

# ATTACK OF THE GNOMES

## Game Design Document



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# Game Concept

## Overview

A tower defence game but played in a first person perspective. You must defend yourself from an onslaught of garden gnomes. To do this you place traps and gather resources from the bodies of the smashed gnomes. Unlike most tower defence games though, you are not viewing things from the safety of the sky, but you are on the ground. This means the player must interact with the gnomes directly, and try to fight them off.

## Player Progression

The game is split into 7 levels. The player will start on level 1 and once completed will be sent straight to level 2 and so on. The player can save and quit at any time but will be able to restart from the last uncompleted level via the Main Menu.

## Game End Condition

If the player reaches the end of the seventh day, they win. If they are overran by Gnomes attacking the player, they lose. See [Player Death](#) for more details.

# Controls

## PC Controls

W / Up Arrow	Move Forwards
S / Down Arrow	Move Backwards
A / Left Arrow	Move Left
D / Right Arrow	Move Right
Mouse	Look
Left Mouse Button	Select / Place Trap
Shift	Hold to Move Faster
1, 2, 3, 4, 5, 6	Select Trap

# Player Details

## Specifications

Size	1 Unit Wide by 1 Unit Deep with a Cylindrical collision box
Walk Speed	0.4 Units per second
Run Speed	0.8 Units per second
View Height	4 Units

## Player Death

If the total size of Gnomes clamped to the player's face is greater than or equal to 1 (see [Gnome Specifications](#)) and the Gnomes remain there for 4 seconds, then the player is killed. A message informing them of their death will be displayed and they are then given the option to either restart the level or return to the Main Menu.

# Traps

## Technical Specifications

Cost	How much Gnome Dust does it cost to create this trap.
Size	How much space on the ground the trap takes up.
Area of Effect	How much space the effects of the trap cover.
Col.	Collision shape for the Area of Effect. C = Cylindrical, R = Rectangle/Square
Durability	How many times the trap can activate before it expires.
Kill Rate	Maximum number of Gnomes it can kill in a single action.
Trigger	What causes the trap to activate.
Speed	Number of frames it takes the trap to reset before it can be triggered again.
Description	What the trap looks like and does.

Name	Cost	Size	AOE	Col.	Durability	Kill Rate	Speed	Trigger	Description
<b>Snare</b>	2	0.25 x 0.25	0.25 x 0.25	C	10	1	3	Gnome entering AOE	A stick with a noose hanging from the end.
<b>Masher</b>	5	0.5 x 0.5	0.5 x 0.5	R	15	100	2	More than 1 Gnome entering AOE	A wooden frame with a stone hanging from the top.
<b>Small Grinder</b>	15	0.5 x 0.25	0.5 x 0.25	R	25	1	0	Gnome entering AOE	Two vertical stacks of rotating blades.
<b>Big Grinder</b>	40	1 x 0.25	1 x 0.25	R	30	100	0	Gnome entering AOE	Two bigger vertical stacks of rotating blades.
<b>Flame-Thrower</b>	50	0 x 0	0.5 x 5	R	1	100	5	When purchased	A large jet of flames held and aimed by the player.
<b>Dog</b>	30	1 x 1	3 x 3	C	15	1	3	Gnome entering AOE	A dog. Will pounce on any Gnome entering AOE.
<b>Mine</b>	20	0.25 x 0.25	5 x 5	C	1	100	0	Gnome touches the mine	Small, flat and hidden underground.
<b>Shocker</b>	5	0.25 x 0.25	0.5 x 0.5	C	10	100	5	Gnome touching the shocker	A Metal plate that electrifies the ground for 0.5 seconds.
<b>Flame Wheel</b>	30	0.5 x 0.5	2.5 x 2.5	C	1	100	10	When placed	A spinning wheel of fire.
<b>Pond</b>	10	0.5 x 0.5	0.5 x 0.5	C	15	1	0	Gnome entering AOE	Drowns Gnomes until it is full.
<b>Bear Trap</b>	15	1 x 1	1 x 1	R	20	1	2	Gnome entering AOE	A bear trap.
<b>Spikes</b>	25	1 x 1	1 x 1	R	25	100	1	More than 1 Gnome entering AOE	A flat surface which a series of spikes rise from.
<b>Venus Gnome Trap</b>	30	0.5 x 0.5	1.5 x 1.5	C	50	1	10	Gnome entering AOE	A plant that eats Gnomes.
<b>Dust Vacuum</b>	10	0.5 x 0.5	5 x 5	C	40 Dusts	--	0	Gnome Dust in AOE	Gathers Gnome Dust for the player.

## Trap Information For Player

This is the information that needs to be shown to the player about each trap.

Name	Cost	Size	Durability	Speed	Description
<b>Snare</b>	2	Small	Low	Moderate	Hangs a single Gnome by a noose.
<b>Masher</b>	5	Medium	Low	Moderate	Smashes multiple Gnomes with a rock.
<b>Small Grinder</b>	15	Small	Fair	Fast	Grinds many Gnomes with two vertical stacks of spinning blades.
<b>Big Grinder</b>	40	Medium	High	Fast	Grinds many more Gnomes with two bigger vertical stacks of spinning blades.
<b>Flame-Thrower</b>	50	Large	Low	Fast	A ferocious jet of flames which you can aim.
<b>Dog</b>	30	Large	Low	Moderate	Will pounce on and attack nearby Gnomes.
<b>Mine</b>	20	Small	Low	Fast	A small explosive with a wide blast radius.
<b>Shocker</b>	5	Small	Low	Slow	Electrifies several Gnomes when triggered.
<b>Flame Wheel</b>	30	Medium	Low	Fast	A spinning wheel of fire.
<b>Pond</b>	10	Medium	Low	Fast	Drowns Gnomes until it is full.
<b>Bear Trap</b>	20	Large	Fair	Moderate	A big bear trap which crunches Gnomes one at a time.
<b>Spikes</b>	25	Large	Fair	Fast	Pierces multiple Gnomes from beneath.
<b>Venus Gnome Trap</b>	30	Medium	High	Slow	A plant that likes to eat Gnomes.
<b>Dust Vacuum</b>	15	Medium	High	Fast	Gathers Gnome Dust for you.

## Trap Availability

More traps become available as the game progresses. Here is the unlock order.

Available In Level	1+	2+	3+	4+	5+
	Snare	Shocker	Bear Trap	Spikes	Dog
	Masher	Small Grinder	Dust Vacuum	Big Grinder	Flamethrower

	Pond	Flame Wheel	Venus Gnome Trap	Mine	
--	------	-------------	---------------------	------	--

Before each level the player must select what traps they wish to have available to use in that level up to a maximum of 6 traps. Each trap chosen will be assigned a number key from 1 to 6. The player can rearrange these assignments before beginning the level.

## Gnomes

### Gnome Specifications

Name	Gnome Name
Size	How much space ground space they occupy in W x D
Dust	How much Gnome Dust they leave behind once destroyed
Speed	How many units it moves per second.
Additional Information	Additional Information

Name	Size	Dust	Speed	Additional Information
<b>Garden Gnome</b>	0.25 x 0.25	1	0.2	Your average Gnome.
<b>Big Gnome</b>	0.5 x 0.5	5	0.1	Destroys traps that are less than 0.5 x 0.5.
<b>Tough Gnome</b>	0.25 x 0.25	2	0.2	Not affected by water, electric or fire traps.
<b>Baby Gnome</b>	0.125 x 0.125	0	0.2	Travels in groups of 6.
<b>Gnome Wrecker</b>	1 x 1	10	0.1	Destroys traps that are 0.5 x 0.5 or smaller.
<b>Fast Gnome</b>	0.25 x 0.25	2	0.4	Moves quicker than other Gnomes.
<b>Half Gnome</b>	0.25 x 0.25	0	0.1	Half of a Gnome.
<b>ParaGnomes</b>	0.25 x 0.25	2	0.2	Gnomes that fall from the sky.

All Gnomes have a cylindrical collision area that matches their size.



## Gnome Information For Player

Information to be displayed to the player about Gnomes.

Name	Size	Dust Carried	Speed	Additional Information
<b>Garden Gnome</b>	Medium	Some	Average	Your average Gnome.
<b>Big Gnome</b>	Large	Lots	Slow	Destroys any small traps that it comes across.
<b>Tough Gnome</b>	Medium	Some	Average	Not affected by water, electric or fire traps.
<b>Baby Gnomes</b>	Small	None	Average	Travel in groups of 6.
<b>Gnome Wrecker</b>	Very large	Lots & lots	Slow	Destroys all small or medium traps it comes across.
<b>Fast Gnome</b>	Medium	Some	Fast	Moves quicker than other Gnomes.
<b>Half Gnome</b>	Medium	None	Slow	Half of a Gnome.
<b>ParaGnomes</b>	Medium	Some	Average	Gnomes that fall from the sky.

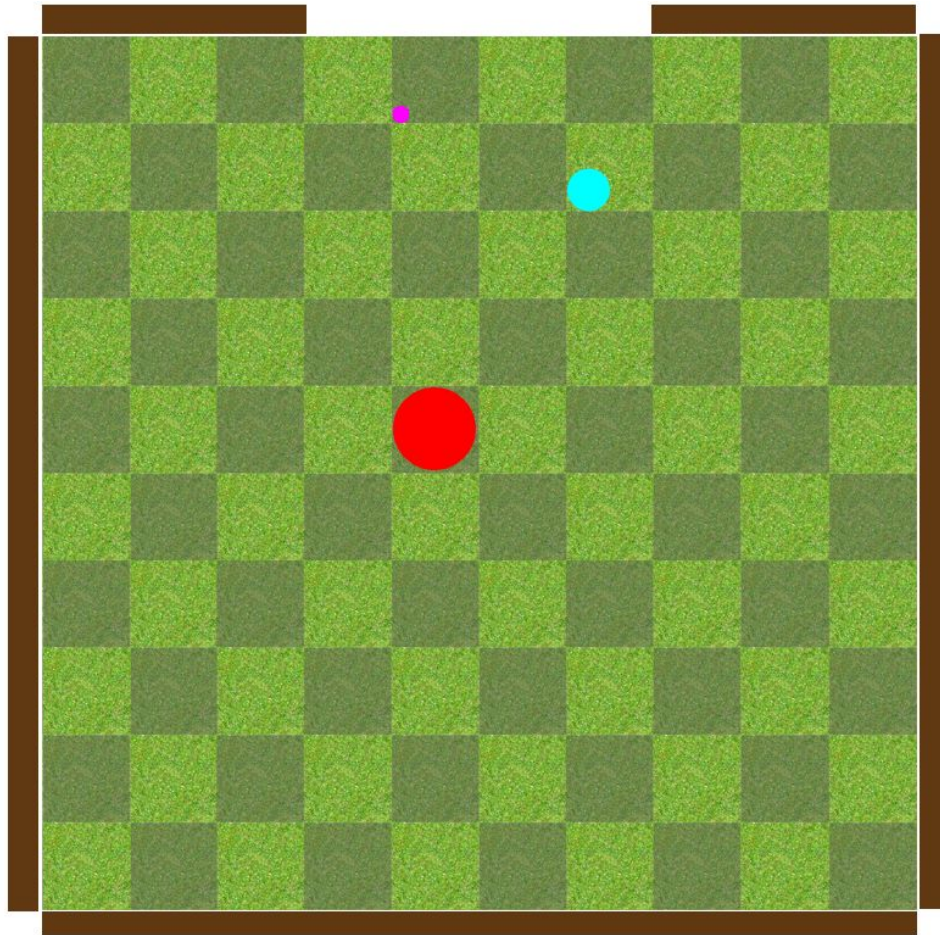
## Gnome Attacks

When a Gnome collides with a player, they will attack him. The Gnome will appear on the screen as if they are grabbing hold of the player's face. Whilst they have a Gnome of their face a player cannot place any traps. By moving the mouse back and forth quickly they can shake the gnome off. A total of 20 complete left to right and back movements with the cursor covering at least half the screen width will cause a Gnome to fall. When a Gnome falls it will break and release its Gnome dust.

## Gnome Dust

Gnome dust will gently float in place at the location of the Gnomes death. It be be collected by the player by them either left clicking on it, walking into it or having it sucked by by the Dust Vacuum. Each piece of dust collected will had 1 to the player's Gnome Dust bank.

## Levels



*Sample top down view of level layout*

### Key

Grass 1x1	Garden Fence	Player	Pond	Garden Gnome
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Each level has the same layout, a 10x10 sized garden which is completely flat. The Gnomes will be able to enter from all sides that are not protected by the Garden Fence. As the levels progress, the fences will fall down, and more Gnomes will enter. Each level ends when all the Gnomes are destroyed.

The Player is not able to exit the 10x10 area but can see 2 units farther in each direction. This is the spawn area for the Gnomes.

## Level Progression

When first starting the game only Level 1 is available. Once a level is completed the player will automatically proceed onto the next level. If they fail they must restart that current level. When a level is completed it becomes unlocked and can be accessed directly from the [Level Select Menu](#).

## Level Tables Explained

Fences - Which fences are up throughout the level. This limits the number of access points for the Gnomes.

Section	Gnome	1 per X Seconds	First Appears After X Seconds	X in Y Seconds
Phase 1	Type of Gnome	1 of this Gnome should appear every (This Many Seconds) X (0.75 to 1.25)	How long after the start of this Phase the first type of this Gnome should appear	N/A in Phases
How long the Phase should last before the Wave begins				
Wave 1	Type of Gnome	N/A in Waves	How long after the start of this Phase the first type of this Gnome should appear	This many Gnomes need to appear during the Wave
How long the wave lasts until the next Phase starts. Also the value for Y.				

**Section - Phases** are longer and slower paced with only a couple of Gnomes appearing at a time. **Waves** are short and have many Gnomes appearing at once.

**1 per X seconds** - During a phase this is how frequently each gnome of this type should appear after its first appearance. This is a rough value and is actually random to be between 75% and 125% of this time. Has no effects during waves.

*Example: In Level 1 the Garden Gnome during Phase 1 has a value of 1 per 10 seconds. After the first spawn the second Garden Gnome will appear between 7.5 and 12.5 seconds later. The third Garden Gnome will appear between 7.5 and 12.5 seconds after the second Garden Gnome.*

**First Appears After X Seconds** - How long after the start of this Phase or Wave the first Gnome of this type should appear. This will then start the **1 per X Seconds** spawn rate for that Gnome.

**X in Y Seconds** - During a wave this is how many Gnomses need to appear during a wave where X is the number of Gnomses and Y is the duration of the wave. The wave duration can be found in the row beneath that wave. Has no effects during phases.

*Example: In Level 1 the Big Gnome during Wave 1 the number of Gnomses to appear is 1 and the wave duration is 15. Therefore 1 Gnome needs to appear during those 15 seconds.*

## Level 1

Fences - All

Section	Gnome	1 per X Seconds	First Appears After X Seconds	X in Y Seconds
Phase 1	Garden Gnome	10	10	--
After 120 Seconds				
Wave 1	Garden Gnome	--	0	15
	Big Gnome	--	5	1
After 15 Seconds				
Phase 2	Garden Gnome	5	1	--
	Big Gnome	40	20	--
After 120 Seconds				
Wave 2	Garden Gnome	--	0	20
	Big Gnome	--	10	2
20 Seconds				

## Level 2

Fences - East, West & South

Section	Gnome	1 per X Seconds	First Appears After X Seconds	X in Y Seconds
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Phase 1	Garden Gnome	8	1	--
	Baby Gnome	40	30	--
After 150 Seconds				
Wave 1	Garden Gnome	--	0	15
	Baby Gnome	--	5	2
After 15 Seconds				
Phase 2	Garden Gnome	5	1	--
	Big Gnome	30	10	--
	Baby Gnome	25	25	--
After 150 Seconds				
Wave 2	Garden Gnome	--	0	10
	Big Gnome	--	5	2
	Baby Gnome	--	2	4
10 Seconds				

### Level 3

Fences - East & South

Section	Gnome	1 per X Seconds	First Appears After X Seconds	X in Y Seconds
Phase 1	Garden Gnome	12	1	--
	Baby Gnome	30	30	--
	Fast Gnome	15	10	--
After 180 Seconds				
Wave 1	Garden Gnome	--	0	10
	Fast Gnome	--	3	2
	Half Gnome	--	1	10

After 10 Seconds				
Phase 2	Garden Gnome	10	1	--
	Fast Gnome	12	10	--
	Baby Gnome	30	20	--
	Half Gnome	20	5	--
After 180 Seconds				
Wave 2	Garden Gnome	--	0	15
	Big Gnome	--	4	3
	Baby Gnome	--	6	2
	Half Gnome	--	1	10
	Fast Gnome	--	1	10
15 Seconds				

## Level 4

Fences - South

Section	Gnome	1 per X Seconds	First Appears After X Seconds	X in Y Seconds
Phase 1	Garden Gnome	12	8	--
	Baby Gnome	60	60	--
	Big Gnome	60	45	--
	Tough Gnome	10	1	--
After 210 Seconds				
Wave 1	Garden Gnome	--	0	10
	Baby Gnome	--	4	3
	Big Gnome	--	2	2
	Tough Gnome	--	1	10

After 10 Seconds				
Phase 2	Garden Gnome	10	4	--
	Tough Gnome	8	1	--
	Big Gnome	60	30	--
	Baby Gnome	80	60	--
	Half Gnome	60	45	--
After 210 Seconds				
Wave 2	Garden Gnome	--	0	15
	Big Gnome	--	5	1
	Baby Gnome	--	2	3
	Half Gnome	--	2	10
	Tough Gnome	--	1	10
After 20 Seconds				

## Level 5

Fences - South

Section	Gnome	1 per X Seconds	First Appears After X Seconds	X in Y Seconds
Phase 1	Garden Gnome	15	1	--
	Big Gnome	40	20	--
	Tough Gnome	15	3	--
	Baby Gnome	20	40	--
	Fast Gnome	15	10	--
After 240 Seconds				
Wave 1	Half Gnome	--	0	10
	Big Gnome	--	1	2

	Tough Gnome	--	0	10
	Fast Gnome	--	1	10
	Baby Gnome	--	3	4
After 10 Seconds				
Phase 2	Garden Gnome	12	3	--
	Tough Gnome	12	1	--
	Big Gnome	50	20	--
	Fast Gnome	30	15	--
	Baby Gnome	20	30	--
	Gnome Wrecker	Just One	150	--
After 210 Seconds				
Wave 2	Half Gnome	--	0	15
	Tough Gnome	--	1	15
	Big Gnome	--	3	2
	Fast Gnome	--	4	5
	Baby Gnome	--	8	4
	Gnome Wrecker	--	10	1
20 Seconds				

## Level 6

Fences - South

Section	Gnome	1 per X Seconds	First Appears After X Seconds	X in Y Seconds
Phase 1	Garden Gnome	15	5	--
	Big Gnome	40	30	--
	Tough Gnome	20	8	--



	Half Gnome	30	60	--
	Para-Gnome	20	1	--
After 240 Seconds				
Wave 1	Garden Gnome	--	0	10
	Big Gnome	--	5	2
	Tough Gnome	--	2	10
	Half Gnome	--	2	10
	Para-Gnome	--	1	10
After 20 Seconds				
Phase 2	Garden Gnome	15	2	--
	Tough Gnome	20	3	--
	Big Gnome	30	15	--
	Para-Gnome	15	1	--
	Baby Gnome	20	20	--
	Half Gnome	30	5	--
After 210 Seconds				
Wave 2	Garden Gnome	--	2	10
	Tough Gnome	--	1	10
	Big Gnome	--	5	2
	Half Gnome	--	2	10
	Baby Gnome	--	3	5
	Para-Gnome	--	0	15
	Gnome Wrecker	--	0	1
20 Seconds				

## Level 7

Fences - None

Section	Gnome	1 per X Seconds	First Appears After X Seconds	X in Y Seconds
Phase 1	Garden Gnome	10	1	--
	Fast Gnome	20	15	--
	Tough Gnome	10	1	--
	Half Gnome	10	15	--
	Para-Gnome	20	1	--
After 240 Seconds				
Wave 1	Garden Gnome	--	1	10
	Baby Gnome	--	0	5
	Tough Gnome	--	0	10
	Half Gnome	--	1	10
	Gnome Wrecker	--	0	1
	Para-Gnome	--	1	20
After 10 Seconds				
Phase 2	Garden Gnome	25	1	--
	Tough Gnome	15	1	--
	Big Gnome	40	10	--
	Para-Gnome	20	1	--
	Baby Gnome	25	40	--
	Fast Gnome	25	5	--
	Half Gnome	20	1	--
After 210 Seconds				

Wave 2	Garden Gnome	--	1	10
	Tough Gnome	--	1	10
	Big Gnome	--	1	2
	Half Gnome	--	0	30
	Baby Gnome	--	0	10
	Para-Gnome	--	1	10
	Fast Gnome		1	10
	Gnome Wrecker	--	0	3
20 Seconds				

## Audio

### **Soundtrack**

The game will have a soundtrack.

### **Sound Effects**

It will also have sound effects.

## Graphics

### **Animations**

Required animations for game models

Gnomes

<b>Gnome</b>	<b>Animations</b>
Garden Gnome	Walk

	Leaping Smashed
Big Gnome	Walk Leaping Smashed
Tough Gnome	Walk Leaping Smashed
Baby Gnome	Walk Leaping Smashed
Gnome Wrecker	Walk Leaping Smashed
Fast Gnome	Running Leaping Smashed
Half Gnome	Walk Crawl Hop Leaping Smashed
ParaGnomes	Descend Land Walk Leaping Smashed

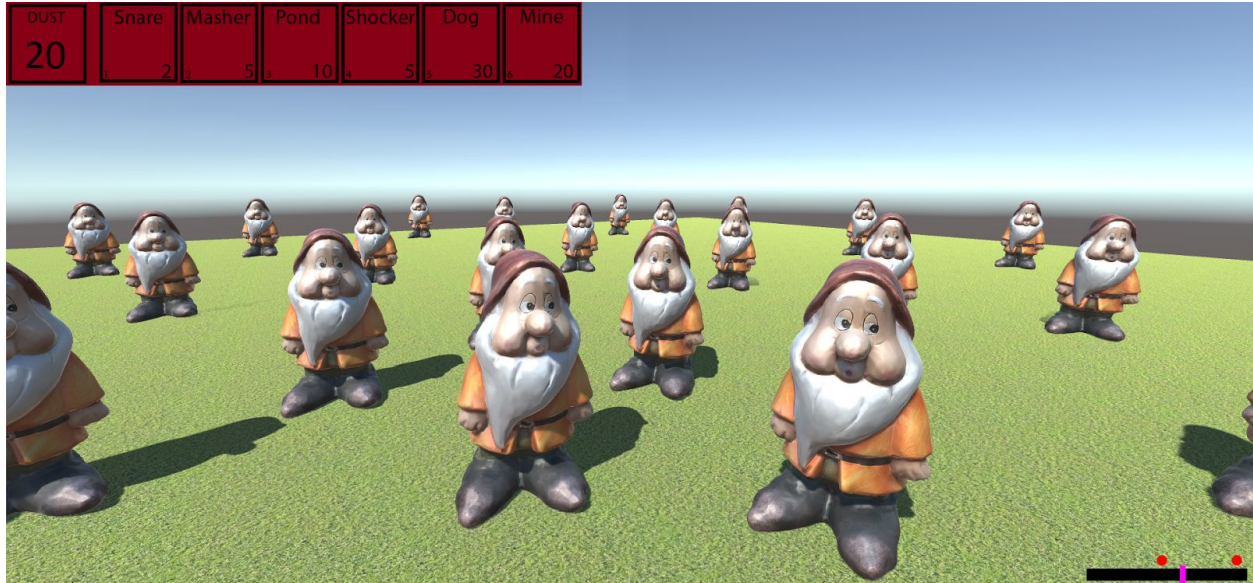
## Traps

Trap	Animation
Snare	Activation Destroyed
Masher	Activation Destroyed
Small Grinder	Activation

	Destroyed
Big Grinder	Activation Destroyed
Flamethrower	Activation
Dog	Activation Idle Runs Away
Mines	Activation
Shocker	Activation Destroyed
Flame Wheel	Activation Destroyed
Pond	Filling Up With Gnomes
Bear Trap	Activation Destroyed
Spikes	Activation Destroyed
Venus Gnome Trap	Activation Destroyed Idle
Dust Vacuum	Activation Destroyed

## In Game Interface

The top left of the screen needs a display showing the player how much Gnome Dust they have and what traps they have available to lay. Each trap has a button detailing it's name, a picture, how much it costs and the keyboard shortcut to buy it. The bottom right of the screen needs a small display showing the player's progression through the level, with markers indicating when the waves are going to come.



*Sample Image*

## **Gnome Design Notes**

Creepy.

## **Menus**

### **Main Menu**

The first menu to be displayed to the Player. From here they have the option to go to either the Gnomeology, Level Select, How To Play, Credits and Exit Game.

### **Credits**

A single screen showing the names and roles of the people who worked on this game and a return button which goes to the Main Menu.

### **How To Play**

A single screen showing information on the controls of the game. There is a return button which will take the player back to either the Main Menu or Pause Menu, depending which they were on last.

## **Pause Menu**

Accessible in game this will pause the game and give the player a few options. They can either Continue Playing, Quit To Main Menu, view How To Play or view the Gnomeology.

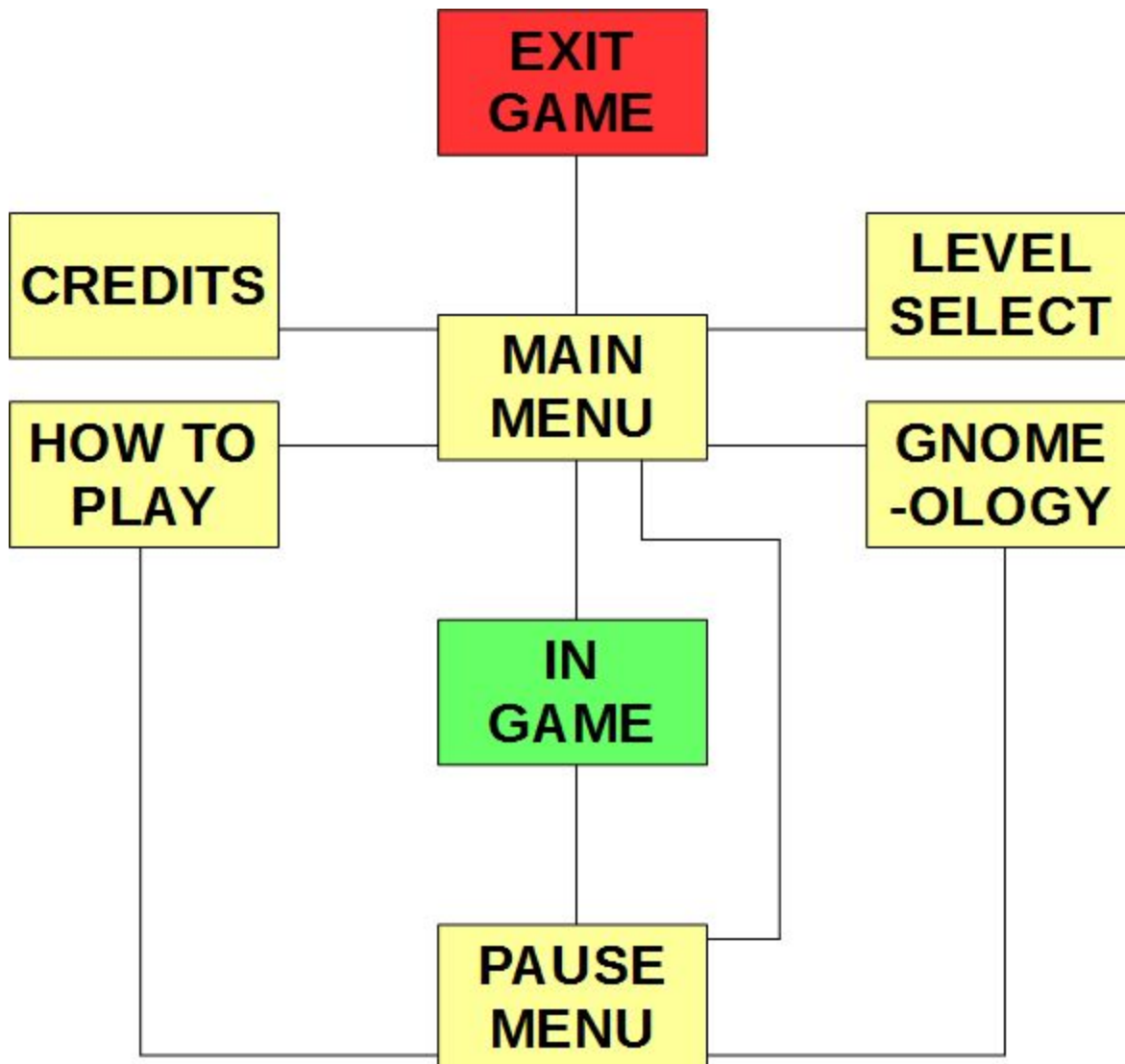
## **Level Select Menu**

A list of the levels which the player has completed so far. They can start any previously completed level from this menu. There is also a return button to go to the Main Menu.

## **Gnomeology**

The Gnomeology is two screens which can be toggled between. One shows information about the Gnomes and the other shows information about the Traps. There is a return button which will take the player back to either the Main Menu or Pause Menu, depending which they were on last. The information to be displayed can be found in the [Gnome Information For Players](#) and [Trap Information for Players](#) sections.

## Menu Flowchart



## File Structure

### Assets

- Master Folder
  - Gnomes
    - GardenGnome
      - Model



- Textures
  - Animation
- BigGnome
  - Model
  - Textures
  - Animation
- ToughGnome
  - Model
  - Textures
  - Animation
- BabyGnome
  - Model
  - Textures
  - Animation
- GnomeWrecker
  - Model
  - Textures
  - Animation
- FastGnome
  - Model
  - Textures
  - Animation
- HalfGnome
  - Model
  - Textures
  - Animation
- ParaGnomes
  - Model
  - Textures
  - Animation
- Traos
  - Snare
    - Model
    - Textures
    - Animation
  - Masher
    - Model
    - Textures
    - Animation
  - SmallGrinder
    - Model
    - Textures
    - Animation

- Flamethrower
  - Model
  - Textures
  - Animation
- Dog
  - Model
  - Textures
  - Animation
- Mine
  - Model
  - Textures
  - Animation
- Shocker
  - Model
  - Textures
  - Animation
- FlameWheel
  - Model
  - Textures
  - Animation
- Pond
  - Model
  - Textures
  - Animation
- BearTrap
  - Model
  - Textures
  - Animation
- Spikes
  - Model
  - Textures
  - Animation
- VenusGnomeTrap
  - Model
  - Textures
  - Animation
- DustVacuum
  - Model
  - Textures
  - Animation
- Environment
  - Ground
  - Skybox

- Fences

## **Wishlist**

- Endless Mode
- Intelligent Gnomes
- Health for Gnome Wrecker
- Day/Night Cycles
- Comical entries in the Gnomeology