Designing Pac-Man

break it down

Overview

- This is a design exercise that takes a known game and asks the designer (Me) to break it down into its component parts. My goal is to communicate my understanding of the game creation process.
  - The first section of the power point will be broken up into different sections for the different disciplines. Each will have its own table of contents to further break the slides down.
  - Preface
  - Artists
  - Animators
  - Coders
  - Sound designers
  - Designers
- Followed by three extra designs: Co-operative game play, multiplayer game play, and a mechanic designed to add to the experience, but not take away from it.

Terms

- These are terms that will be used throughout the design document.
  - Pac-Man – Player character
  - Eat or gobble – the pellet or ghost goes into Pac-Man's mouth.
  - Pellet: small dot – main goal is to collect these
  - Big Pellet: This is a power up that makes ghosts reverse their behavior and allows the player character to "gobble" them up.
  - Tiles: the measurement used to make the level the proper size. EX: 1 Tile = 1 pellet = 8 x 8 pixels
  - Ghost: Enemies, most of the time they will be referred to as ghosts.
    - Inky – light blue ghost
    - Pinky – Pink ghost

Artists

- Artists sections will be broken up as follows
  - Asset list: reference list of every asset required
  - Hex code list – hex codes required and what part of the asset they are on.
  - Color Palette/hex code list: Just a list of hex codes and a name of what it is for.
  - Atmosphere: Look and feel
  - Requirements: name, pixel size, how to make it and save it for animators if need be.
  - Feel

Asset List pt.1

- This is a list of every asset that is required: Please not, this is only a list. For further information, please refer further into the PowerPoint.)
  - All assets should be 8 bit
- Pac-Man
- Ms. Pac-Man
- Ghosts (do not include eyes on any of the ghosts)
  - Basic Ghost model
  - Light Blue ghost overlay
  - Red ghost overlay
  - Orange ghost overlay
  - Pink ghost overlay
- Eyes (used for ghost eyes and “Ghost death” eyes)
  - Up
  - Down
  - Left
  - right
- Fruit
  - cherry
  - Strawberry
  - Peach 1
  - Peach2
  - Apple1
  - Apple2
  - Melon1
  - Melon2
  - Galaxian1
  - Galaxian2
  - Bell1
  - Bell2
  - Key 1-10
- Small pellet
- Big pellet
- Level

Hex Codes

- This is a list of hex codes for the assets
- Numbers and writing
  - Ready! - ffff00
  - Game over – fe0000
  - All other letters - dedede
- Fruit
  - Key
    - Top - 0098f8
    - Main – ffffff
    - Indent/shadow – 080808
    - Loop - 08080a
  - Bell
    - Metal - ffff00
    - Shadow – 080808
    - Inner bell - 0098f8
    - Clapper - ffffff
  - Peach
    - Main - ffb8de
    - Indent - ff97de
    - Leaves - 00ff00
  - Strawberry
    - Main - fe0000
    - Seeds - fff5f6
    - Leaves - 089e09
  - Cherry
    - Main - fe0000
    - Shine – ffeded
    - Stem - d25b01
  - Galaxian –
    - Top -fe0000
    - Sides - 0204e5
- Pac-Man
  - Body – ffff00
  - Ms. Pac-Man
  - Body - fef200
  - Ribbon - b62705
- Level
  - Walls
    - Wall – 2121de
    - Ghost “Door” - ffb8de
    - Background - 00000
- Ghosts
  - Scared ghost (dark blue)
    - Main body - 0000fe
    - Eyes and Mouth - ffb897
  - Eyes –
    - White of eyes – dedede
    - Pupils – 2121de
  - Red Ghost (Blinky)
    - Main body - ff0000
  - Orange Ghost (Clyde)
    - Main body – ffb847
  - Ping Ghost (Pinky)
    - Main body – ffb8de
  - Blue_ghost (Inky)
    - Main body –ff0000
- Ghost blob
    - Main body – ffb8de
- Big pellet
  - Body - ffb897
- Pellet
  - Inner - ffb897

Pac-Man

- Size = 16 x 8 pixels
  - For large Pac-Man: 42 x 42
- Hex code
  - Body – ffff00
- Look and feel –Should look like a yellow circle and a yellow circle with a 1/5 missing.
- Make with mouth open and closed for animators.
  - Create one version of each facing 0°, 90°, 180 °, and 270°
  - For intermission make 3x size Pac-Man facing 180° open and closed.

  - Make one set of 10:
    - Pac-Man opens from the right side (180°), and opens farther, revealing more of the black background and slowly disappearing, losing 36° out of 360° each time, until he disappears.

Basic_ghost

- Ghost = 16 x 8 pixels
- White with black outline
- Look and feel – should look like a hung sheet with a jagged bottom edge.
- This is a place holder and does not go into the game, it is for reference purposes as a guide.
- Make 3 versions of basic ghost with cape in different positions

Dark_Blue_Ghost “Scared” ghost

- Size – 16 x 8 pixels
- Hex codes
  - Main body - 0000fe
  - Mouth and eyes - 13f2ff
- Use basic ghost outline
- Look and feel – should look “Scared”
- fill entirely with main body for all 3 versions of “Basic_ghost” and
  - replace main body with 0000fe,
    - Use 13f2ff for mouth and eyes (this mouth and eyes are separate from other ghosts, should look “scared”)

Ghost eyes

- Size – 5 x 5
- Hex codes
    - White of eyes – dedede
    - Pupils – 2121de
  - Main white of the eye is 4 x 4 cross
    - Main pupil is 2 x 2
- Look and feel – As if they are saying “Oooooh hi there!” or “Yummy!”
- Make 4 versions of eyes with pupils at 0°, 90°, 180 °, and 270°

Ghosts

- Note: other than the Dark Blue ghost the other ghosts (Ping Ghost , Orange Ghost Blue ghost , Red Ghost) are made the same way.
- Size – 16 x 8 pixels
  - Size is for all ghosts listed below
- Look and feel – ghosts should look excited to be there and have an almost child like feel of “What is that over there?”
- Use Basic_ghost 1-3
- Hex codes
  - Red Ghost (Blinky)
    - Main body - ff0000
  - Orange Ghost (Clyde)
    - Main body – ffb847
  - Ping Ghost (Pinky)
    - Main body – ffb8de
  - Blue_ghost (Inky)
    - Main body –ff0000
- Use basic ghost as guide
  - Color in the 3 versions with hex codes listed above
    - Take those 3 versions and save as separate files
      - Then make 4 different versions of each piece for animation by adding the eyes 0°, 90°, 180 °, and 270°
        - Then save as separate files 4 separate files for each of the 3 separate animations

Ghost blob

- This is used in one cut scene
- Size – 16 x 8 pixels
- Look and feel – should look like a scared ghost that was turned into a blob it was so scared, should look like it is urging itself forward.

- Hex codes
  - Ghost blob
    - Main body - ff0000
- Make 3 versions of the ghost as if he is running using the 180° eyes on each.

Level

- Level size: 240 x 320 pixels
- Hex codes
  - Walls
    - Wall – 2121de
    - Ghost “Door” - ffb8de
- Look and feel – should feel bright and shiny, while having a cool temperature feel to it.
- Follow outline provided by designers for size

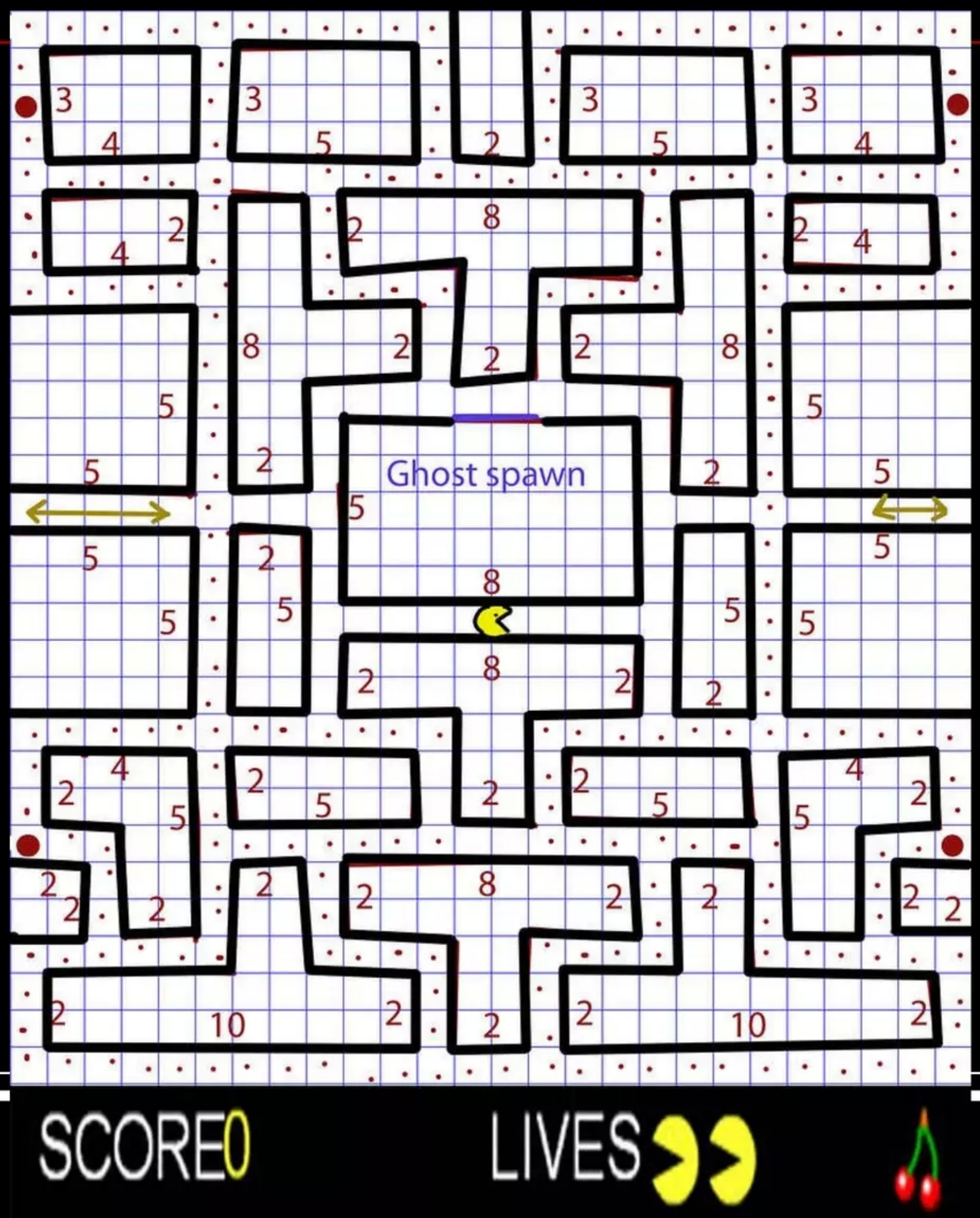
Fruit

- Fruit size – 8 x 8 pixels
- Hex codes
  - Key
    - Top - 0098f8
    - Main – ffffff
    - Indent/shadow – 080808
    - Loop - 08080a
  - Bell
    - Metal - ffff00
    - Shadow – 080808
    - Inner bell - 0098f8
    - Clapper - ffffff
  - Peach
    - Main - ffb8de
    - Indent - ff97de
    - Leaves - 00ff00
  - Strawberry
    - Main - fe0000
    - Seeds - fff5f6
    - Leaves - 089e09
  - Cherry
    - Main - fe0000
    - Shine – ffeded
    - Stem - d25b01
  - Galaxian –
    - Top -fe0000
    - Sides - 0204e5
- Look and feel – Shiny! Fun! Yay fruit! Should give the player a sense of gladness and happiness. Yummy!
- Fruit should be saved as one file and look like its assigned name.

Numbers and writing

- Hex codes
  - Ready! - ffff00
  - All other letters - dedede
- Ready! Size: 46 x 7
- Ready! Should look exciting!
  - Save as single file
- All other letters and numbers
  - Size: 7 x 7
- Hex codes
  - Letters and numbers - dedede

HUD Note: red numbers are not in the game



Title screen

- Size –
  - 320 x 240
- Should have all ghosts (minus scared ghost) and the name of the ghost in the same hex code for lettering

Game over text

- Game over text
- Size - 92 x 7
  - Game over – fe0000
- Look and feel – Doooooom, play again! That is what the player should feel when they see this.

Animators

- These are the sections of this part of the PowerPoint
  - Animation list
  - Animations and the description of each scene

List of animations needed

- Pac-Man
- Ghosts
  - “Scared” dark blue
  - Light blue
  - Red
  - Orange
  - pink
- Large pellet
- Blinking 1 up
- Intermissions
  - 1
  - 2
  - 3

Pac-Man

- Assets used: Pac-Man 0°, 90°, 180 °, and 270°, open and closed mouthed
- Frames – 2 per
  - Time split in half for each frame
- Scene Time - .5 seconds
- Look and feel – Oh tasty pellets of goodness! Gimme gimme.
- There should be 3 frames of closed – open Pac-Man facing, using the assets provided by artists 0°, 90°, 180 °, and 270°
  - Should be able to loop
  - time
- Frames: 10
- Scene time: 1 second
- One animation using 10 set for disappearing
  - If Pac-Man enters a tile with a ghost
    - Then play animation

Ghosts

- Assets used: Red ghost, blue ghost, orange ghost, pink ghost, and dark blue ghost 1-3, with eye facings 0°, 90°, 180 °, and 270°.
- Frames – 3 per
- Time - .75 seconds
  - .25 seconds per frame
- Look and feel – I'm coming to get you.
- There should be 4 scenes made per ghost
- One made per facing 0°, 90°, 180 °, and 270° of eyes using all 3 frames that were made with that particular facing
  - Example: 3 frames of animation using 0° to make one complete scene with that particular ghost.

Big pellet

- Assets used: Big pellet
- Frames – 2
- Scene time - .5 seconds
- Look and feel – blinking
- Should use “Big pellet” asset and make one frame with big pellet in it and one frame without it.

1 Up

- Assets used: 1 Up
- Frames – 2
- Scene time - .8 seconds
  - Frames are .4 seconds a piece
- Look and feel – blinking
- Should use the “1 Up” asset and make one frame with the text in it and one blank frame

Intermission 1

- Assets used: Pac-Man open and closed at 0°, 180°, and red ghost 1-3 at 0°, 180°
- Time: 10 seconds
- Frames: 20-40
- Description: Pac-Man is running away from red ghost horizontally across the screen (right to left) and the red ghost is hot on his heels. They disappear off of the screen left side)…oh no what happened? Pac-Man comes back onto the screen (left side) and he is 3x his size and the ghost has turned to "Scared ghost" (dark blue) and is running away scared. Pac-Man chases him to the other side of the screen (left to right) horizontally and they disappear off the edge (right side). - End scene

Intermission 2

- Assets used: Pac-Man open and closed at 0°, large Pac-Man open and closed at 180°, and red ghost 1-3 at 0°, 180°
- Time: 10 seconds
- Frames: 20-40
- Description: Pac-Man is chased onto the screen (right side) by red ghost. They get to the center of the screen and Pac-Man continues on. Red ghost stays in the center and looks around for Pac-Man. "????where did he go?" - End scene

Intermission 3

- Assets used: Pac-Man open and closed at 0°, red ghost 1-3 at 0°, Blob 1-3
- Time: 10 seconds
- Frames: 20 - 40
- Description: Pac-Man is being chased across the screen horizontally (right to left). Oh no! They disappear off the screen and then the ghost blob appears (Left side) running away from something (left to right), though it is never shown. It disappears off the screen (right side). Scene end.

Coders

- This section is for programmers.
- It contains tables and information that is needed to program the game.
- Note: Programmers should refer to the sound section for sound design/implementation for coding purposes

Layout

- The following area is done in this format:
  - Victory win/loss conditions
  - Controls
  - Ghost AI
    - Red ghost
    - Dark blue ghost
    - Blue ghost
    - Pink ghost
    - Orange ghost
  - Level Layout
  - Ghost pen
  - Movement and collision
    - Warp wall
  - List of assets for the game
  - Intended purpose of asset
    - Actions asset takes
    - Animations
    - When they take place
    - What they are used for
  - Scoring
    - 1 ups and scoring
  - Engine requirements

Victory win/loss conditions

- Win conditions
  - Per level
    - All pellets in the level are eaten
  - Per game
    - Player eats all pellets in all levels 1-256
- Loss conditions
  - Per level
    - Player runs out of lives
  - If player runs out of lives
    - Player gets “Counting screen” and counts down from 9-0
      - At 0 player gets “Game Over”
        - Game ends

Starting a game

- Actions:
- Insert coin/hit start
  - Player starts at 5 lives
    - Screen cuts to level screen
    - “Ready!” is shown on screen
    - Game Begins
      - Player gains control of Pac-Man

Controls

- Controls are simple and binary, should work as on/off and operate one at a time.
- Once a direction has been chosen, Pac-Man will continue forward without movement on the joystick
- For purposes of description, consider the top side of the screen to be 90° and the left side to be 0°.
  - Joystick pushed to 0° (-X axis)- Pac-Man turns left/ moves in the 0° axis,
  - Joystick pushed to 90° (+Y Axis) - Pac-Man moves up, 90° axis,
  - Joystick pushed to 180 ° (+X Axis) - Pac-Man moves left, 180° axis,
  - Joystick pushed to 270° (-Y Axis)- Pac-Man moves down, 270° axis,

Lives

- How to get lives
  - Start game
    - Player starts with 5 lives
  - Insert quarter/use continue
    - Player gets 5 lives
- How to lose lives
  - Player enters collision box of Ghost at any time.
- If player runs out of lives
    - Player gets “Counting screen” Counts down from 9-0
      - At 0 player gets “Game Over”
        - Game ends
        - Use base numbers for counting at center of screen
        - Game Proceeds to start screen
        - Player must insert 1 quarter/press start
        - All levels reset, player starts at level 1 upon game start

Ghost AI

- The ghost AI section is broken up into 5 sections for each ghost type.
  - Red ghost
  - Pink ghost
  - Light blue ghost
  - Orange ghost
  - Dark blue ghost

Red Ghost AI

- Red ghost is the "Aggressive/shadow ghost"
  - Note: Remember 1 "tile" = a 16 x 8 pixel square
  - Behavior – will chase the player relentlessly and as pellets get eaten it speeds up.
    - Red ghost will always follow the exact Tile that the player is on.
    - If red ghost leaves the "ghost pen"
      - Then it begins to follow the player's current tile at all times.
- If X (part 1) pellets are left
  - Then Red ghost speeds up first time
    - If Y (part 2) pellets are left
      - Red ghost speeds up final time
- Speed tables are on the next page.
- Prior to satisfying the pellet requirements for speed increase/s, Red Ghost moves at the same speed as the other ghosts.
  - Level 1 = 75% Pac-Man speed
  - Level 2-4 = 85% Pac-Man speed
  - Level 5+ = 95% Pac-Man speed

Red ghost speed increase table
Ghost speed is based on Pac-Man base speed

Level	Pellets left aggressive AI Pt. 1	Red ghost speed Aggressive AI Pt. 1	Pellets left aggressive AI Pt. 2	Red ghost speed Aggressive AI Pt. 2
Level 1	20	80%	10	85%
Level 2	30	90%	15	95%
Level 3	40	90%	20	95%
Level 4	40	90%	20	95%
Level 5	40	100%	20	105%
Level 6	50	100%	25	105%
Level 7	50	100%	25	105%
Level 8	50	100%	25	105%
Level 9	60	100%	30	105%
Level 10	60	100%	30	105%
Level 11	60	100%	30	105%
Level 12	80	100%	40	105%
Level 13	80	100%	40	105%
Level 14	80	100%	40	105%
Level 15	100	100%	50	105%
Level 16	100	100%	50	105%
Level 17	100	100%	50	105%
Level 18	100	100%	50	105%
Level 19	120	100%	60	105%
Level 20	120	100%	60	105%

Pink ghost AI

- Pink ghost is the “has a crush on Pac-Man”
  - Note: Remember 1 “tile” = a 8 x 8 pixel square
  - Behavior – The pink ghost has a crush on Pac-Man, so she will always trace Pac-Man and follow four tiles ahead of him, but if he looks at her, she will run after 1 second, being “Frightened”
    - Pink ghost always moves at
      - Level 1 = 75% Pac-Man speed
      - Level 2-4 = 85% Pac-Man speed
      - Level 5+ = 95% Pac-Man speed
    - If Pac-Man is not within 8 tiles of pink ghost
      - Random movement begins
    - If Pac-Man comes within 8 tiles of pink ghost
      - Then pink ghost begins following 4 tiles ahead of Pac-Man at all times, adjusting accordingly
    - if Pac-Man comes within 2 tiles of her “Looks at her”,
      - Then it will run away and go the opposite direction from Pac-Man.

Orange ghost AI

- Orange ghost is the “is shy”
  - Note: Remember 1 “tile” = a 16 x 8 pixel square
  - Behavior – orange ghost will behave erratically and does not have a set pattern.
    - Orange ghost always moves at
      - Level 1 = 75% Pac-Man speed
      - Level 2-4 = 85% Pac-Man speed
      - Level 5+ = 95% Pac-Man speed
    - If Pac-Man is not within 8 tiles of Orange ghost
      - Then Random movement begins
        - Random movement begins again if Pac-Man leaves 8 tile radius
    - If Pac-Man comes within 8 tiles of Orange ghost
      - Then orange ghost begins to follow the current tile of Pac-Man.

Light blue ghost

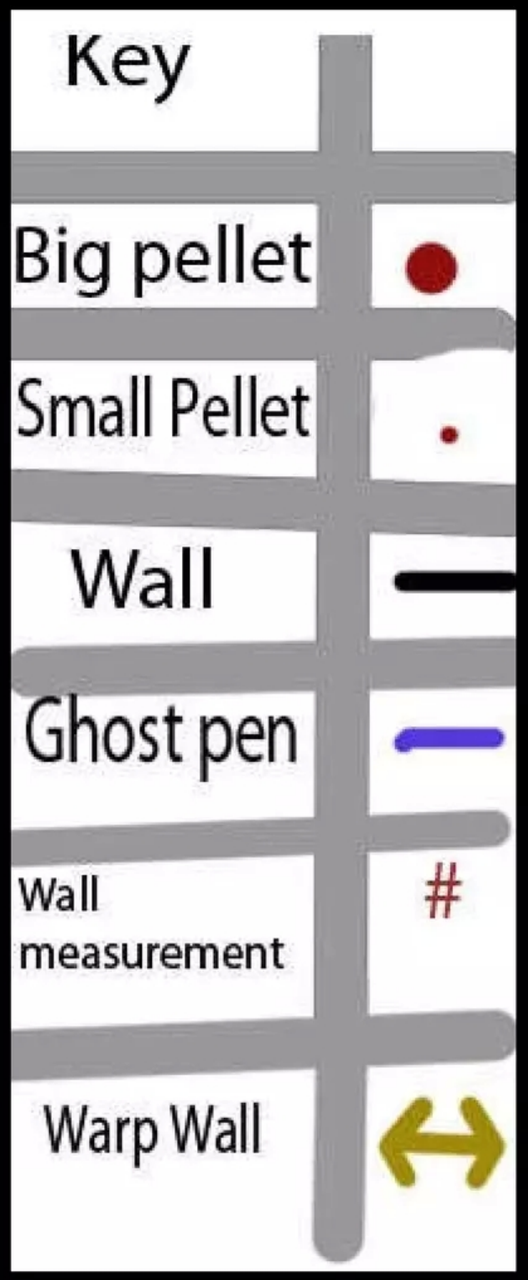
- Pink ghost is the “random ghost”
  - Note: Remember 1 “tile” = a 16 x 8 pixel square
  - Behavior – Inky is strange, he actually behaves like the other three and cannot seem to make up his mind.
    - Light blue ghost always moves at
      - Level 1 = 75% Pac-Man speed
      - Level 2-4 = 85% Pac-Man speed
      - Level 5+ = 95% Pac-Man speed
  - This ghost was included last, please refer to Red Ghost AI, Pink ghost AI, and Orange ghost AI sections for specific AI references
    - Light blue ghost will perform a check every 10 seconds to decide AI
    - If 10 seconds pass (cycling/repeating)
      - Then AI check is made
        - Light blue ghost gets an AI set at random. (Pink, Orange, or Red)

Dark Blue Ghost/s

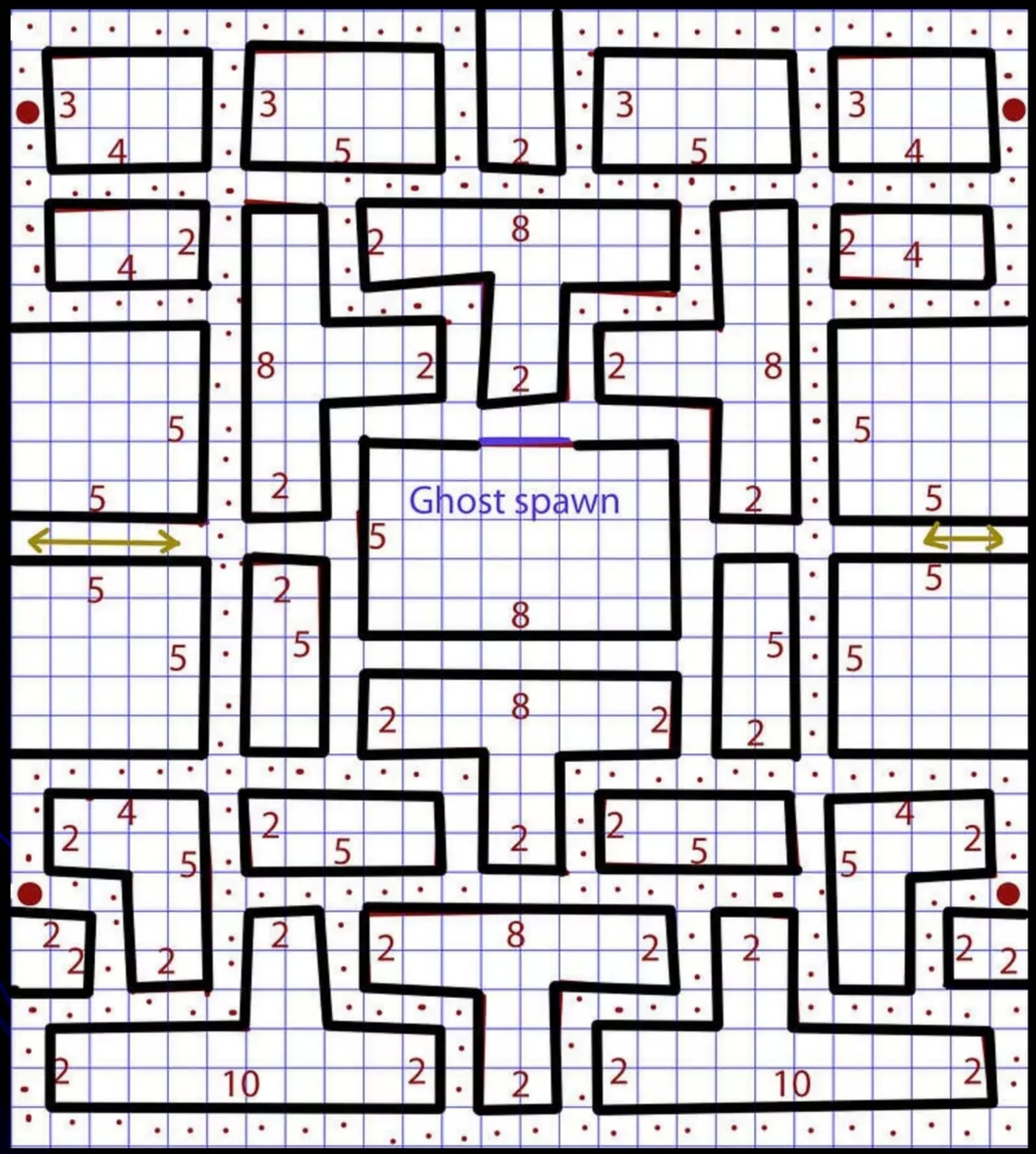
- Dark Blue ghost happens when the large pellet is eaten and all the ghosts turn dark blue and become “Frightened
  - Behavior – When “Frightened” mode is entered, ghosts will reverse their direction and wander random directions for a short period of time.
  - If large pellet is eaten
    - Ghosts enter “Frightened mode
      - If in frightened mode
        - Ghosts can be eaten for points
  - If a ghost is eaten for points
    - Then it returns (as a set of eyes) to the “Ghost pen”
      - If a ghost returns to the ghost pen
        - Then it exits as its normal self (Colored ghost: Pink, orange, light blue, and/or red)
  - Dark blue ghosts always moves at the same speed as the other ghosts (Minus red).

Level Layout: Key

- Big Pellet: Causes ghosts to enter frightened mode
- Small pellet: Eat all of these to clear the level
- Ghost Pen: Ghosts exit out of this door
- Wall measurement: Number of tiles each wall takes up.
- Warp Wall: go through this wall and appear on the other side.



Level

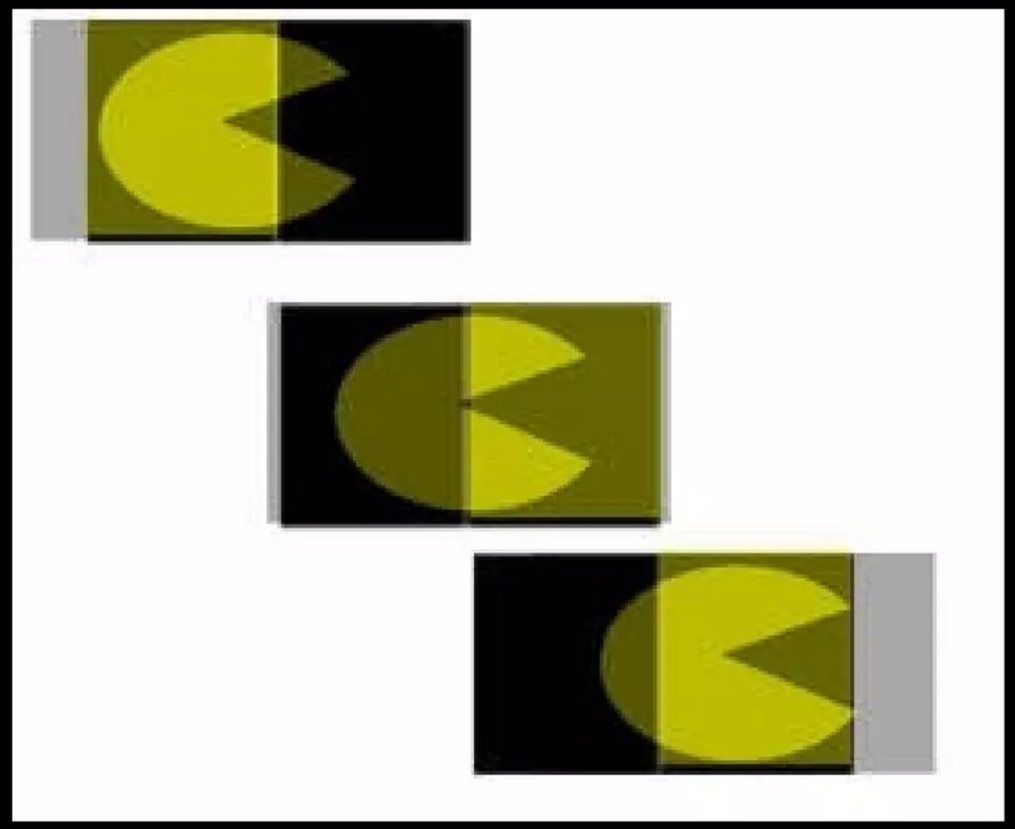


Ghost Pen

- What is the Ghost Pen?
  - The ghost pen is where all the ghosts start at the beginning of any match
- Ghosts leave in a set order
  - 1. Red
  - 2. Pink
  - 3. Blue
  - 4. orange
- If ghost leaves pen
  - Ghost begins AI sequence
- If ghost is “eaten” ghost returns to pen as a set of eyes and leaves immediately.

Ghosts/Pac-Man and the space they take up

- Ghosts take up a more than one tile, as does Pac-Man
  - Ghosts/Pac-Man take up 2 tiles
    - The “Collision” for Pac-Man is based on the “Forward” piece that is fully in one square.
      - When Pac-Man enters square, he leads with his right most quarter, which has no collision.
      - The middle piece has collision, while the back quarter has no collision.
  - Collision is used for:
    - Hitting ghosts/Ghosts hitting Pac-Man
    - Eating Pellets
    - Eating fruit
    - Eating Ghosts
  - When Pac-Man enters square and takes up the front square with his front area, the front square has full collision, while the back square has none.
    - Rinse repeat.
    - This works for all angles of movement.
  - Collision is used for:
    - Hitting ghosts/Ghosts hitting Pac-Man
    - Eating Pellets
    - Eating fruit
    - Eating Ghosts



Warp Wall

- Moving your collision area into the tile past the warp wall, causes you to appear at the other warp wall, continuing to go the same direction you were before.
  - If player enters collision square of warp wall
    - Then player appears at other warp wall traveling along same degrees of travel

Asset list/actions taken/game play use

- Asset list:
  - This is a copy paste of the asset list from the top.
- Asset information:
  - Actions asset takes: this is a list of the animations associated with the asset (if any)
  - Game play use: what association this asset has to game play

Asset List pt.1

- Note: Anything numbered 1 or 2, is the same asset, it is listed separately due to point values.
- Pac-Man
- Ghosts (do not include eyes on any of the ghosts)
  - Basic Ghost model
  - Light Blue ghost overlay
  - Red ghost overlay
  - Orange ghost overlay
  - Pink ghost overlay
- Eyes (used for ghost eyes and “Ghost death” eyes)
  - Up
  - Down
  - Left
  - right
- Fruit
  - cherry
  - Strawberry
  - Peach 1
  - Peach2
  - Apple1
  - Apple2
  - Melon1
  - Melon2
  - Galaxian1
  - Galaxian2
  - Bell1
  - Bell2
  - Key 1-10
- Small pellet
- Big pellet
- Level

Pac-Man

- Animations associated: movement at 0°, 90°, 180 °, and 270°
- Game play use: Player character
  - Movement speed: 11 Tiles per second
  - Actions taken- eat pellet, eat ghost, gain points
    - Eat pellet
      - If Pac-Man's collision square moves over pellet
        - Then Pac-Man "eats" pellet, making it disappear,
        - Points get added
    - If Pac-Man eats ghost
      - Then ghost returns to "Ghost Pen"
        - Points get added
    - If Pac-Man "dies", runs into a ghost (while not frightened)
      - Then Pac-Man loses 1 life.
        - Pac-Man starts at starting point and ghosts return to ghost pen
        - If no lives are left, "Game Over"

Light Blue ghost

- Animations associated: One made per facing 0°, 90°, 180 °, and 270° of eyes using all 3 frames that were made with that particular facing
- Game play use: Ghost attacks player

Red Ghost

- Animations associated: One made per facing 0°, 90°, 180 °, and 270° of eyes using all 3 frames that were made with that particular facing
- Game play use: Ghost attacks player

Orange ghost

- Animations associated: One made per facing 0°, 90°, 180 °, and 270° of eyes using all 3 frames that were made with that particular facing
- Game play use: Ghost attacks player

Pink Ghost

- Animations associated: One made per facing 0°, 90°, 180 °, and 270° of eyes using all 3 frames that were made with that particular facing
- Game play use: Ghost attacks player

Eyes

- Animations associated: One made per facing 0°, 90°, 180 °, and 270° of eyes using all 3 frames that were made with that particular facing
- Game play use: moves back to ghost pen after ghost is eaten and becomes active non scared ghost

Fruits

- Static models: Cherry, Strawberry, peach 1, Peach 2, Apple 1, Apple 2, Melon 1, Melon 2, Galaxian 1, Galaxian 2, Key 11-21+
- Animations associated: Static
- Game play use: Worth points. Goes towards 1 UP and final score

Small Pellet

- Animations associated: Static
- Game play use: worth points, goes towards level completion criteria, goes towards game completion criteria, goes towards high score, goes towards 1UP

Big Pellet

- Animations associated: Blinking animation
- Game play use: worth points, goes towards level completion criteria, goes towards game completion criteria, goes towards high score, goes towards 1UP, causes ghosts to become “Frightened”

Scoring

- Score goes towards “High score” at the end of the game, once game over is achieved
- Score goes towards 1UP
  - If player gets 10,000 points
    - Then player gets extra life
      - Life total goes up by +1

Pellets

- 244 pellets per maze
- Pellets = 10 points
  - Ghosts can be eaten for points consecutively for increasing points, this resets at the end of that “frightened” mode.
    - 1st ghost = 200
    - 2nd ghost = 400
    - 3rd ghost = 800
    - 4th ghost = 1600

Large pellet

- Large pellets = 50 points
  - If large pellet is eaten
    - Then Ghosts enter frightened

- Ghosts enter frightened mode for X amount of seconds dependent on level:
  - level 1 = 6 seconds
  - level 2 = 5 seconds
  - level 3 = 4 seconds
  - level 4 = 3 seconds
  - level 2 = 5 seconds
  - level 6 = 5 seconds
  - level 7 = 2 seconds
  - level 8 = 2 seconds
  - level 9 = 1 seconds
  - level 10 = 5 seconds
  - level 11 = 2 seconds
  - level 12 = 2 seconds
  - level 13 = 1 seconds
  - level 14 = 3 seconds
  - level 15 = 1 seconds
  - level 16 = 1 seconds
  - level 17 = N/A seconds
  - Level 18 = 1 seconds
  - level 19+ = N/A seconds

Fruit

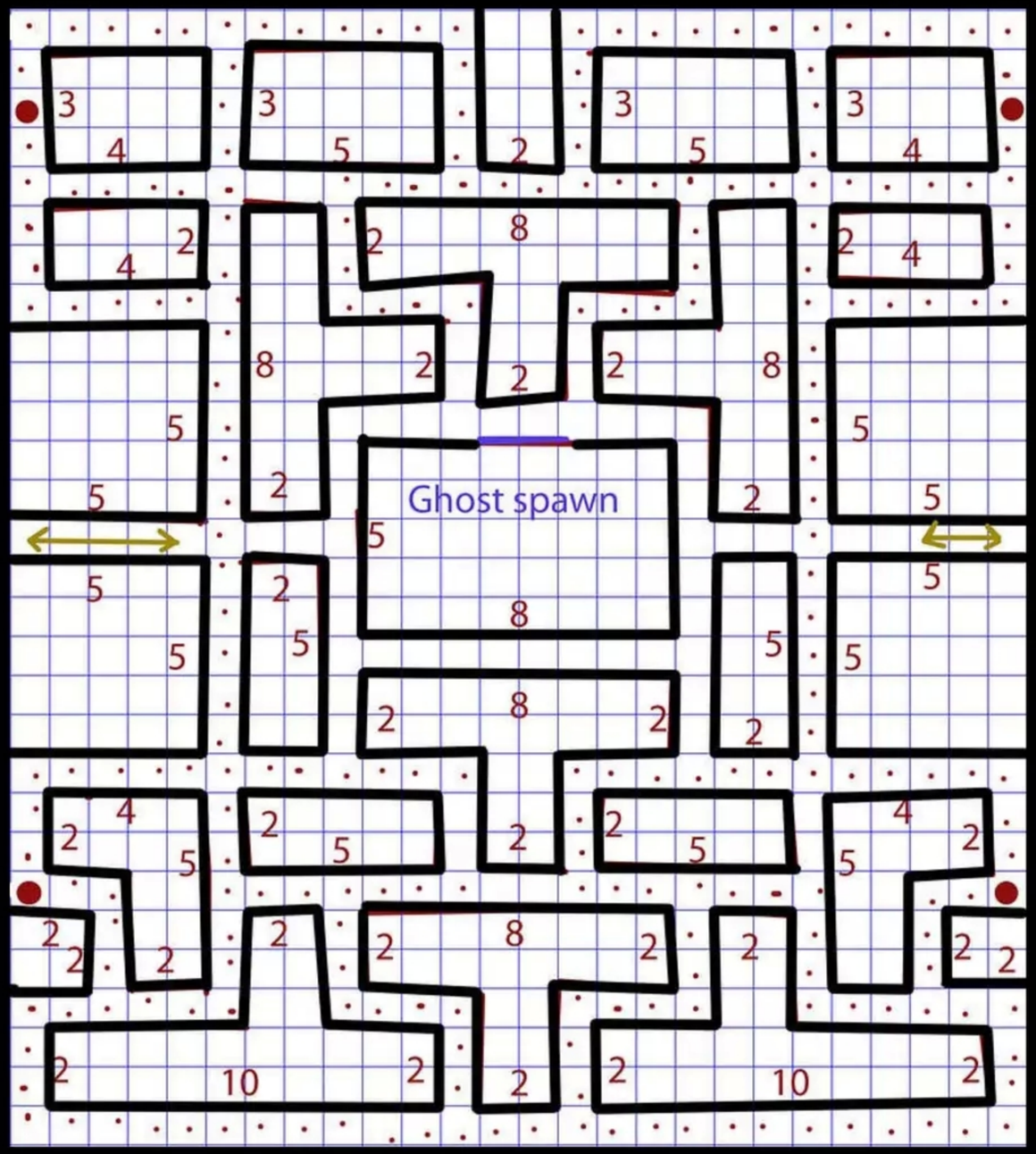
- Fruit
  - Cherry – 100 points
  - Strawberry – 300 points
  - Peach 1 - 500points
  - Peach2 – 500 points
  - Apple1 – 700 points
  - Apple2 - 700 points
  - Melon1 - 1000 points
  - Melon2 – 1000 points
  - Galaxian1 – 2000 points
  - Galaxian2 – 2000 points
  - Bell1 – 3000 points
  - Bell2 – 3000 points
  - Key 1+ - 5000 points

Engine requirements

- Quality = 8 bit
- Resolution = 320 x 240
- Support colors = RGB’
- Sound: Supports MIDI

Level collision

- Black walls and purple walls indicate level collision
- If Pac-Man collides with Black line,
  - Then Pac-Man stops moving.



Sound Design

- This is the section for sound designers
  - All sound design will be done in MIDI

List of sounds needed

- Opening level intro
- Open close mouth
- Sound of ghost moving
  - Sound of ghosts faster
  - Sound of ghosts super fast
- Ghost scared
  - Ghost scared beginning
- Pac-Man eating ghost
- Pac-Man eating fruit
- Intermission sounds
- Game over
- Pac-Man dieing

Opening level intro

- Length: 5 seconds
- Sound and feel: Should be up beat and happy, use mid octaves
- If game begins/continue is used/quarter is used/ and player enters game/enters game again
  - Then sound plays one time (repeat if previous if statement is satisfied)

Open/close mouth “eating”

- Length: .5 seconds
- Sound and feel: should sound like Pac-Man is eating pellets. Happy sounding, as if he is saying, oh yum!
- Sound should be able to loop
- If Pac-Man enters space with a pellet
  - Begin playing sound until he leaves tile
    - Continue sound/loop if there is a pellet in the following tile

Sound of ghost/s moving

- Length: .5 seconds
- Sound and feel: should sound like a rotating happy sphere.
- If ghost begins moving
  - Then play sound and loop until fast sound of ghost/s moving begins

Sound of ghost/s moving faster

- Length: .4 seconds
- Sound and feel: higher pitched version of the sound of ghost/s moving
- If ghost is moving and has satisfied requirements for the first stage of faster movement,
  - Then play sound and loop until super fast sound of ghost/s moving begins

Sound of ghost moving super fast

- Length: .3 seconds
- Sound and feel: higher pitched version of the sound of “ghost/s moving faster”
- If ghost is moving and has satisfied requirements for the first stage of faster movement,
  - Then play sound and loop until super fast sound of ghost/s moving begins

Start of ghost running away sound

- Length: 1 second
- Sound and feel: This should give a feeling of tension, but also instill excitement in the player.
- If player eats big pellet
  - Then ghosts begin “Ghost running away” sound file plays one time,
    - Then “Looped: Ghost running away” plays in a loop.

Looped: Ghost running away

- Length: .3
- Sound and feel: should sound fast, excited, and high pitched. This should give a feeling of tension to the player, as if time is running out.
- If player eats big pellet
  - Then ghosts begin “Ghost running away” sound file plays one time,
    - Then “Looped: Ghost running away” plays in a loop.

Pac-Man eating ghost

- Length: .5
- Sound and feel: Almost as if Pac-Man just went *Chomp*
- If Pac-Man enters a square with a ghost when the ghost is “Frightened”
  - Then play sound file one time.
    - Play for each time Pac-Man enters a square with a “Frightened” ghost.

Pac-Man eating pellet

- Length: .2
- Sound and feel: high pitched, quick, simple, one tone
- If Pac-Man enters a tile with a pellet
  - Then play sound one time
    - Repeat for consecutive pellets as much as needed.

Pac-Man eating fruit

- Length: .5
- Sound and feel: should be more exciting sounding than eating a pellet, one tone pitch, quick, simple.
- If Pac-Man enters a tile with a “Fruit”
  - Then play sound one time.

Intermission music

- Length: 10 seconds
- Sound and feel: should sound excited, fun, entertaining. Think sort of like Ben and Jerry.
- If Intermission begins
  - Then Play sound file one time in sync with movie.

Pac-Man Dieing

- Length: 1 second
- Sound and feel: as if you just died a bit inside and are sad. This should instill a feeling of sadness in the player and make them feel as if they need to save him.
- If Pac-Man enters a square with a ghost that is not “Frightened”
  - then he “Dies”, play dieing sound one time.

Designers

- This is reference material for designers.

Table of contents

- How this will be broken up.
  - Win/loss conditions
    - Lives
  - Level
  - Movement and collision
  - Ghost AI
  - Scoring

Victory win/loss conditions

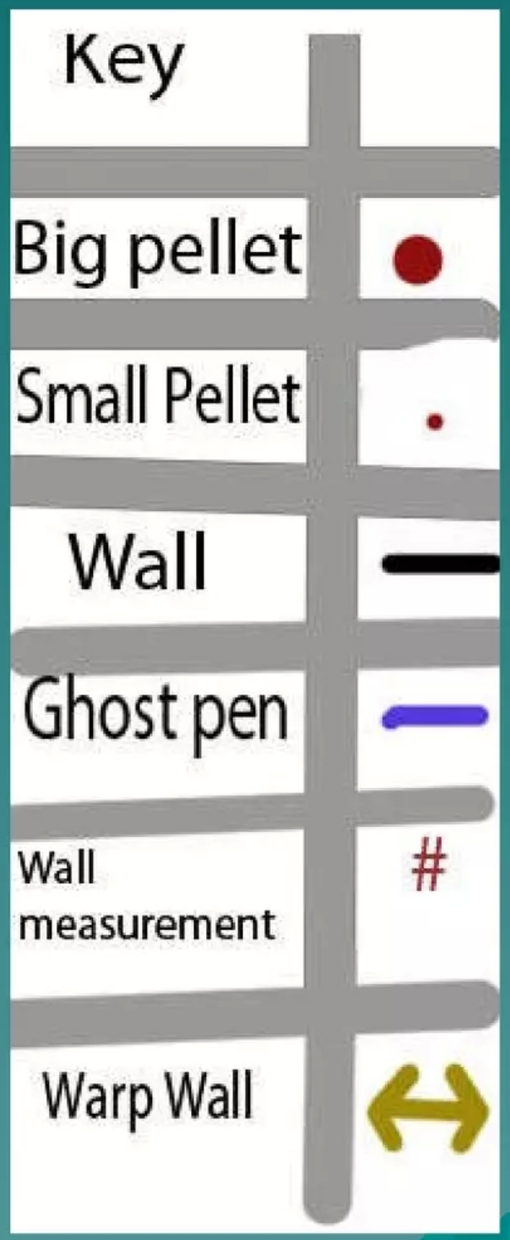
- Win conditions
  - Per level
    - All pellets in the level are eaten
    - Pellets per level: 244
  - Per game
    - Player eats all pellets in all levels 1-256
- Loss conditions
  - Per level
    - Player runs out of lives
  - If player runs out of lives
    - Player gets “Counting screen” and counts down from 9-0
      - At 0 player gets “Game Over”
        - Game ends

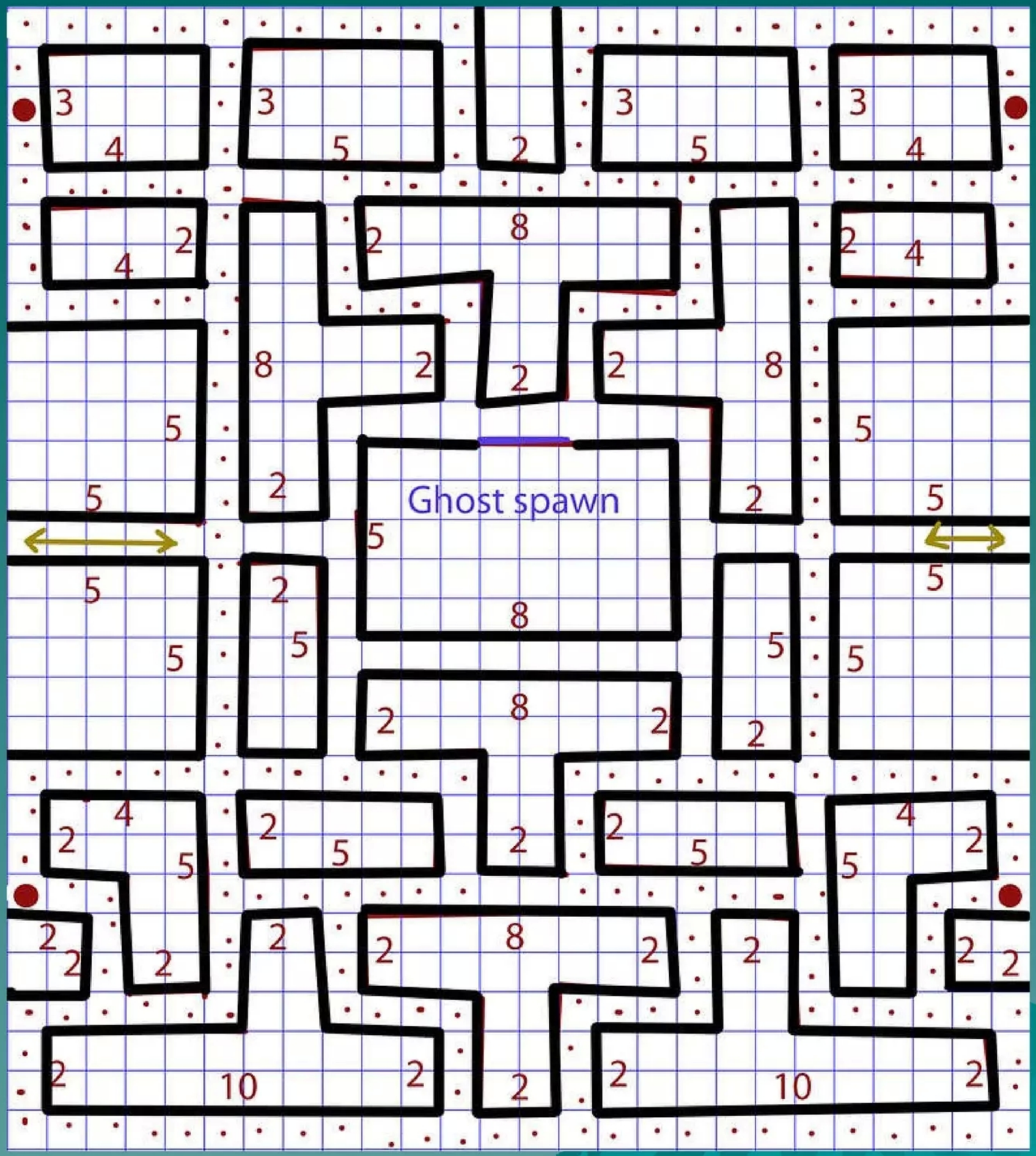
Lives

- How to get lives
  - Start game
    - Player starts with 5 lives
  - Insert quarter/use continue
    - Player gets 5 lives
- How to lose lives
  - Player enters collision box of Ghost at any time.
- If player runs out of lives
    - Player gets “Counting screen” Counts down from 9-0
      - At 0 player gets “Game Over”
        - Game ends
        - Use base numbers for counting at center of screen

Level Layout: Key

- Big Pellet: Causes ghosts to enter frightened mode
- Small pellet: Eat all of these to clear the level
- Ghost Pen: Ghosts exit out of this door
- Wall measurement: Number of tiles each wall takes up.
- Warp Wall: go through this wall and appear on the other side.




Ghost spawn

Pac-Man Movement

- Pac-Man moves: 11 tiles/second
- Which means, Pac-Man can eat, 11 pellets a second.
- Cornering
  - Pac-Man can begin turning ½ a tile prior to the tile he is turning into
    - If turn is initiated, during or ½ a tile prior to entering tile player would like to turn at,
      - Then Pac-Man turns

Red Ghost AI

- Red ghost is the "Aggressive/shadow ghost"
  - Note: Remember 1 "tile" = a 16 x 8 pixel square
  - Behavior – will chase the player relentlessly and as pellets get eaten it speeds up.
    - Red ghost will always follow the exact Tile that the player is on.
    - If red ghost leaves the "ghost pen"
      - Then it begins to follow the player's current tile at all times.
  - If X pellets are left
    - Then Red ghost speeds up first time
      - If Y (part 2) pellets are left
        - Red ghost speeds up final time

Red ghost speed increase table
Ghost speed is based on Pac-Man base speed

http://home.comcast.net/~jpittman2/Pac-Man/Pac-Mandossier.html

Level	Pellets left aggressive AI Pt. 1	Red ghost speed Aggressive AI Pt. 1	Pellets left aggressive AI Pt. 2	Red ghost speed Aggressive AI Pt. 2
Level 2	30	90%	15	95%
Level 3	40	90%	20	95%
Level 4	40	90%	20	95%
Level 5	40	100%	20	105%
Level 6	50	100%	25	105%
Level 7	50	100%	25	105%
Level 8	50	100%	25	105%
Level 9	60	100%	30	105%
Level 10	60	100%	30	105%
Level 11	60	100%	30	105%
Level 12	80	100%	40	105%
Level 13	80	100%	40	105%
Level 14	80	100%	40	105%
Level 15	100	100%	50	105%
Level 16	100	100%	50	105%
Level 17	100	100%	50	105%
Level 18	100	100%	50	105%
Level 19	120	100%	60	105%
Level 20	120	100%	60	105%
Level 21+	120	100%	60	105%

Pink ghost AI

- Pink ghost is the “has a crush on Pac-Man”
  - Note: Remember 1 “tile” = a 16 x 8 pixel square
  - Behavior – The pink ghost has a crush on Pac-Man, so she will always trace Pac-Man and follow four tiles ahead of him, but if he looks at her, she will run after 1 second, being “Frightened”
    - Pink ghost always moves at
      - Level 1 = 75% Pac-Man speed
      - Level 2-4 = 85% Pac-Man speed
      - Level 5+ = 95% Pac-Man speed
    - If Pac-Man is not within 8 tiles of pink ghost
      - Random movement begins
    - If Pac-Man comes within 8 tiles of pink ghost
      - Then pink ghost begins following 4 tiles ahead of Pac-Man at all times, adjusting accordingly
    - if Pac-Man comes within 2 tiles of her “Looks at her”,
      - Then it will run away and go the opposite direction from Pac-Man.

Orange ghost AI

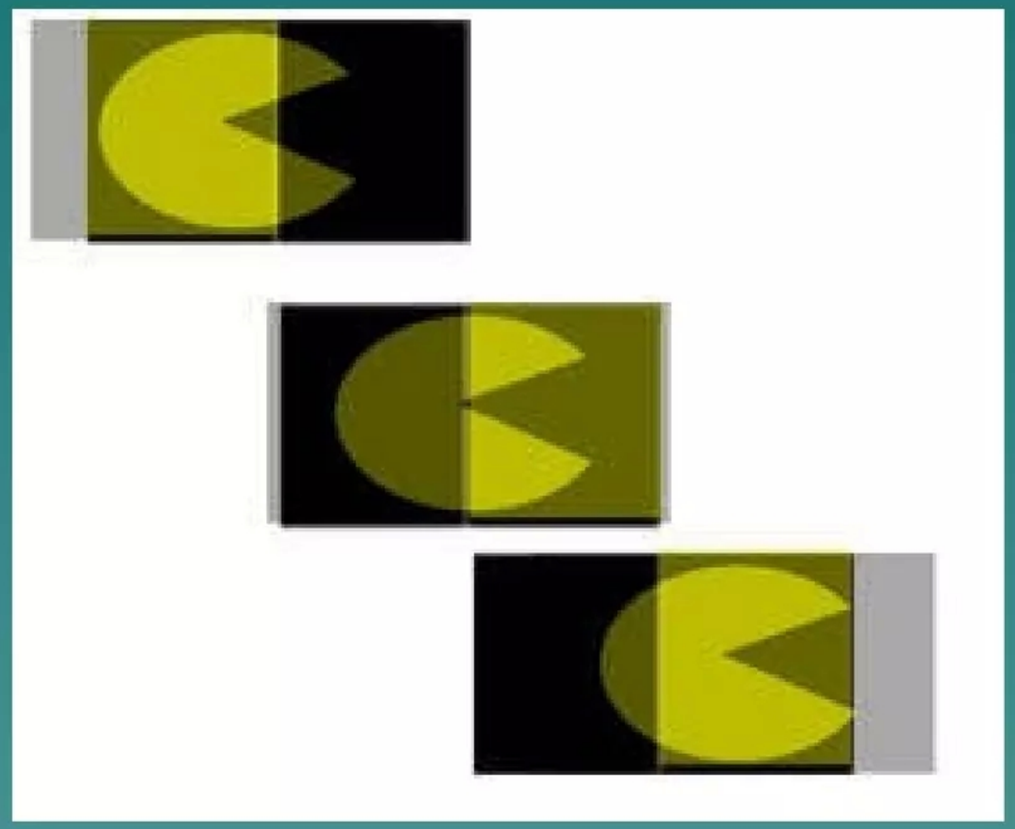
- Orange ghost is the "is shy"
  - Note: Remember 1 "tile" = a 16 x 8 pixel square
  - Behavior – orange ghost will behave erratically and does not have a set pattern.
    - Orange ghost always moves at
      - Level 1 = 75% Pac-Man speed
      - Level 2-4 = 85% Pac-Man speed
      - Level 5+ = 95% Pac-Man speed
    - If Pac-Man is not within 8 tiles of Orange ghost
      - Then Random movement begins
        - Random movement begins again if Pac-Man leaves 8 tile radius
    - If Pac-Man comes within 8 tiles of Orange ghost
      - Then orange ghost begins to follow the current tile of Pac-Man.

Light blue ghost

- Pink ghost is the “random ghost”
  - Note: Remember 1 “tile” = a 16 x 8 pixel square
  - Behavior – Inky is strange, he actually behaves like the other three and cannot seem to make up his mind.
    - Light blue ghost always moves at
      - Level 1 = 75% Pac-Man speed
      - Level 2-4 = 85% Pac-Man speed
      - Level 5+ = 95% Pac-Man speed
  - This ghost was included last, please refer to Red Ghost AI, Pink ghost AI, and Orange ghost AI sections for specific AI references
    - Light blue ghost will perform a check every 10 seconds to decide AI
    - If 10 seconds pass (cycling/repeating)
      - Then AI check is made
        - Light blue ghost gets an AI set at random. (Pink, Orange, or Red)

Ghosts/Pac-Man and the space they take up

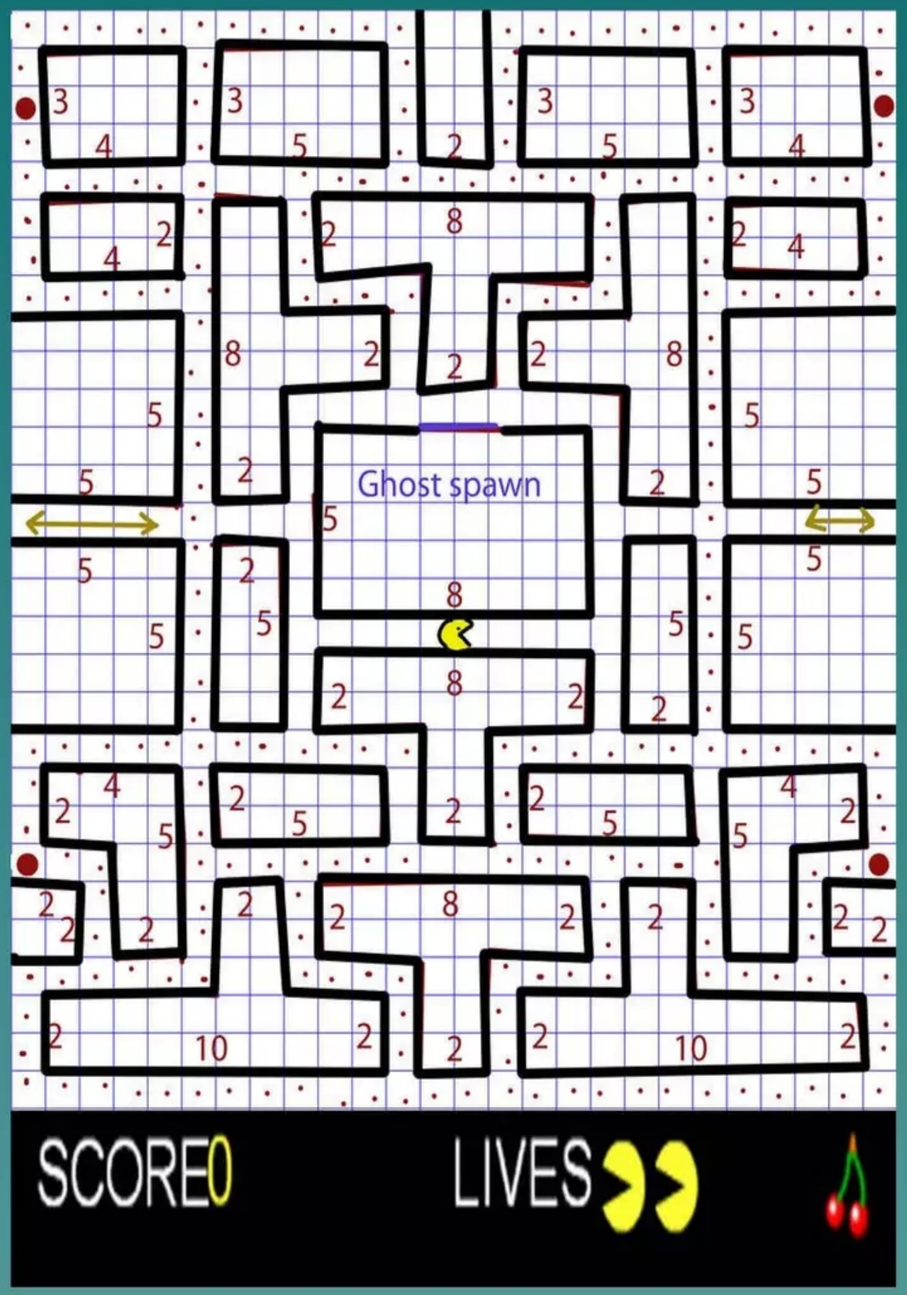
- Ghosts take up a more than one tile, as does Pac-Man
- 1 tile = 8 x 8 pixel square
  - Ghosts/Pac-Man take up 2 tiles
    - The "Collision" for Pac-Man is based on the "Forward" piece that is fully in one square.
      - When Pac-Man enters square, he leads with his right most quarter, which has no collision.
      - The middle piece has collision, while the back quarter has no collision.
  - When Pac-Man enters square and takes up the front square with his front area, the front square has full collision, while the back square has none.
    - Rinse repeat.
    - This works for all angles of movement.
  - Collision is used for:
    - Hitting ghosts/Ghosts hitting Pac-Man
    - Eating Pellets
    - Eating fruit
    - Eating Ghosts



Warp Wall

- Moving your collision area into the tile past the warp wall, causes you to appear at the other warp wall, continuing to go the same direction you were before.
  - If player enters collision square of warp wall
    - Then player appears at other warp wall traveling along same degrees of travel

HUD



- Note: red numbers, Brown arrows, blue letters are not in the game.
- Score: increases as points are accrued
- Lives: Shows the number of lives that the player currently has
- Cherry, add other fruits as player eats fruit.

Scoring

- Score goes towards “High score” at the end of the game, once game over is achieved
- Score goes towards 1UP
  - If player gets 10,000 points
    - Then player gets extra life
      - Life total goes up by +1

Pellets

- 244 pellets per maze
- Pellets = 10 points
  - Ghosts can be eaten for points consecutively for increasing points, this resets at the end of that "frightened" mode.
    - 1st ghost = 200
    - 2nd ghost = 400
    - 3rd ghost = 800
    - 4th ghost = 1600

Large pellet

- Large pellets = 50 points
  - If large pellet is eaten
  - Then Ghosts enter frightened

- Ghosts enter frightened mode for X amount of seconds dependent on level:
  - level 1 = 6 seconds
  - level 2 = 5 seconds
  - level 3 = 4 seconds
  - level 4 = 3 seconds
  - level 2 = 5 seconds
  - level 6 = 5 seconds
  - level 7 = 2 seconds
  - level 8 = 2 seconds
  - level 9 = 1 seconds
  - level 10 = 5 seconds
  - level 11 = 2 seconds
  - level 1 = 12 seconds
  - level 13 = 1 seconds
  - level 14 = 3 seconds
  - level 15 = 1 seconds
  - level 16 = 1 seconds
  - level 17 = N/A seconds
  - Level 18 = 1 seconds
  - level 19+ = N/A seconds

Fruit

- Fruit
  - Cherry – 100 points
  - Strawberry – 300 points
  - Peach 1 - 500points
  - Peach2 – 500 points
  - Apple1 – 700 points
  - Apple2 - 700 points
  - Melon1 - 1000 points
  - Melon2 – 1000 points
  - Galaxian1 – 2000 points
  - Galaxian2 – 2000 points
  - Bell1 – 3000 points
  - Bell2 – 3000 points
  - Key 1+ - 5000 points

Test 3: Innovation

Speed boost

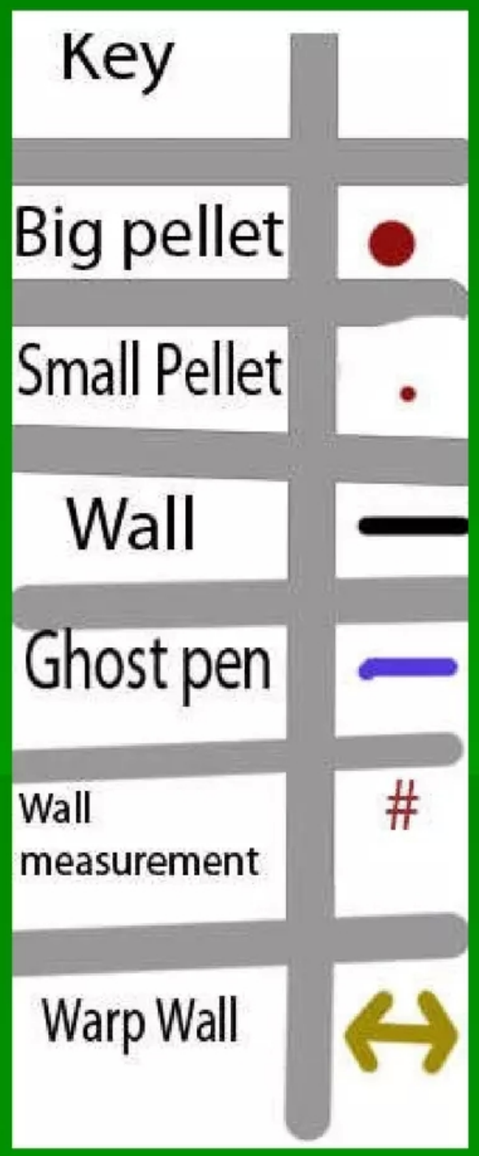
Speed Boost Tiles

- These are tiles on the level that when the player passes over them, he/she gains a temporary speed boost of +50%
- Note: These tiles do not effect ghost movement.

Speed boost mechanics

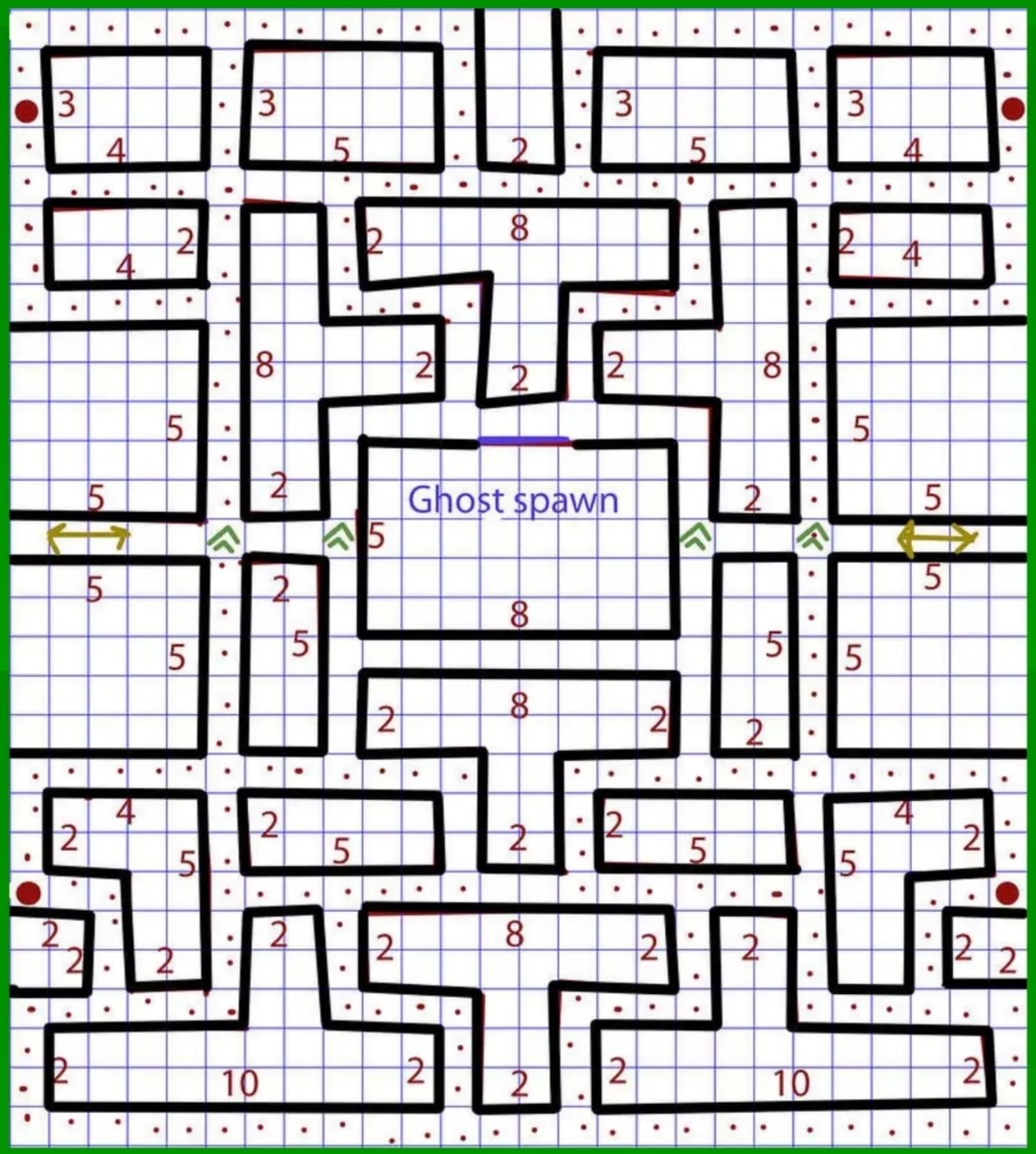
- Entering the tile with the Speed Boost Tile with the collision square of Pac-Man, causes Pac-Man to gain a 1.5 second speed enhancement.
- Pac-Man's normal speed is 11 tiles per a second.
- When he gets the speed boost, his speed increases to 16 tiles per a second.
- Player can gain a maximum of 2 speed boosts.
  - If player gains first speed boost
    - 1.5 second duration
      - If Player gains second speed boost
        - 1.5 second timer resets
  - Due to placement, this is stackable.
    - Passing over one
      - +50% speed boost to 11= 1.5(11)= 16 tiles per second (Round down)
      - +50% speed boost to 16 A second = 1.5(16) = 24 tiles per second
        - If player gains second speed boost

Speed Boost Tile placement



- This is the speed tile
- It takes up one tile area and replaces a pellet if the pellet is present in the tile (Lowering the pellet count per level to 242)
- The rest of the key:
- Big Pellet: Causes ghosts to enter frightened mode
- Small pellet: Eat all of these to clear the level
- Ghost Pen: Ghosts exit out of this door
- Wall measurement: Number of tiles each wall takes up.
- Warp Wall: go through this wall and appear on the other side.

Level Map with Speed Boost Tile



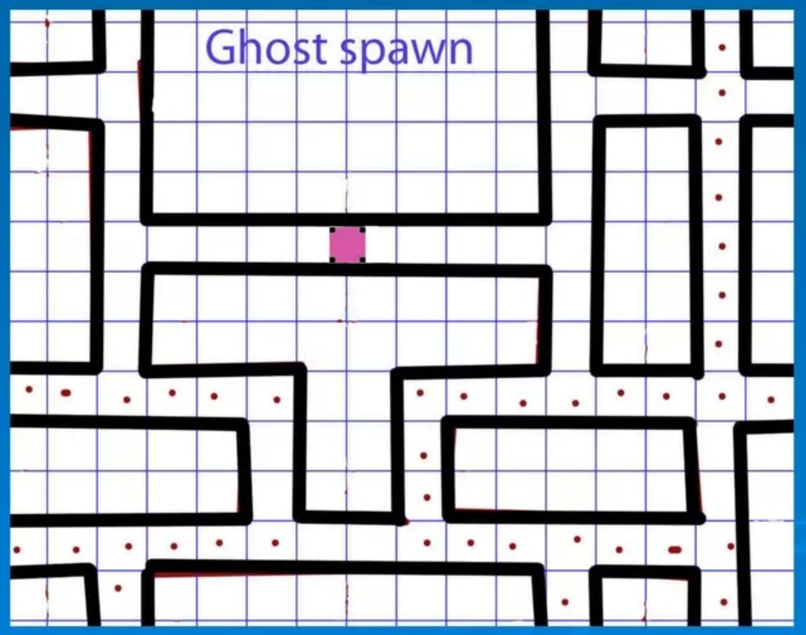
Test 4: risk reward game play

The Super Pellet!!!!!!

The Super Pellet

- What is it?
  - It causes ghosts to become “Aggressive” and attack Pac-Man, but oops! The ghosts also appear to be edible.
    - Use it to your advantage and munch down a ghost or four. But, be careful, it only has a set amount of time that it is active and whoops.
    - When time is up, ghosts are no longer so yummy and attack Pac-Man for real.

What it looks like and where it appears



- The Super pellet looks like a new, improved, and awesome version of the normal large pellet.
  - It is colored differently to distinguish it.
  - Top left, what it looks like
  - Bottom left, where it appears.

How it appears

- The Super pellet appears at random intervals between when normal fruit appear.
  - Every time a fruit is about to “Spawn”, do a check between 1-3
    - If 2 or 3,
      - Then fruit appears as normal
    - If 1
      - Then Super Pellet appears in the place of the fruit.

What levels does it appear in?

- Super pellet only appears in levels with a “Fright timer”
- After level 19, there is no fright timer for ghosts, so it does not appear.

Super Pellet timer

- This is how long fright lasts when the normal Large Pellet is eaten.
- Super Pellet works off of the same timer.
- Timer is listed to the right, per level

- Ghosts enter frightened mode for X amount of seconds dependent on level:
  - level 1 = 6 seconds
  - level 2 = 5 seconds
  - level 3 = 4 seconds
  - level 4 = 3 seconds
  - level 2 = 5 seconds
  - level 6 = 5 seconds
  - level 7 = 2 seconds
  - level 8 = 2 seconds
  - level 9 = 1 seconds
  - level 10 = 5 seconds
  - level 11 = 2 seconds
  - level 1 = 2 seconds
  - level 13 = 1 seconds
  - level 14 = 3 seconds
  - level 15 = 1 seconds
  - level 16 = 1 seconds
  - level 17 = N/A seconds
  - Level 18 = 1 seconds
  - level 19+ = N/A seconds

Mechanics

- If Super Pellet is eaten
  - Then Ghosts become “Blue” and enter “Super Pellet Time”
    - If ghosts are blue
      - Ghosts can be “Eaten” and grant the player points
        - 200 for the first
        - 400 for second
        - 800 for third
        - 1600 for fourth
  - Then all ghosts replace existing AI with the AI of Red Ghost. For duration for “Super Pellet Time”
- During Super Pellet time, ghost speed is never altered.
  - Ghosts retain original speed.
- If super pellet time ends,
  - Then ghosts become normal and resume normal AI sequence.
    - Light Blue Ghost performs new AI check at random.

Super Pellet Time: Ghost AI

- Red ghost is the “Aggressive/shadow ghost”
  - Note: Remember 1 “tile” = a 8 x 8 pixel square
  - Behavior – will chase the player relentlessly and as pellets get eaten it speeds up.
    - Red ghost will always follow the exact Tile that the player is on.
    - If red ghost leaves the “ghost pen”
    - Then it begins to follow the player’s current tile at all times.

Level	Pellets left aggressive AI Pt. 1	Red ghost speed Aggressive AI Pt. 1	Pellets left aggressive AI Pt. 2	Red ghost speed Aggressive AI Pt. 2
Level 1	20	80%	10	85%
Level 2	30	90%	15	95%
Level 3	40	90%	20	95%
Level 4	40	90%	20	95%
Level 5	40	100%	20	105%
Level 6	50	100%	25	105%
Level 7	50	100%	25	105%
Level 8	50	100%	25	105%
Level 9	60	100%	30	105%
Level 10	60	100%	30	105%
Level 11	60	100%	30	105%
Level 12	80	100%	40	105%
Level 13	80	100%	40	105%
Level 14	80	100%	40	105%
Level 15	100	100%	50	105%
Level 16	100	100%	50	105%
Level 17	100	100%	50	105%
Level 18	100	100%	50	105%
Level 19	120	100%	60	105%
Level 20	120	100%	60	105%
Level 21+	120	100%	60	105%

Super Pellet Point Value

- Super Pellet is always worth 100 points.

A Multiplayer

Table of contents

- Part 1: Co-operative game type – The Ghost Operative
- Part 2: Competitive game type – The Fifth Ghost

How to start game for player 1 and 2

- Player 1 or player 2 inserts coin and/or hits “Start”
- Game starts
- Player 1 or Player 2 (Assume the prior is not available), Said player inserts coin and/or hits “Start”
- Game begins as Multiplayer
  - Assume for each multiplayer mode, this slide

Assumptions

- Assume that there are two joysticks available on console, one for Player 1 and one for Player 2

Co-Operative

The Ghost Operative

What is it?

- Player 1 and 2 swap roles as the "Ghost Operative"
- What is the Ghost Operative?
  - The Ghost Operative is a Pac-Man player that is disguised as a ghost.
    - He/she moves slower and still collects pellets

How it works

- At the start of a match, a random number is generated between 1-2
  - If 1 is chosen,
    - Then player one becomes Ghost Operative
  - If 2 is chosen,
    - Then player 2 becomes Ghost Operative
- Ghost Operative mode lasts 15 seconds.

Duration

- Duration of Ghost Operative = 15 seconds
- At start, player flashes one time and changes into a “Grey” ghost form.
  - When 3 seconds are left, player begins to flash and
    - 15 seconds is up, player becomes a Pac-Man.
  - Pac-Man becomes Ghost Operative
    - If Ghost Operative becomes Pac-Man (Alternate Player)

New Model/static image: Grey Ghost

- Note: other than the Dark Blue ghost the other ghosts (Ping Ghost , Orange Ghost Blue ghost , Red Ghost) are made the same way.
- Size – 16 x 8 pixels
  - Size is for all ghosts listed below
- Look and feel – should look "discreet" and "deceptive".
- Use Basic ghost 1-3
- Hex codes
  - Grey Ghost – 5a5a5a
- Use basic ghost as guide
  - Color in the 3 versions with hex codes listed above
    - Take those 3 versions and save as separate files
      - Then make 4 different versions of each piece for animation by adding the eyes 0°, 90°, 180 °, and 270°
        - Then save as separate files 4 separate files for each of the 3 separate animations

Mechanics

- Ghost Operative collects pellets as normal
  - Pellets collected by Ghost Operative count towards level completion
- Big Pellet
  - If a Big Pellet is eaten, either by Pac-Man or Ghost Operative
    - Ghost Operative cannot eat ghosts.
- Ghost AI will not actively target or run away from the Ghost Operative
- The Ghost Operative can still die by touching a ghost.
- The Player moves at Normal speed as Pac-Man
- The player moves at 1/3 normal speed (Round up)
  - Pac-Man = 11 tiles per/second
  - Ghost Operative = 4 tiles per/second

Part 2: Competitive Game Type

The fifth ghost

What is the “Fifth Ghost”?

- In the game of Pac-Man there are 4 ghosts,
  - Red
  - Pink
  - Light Blue
  - And Orange
- In the “Fifth Ghost” the player plays as a fifth ghost, but unlike his other ghost counter parts, he has full control of his/her character and can “Kill” Pac-Man in the same way that the other ghosts can.

Movement

- The ghost player’s ghost works off of the same movement speed of the red ghost, speeding up as more pellets are eaten.

Level	Ghost player Pellets left for first movement speed increase Pt. 1	Ghost player movement speed increase Pt. 1	Ghost player Pellets left for movement speed increase Pt. 2	Ghost player movement speed increase Pt. 2
Level 1	20	80%	10	85%
Level 2	30	90%	15	95%
Level 3	40	90%	20	95%
Level 4	40	90%	20	95%
Level 5	40	100%	20	105%
Level 6	50	100%	25	105%
Level 7	50	100%	25	105%
Level 8	50	100%	25	105%
Level 9	60	100%	30	105%
Level 10	60	100%	30	105%
Level 11	60	100%	30	105%
Level 12	80	100%	40	105%
Level 13	80	100%	40	105%
Level 14	80	100%	40	105%
Level 15	100	100%	50	105%
Level 16	100	100%	50	105%
Level 17	100	100%	50	105%
Level 18	100	100%	50	105%
Level 19	120	100%	60	105%
Level 20	120	100%	60	105%
Level 21+	120	100%	60	105%

Controls

- Controls are simple and binary, should work as on/off and operate one at a time.
- Once a direction has been chosen, Ghost Player will continue forward without movement on the joystick
- For purposes of description, consider the top side of the screen to be 90° and the left side to be 0°.
  - Joystick pushed to 0° (-X axis)- Ghost Player turns left/ moves in the 0° axis,
  - Joystick pushed to 90° (+Y Axis) - Ghost Player moves up, 90° axis,
  - Joystick pushed to 180 ° (+X Axis) - Ghost Player moves left, 180° axis,
  - Joystick pushed to 270° (-Y Axis)- Pac-Man moves down, 270° axis,

Lives

- How to get lives for player 1 or 2
  - Start game
    - Player starts with 5 lives
  - Insert quarter/use continue
    - Player gets 5 lives
  - If player runs out of lives
    - Player gets “Counting screen” Counts down from 9-0
      - At 0 player gets “Game Over”
        - Game ends
        - Use base numbers for counting at center of screen

The large Pellet

- The ghost player is susceptible to the effects of the large pellet
- If large pellet is eaten
  - Then the ghost player becomes “Frightened” during fright time, but does not lose control of his/her character.
    - During this time the ghost player can be eaten by the player playing as Pac-Man and the Pac-Man player gains points as he/she would the other ghosts.
    - If ghost player is eaten
      - If ghost player loses 1 life.
      - Then ghost player acts as a another ghost in the table below, filling any of the slots, as do the other ghosts.
      - 1st ghost = 200
      - 2nd ghost = 400
      - 3rd ghost = 800
      - 4th ghost = 1600
      - 5th ghost = 3200

Large Pellet length

- Ghosts enter frightened mode for X amount of seconds dependent on level
- Unlike other modes, this mode has an arbitrary let amount for seconds that “frightened” mode lasts after level 13.
  - level 1 = 6 seconds
  - level 2 = 5 seconds
  - level 3 = 4 seconds
  - level 4 = 3 seconds
  - level 2 = 5 seconds
  - level 6 = 5 seconds
  - level 7 = 2 seconds
  - level 8 = 2 seconds
  - level 9 = 1 seconds
  - level 10 = 5 seconds
  - level 11 = 2 seconds
  - level 1 = 12 seconds
  - level 13+ = 2 seconds

Scoring

- The second player gains 1000 points for every kill he/she gets.
  - Not the other ghosts.
  - These points count towards extra lives
- Scoring is done the same way as the normal game with one exception
  - There is a second score added up for the second player.

Swapping roles

- Once all pellets have been eaten in one round,
  - Then a new round starts
  - The new round has the last player who played as Pac-Man,
    - Play as the Fifth Ghost.

Advancing levels

- After both players have been both Pac-Man and the Ghost
  - Advance up 1 level
    - EX: player 1 plays as ghost, then as pac-man – player 2 plays as Pac-Man, then Ghost
      - Level advances from 1 to 2
- If neither player loses all of their lives, the level advances.