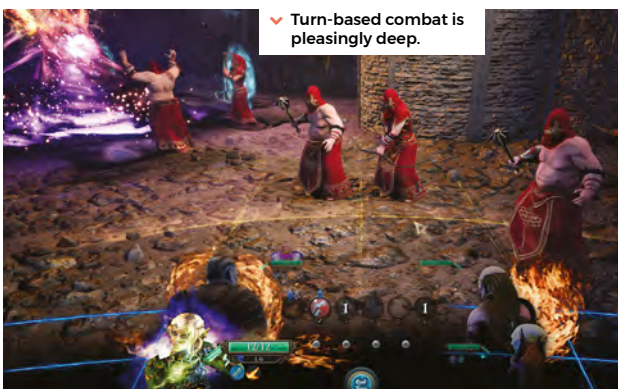
We all need a change of pace from the horrors of war or grim apocalypses from time to time, and few things cleanse the palate better than an unabashed, borderline-clichéd fantasy. Whether it's elven mages and dwarven bards banding together to stop an ancient evil, plunging the depths of a puzzle-filled ruin for the mightiest of loot, or stomping across the creaky floorboards of a lively tavern, *The Bard's Tale IV: Barrows Deep* offers up that exact flavour of camp to great effect. That is, if you can stomach the unending technical problems.

Barrows Deep does away with inXile's previous *Bard's Tale* game from 2004, and instead takes place long after the original three, the last of which came out back in 1988. The city of Skara Brae is once again threatened by an immense evil, and it's up to your bard and a band of mercenaries to save the day. Sometimes this means solving puzzles scattered throughout the world (with the help of the magical songs learned along the way), and at others engaging in some surprisingly complex turn-based fights.

With your party and the enemies set out on opposing sides of a grid, *Bard's Tale IV*'s combat is a bit like chess, in that positioning and anticipating your opponent's next move is just as important as which skills you choose. Setting up traps, distracting the enemy long enough to charge devastating channelled abilities, shifting focus between the team – each confrontation is its own, highly satisfying puzzle to figure out.

As would be expected of a game of its size, *The Bard's Tale IV* is a bit of a slow burn, especially at the start. Skara Brae is a muddy, miserable city full of corruption, but a few hours in and the true beauty of the world becomes abundantly clear. Dungeons and towers offer up plenty of cerebral challenges, while the lands surrounding Skara Brae are stunning. Every crevice begs to be explored.

Unfortunately, every good idea *Barrows Deep* has is overshadowed by an extreme number of bugs, performance issues, and other technical problems. For example, every time the game is launched, it starts on the wrong screen, in the wrong resolution, and in German. From there, loading takes multiple minutes, textures pop in when they feel like it, everything stutters incessantly, and something as simple as opening the inventory causes the game to lock up for at least a second. These glaringly rough edges mar what might otherwise have been an immersive fantasy experience.



Turn-based combat is pleasingly deep.

Making mischief in Just Cause 3

Ahead of Just Cause 4's release, we decided to revisit the last game's chaotic island paradise

'In view of authorities': that phrase pops up a lot in *Just Cause 3*, and it's not so much a warning as a dare. Avalanche's game exists solely to scratch our rebellious itch: it offers a generous spread of oppressed towns and military bases to relieve from the clutches of a vicious dictator and his army. And while the process of blowing stuff up and spearheading an uprising is repetitive in theory, it's almost embarrassingly addictive in practice – so much so that, ahead of *Just Cause 4*'s launch in December, we decided to pay the third game a return visit.

"What makes the *Just Cause* formula so addictive is its variety"

What makes the *Just Cause* formula so addictive is its variety; the freedom not just to travel its island dictatorship at will, but also to tackle the act of reclaiming enemy territory in any way you fancy. Anonymous hero Rico Rodriguez can shoot guns and throw grenades like any freedom fighter worth his salt, but he can also use his Spider-Man-like grappling hook to fling himself in the air or lash objects together. Couple these mechanics with a wealth of vehicles and a distinctly wacky physics engine, and you're left with an action game where you can cheerfully tangle together an enemy helicopter, a tank, and a propane canister and watch the chaos unfold.

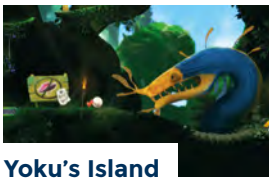
Some of *Just Cause 3*'s best moments occur just before all that chaos. You're skulking around outside some military outpost or other, checking out where the vulnerable water towers and radar dishes are lying around, as the soldiers within watch your every move. Then, just as those familiar words 'In view of authorities' flash up on the screen, you'll do something that throws the bad guys into a state of panic: set off a timed explosion on the side of a lookout post, use a grappling line to send a red barrel skittering into a fuel silo. Then Henry Jackman's score sparks up, and you're plunged into yet another madcap battle.

Even when you're in the middle of enemy territory with soldiers and military hardware pressing in from all sides, *Just Cause 3* seldom leaves you feeling helpless. Indeed, it's exhilarating to employ your handy grappling hook to hijack a helicopter hovering overhead and use its rockets to destroy an advancing army of tanks and jeeps.

There are sundry faults and technical glitches in *Just Cause 3*, but even in 2018 it remains such an entertaining bit of froth that we wonder how Avalanche will improve on the formula in the forthcoming sequel. Will its new range of physics-based toys and weather systems be enough to keep it feeling fresh? Whatever *Just Cause 4* brings, here's hoping it's laced with that same spirit of rebelliousness.

Plane surfing: just one of the activities on offer in *Just Cause 3*.

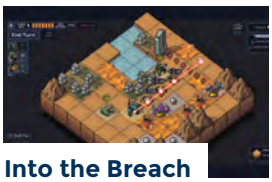
Wireframe Recommends



Yoku's Island Express

PC / PS4 / XBO / SWITCH

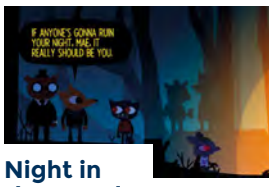
Six months on, Villa Gorilla's pinball-platformer remains a delight. If you missed it on release, *Yoku's Island Express* is a must-have indie gem.



Into the Breach

PC / SWITCH / LINUX / MAC

From the makers of *FTL*, this turn-based strategy game is well worth a download on Steam. Build mechs; defend cities; kill colossal subterranean monsters.



Night in the Woods

PC / PS4 / XBO / SWITCH / VARIOUS

A 2D adventure with a wonderfully bleak sense of humour, *Night in the Woods* is now available for just about every current system, meaning there's no excuse not to give it a try.

Split/Second: Velocity

It's an arcade racer coupled with the chaos of a Hollywood blockbuster. We take a look at Split/Second's killer feature

BLACK ROCK STUDIO / 2010 / MULTI

May 2010 was a tough month for driving games – tough because three separate studios decided to release their own entries in the genre within days of one another. The result? Hardly anybody bought them. Sony's *ModNation Racers* fared dismally; Bizarre Creations' *Blur*, released on precisely the same day, was a similarly slow seller.

The third casualty of May 2010's driving game war was *Split/Second*, a spectacular arcade racer developed by Black Rock Studio. Released for multiple platforms, including PC and consoles, *Split/Second* was the latest effort from a studio with a solid track record in the racing genre – by 2010, Black Rock had already put out the likes of the *MotoGP* and *ATV* games (under its old Climax Racing banner) and the well-received quad-bike racer, *Pure*.

Split/Second was arguably the Brighton-based firm's most accomplished game up to that point: a racer that favoured improbable stunts and pyrotechnics over realism. Indeed, triggering explosions and other acts of chaos is *Split/Second*'s ingenious killer feature – in essence, this is *Super Mario Kart* directed by Michael Bay, with collapsing bridges, detonations, and flying debris taking the place of bananas and blue shells.

In *Split/Second*, each course is littered with hazards, ranging from cranes dropping girders in construction areas to planes rolling out into the driver's path on a busy runway. As they hurtle round the track, players can trigger these hazards to wipe out their opponents – and, of course, those opponents can do the same to the player.

What makes *Split/Second*'s destruction mechanic so effective is that, unlike *Super Mario Kart*'s shells and bananas, the positions of the hazards are at fixed points on the track, meaning that skilled players can still avoid being taken out if they're quick enough on the brakes or steering wheel. As a result, there's both an exhilaration from setting off an explosion precisely enough to take out a rival, and also a similar thrill from swerving just at the right moment to dodge a paint-stripping fireball.

"A racer that favoured improbable stunts and pyrotechnics over realism"

It helps, too, that few racers outside Acclaim's legendary *Burnout* series have quite such an impressive turn of speed or sense of balance in the tail-happy controls. Had *Split/Second* received better marketing, or at the very least launched at a different time by its publisher, Disney Interactive, then Black Rock may have had the chance to develop its ideas further in a sequel. Instead, *Split/Second*'s sales were deemed a disappointment – it reportedly shifted fewer than 100,000 copies in its first three months of sale – a planned sequel was cancelled and, like Bizarre, Black Rock Studio was closed a few months later.

Despite Black Rock's undeserved fate, *Split/Second* remains a lasting – if sorely overlooked – testament to its skills as a developer. And as for its killer feature – well, we'd argue that blowing up bits of the environment next to a rival racer is an idea sorely in need of further investigation.

Next Issue

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The Blackout Club

From the director of Bioshock 2

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