

A GAME BY JAKE DENTON

CREEPERS



DESIGN DOCUMENT

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
OVERVIEW	4
DEMOGRAPHIC	4
PLATFORMS	4
STORY PREMISE	5
CHOSEN TECHNOLOGY	5
DESIGN PILLARS	6
CORE LOOP	7
CORE MECHANICS / GAMEPLAY	8
PLAYER	8
INVENTORY	8
ENEMIES	8
ALIENS	9
ALIEN SPAWNING	12
PIRATES	13
BEHAVIOUR AND BEHAVIOUR STATES	17
NETHACK	18
MULTI-TOOL	19
DOORS	20
WEAPONS	21
PISTOL	22
HEAVY PISTOL	22
MAGNUM REVOLVER	22
SUBMACHINE GUN	23
ASSAULT RIFLE	23
SEMI-AUTO RIFLE	23
PUMP ACTION SHOTGUN	24
AUTO SHOTGUN	24
EQUIPMENT ITEMS	25
HAND GRENADE	25
TRIP MINE	26
REMOTE MINE	27
DEPLOYABLE TURRET	28
EMP GRENADE	28
MOTION SENSOR	29
QUICK-HACK KIT	29
QUICK-WELD KIT	29

ENVIRONMENTAL ELEMENTS	30
MOUNTED TURRETS.....	30
SECURITY GATES.....	30
STEAM PIPES.....	30
ROOM GENERATION	31
ALIEN BREACH POINTS.....	31
ITEM SPAWNING.....	31
GUNS, SPAWN RATES.....	32
HEALTH ITEMS, SPAWN RATES.....	33
AMMO BOXES, SPAWN RATES.....	34
PREFAB ROOMS	35
THE STARTING ROOM.....	35
ARMOURIES.....	35
MED-BAYS.....	35
TOOL WORKSHOPS.....	36
OBJECTIVE ROOMS.....	36
OBJECTIVE TYPES	37
CONTROLS	40
TEN MINUTES OF PLAY	41
BUSINESS CASE	42

EXECUTIVE SUMMARY

Creepers is a sci-fi horror-action game which casts the player as a lone survivor onboard a hostile and unfamiliar space vessel. Taking inspiration from Ridley Scott's *Alien* (1979) and *Space Beast Terror Fright* (2015), players must use whatever they can find to survive this terrifying procedural experience, where no two playthroughs are the same.

OVERVIEW

In *Creepers*, players must survive against space pirates and deadly aliens to complete a series of objectives and escape the space vessel. *Creepers* is a 2D top-down game with shooter and survival-horror elements. Players will scavenge for resources and use the weapons and tools at their disposal to fight off threats and stay alive.

Creepers heavily features procedural content generation (PCG). As such, each time the game is played, players will receive a random selection of objectives and a unique space vessel to explore.

DEMOGRAPHIC

Creepers is aimed at players who enjoy sci-fi action/horror, as well as short, infinitely-replayable experiences. The game aims to deliver a tense and frightening experience, which will certainly alienate some players, but will have greater appeal to certain communities who enjoy horror games. While the game will provide a challenging experience, the game's dynamic difficulty attempts to keep players on the edge of survival rather than outright killing them, so the game will be accessible to both seasoned and novice players alike. As the game will feature violent content, the game will be most suitable for those aged 18 and up.

PLATFORMS

Creepers is targeting a PC release first, with possible console releases later. The game is being designed first for a PC audience with features like an inventory hotbar mapped to the number keys on the keyboard, which doesn't translate well to a gamepad.

There is an established audience on PC for sci-fi action/horror titles, such as *Space Beast Terror Fright*, *Killing Floor 2* (2016), and *Alien: Isolation* (2014), as well as replayable procedural games such as *FTL: Faster Than Light* (2012), *Dead Cells* (2018), and *The Binding of Isaac* (2011), so we believe *Creepers* has good sales potential on the PC platform.

STORY PREMISE

The player is a member of a crew onboard a space vessel, transporting a newly-discovered and unidentified organism. During the transportation, your vessel is intercepted by space pirates, who tether your ship to theirs and prevent your ship from going anywhere. They capture your crew and bring you aboard their ship, along with the organism which they intend to sell off to the highest bidder.

However, the organism is unlike anything seen before. It self-replicates, quickly evolves, and breaks free, wreaking havoc on the pirate space vessel and killing your crew in the process. You are the last surviving member of your crew, on an unfamiliar and hostile space vessel. Not only do these ferocious aliens stalk the ship, some pirates remain alive and form groups to hunt the creatures, and both will attempt to kill you on sight.

Your task is to survive, disrupt the pirates' operation, and get the hell off the ship.

CHOSEN TECHNOLOGY

The technology chosen for this project is procedural content generation (PCG). PCG will be used for level generation, as rooms will be generated depending on where the player chooses to go, as well as for dynamically adjusting the difficulty of the game, by tweaking numbers and adjusting the chance of things such as item spawns and enemy spawns depending on factors such as the player's health and ammo status.

By using PCG, we can give players a different experience each time they play the game, and this contributes towards a feeling of unease and uncertainty, as players can never know for sure where their objectives are or where exactly they can find resources to keep themselves alive.

DESIGN PILLARS



UNCERTAINTY

Nothing is guaranteed, including level layout, objective locations, pickups, enemy spawn points, or even how many shots it will take to kill an enemy. The intention is to provide a more tense experience because the player is never in control of the situation. This means they can never entirely plan ahead because of too many unpredictable elements, disempowering the player and making them feel more vulnerable.

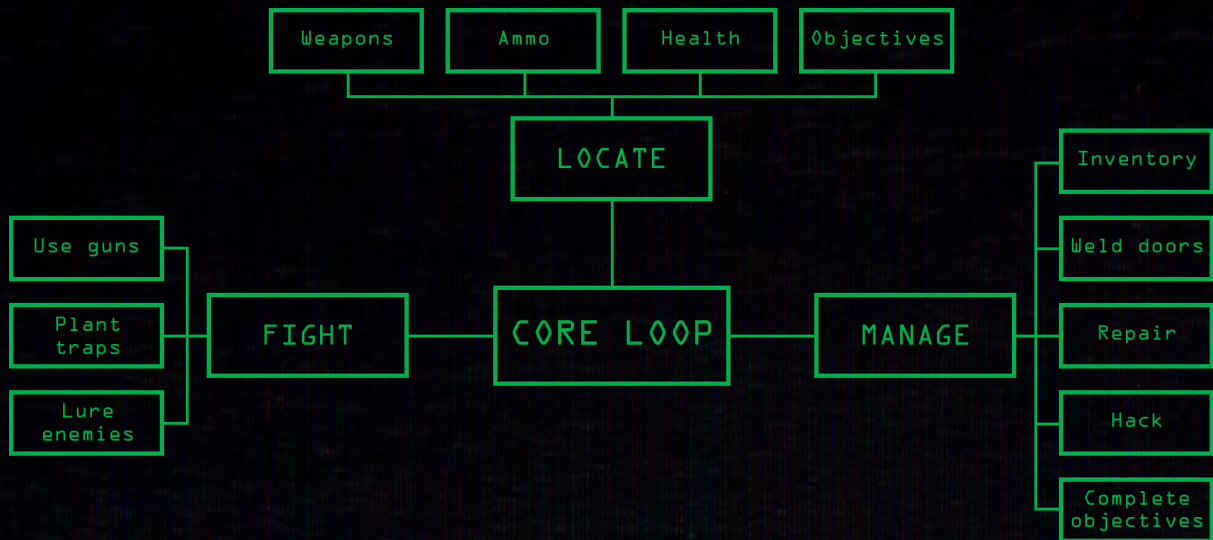
FLOW

I aim to keep players in the difficulty 'sweet-spot' by dynamically balancing the game based on the player's status. For example, pickups will be more likely to spawn if the player is low on resources, and enemy waves will spawn fewer enemies if the player's health is low. This should help to keep players in a state of 'flow', never too challenged that they get frustrated, but not allowing them to get complacent or become bored at the lack of challenge either.

TACTICAL CHOICE

Players have tools and options at their disposal to help them survive. As well as guns and equipment, players can weld doors, hack security systems, and turn the ship's defences against enemies.

CORE LOOP



LOCATE: Players must explore the space vessel to locate their objectives as well as resources to help them survive.

MANAGE: Players must manage their inventory, as they can only carry so many weapons and items at a time. Players must also manage their environment and objectives, by hacking, repairing, and welding appropriate objects and devices.

FIGHT: Use the resources you've found to fight enemies and stay alive. Use your guns, plant traps, and lure enemies into ambushes.

CORE MECHANICS / GAMEPLAY

PLAYER

The player can pick up items, use weapons, and interact with the environment around them.

Player walk speed: 1.5 metres per second

Player run speed: 4.5 metres per second

Starting equipment:

Multi-tool, level 1

NetHack, level 1

Pistol + 9 bullets

INVENTORY

Players have access to a quick-select inventory hotbar, like the kind found in *Deus Ex* (2000) or *Minecraft* (2011). The hotbar contains six slots in total. The first slot is always reserved for the multi-tool, and the second slot is always reserved for the NetHack. The remaining four slots may be filled with weapons or equipment items. With only limited slots, the player is forced to choose which items to take with them and which to leave behind.

Ammunition for weapons does not take up inventory space. The player cannot have the same weapon or item in multiple slots. For example, if the player is carrying a heavy pistol in one slot, they may not pick up another heavy pistol. For equipment items such as grenades, where multiple may be carried at once, the grenades are contained in a single slot. When another grenade is picked up, it adds to the number of grenades available to use, but does not occupy another slot.

ENEMIES

There are two categories of enemies: Aliens and Space Pirates. Within each category are several variations of that enemy type. Both categories of enemy are not only hostile to the player, but hostile to each other, too. Aliens and Space Pirates will attack each other, as well as the player, on sight.

ALIENS

Aliens may only spawn from 'breach points', located in various places throughout the space vessel (See ROOM GENERATION for more information).

Aliens go through an evolution cycle over the course of the game. At the start of the game, aliens begin as baby aliens - small, fast, hard to hit, but weak. If an individual alien manages to kill a certain amount of targets (numbers listed below), that alien can evolve to the next stage.

However, every five minutes, the next evolutionary stage of alien will be added to the list of possible aliens that can spawn from breach points. For example, for the first five minutes of the game, only baby aliens can spawn from breach points. After five minutes, baby aliens and young aliens may spawn. After 10 minutes, baby aliens, young aliens, and mature aliens. And so on.

Because of this, players may wish to work quickly to get their objectives done before aliens become too powerful, though players may also choose to allow aliens to kill some pirates first and get them out of the way.

Aliens primarily use melee attacks. They will attempt to get close and slash targets with their claws.

Baby alien

Health: 50

Walk speed: 2.25 metres per second

Run speed: 6.75 metres per second

Vision range: 10 metres

Kills to evolve: 2

What they drop upon defeat: 75 DNA

Attacks:

Pounce attack

Performs this attack if a target is within 8 metres. Deals damage if it collides with a target.

Damage to other NPCs: Instant death

Damage to player: 50

Damage to welded door: 1%

Cooldown: 3 seconds

Young alien:

Health: 75

Walk speed: 1.75 metres per second

Run speed: 5.25 metres per second

Vision range: 15 metres

Kills to evolve: 3 (*not* including kills from previous stage)

What they drop upon defeat: 100 DNA

Attacks:

Lunge attack

Performs this attack if a target is within 6 metres.
Deals damage if it collides with a target.

Damage to other NPCs: 60

Damage to player: 25

Damage to welded door: 10%

Cooldown: 3 seconds

Slash attack

Performs this attack if a target is within 1.5 metres.

Damage to other NPCs: 25

Damage to player: 15

Damage to welded door: 4%

Cooldown: 0.75 seconds

Mature alien:

Health: 100

Walk speed: 1.6 metres per second

Run speed: 4.8 metres per second

Vision range: 20 metres

Kills to evolve: 5 (*not* including kills from previous stage)

What they drop upon defeat: 125 DNA

Attacks:

Lunge attack

Performs this attack if a target is within 5 metres.
Deals damage if it collides with a target.

Damage to other NPCs: 80

Damage to player: 30

Damage to welded door: 12%

Cooldown: 3.5 seconds

Slash attack

Performs this attack if a target is within 1.5 metres.

Damage to other NPCs: 30

Damage to player: 20

Damage to welded door: 6%

Cooldown: 0.85 seconds

Superior alien:

Health: 125

Walk speed: 1.4 metres per second

Run speed: 4.2 metres per second

Vision range: 25 metres

Kills to evolve: 8 (*not* including kills from previous stage)

What they drop upon defeat: 150 DNA

Attacks:

Acid spit (Poison instead? Find antidote?)

Performs this attack if a target is within 6 metres.

Deals damage if it collides with a target.

Damage to other NPCs: 75

Damage to player: 30

Damage to welded door: 15%

Cooldown: 3.2 seconds

Slash attack

Performs this attack if a target is within 1.5 metres.

Damage to other NPCs: 35

Damage to player: 25

Damage to welded door: 8%

Cooldown: 0.95 seconds

Elite alien:

Health: 150

Walk speed: 1.2 metres per second

Run speed: 3.6 metres per second

Vision range: 30 metres

Kills to evolve: N/A

What they drop upon defeat: 200 DNA

Attacks:

Acid spit

Performs this attack if a target is within 6 metres.

Deals damage if it collides with a target.

Damage to other NPCs: 80

Damage to player: 30

Damage to welded door: 18%

Cooldown: 3 seconds

Slash attack

Performs this attack if a target is within 1.5 metres.

Damage to other NPCs: 50

Damage to player: 30

Damage to welded door: 10%

Cooldown: 1 second

And here is how the aliens compare to one another in terms of damage stats.

Damage to NPCs	Damage to player	Damage to welded door (%)	Cooldown (seconds)	DPS (NPCs)	DPS (Player)	DPS (Door, %)
BABY ALIEN						
RANGED ATTACK - POUNCE						
Death	50	1	3	N/A	16.67	0.33
YOUNG ALIEN						
RANGED ATTACK - LUNGE						
60	25	10	3	20	8.33	3.33
MELEE ATTACK - SLASH						
25	15	4	0.75	33.33	20	5.33
MATURE ALIEN						
RANGED ATTACK - LUNGE						
80	30	12	3.5	22.86	8.57	3.43
MELEE ATTACK - SLASH						
30	20	6	0.85	35.29	23.53	7.06
SUPERIOR ALIEN						
RANGED ATTACK - ACID SPIT						
75	30	15	3.2	23.44	9.38	4.69
MELEE ATTACK - SLASH						
35	25	8	0.95	36.84	26.32	8.42
ELITE ALIEN						
RANGED ATTACK - ACID SPIT						
80	30	18	3	26.67	10.00	6
MELEE ATTACK - SLASH						
50	30	10	1	50	30	10

ALIEN SPAWNING

Every 60 seconds, each breach point spawns in a wave of 10-25 aliens. The types and numbers of aliens that spawn from breach points is dependent upon the player's status. If the player is low on health or ammo, fewer aliens will spawn, and the ones that *do* spawn are more likely to be the weaker alien types. However, if the player is healthy and well-equipped then tougher aliens will spawn in bigger numbers.

PIRATES

Pirates are gun-toting humans. They will attack both the player, and aliens.

Standard pirate

Health: 75

Walk speed: 1.4 metres per second

Run speed: 4.2 metres per second

Vision range: 25 metres

What they drop upon defeat: Pistol, 15-25 pistol ammo

Equipment:

Pistol

Maximum damage: 12 (to player) / 25 (to aliens)

Minimum damage: 9 (to player) / 18 (to aliens)

Rate of fire: 250 rounds per minute

Magazine capacity: 18

Audible range: 30 metres

Trapper

Health: 60

Walk speed: 1.6 metres per second

Run speed: 4.8 metres per second

Vision range: 25 metres

What they drop upon defeat: Pistol, 5-15 pistol ammo, any unused trip mines

Equipment:

Pistol

Maximum damage: 12 (to player) / 25 (to aliens)

Minimum damage: 9 (to player) / 18 (to aliens)

Rate of fire: 250 rounds per minute

Magazine capacity: 18

Audible range: 30 metres

Motion sensor

Has a 5m detection radius from where it's placed. If anything enters the detection radius, it sets off a noise with an audible range of 35m for 10 seconds. Any aliens or pirates within this range that hear the noise will investigate. The Trapper carries two motion sensors. If one is tripped, or left for 2 minutes without detecting anything, The Trapper can retrieve it and place it elsewhere.

Trip mines

Placed on wall surfaces and projects a beam that travels until it hits another wall surface. If anything trips the beam, the trip mine detonates, damaging any alien, human, or player within 10 metres of the blast. The Trapper carries 2 trip mines. The Trapper may retrieve a placed mine, provided it has not detonated, and place it elsewhere. The Trapper cannot replenish their trip mines once exploded.

Combat pirate

Health: 110

Walk speed: 1.2 metres per second

Run speed: 3.6 metres per second

Vision range: 30 metres

What they drop upon defeat: [Whatever gun they had], 20-40 SMG ammo/15-30 Rifle Ammo/4-8 Shotgun Ammo (ammo type dependent on dropped weapon), any unused hand grenades

Equipment:

[Randomly picks ONE gun from the following...]

Submachine gun

Max damage: 7 (to player) / 18 (to aliens)

Min damage: 4 (to player) / 10 (to aliens)

Rate of fire: 750 rounds per minute

Magazine capacity: 60

Audible range: 30 metres

Assault rifle

Max damage: 10 (to player) / 30 (to aliens)

Min damage: 6 (to player) / 20 (to aliens)

Rate of fire: 600 rounds per minute

Magazine capacity: 40

Audible range: 45 metres

Pump action shotgun

(Each shot fires 12 pellets)

Max damage (per pellet): 4 (to player) / 9 (to aliens)

Min damage (per pellet): 2 (to player) / 6 (to aliens)

Rate of fire: 50 rounds per minute

Magazine capacity: 10

Audible range: 50 metres

[End of random gun selection]

Hand grenade

The hand grenade is thrown towards a target and detonates 4 seconds later. It has a blast radius of 8 metres. The combat pirate carries two hand grenades and cannot replenish them once used.

Captain

Health: 90

Walk speed: 1.65 metres per second

Run speed: 4.95 metres per second

Vision range: 30 metres

What they drop upon defeat: Magnum revolver, 2-6 magnum ammo, ID card

Equipment:

Magnum revolver

Maximum damage: 30 (to player) / 50 (to aliens)

Minimum damage: 15 (to player) / 30 (to aliens)

Rate of fire: 90 rounds per minute

Magazine capacity: 8

Audible range: 55 metres

ID card

BEHAVIOUR AND BEHAVIOUR STATES

Enemies behave differently according to the situation they find themselves in.

Both enemy categories have three behaviour states - CALM, INVESTIGATING, and COMBAT.

During the CALM state, aliens will randomly roam the space vessel, but the randomisation is weighted so that they are a little more likely to roam towards the player's location. In their CALM state, pirates will form groups and randomly roam around the space vessel.

Certain sights or sounds can cause aliens and pirates to switch to the INVESTIGATING state. During this state, enemies will move towards the origin of the sight or sound that triggered this state change.

For both aliens and pirates, suspicious sounds, such as gunshots, explosions, and motion sensor detection sounds, have an audible range. If enemies are within this range, they will switch to the INVESTIGATING state and *walk* to the source of the noise. However, if enemies are within *half* of the audible range, they will switch to the INVESTIGATING state and *run* to the source of the noise.

For example, if a gunshot has an audible range of 40 metres, if an enemy is between 40 - 20 metres of the noise, they will switch to INVESTIGATING and walk to the source of the noise, but if they are within 20 metres, they will switch to INVESTIGATING and run to the source of the noise.

Enemies switch to their COMBAT state when they identify a threat. In this state, aliens rush towards their target and attack when in range. Pirates primarily use their guns to shoot at their targets, retreating to cover when appropriate.

Pirates have statistics that determine how they behave in, and react to, situations. Each pirate has these stats randomised to be a value between 1 - 100.

Courage: How likely they are to stay and fight under distressing circumstances.

Teamwork: How likely they are to investigate disturbances with others, call others to go with them.

Combat efficiency: How effective they are with their weapons. Accuracy of guns/grenades. 0-100 rating, +x% bullet deviance when fired

When pirates switch to their INVESTIGATING state, they call out to any other pirates within a 10 metre radius of them. Any pirate within this 10 metre radius has a chance to join the caller in the investigation, based on their teamwork stat. A pirate with a high level of teamwork is more likely to join the caller in the investigation. Each pirate that accepts the call also calls out to pirates in a 10 metre radius, though each pirate that accepts reduces the chance of another pirate joining. This makes enemies appear smarter by grouping up, and prevents the player from knowing exactly how many enemies will investigate a sight or sound.

NETHACK

The NetHack is a tool used for hacking into electronics, and downloading data.

The NetHack is context sensitive and will perform the appropriate action for whatever it is aimed at. The player needs only to equip it, aim it at the desired target, and press the 'fire' button when they see the context-appropriate icon.



HACK



DOWNLOAD

The player may find an upgraded NetHack during their play session. Players start with a level 1 NetHack, but there is a 2nd, 3rd, and 4th level of NetHack to find. Each level up will provide an increase in interaction speeds over the previous level. Any interactions that the NetHack is used for will be sped up by the listed amount below.

NETHACK, LVL 1

Hacking speed: Base values

Downloading speed: Base values

NETHACK, LVL 2

Hacking speed: +20%

Downloading speed: +20%

NETHACK, LVL 3

Hacking speed: +40%

Downloading speed: +40%

NETHACK, LVL 4

Hacking speed: +60%

Downloading speed: +60%

MULTI-TOOL

The multi-tool is used for manual, physical tasks such as repairing devices and welding, but can also double up as a melee weapon.

Like the NetHack, the multi-tool is context sensitive. Aim it at an appropriate target and use the 'fire' button when the icon appears to initiate the corresponding action.



REPAIR



WELD

When it comes to welding, the player can both weld and un-weld. While aiming at a closed door, holding the 'fire' button will weld the door, while holding the 'secondary fire' button, will un-weld it.

When equipped, the player can use the multi-tool as a blunt melee weapon. By pressing the 'fire' button, the player can swing the weapon every 0.5 seconds. If it hits an enemy it will deal damage. The damage it deals will depend on the level of the multi-tool. Like the NetHack, higher-level multi-tools can be found around the space vessel.

MULTI-TOOL, LVL 1

Welding speed: 10% per second
Un-welding speed: 15% per second
Repairing speed: 20% per second
Damage: 17

MULTI-TOOL, LVL 2

Welding speed: 12% per second
Un-welding speed: 18% per second
Repairing speed: 25% per second
Damage: 20

MULTI-TOOL, LVL 3

Welding speed: 14% per second
Un-welding speed: 21% per second
Repairing speed: 30% per second
Damage: 25

MULTI-TOOL, LVL 4

Welding speed: 16% per second
Un-welding speed: 24% per second
Repairing speed: 35% per second
Damage: 34

DOORS

All doors onboard the space vessel default to a closed state. The player and pirate enemies are capable of opening and closing doors normally. If an alien encounters a closed door, they must manually force it open, which will take them a varying number of seconds to do, depending on the alien type. These speeds are listed below:

BABY ALIEN: N/A, cannot open doors

YOUNG ALIEN: 10 seconds

MATURE ALIEN: 8 seconds

SUPERIOR ALIEN: 6 seconds

ELITE ALIEN: 4 seconds

Closed doors may be welded shut (See NETHACK). When doors are welded shut, they cannot be opened. The player may un-weld the door if they wish to open it again. Aliens may also break through a welded door by attacking it until its hit points reach zero. When a welded door's hit points reach zero, the door will be permanently destroyed, and thus cannot be closed again.

WEAPONS

Each time a bullet hits a target, that bullet will deal a random amount of damage between (inclusive) a minimum and maximum damage value according to the gun it was fired from. So a bullet fired from the PISTOL can damage a target for 18 damage (it's minimum value), 25 damage (it's maximum value), or any integer in between.

Weapon damage may receive a bonus depending on the proximity of the target to the player. When enemies are within 8 metres of the player, the player's weapon damage receives a 1.25x bonus. For example, a SUBMACHINE GUN bullet can deal damage between 10 - 18. If it hits a target for 16 damage, but that target is within 8 metres, the damage is:

$$16 * 1.25 = 20 \text{ damage}$$

When enemies are within 4 metres of the player, the player's weapon damage bonus becomes 1.5x (does NOT stack with the 1.25x bonus from 8 metre proximity). If we shot that same SUBMACHINE GUN bullet at this range, it's damage would be:

$$16 * 2 = 24 \text{ damage}$$

Furthermore, weapons also have a chance to land a critical hit. A critical hit means a bullet will deal 2x its damage value. This stacks with the proximity damage bonus.

A weapon's critical hit chance adjusts according to player status. When the player is below 50% health, critical hit chance is the base value multiplied by 1.5. So, for example, the HEAVY PISTOL's critical hit chance at <50% health would be:

$$5\% * 1.5 = 7.5\%$$

When the player's health is below 25%, the base critical chance is multiplied by 2. If we look at the HEAVY PISTOL again, it's critical hit chance at <25% health would be:

$$5\% * 2 = 10\%$$

A weapon's critical hit chance gets a bonus for proximity, too. This stacks with the critical hit bonus for player status. If the target is within 8 metres, the critical hit chance is multiplied by 1.25x. Within 4 metres, the critical hit chance is multiplied by 1.5x.

Putting this all together, let's take the PISTOL for example. If the player is at 20% health and shoots a target from 8 metres away, the critical hit chance would be:

$$10\% \text{ (base value)} * 2 \text{ (player status bonus)} * 1.25 \text{ (proximity bonus)} = 25\%$$

If the player scores a critical hit from this shot, the damage would then be:

$$22 \text{ (random base damage value between min and max damage)} * 1.25 \text{ (proximity bonus)} * 2 \text{ (critical hit bonus)} = 55 \text{ damage}$$

In regards to the shotgun weapons, which fire a volley of pellets instead of a single bullet, these damage bonuses apply to each pellet in the shot.

PISTOL

Maximum damage: 25

Minimum damage: 18

Rate of fire: 400 rounds per minute

Recoil: Light

Magazine capacity: 18

Base critical hit chance: 10%

Audible range: 30 metres

Ammo type: Pistol

HEAVY PISTOL

Maximum damage: 35

Minimum damage: 20

Rate of fire: 150 rounds per minute

Recoil: Medium

Magazine capacity: 12

Base critical hit chance: 5%

Audible range: 45 metres

Ammo type: Magnum

MAGNUM REVOLVER

Maximum damage: 50

Minimum damage: 30

Rate of fire: 100 rounds per minute

Recoil: Strong

Magazine capacity: 8

Base critical hit chance: 4%

Audible range: 55 metres

Ammo type: Magnum

SUBMACHINE GUN

Maximum damage: 18

Minimum damage: 10

Rate of fire: 900 rounds per minute

Recoil: Light

Magazine capacity: 60

Base critical hit chance: 5%

Audible range: 30 metres

Ammo type: SMG

ASSAULT RIFLE

Maximum damage: 30

Minimum damage: 20

Rate of fire: 750 rounds per minute

Recoil: Medium

Magazine capacity: 40

Base critical hit chance: 5%

Audible range: 45 metres

Ammo type: Rifle

SEMI-AUTO RIFLE

Maximum damage: 40

Minimum damage: 25

Rate of fire: 300 rounds per minute

Recoil: Strong

Magazine capacity: 20

Base critical hit chance: 6%

Audible range: 50 metres

Ammo type: Rifle

PUMP ACTION SHOTGUN

Maximum damage: 9 per pellet (each shot fires 12 pellets)

Minimum damage: 6 per pellet

Rate of fire: 65 rounds per minute

Recoil: Strong

Magazine capacity: 10

Base critical hit chance: 8%

Audible range: 50 metres

Ammo type: Shotgun

AUTO SHOTGUN

Maximum damage: 7 per pellet (each shot fires 12 pellets)

Minimum damage: 5 per pellet

Rate of fire: 240 rounds per minute

Recoil: Medium

Magazine capacity: 15

Base critical hit chance: 4%

Audible range: 45 metres

Ammo type: Shotgun

EQUIPMENT ITEMS

HAND GRENADE

The hand grenade is a throwable explosive weapon. With the grenade equipped, pressing the fire button once will pull the pin. Holding the fire button now will begin filling a bar that indicates how far the grenade will be thrown. Release the fire button to throw the grenade. The hand grenade will explode 4 seconds after the pin is pulled, damaging any living creature within its blast range.

Base damage: 200

Blast range: 10 metres

Maximum carry capacity: 3



TRIP MINE

Trip mines are placed on wall surfaces and become armed 3 seconds after being placed. Once they are armed, they cast a laser trip wire in a straight line until it collides with another wall surface. If this line is tripped by an alien, pirate, or the player themselves, the mine will detonate, damaging any living creature within 12 metres of the mine. The trip mine will also detonate if it is shot.

The player may disable an already-placed trip mine by hacking it with their NetHack.

Base damage: 250

Blast range: 12 metres

Maximum carry capacity: 3

Hack speed (base value): 5 seconds



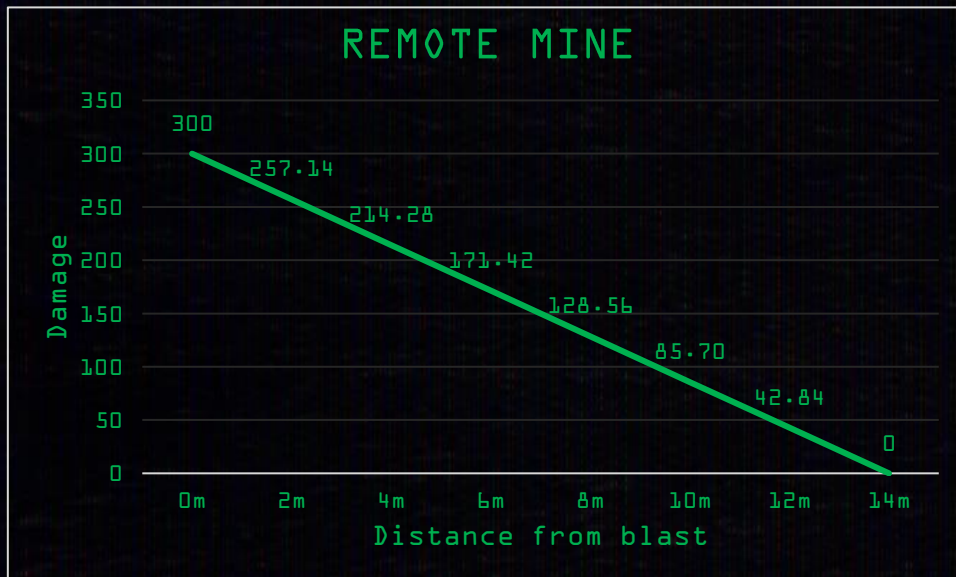
REMOTE MINE

The remote explosive is placed on the floor and triggered via a remote detonator. Press the fire button to place a remote mine down where you are standing, and press the secondary fire button to detonate any remote mines that you've placed. You can place several mines down before detonating all of them at once. When they explode, they deal damage to any living creature with 14 metres of the blast.

Maximum carry capacity: 3

Base damage: 300

Blast range: 14 metres



DEPLOYABLE TURRET

The deployable turret is a one-time-use deployable machine gun. To place a turret, equip it from the inventory and press the fire button. It will be placed facing in the direction the player is looking. Once placed, the turret cannot be picked up again. The turret will automatically detect and fire upon enemies within 15 metres, in a 120 degree vision cone. The turret does not need to reload. The turret can receive the same proximity and critical hit damage bonuses as the regular guns.

Enemies may damage the turret, and it will become disabled if its hit points reach 0. Should this happen, the player may use their multi-tool to repair the turret.

Hit points: 120

Maximum damage: 40

Minimum damage: 25

Rate of fire: 390 rounds per minute

Ammo capacity: 300

Base critical hit chance: 5%

Audible range: 60 metres

Maximum carry capacity: 1

Repair speed (base value): 5 seconds

EMP GRENADE

The EMP grenade can be used temporarily disable electronic devices such as security gates, sentry turrets, motion sensors, and trip mines. With the grenade equipped, pressing the fire button once will pull the pin. Holding the fire button now will begin filling a bar that indicates how far the grenade will be thrown. Release the fire button to throw the grenade. The EMP grenade will detonate 3 seconds after the pin is pulled, jamming any electronics within its effective range.

Effective range: 10 metres

Maximum carry capacity: 4

MOTION SENSOR

The motion sensor is a small device placed on the ground. If it detects motion from living creatures within its detection radius, it will emit an audible noise for 10 seconds. The player can use this noise to inform them of where enemies are located, or it can be used to lure enemies towards the location of the motion sensor.

Detection radius: 5 metres

Audible range: 35 metres

Maximum carry capacity: 3

QUICK-HACK KIT

The quick-hack kit is a one-time use item that can be used to instantly complete a hack. Rather than using their NetHack, which takes time to hack, players may instead equip the quick-hack kit, aim it at a hackable target, and press the fire button to instantly hack it.

Maximum carry capacity: 3

QUICK-WELD KIT

The quick-weld kit is a one-time use item that can be used to instantly weld a door up to 100%. Instead of using the multi-tool, players may equip a quick-weld kit, aim it at a closed door, and press the fire button to instantly weld the door.

Maximum carry capacity: 3

ENVIRONMENTAL ELEMENTS

MOUNTED TURRETS

Around the space vessel will be mounted machine gun turrets that the Pirates have installed as defences. Each mounted turret will have a 90 degree vision cone and will fire upon aliens and the player within its vision cone, up to 15 metres away. The player can destroy mounted turrets with guns or explosives, disable turrets with an EMP grenade, or hack turrets to make them fire upon pirates and aliens, but not the player.

Hit points: 150

Damage (per bullet): 25-40 (to enemies) / 5 (to player)

Rate of fire: 390 rounds per minute

SECURITY GATES

At various points around the space vessel, security gates will be placed that can be switched on or off. While activated, the security gate creates an impenetrable wall of lasers. Any enemy that touches it will instantly die, while the player will take damage by colliding with it. Once the player has hacked the security gate, they can toggle its activation state by using the 'interact' button.

Damage to player (per collision): 25

Hack speed (base value): 4 seconds

STEAM PIPES

Steam pipes run alongside certain walls. If a steam pipe is shot, a burst of steam will shoot out at the point of impact. Any enemy that gets hit with the steam will be temporarily stunned, and will not be able to move or attack for 5 seconds. If the player gets hit with the steam, their movement will be slowed by 50% for 5 seconds.

ROOM GENERATION

Rooms are generated as the player explores the space vessel. Where the ship generates rooms depends upon which doors the player opens. When a player opens a door onto an empty space, a room is generated using a random walk algorithm.

This algorithm chooses a random direction from up, down, left, or right, takes a step in that direction, and then generates a tile at that position. It repeats this process until the number of allowed steps counts down to zero, at which point, the generation stops, and the room is considered complete. The random walk algorithm I am using is non-self-avoiding, meaning it can walk back over where it has already generated tiles. However, I have programmed it so that it does not generate tiles on top of one another and taking a step over an already generated tile does not subtract from the remaining number of steps.

ALIEN BREACH POINTS

As the level generates, several 'breach points' will be created where alien enemies can spawn from. Breach points may not spawn within 40 metres of each other.

ITEM SPAWNING

The level generation works by spawning 4x4 tiles. Each 4x4 tile will have an item spawn point in the centre of it. The probability of an item actually spawning will be based on the player's current status. Each room will track how many items are spawned inside of it, and I will use this to limit the number of items that are spawned by reducing the probability of an item being spawned as the number of spawned items increases.

These are the items that may be spawned in randomly-generated rooms around the space vessel:

- Guns
 - o Pistol + 18 pistol bullets
 - o Heavy Pistol + 12 magnum bullets
 - o Submachine Gun + 60 SMG bullets
 - o Pump-Action Shotgun + 10 shotgun shells
- Ammo
 - o Pistol ammo box: 18 pistol bullets
 - o Magnum ammo box: 12 magnum bullets
 - o SMG ammo box: 60 SMG bullets
 - o Rifle ammo box: 30 rifle bullets
 - o Shotgun ammo box: 10 shotgun shells
- Health
 - o Bandages: Restores 20 health
 - o Healing gel: Restores 40 health

The spawn rates in relation to player status are listed below...

GUNS, SPAWN RATES

Player health	Additional spawn chance (%)
100	0
90	2
80	4
70	6
60	8
50	10
40	12
30	14
20	16
10	18
0	20

Ammo capacity (% of all carried weapons)	Additional spawn chance (%)
100	0
90	3
80	6
70	9
60	12
50	15
40	18
30	21
20	24
10	27
0	30

# weapons in inventory	Additional spawn chance (%)
4	0.0
3	12.5
2	25.0
1	37.5
0	50.0

HEALTH ITEMS, SPAWN RATES

Player health	Additional spawn chance (%)
100	0.0
90	7.5
80	15.0
70	22.5
60	30.0
50	37.5
40	45.0
30	52.5
20	60.0
10	67.5
0	75.0

Ammo capacity (% of all carried weapons)	Additional spawn chance (%)
100	0
90	2
80	4
70	6
60	8
50	10
40	12
30	14
20	16
10	18
0	20

# weapons in inventory	Additional spawn chance (%)
4	0.0
3	1.25
2	2.5
1	3.75
0	5.0

AMMO BOXES, SPAWN RATES

Player health	Additional spawn chance (%)
100	0
90	1
80	2
70	3
60	4
50	5
40	6
30	7
20	8
10	9
0	10

Ammo capacity (% of all carried weapons)	Additional spawn chance (%)
100	0
90	6
80	12
70	18
60	24
50	30
40	36
30	42
20	48
10	54
0	60

# weapons in inventory	Additional spawn chance (%)
4	0.0
3	7.5
2	15.0
1	22.5
0	30.0

PREFAB ROOMS

Although the level will be randomly-generated for each playthrough, specific key rooms, such as armouries, tool workshops, med-bays, and objective rooms, will be prefabricated and appropriately spawned in, rather than randomly-generating these. They will be spawned in a different location each time the game is played, but the layout of these rooms will remain the same. Using prefabricated rooms will ensure that these rooms are laid out in a way that makes sense, and that all the key functionality of these rooms is accessible to the player. However, with the exception of the starting room, the items that may spawn inside of these rooms may change.

These prefab rooms are...

THE STARTING ROOM

The starting room is a jail cell, which the player starts inside of. Just on the other side of the bars is a dead pirate, a NetHack (Lvl 1), multi-tool (Lvl 1), and a pistol with 9 bullets.

ARMOURIES

Each armoury contains three random guns from the following list...

- Heavy Pistol
- Magnum Revolver
- Submachine Gun
- Assault Rifle
- Semi-Auto Rifle
- Pump-Action Shotgun
- Auto Shotgun

And three ammo boxes for each of those guns. The possible ammo types are...

- Pistol ammo box: 18 pistol bullets
- Magnum ammo box: 12 magnum bullets
- SMG ammo box: 60 SMG bullets
- Rifle ammo box: 30 rifle bullets
- Shotgun ammo box: 10 shotgun shells

MED-BAYS

In med-bays, players can find 4 random health items. The possible health items that can spawn are...

- Healing gel: Restores 40 health
- First aid kit: Restores 75 health

TOOL WORKSHOPS

Tool workshops contain 2 - 3 random tools to give players upgraded abilities.

- NetHack (Lvl 2, 3, 4)
- Multi-tool (Lvl 2, 3, 4)
- Quick-hack kit
- Quick-weld kit

OBJECTIVE ROOMS

Objective rooms are specifically designed for the particular objective(s) that they contain.

OBJECTIVE TYPES

Each time the game is played, players will be given a random selection of 3 objectives and 1 escape objective. Each objective contains multiple steps in order to complete it.

OBJECTIVE: Redirect ship destination

1) Find an identity card

Identity cards are carried by Pirate Captains. Kill one to take their identity card.

2) Hack into a registration terminal

Use your NetHack to hack the registration terminal.

Hack speed (base value): 8 seconds

3) Modify the card

Use the hacked registration terminal to modify the biometric data on the card and register your own biometrics. Hold down the interact key to perform the interaction. This interaction takes 8 seconds to complete.

4) Use new card to override navigation

Go to the navigation room and use the modified identity card with the destination terminal to complete the objective.

OBJECTIVE: Download data logs

1) Hack server bank

Find the server room and use your NetHack to hack the server bank.

Hack speed (base value): 10 seconds

2) Download data

i. Find three data terminals around the ship and use your NetHack to download data from them.

Download speed (base value): 15 seconds

ii. Go to the bridge and use your NetHack to download flight data from the control system.

Download speed (base value): 15 seconds

OBJECTIVE: Collect alien DNA

1) Collect 2000 DNA

Kill aliens and walk over their bodies to collect some DNA. Tougher aliens provide more DNA. (See ENEMIES > ALIENS for DNA values)

2) Contain DNA

Take DNA to a Med-Bay and properly contain it.

OBJECTIVE: Set ship to self-destruct

1) Override safety protocols

Go to the main security station and hack the control desk.

Hack speed (base value): 10 seconds

2) Overheat engines

i. Hack left engines to push them beyond safe levels.

Hack speed (base value): 6 seconds

ii. Hack right engines to push them beyond safe levels.

Hack speed (base value): 6 seconds

3) Cause reactor meltdown

Destroy the 2 cooling units that keep the reactor core at a stable temperature.

Cooling unit hit points: 200

4) Escape

Completing the first three steps will prime the ship for destruction in 90 seconds. Make sure you complete one of the escape objectives before time runs out!

ESCAPE OBJECTIVE: Free your ship and escape

1) Bring pirate vessel to a stop

Go to the cockpit and hack the controls to bring the vessel to a stop.

Hack speed (base value): 10 seconds

2) Destroy fuel

i. Destroy the ship's fuel tanks to leak fuel.

ii. Destroy fuel reserves so the ship cannot be refuelled.

3) Repair locking mechanism fault

The locking mechanism holding your ship in place is faulty and cannot retract. It must be repaired before it can be disengaged.

Repair speed (base value): 10 seconds

4) Disengage locks

Hack the mechanism controls to disengage the locks and free your ship.

Hack speed (base value): 8 seconds

5) Board your ship

Interact with the access point that leads to your ship to escape.

ESCAPE OBJECTIVE: Escape via evacuation pod

1) Unlock pod bay

Go to the access centre and hack into the terminal to unlock the pod bay.

Hack speed (base value): 8 seconds

2) Gain access to pod

Hack into the authorisation terminal and unlock an evacuation pod.

Hack speed (base value): 6 seconds

3) Refuel pod

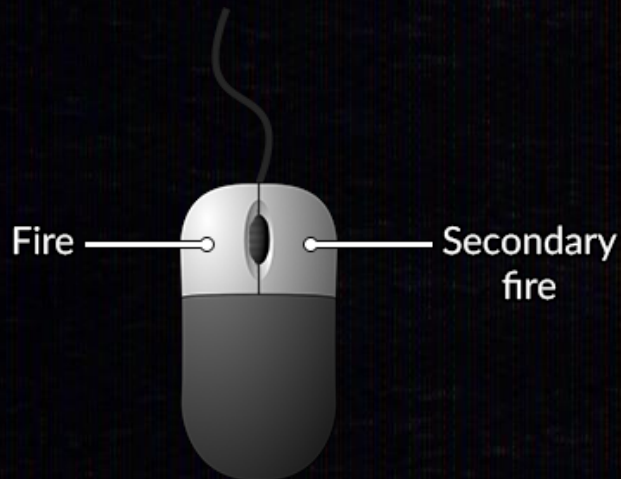
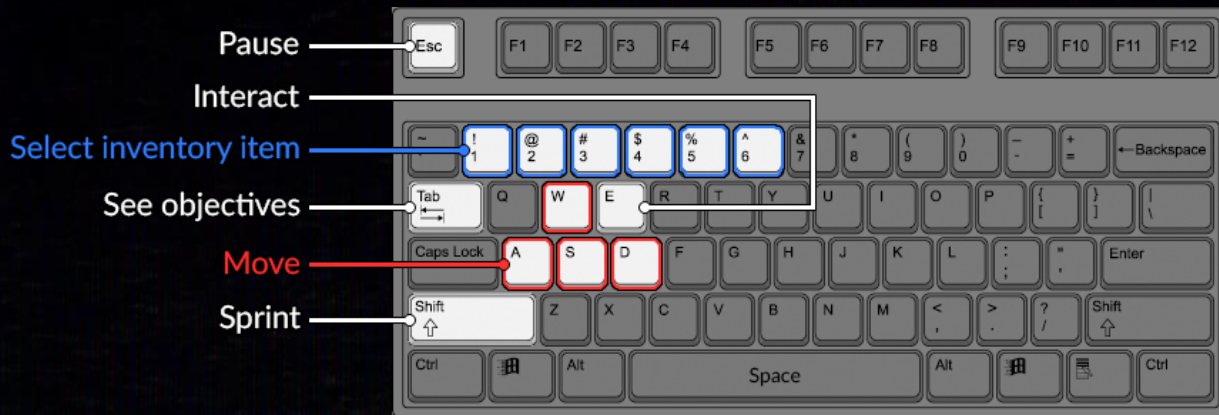
Find three fuel cannisters and bring them to the unlocked evacuation pod to refuel it. Hold the interaction key when in possession of a fuel cannister to refuel the pod.

Refuel speed: 6 seconds

4) Board pod and escape

Get inside the evacuation pod and launch it to escape.

CONTROLS



TEN MINUTES OF PLAY

FIRST

When the player first begins playing *Creepers*, they will likely feel a little intimidated by the randomised level layout and the free-form approach to completing objectives. The game doesn't hand-hold players or guide them through a tightly-controlled experience, and although the dynamic difficulty will attempt to make things a little easier for them, they may still have some difficulty surviving long enough to complete a full playthrough.

LATER

Now that the player has become more familiar with the game's systems and mechanics, they can progress further and complete more objectives. They still find fights against enemies challenging, but now find them more manageable. They struggle to use more advanced mechanics like traps and ship defences effectively, but can rely on their guns to get them out of trouble. The player can successfully complete a full playthrough, though they find it challenging.

LATEST

The player has now mastered the game's systems and mechanics, and competently make full use of weapons, traps, and hacked ship defences to defeat enemies and survive. The player will routinely complete playthroughs, but the unpredictable nature of the game still provides them an engaging experience.

BUSINESS CASE

Creepers will be released on PC platforms such as Steam and GOG for £14.99.

We estimate the development cycle to last around 1 year with the development costs estimated to be in the £400,000 - £500,000 range.

A speculative development team and the associated costs is outlined below...

Role	Salary / year	How many we'll need	How many years they'll be employed	Total cost
Director	£45,000	1	1	£45,000
Programmer	£32,000	2	1	£64,000
Artist	£31,000	2	1	£62,000
Animator	£31,000	2	1	£62,000
Lead designer	£34,000	1	1	£34,000
Designer	£30,000	1	1	£30,000
Producer	£34,000	1	1	£34,000
Sound design/Music	£31,000	1	0.75	£23,250
QA	£24,000	2	0.75	£36,000
Marketing/PR/Sales	£40,000	1	0.25	£10,000

TOTAL: £400,250

The game is being developed with Unity, and as such, we will have to pay licensing costs for the engine, too. Costing around \$1,800 per year, per seat, for a Unity 'Pro' license, we anticipate the total licensing costs to be around \$18,000 for the 10 developers we expect to need it. This converts to approximately £12,957, bringing the total development costs to £413,207.

As 30% is the standard cut that stores and platform holders take, each copy of *Creepers* sold at £14.99 would give us a return of approximately £10.49. To make a return on a total development budget of £413,207, we would have to sell around 40,000 copies at £14.99.

REFERENCES

<https://www.psdgraphics.com/textures/magnesium-metal-texture/>

<https://negativespace.co/wp-content/uploads/2019/01/negative-space-black-metal-texture.jpg>

<https://img1.goodfon.com/wallpaper/nbig/2/44/metal-grunge-metallic-steel-5838.jpg>

<https://i.pinimg.com/originals/0d/e7/4d/0de74da3bcee217e5bac706608edf79f.jpg>

https://motionarray.imgix.net/preview-174781-9Lw6S35WfF-high_0008.jpg

https://cdnb.artstation.com/p/marketplace/presentation_assets/000/468/299/large/file.jpg?1596124359

<https://www.vecteezy.com/vector-art/701688-monochrome-grunge-texture-background>

<https://i.pinimg.com/originals/3a/c4/06/3ac406bc37978b9237b7059dd7a20bf4.jpg>

<https://unblast.com/wp-content/uploads/2020/06/Grunge-Textures-2.jpg>

<https://media.macphun.com/img/uploads/customer/blog/1541154551/15411554815bdc2a99267047.50976593.jpg?q=85&w=1680>

<https://unblast.com/wp-content/uploads/2020/06/Grunge-Textures-5.jpg>

<https://cdn.mos.cms.futurecdn.net/xepTKUayyCCn7@nVXUjhTg.jpg>

<https://wallpaperaccess.com/full/372551.jpg>

<https://i.pinimg.com/originals/f1/b0/70/f1b0703c370a3b5ad8de08740e1e8485.png>

Pillar by yudi from the Noun Project

Shield Protection by Grafix Point from the Noun Project

LUDOGRAPHY

nornware AB. (2015). *Space Beast Terror Fright*. nornware AB.

Ion Storm. (2000). *Deus Ex*. Eidos Interactive.

Mojang. (2011). *Minecraft*. Microsoft Studios.

Tripwire Interactive. (2016). *Killing Floor 2*. Tripwire Interactive.

Creative Assembly. (2014). *Alien: Isolation*. SEGA.

Subset Games. (2012). *FTL: Faster Than Light*. Subset Games.

Motion Twin. (2018). *Dead Cells*. Motion Twin.

Edmund McMillen, Florian Himsl. (2011). *The Binding of Isaac*. Edmund McMillen

FILMOGRAPHY

Scott, R. (1979). *Alien*. Twentieth Century-Fox Productions.