

Kung

# Level Design Saga: Creating Levels for Casual Games

Jeremy Kang | Principal Game Designer | King, Berlin | [jeremy.kang@king.com](mailto:jeremy.kang@king.com)

# About Me



- Principal Game Designer at King, Berlin
- Working on a brand new Saga from King.
- From Sunny Singapore to vibrant Berlin.
- Life-long passionate gamer that started with the original Super Mario Bros.
- 9 years in games: from start-ups, to indie, to academia, to triple-A companies.
- Worked on games across multiple platforms - from console to mobile.
- Released games for both the international and Asian markets.
- Brave new world of mobile games.

# Why?

- Game Design vs. Level Design
  - Lesser material for Level Design.
- Casual vs. Core
  - Lesser Material for Casual vs. Core.
- Based to King Saga games
  - Linear Progression.
  - For a casual audience.





# Contents

THEORY | Level Design Overview

THOUGHT | Level Design Principles

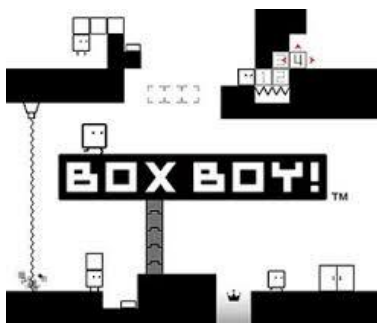
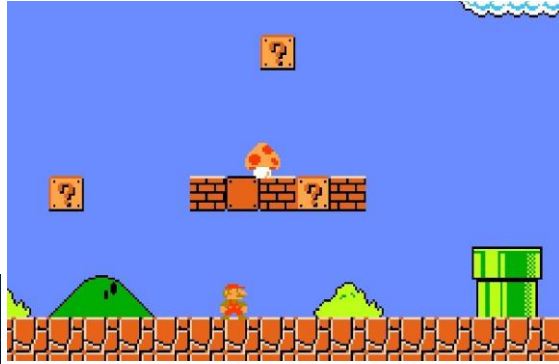
TOOLS | Building a Saga

TESTING | Tweaking and Tinkering

# Theory | Level Design Overview

Level Design at King

# Level Design in Games



# What is Level Design?

- Level Design is a Composite Role
  - bringing together several disciplines: art, design, and engineering
- Game Designer vs. Level Designer
  - Game Designers create rules and systems.
  - Level Designers implement them into Gameplay experiences.

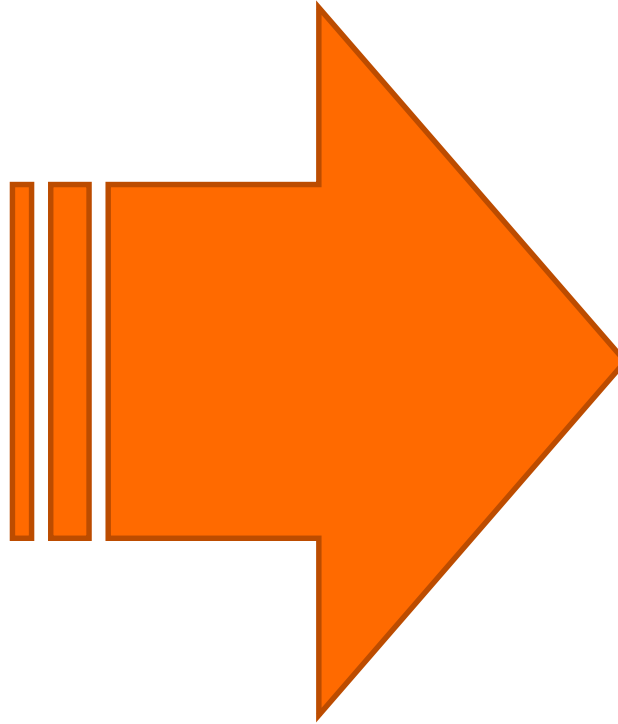




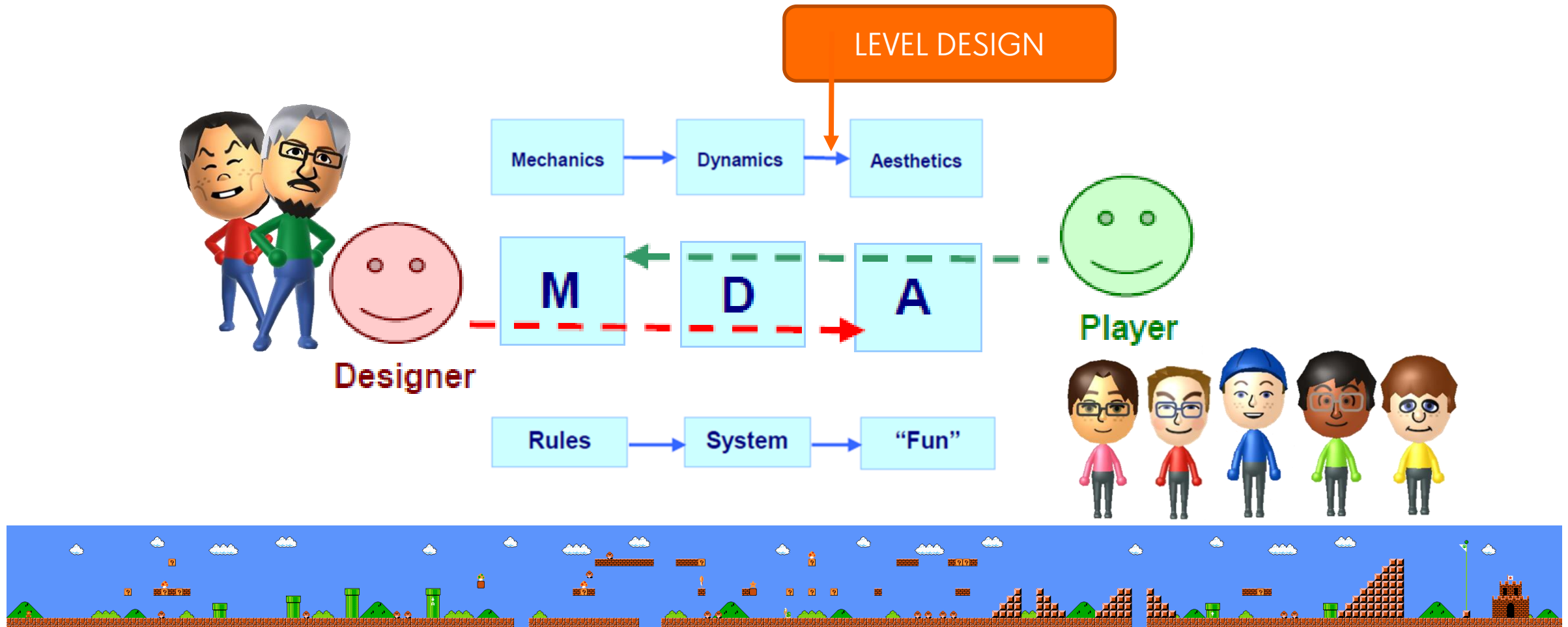




# Mechanics to Dynamics



# Mechanics to Dynamics





# Level Design at King

- **Role of a Level Designer**
  - Design levels and progressions.
  - Create content at a regular pace.
  - Involved in designing new content as well.
  - Game Designers do Level Design too!
- **Knowledge Sharing in King**
  - Play other teams' games.
  - Lots of information sharing across teams.
  - Designer meetups and sharing sessions.

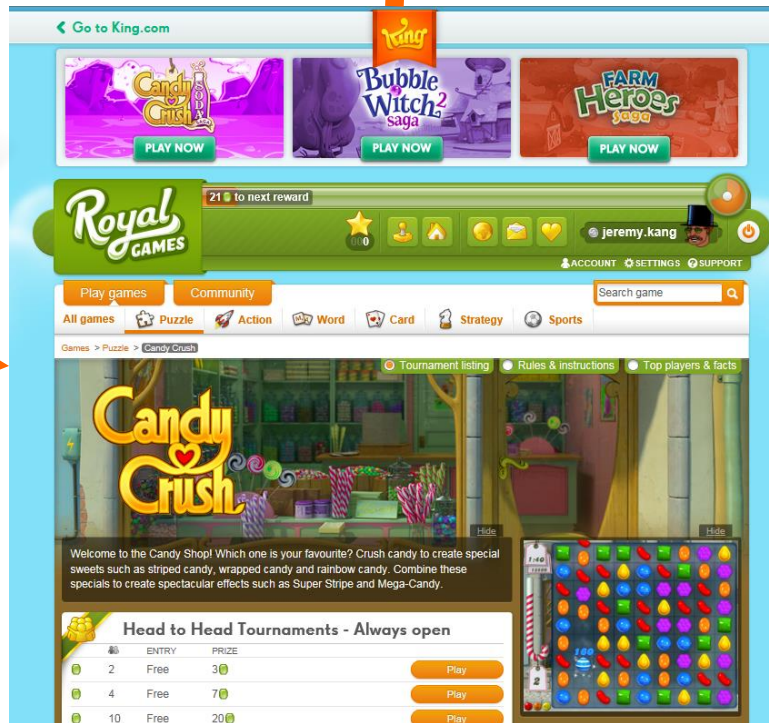


# Thought | Level Design Principles

Level Concepts



# Building a Saga





# Finding Mechanics



Go to King.com

King

Candy Crush PLAY NOW

Bubble Witch 2 saga PLAY NOW

FARM Heroes saga PLAY NOW

Royal GAMES 21 to next reward

jeremy.kang

ACCOUNT SETTINGS SUPPORT

Play games Community

All games Puzzle Action Word Card Strategy Sports

Games > Puzzle > Candy Crush

Tournament listing Rules & instructions Top players & facts

Candy Crush

Welcome to the Candy Shop! Which one is your favourite? Crush candy to create special sweets such as striped candy, wrapped candy and rainbow candy. Combine these specials to create spectacular effects such as Super Stripe and Mega-Candy.

Head to Head Tournaments - Always open

	ENTRY	PRIZE	
2	Free	3	Play
4	Free	7	Play
10	Free	20	Play



# The Saga Envelope

- Linear Progression.
- 100s – 1000s levels.
- New levels every 1-2 weeks.
- Light social elements.
- For a casual audience.





# The Saga Envelope

- Progression-based retention driver.
- Continuous new content for casual players.
- Applied across different King games.

But this means...

- We need lots of levels!





# Lucky Lantern



Gameplay Video: <https://youtu.be/rsYTdNLCDc0>

© King.com Ltd 2016

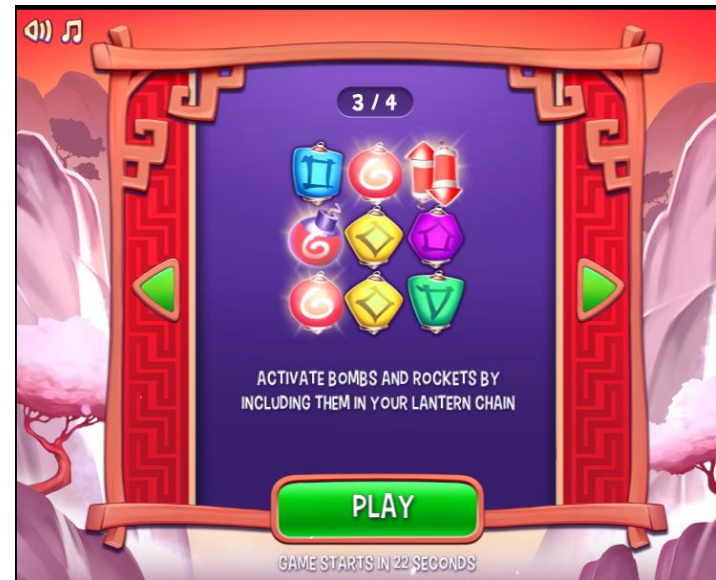
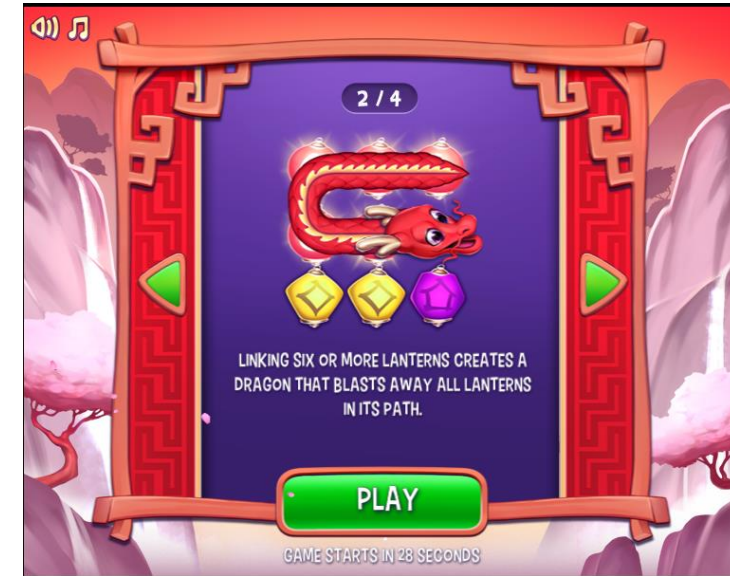
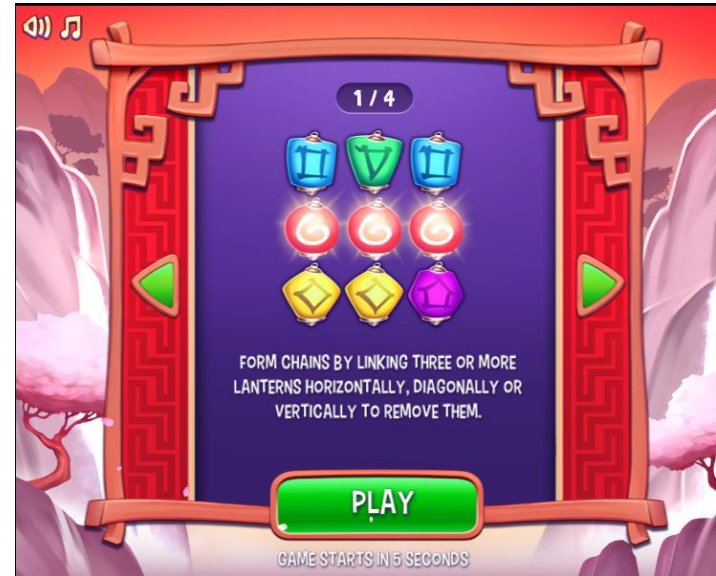






# Lucky Lantern

- Link **3+ Lanterns** to remove them.
- Link **6+ Lanterns** to create a **Dragon**.
- Activate **Bombs and Rockets** by linking into them.
- Collect **Coins** by bringing them to the bottom or hitting them with Power Ups.

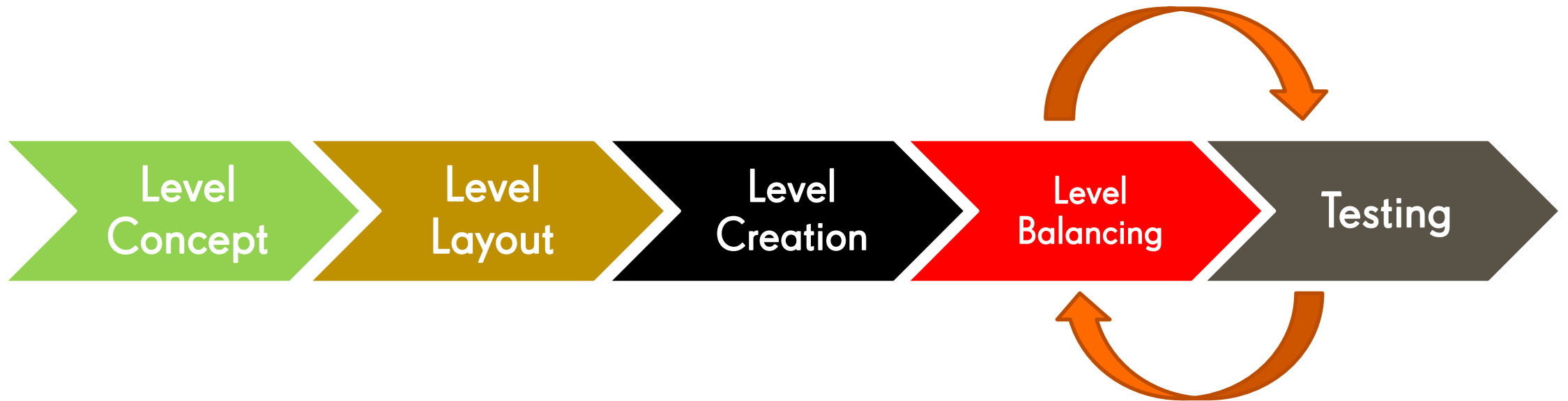




# Where to Start Designing Levels?



# Level Design Process



# Identifying Building Blocks | Lucky Lantern

## Game Mechanics

- Basic Linking
- Activating Power Ups
- Creating Dragons
- Collect Coins

## Gameplay Elements

- Lanterns
- Rockets
- Bombs
- Coins

## Game Modes

- High Score

## Blockers

- Clouds
- Coins (?)



# Identifying Building Blocks | CCSS

## Game Mechanics

- Basic Swapping
- Power Up Creation
- Power Up Combos
- Helper Abilities

## Gameplay Elements

- Candies
- Power Ups
- Walls
- Holes

## Modifiers

- Soda Physics
- Gravity Direction
- Multiple Screens
- Scrolling Levels

## Game Modes

- Pop the Bottles
- Find the Bears
- Clear the Chocolate
- Clear the Bubblegum
- Spread the Jam

## Blockers

- Frosting
- Liquorice Locks
- Cupcakes
- Jelly Cake
- Honey
- Liquorice Swirl



# Level Design Principles

## Difficulty

*Keeping Players Challenged*

## Rhythm

*Varying the Player Experience*

## Flow

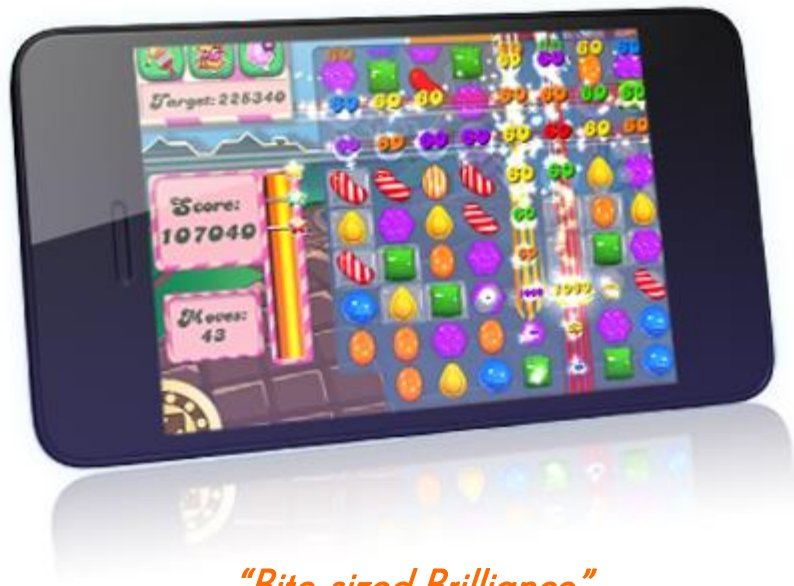
*Keep Players moving towards the Goal*

## Hooks

*Making Levels Different*



# Level Design for Casual Games



*"Bite-sized Brilliance"*



# Hooks

- Unique elements that make a level different from other levels in the game.
- A good hook can be all-encompassing “twist” that affects everything in the level.
  - Special powers
  - Different gameplay style
  - Environmental style





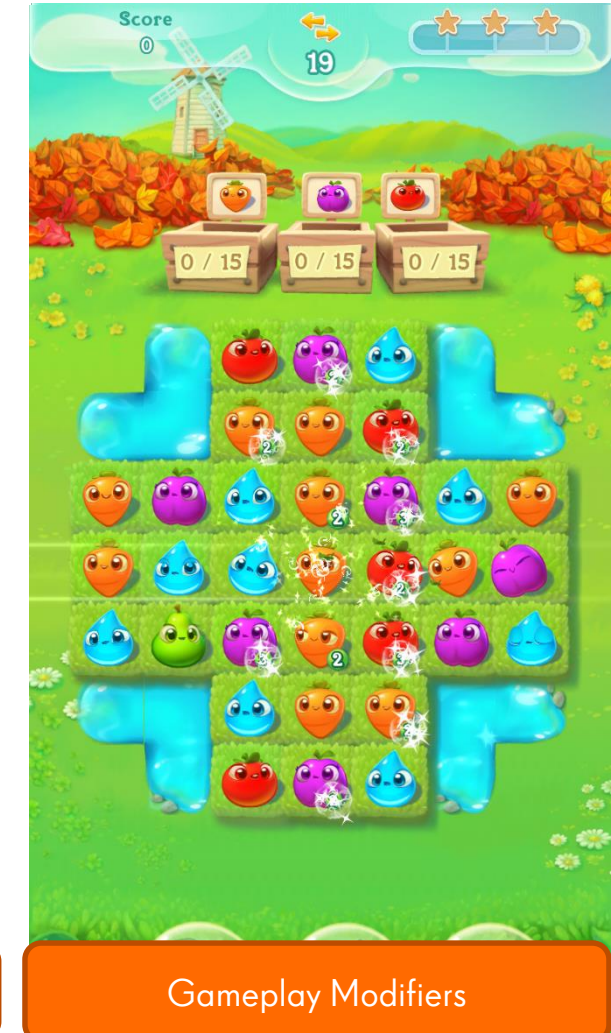
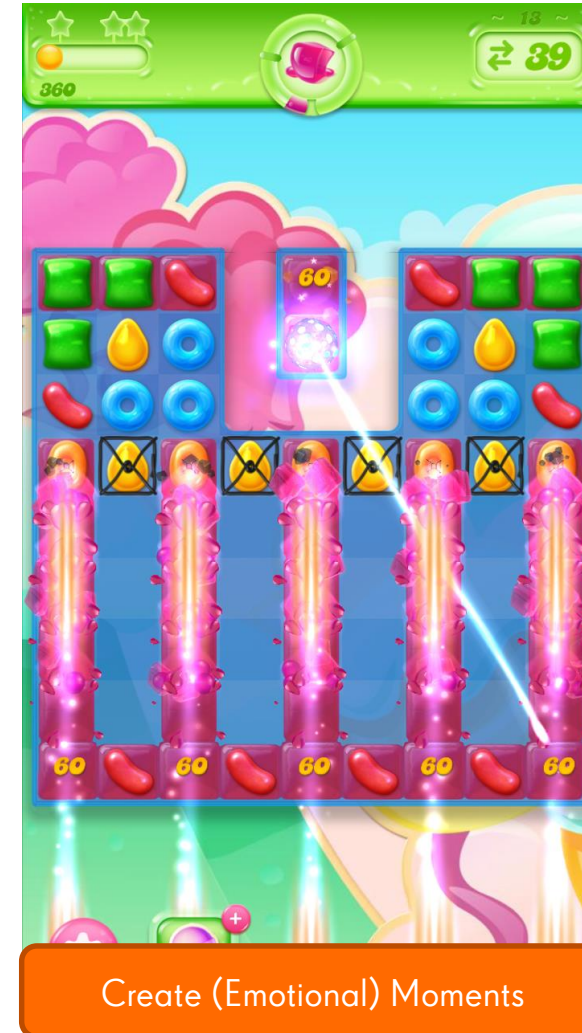
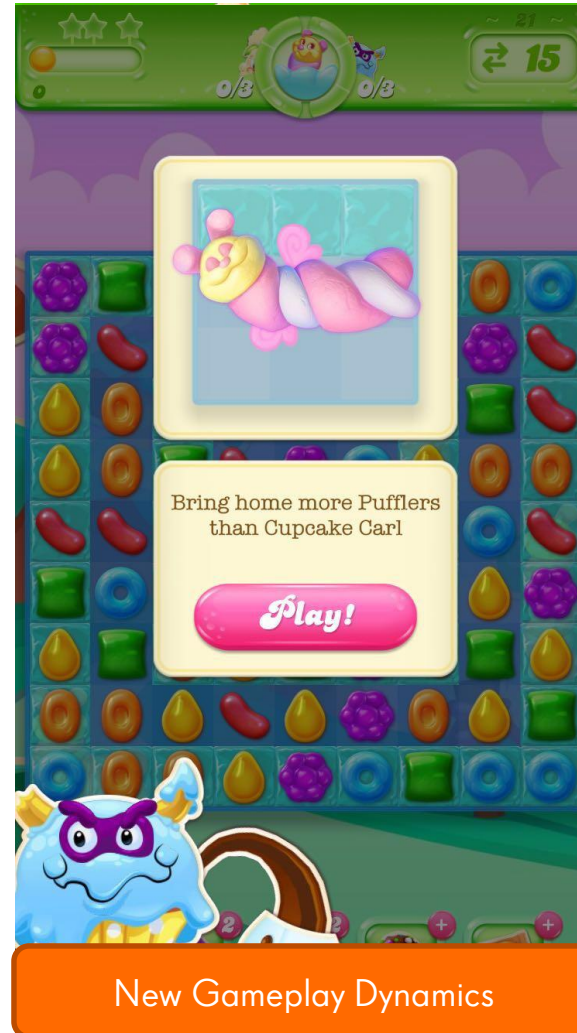
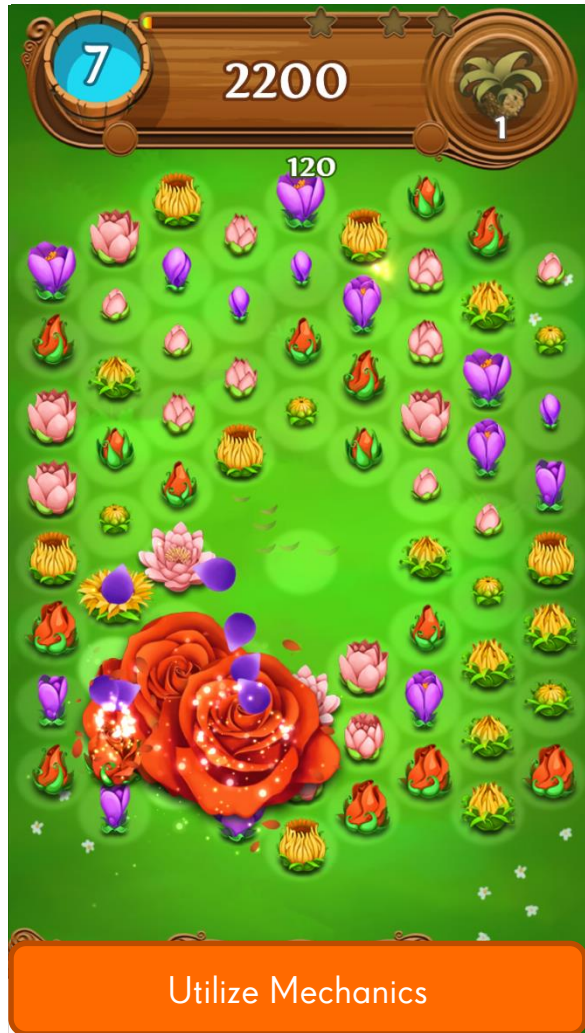
# Level Hooks in Games



Clockwise from Top Left: *Super Mario 3D World*, *Shadow of the Colossus*, *Half-Life 2*, *Bayonetta 2*

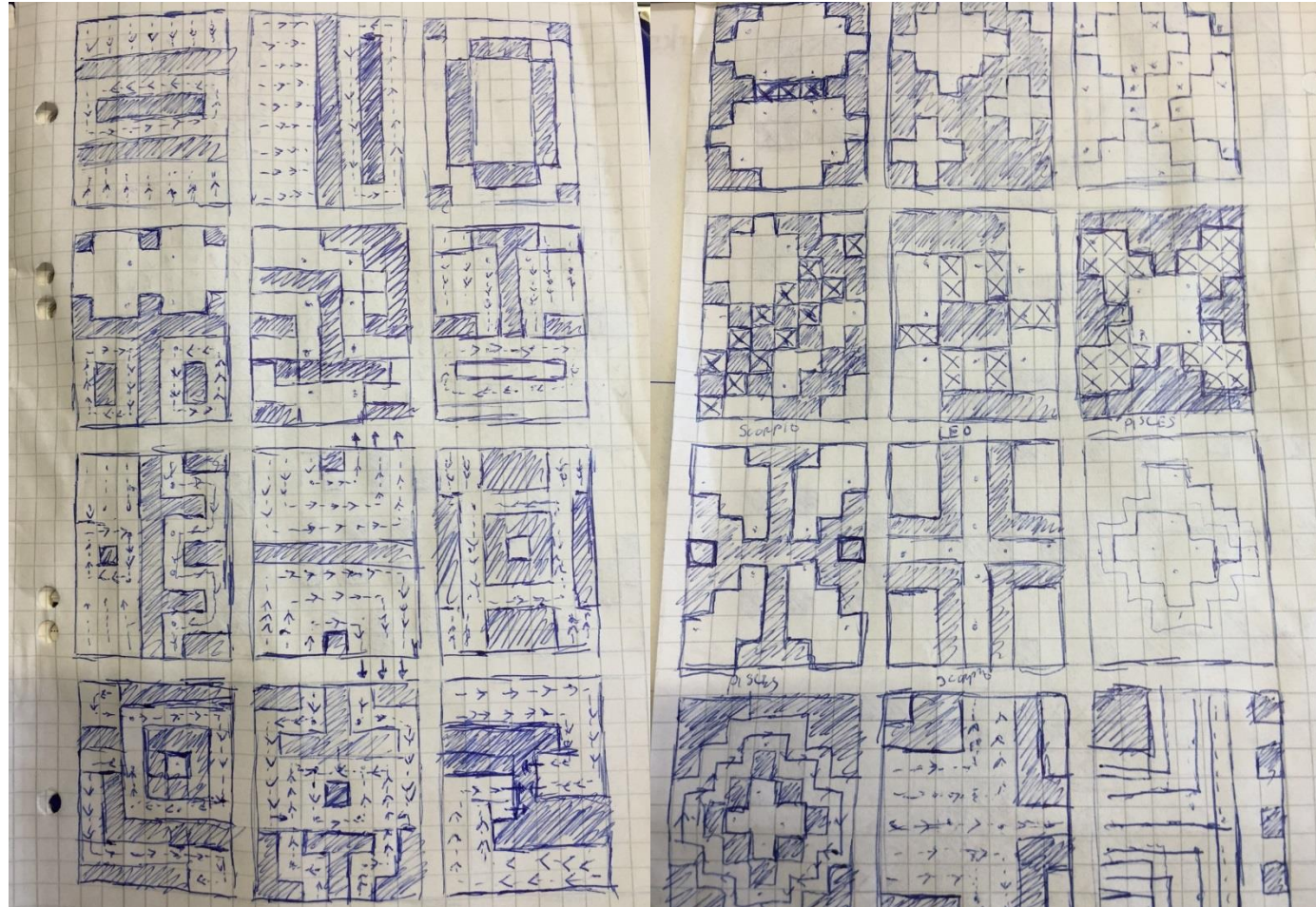


# Level Concept Examples





# Level Layout | Paper Design







# Tools | Building a Saga

Level Creation in King

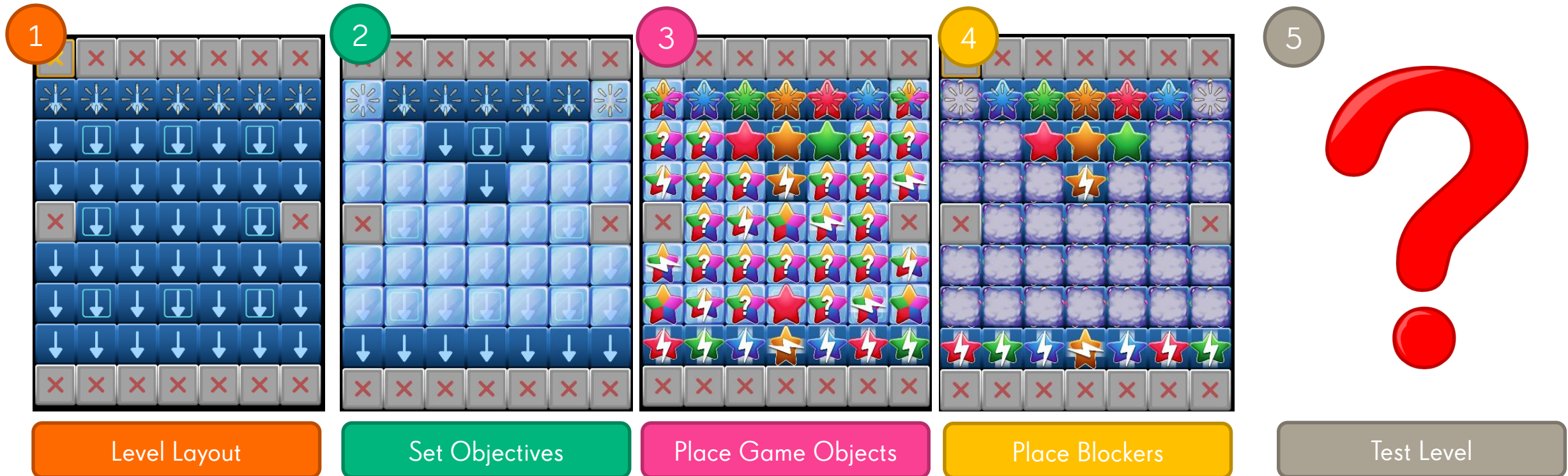


# Level Creation

The screenshot displays the Level Creation tool interface. The main workspace shows a 10x10 grid with various objects placed on it. The objects include stars of different colors (red, green, blue, purple, yellow), lightning bolts, and question marks. The grid is surrounded by a black border. Below the grid, there is a filter dropdown set to 'random' and a row of object icons. At the bottom, there is a toolbar with checkboxes for 'Show None', 'Show Custom', 'Show Cells', 'Show Runes', 'Show Spawners', 'Show Collectors', 'Show Jellies', 'Show Objects', 'Show Blockers', and 'Show Clouds'. The right panel shows the 'Level' tab with a table of properties and values.

Property	Value
Number of grids	1
Moves	18
Score for stars	
For 1 star(s)	40000
For 2 star(s)	45000
For 3 star(s)	50000
Victory conditions	
Collect colors	false
Clear Jellies	
Enabled	false
Find Runes	
Enabled	false
Collect Birthstones	
Enabled	false
Zodiac family	Leo
Zodiac level	Level1
Points to charge zodiac	80
Zodiac progression factor	1.2
Zodiac charge values	
Red	1
Green	1
Blue	1
Purple	1
Yellow	1
Coin	999
Zodiac initial special object probabilities	
None	50
Vertical blast	0
Horizontal blast	0
Bomb	50
Cross blast	0
Super bomb	0
Coin	0
Birthstone	0
Zodiac charge special object probabilities	
None	0
Vertical blast	0
Horizontal blast	0
Bomb	1
Cross blast	0
Super bomb	0
Coin	0
Birthstone	0
Initial color probabilities	
Red	1
Green	1
Blue	1
Purple	0
Yellow	1
Spawn color probabilities	
Red	1

# Level Creation Process









# Finding the Fun

- Gameplay Possibility Space.
- Gameplay Dynamics.
- Moment-to-Moment Gameplay.
- Level Flow Concepts.



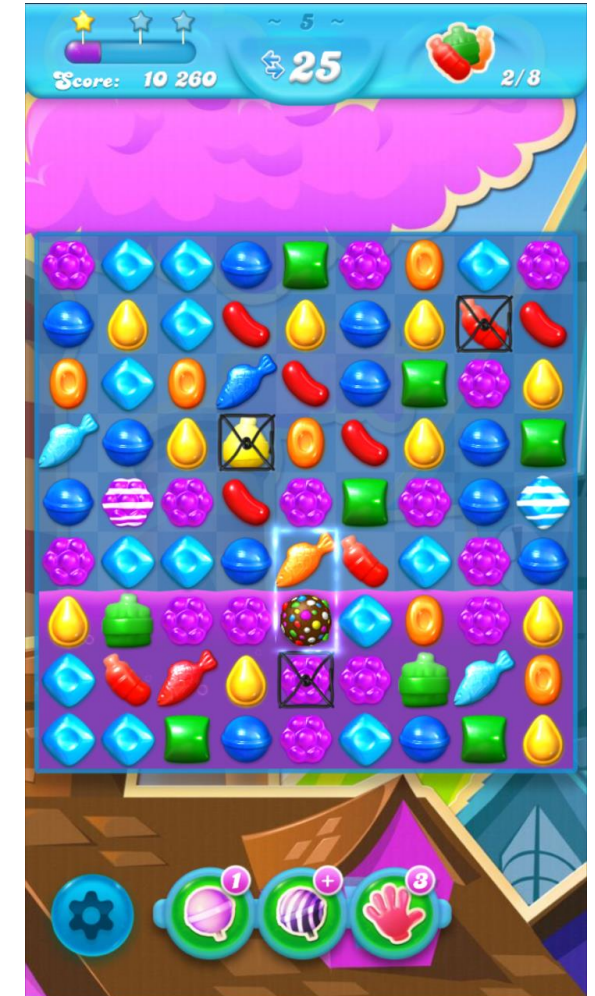
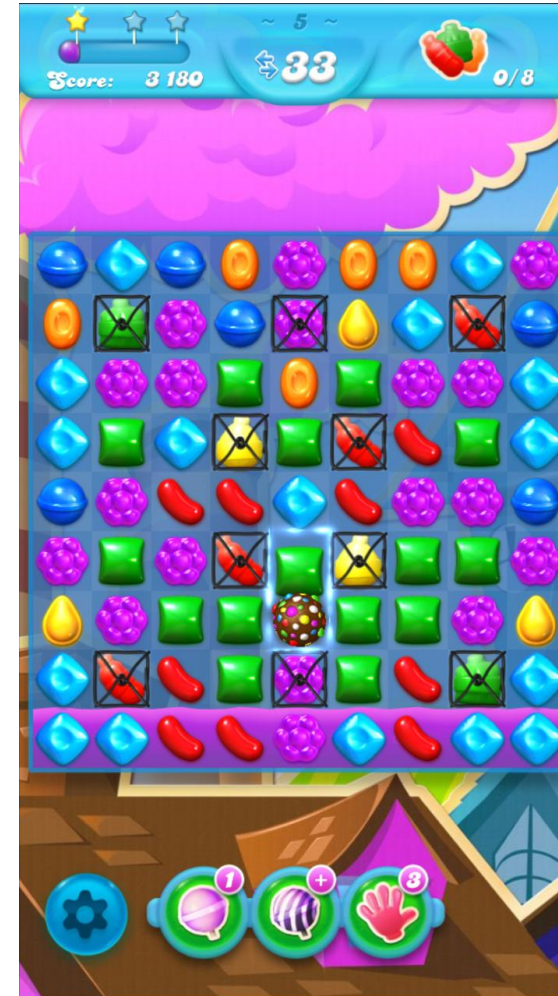


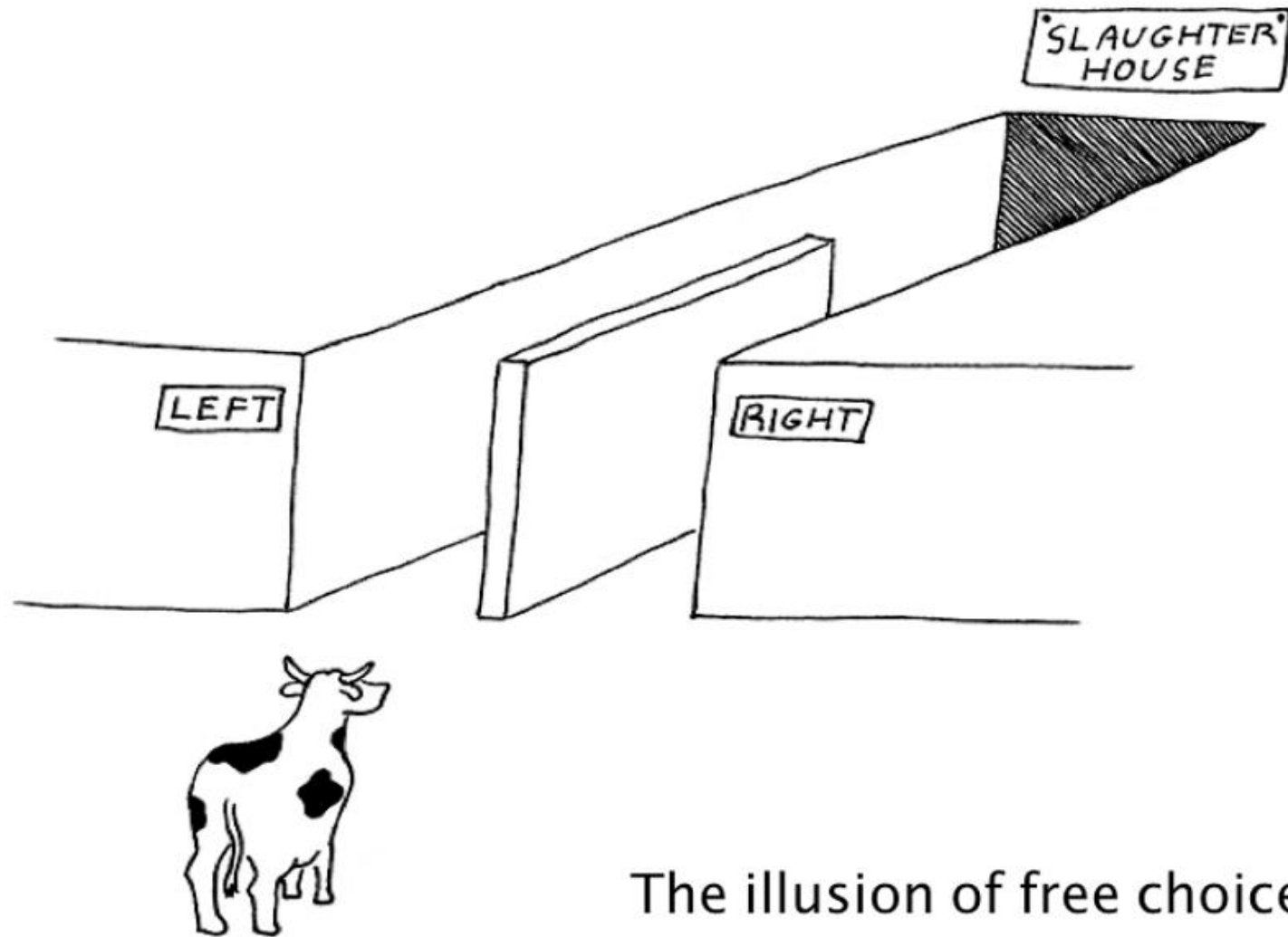
# Flow

- Keep Players moving toward the goal
  - Signposting
  - Goals and Sub-goals
  - Hints
- Level Designer is the invisible hand that guides players forward.
  - The more aware the player is of this though, the less fun it'll be.



# Level Flow and Dynamics





The illusion of free choice.



# Level Flow and Dynamics

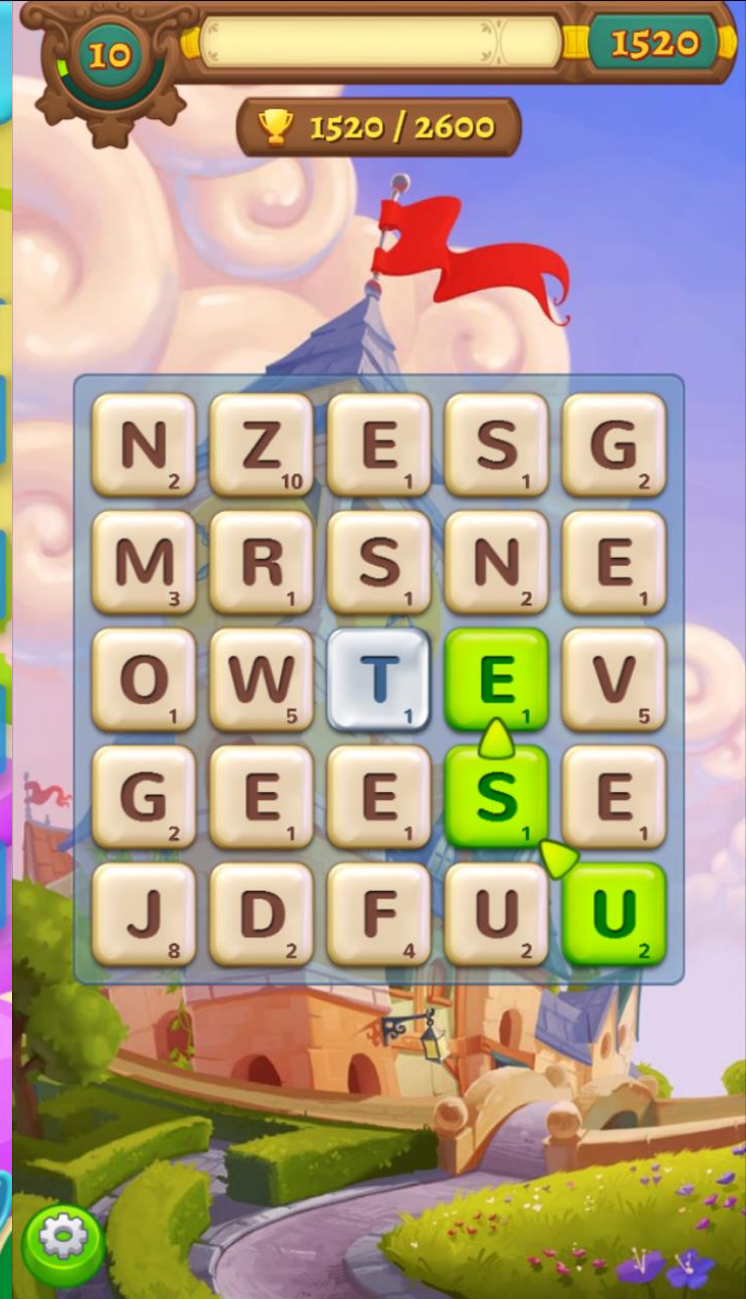
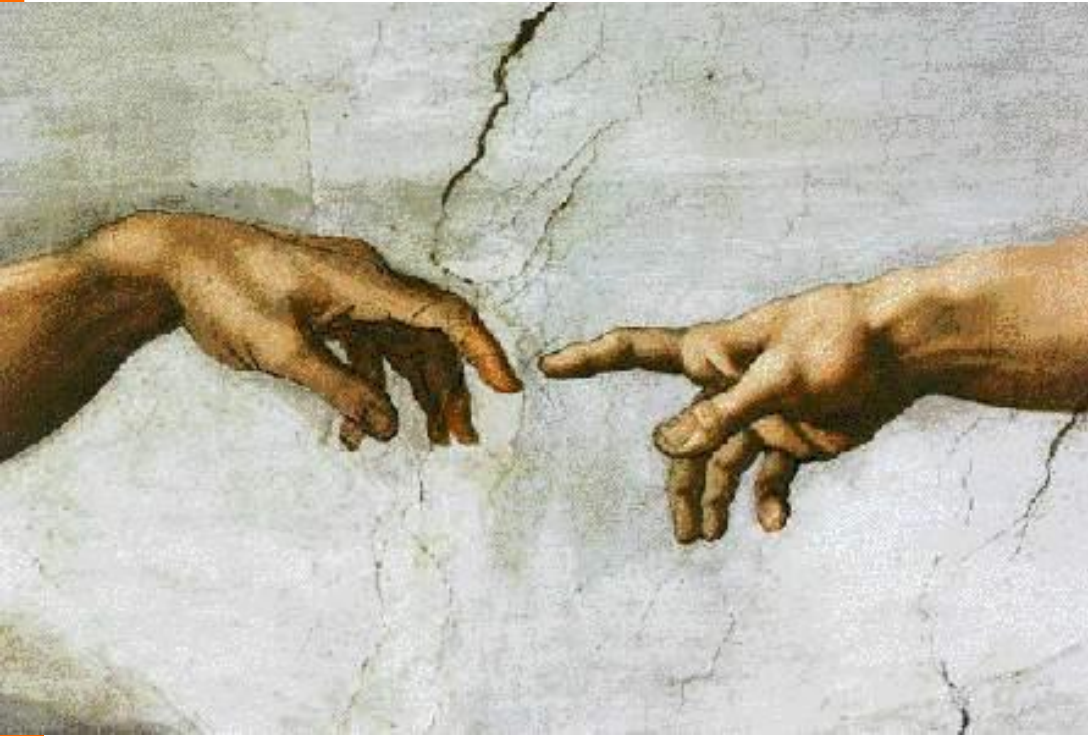








# When all else Fails...



































# Building a Saga





# Level Progression Mapping

 <p>201 Puff Boss 01.0 801 Difficulty: 0 / 10 09/03/2016 11:52 [david.darabian] ✎ 🗑️ ➕</p>	 <p>202 Monkling 06.0 802 Difficulty: 0 / 10 06/07/2016 09:12 [david.darabian] ✎ 🗑️ ➕</p>	 <p>203 Rodeo Puffling 01.0 803 Difficulty: 0 / 10 06/07/2016 10:30 [david.darabian] ✎ 🗑️ ➕</p>	 <p>204 Jelly Jungle 02.0 804 Difficulty: 0 / 10 08/03/2016 11:33 [david.darabian] ✎ 🗑️ ➕</p>	 <p>205 Monkboss 05.0 805 Difficulty: 0 / 10 07/07/2016 11:41 [david.darabian] ✎ 🗑️ ➕</p>	 <p>221 Monkling no bucket slots.0 881 Difficulty: 0 / 10 19/04/2016 13:44 [jennika.cederholm] ✎ 🗑️ ➕</p>	 <p>222 Two To Too noBucket.0 882 Difficulty: 0 / 10 11/05/2016 15:10 [david.darabian] ✎ 🗑️ ➕</p>	 <p>223 noBucket puffer.0 883 Difficulty: 0 / 10 19/04/2016 13:50 [david.darabian] ✎ 🗑️ ➕</p>	 <p>224 Puffler boss boom boom.0 884 Difficulty: 0 / 10 29/03/2016 16:12 [jennika.cederholm] ✎ 🗑️ ➕</p>	 <p>225 noBucket monkling.0 885 Difficulty: 0 / 10 19/04/2016 13:59 [david.darabian] ✎ 🗑️ ➕</p>
 <p>206 Rodeo Puffling 02.0 806 Difficulty: 0 / 10 10/03/2016 11:55 [david.darabian] ✎ 🗑️ ➕</p>	 <p>207 Jelly Jungle 03.0 807 Difficulty: 0 / 10 07/07/2016 09:57 [david.darabian] ✎ 🗑️ ➕</p>	 <p>208 Monkling 09.0 808 Difficulty: 0 / 10 11/03/2016 11:36 [david.darabian] ✎ 🗑️ ➕</p>	 <p>209 Jelly Tower 02.0 809 Difficulty: 0 / 10 07/07/2016 14:22 [david.darabian] ✎ 🗑️ ➕</p>	 <p>210 Rodeo Puffling 03.0 810 Difficulty: 0 / 10 13/07/2016 10:41 [david.darabian] ✎ 🗑️ ➕</p>	 <p>226 Jelly boss rabbit holes.0 886 Difficulty: 0 / 10 07/04/2016 14:50 [jennika.cederholm] ✎ 🗑️ ➕</p>	 <p>227 Puffler tanks.0 887 Difficulty: 0 / 10 24/03/2016 16:23 [jennika.cederholm] ✎ 🗑️ ➕</p>	 <p>228 crust jelly.0 888 Difficulty: 0 / 10 27/07/2016 11:01 [yan.dou] ✎ 🗑️ ➕</p>	 <p>229 Puffler sailor moon nobucket.0 889 Difficulty: 0 / 10 19/04/2016 14:01 [jennika.cederholm] ✎ 🗑️ ➕</p>	 <p>230 Monkling 08.0 890 Difficulty: 0 / 10 19/04/2016 14:57 [david.darabian] ✎ 🗑️ ➕</p>
 <p>211 Jelly Boss color war.0 811 Difficulty: 0 / 10 07/07/2016 15:41 [david.darabian] ✎ 🗑️ ➕</p>	 <p>212 Jelly evil butterfly.0 812 Difficulty: 0 / 10 07/07/2016 16:06 [david.darabian] ✎ 🗑️ ➕</p>	 <p>213 undertone.0 813 Difficulty: 0 / 10 15/03/2016 17:43 [yan.dou] ✎ 🗑️ ➕</p>	 <p>214 Pipi.0 814 Difficulty: 0 / 10 15/03/2016 17:34 [yan.dou] ✎ 🗑️ ➕</p>	 <p>215 Jelly liq tree.0 815 Difficulty: 0 / 10 15/03/2016 17:24 [yan.dou] ✎ 🗑️ ➕</p>	 <p>231 noBucket monkling Boss.0 891 Difficulty: 0 / 10 19/04/2016 15:43 [david.darabian] ✎ 🗑️ ➕</p>	 <p>232 small no bucket jelly.0 892 Difficulty: 0 / 10 31/03/2016 13:50 [david.darabian] ✎ 🗑️ ➕</p>	 <p>233 no bucket jelly boss.0 893 Difficulty: 0 / 10 19/04/2016 15:28 [david.darabian] ✎ 🗑️ ➕</p>	 <p>234 Easy puffer.0 894 Difficulty: 0 / 10 29/03/2016 16:28 [david.darabian] ✎ 🗑️ ➕</p>	 <p>235 Monkling 12.0 895 Difficulty: 0 / 10 29/03/2016 16:28 [david.darabian] ✎ 🗑️ ➕</p>

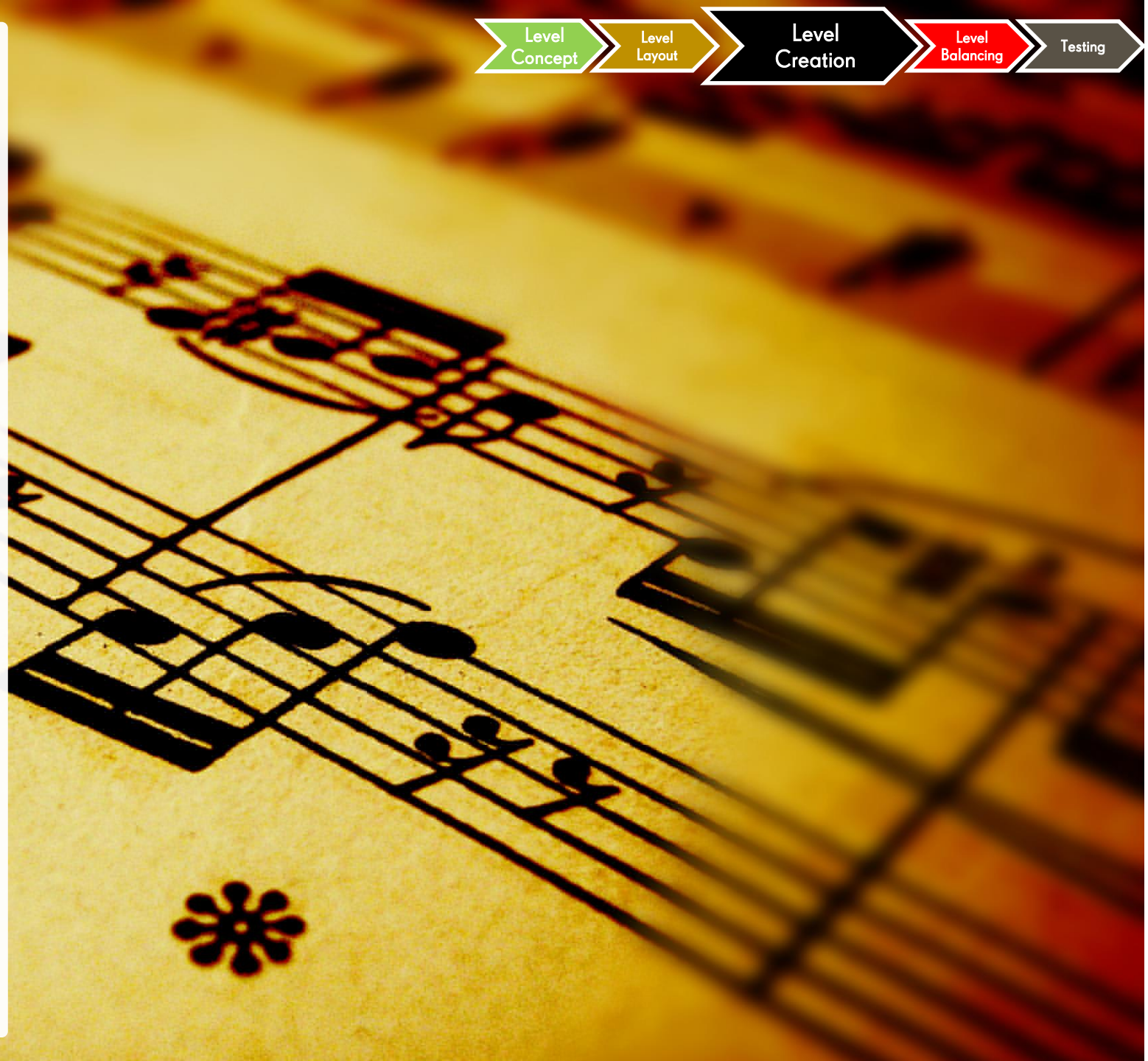
state=LIVE





# Rhythm

- Rhythm is a way of expressing the pattern, frequency, and intensity of the sequences of events in a level.
- Variety in the player experience and emotional journey.
- Keeps players engaged in the game.

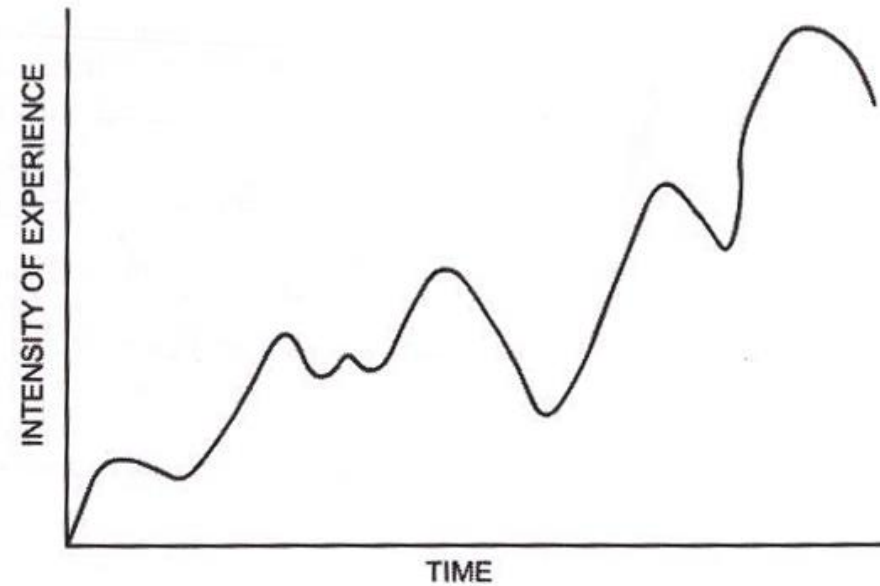




# Plotting the Player Experience

## Factors

- Different Game Modes.
- Hard Levels vs. Easy Levels.
- Short Levels vs. Long Levels.
- Pace of introducing new content



**FIGURE 4.3** An example rhythm graph for an average game.



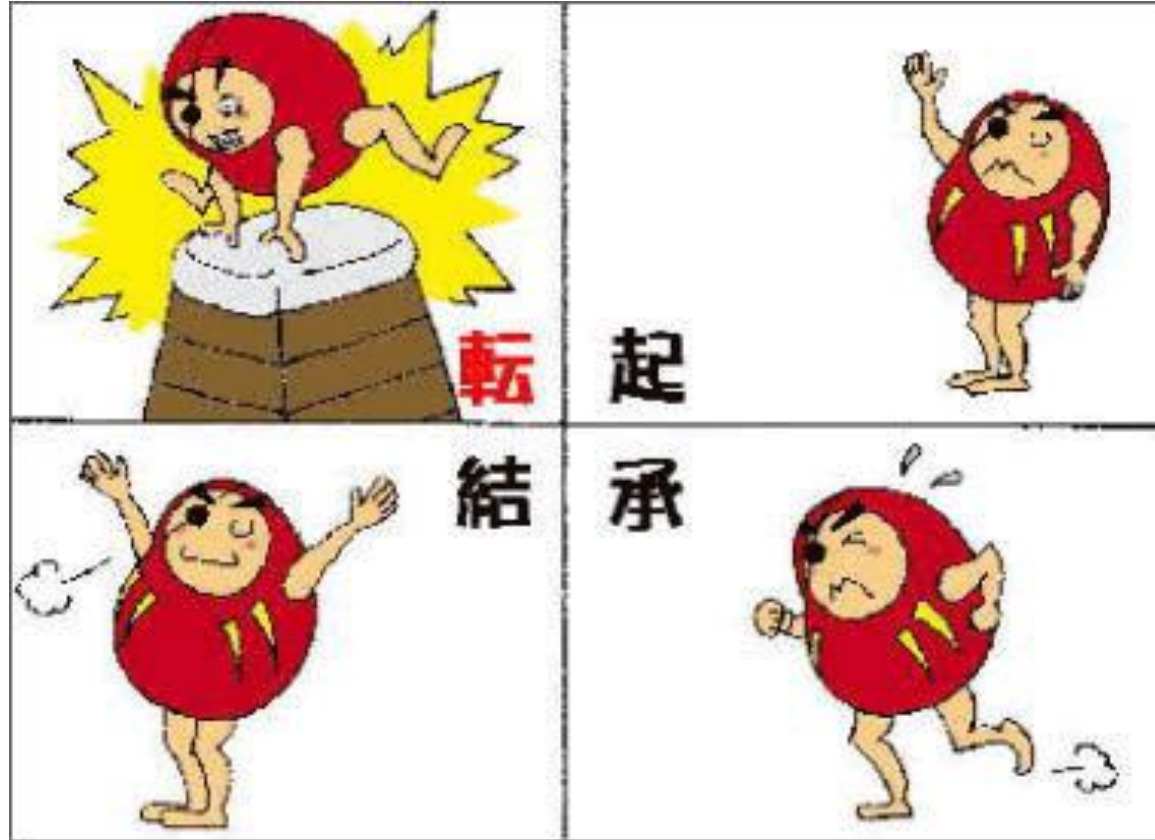
# Level Library and Beat Charts

No	Level_ID	Zodiac	Objective	Blockers / Elements									Gravity Dynamics		
				Clouds 1	Clouds 2	Clouds 3	Locks 1	Locks 2	Locks 3	Ice 1	Ice 2	Ice 3	Coins		
1	0001 Tut Linking	None	Score												
2	0002c Tut Cosmic	None	Score												
3	0004c Tut Cloud Bomb	None	Score	X											
4	0003 Tut Ice	None	Ice							X					
5	0007 Tut Zodiac	Leo	Ice	X						X					
6	0008 Tut PowerCombo	Leo	Ice	X						X					
7	0011 Tut ColorCollection	Leo	Collect 1	X	X								X		
8	0014e Cc1Leo NoCoins	Leo	Collect 1	X	X					X					
9	0081 CcLeo Chase2Colors	Leo	Collect 2	X	X										Choke
10	0070b Tut Runes	None	Runes	X	X										Dig Down
11	0073b TutLongLink	Leo	Runes		X										Dig Down
12	0016b Tut LineBlast	Pisces	Runes	X						X					
13	0017c Tut CrossBlast	Pisces	Score	X	X										
14	0019 Tut Lock	Pisces	Ice				X								
15	0020 IcePis DigDown	Pisces	Ice				X			X			X		Choke
16	0021b IcePis LockHourglass	Pisces	Ice				X			X					Choke
17	0053 Tut CosmicStep	None	Ice	X											Shooting Star
18	0081 CcLeo Chase2Colors	Leo	Collect 2	X	X										Choke
19	0010 IceLeo Invaders	Leo	Ice							X			X		Shooting Star
20	0036b Tut Coin FourTriples	Aries	Score		X								X		
21	0024 IceLeo IceStripe	Leo	Ice							X	X		X		
22	0031 Tut Gravity	Pisces	Ice							X	X		X	Narrow	
23	0074 RunPis Tetris	Pisces	Runes		X								X		Dig Down
24	0032 IceLeo Snake	Leo	Ice	X						X			X	Narrow	
25	0023 CcHLeo TheT	Leo	Collect 2	X	X		X						X		Dig Down
26	0061b IceAri MiddleSquare	Aries	Ice												Dig Down
27	0030 IcePis 4corners	Pisces	Ice				X			X	X		X		Shooting Star
28	0034 Cc2Pis Tiago	Pisces	Collect 2										X	Multi	Split
29	0039 IceAri CoinSink	Aries	Ice								X		X	Narrow	
30	0075b RunPis Corners	Pisces	Runes		X										Dig Down
31	0047b CcHPis Allocked LessLocks	Pisces	Collect 1				X	X							Dig Down
32	0040b IceAri House NoCoins	Aries	Ice	X			X			X	X				Dig Down
33	0078 IceAri SodaFall	Aries	Ice				X	X			X			Multi	Choke
34	0045b CcAri Koffing	Aries	Collect 1	X	X		X	X		X	X		X	Multi	Center



# Ki-Shō-Ten-Ketsu

Ten



Ki

Ketsu

Shō

# Ki-Shō-Ten-Ketsu Example



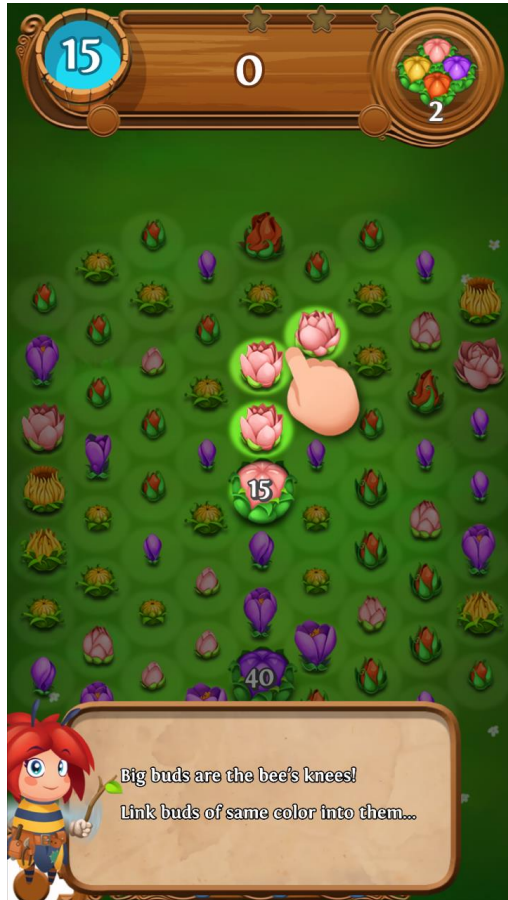
Source: <https://youtu.be/dBmlkEvEBtA?t=44>

© King.com Ltd 2016

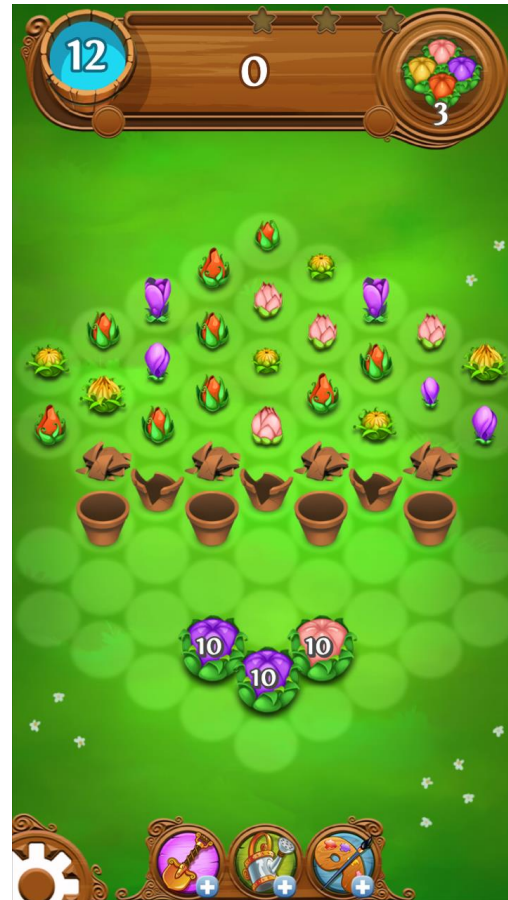




# Ki-Shō-Ten-Ketsu Applied



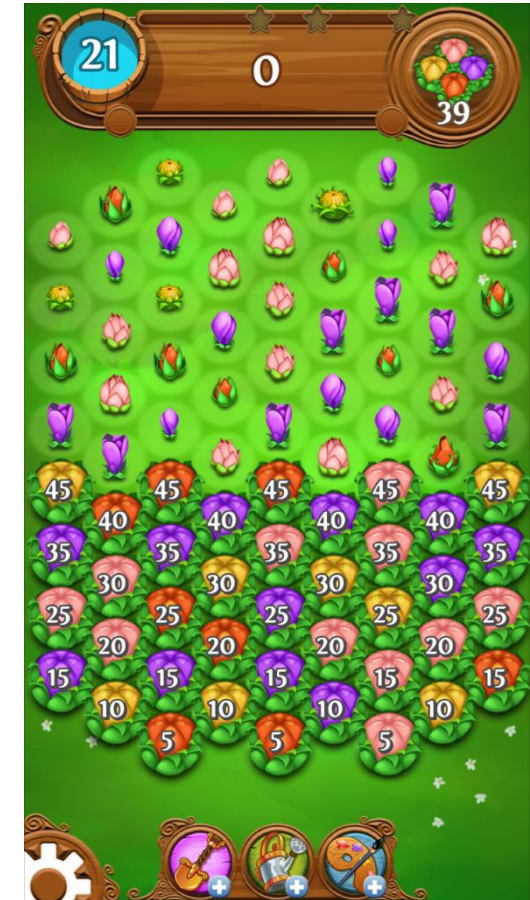
Ki



Shō



Ten



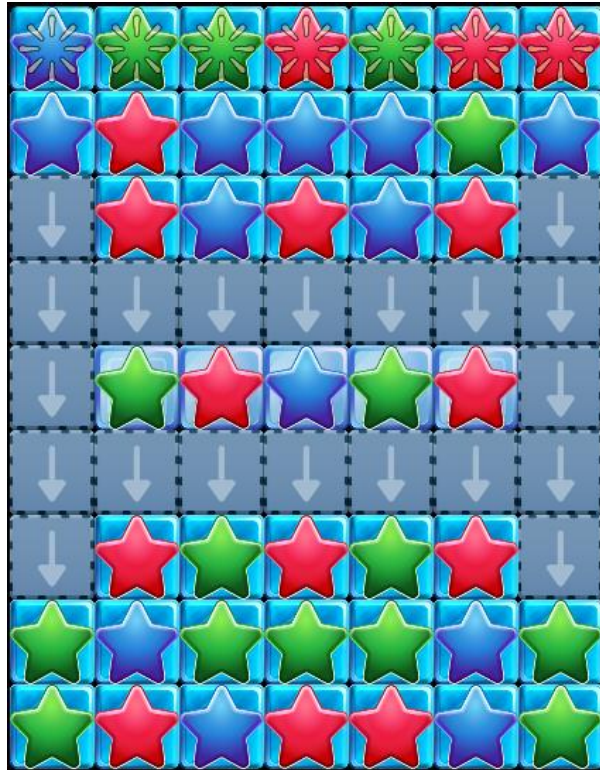
Ketsu



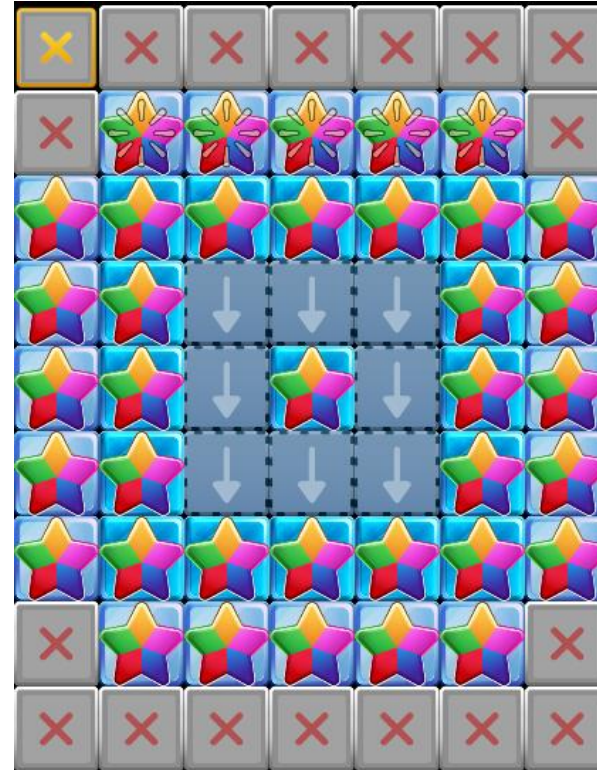
# Ki-Shō-Ten-Ketsu Applied



Ki



Shō



Ten



Ketsu

# Testing | Tweaking and Tinkering



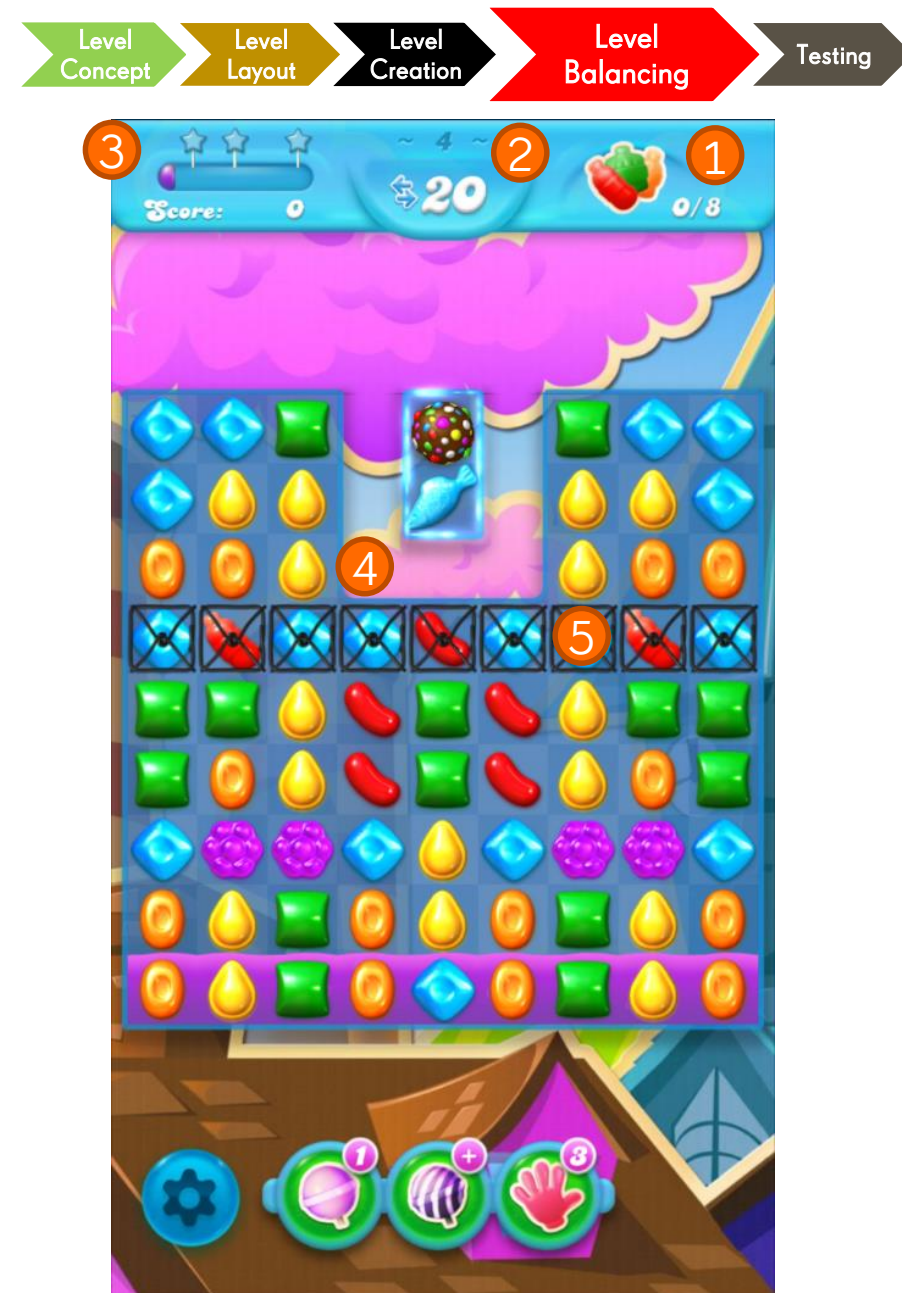
# Difficulty

- Difficulty keeps the player challenged in a level.
- Difficulty as a level design tool encompasses rhythm and flow.
- Every game has a difficulty curve
  - By extension, every level – as a point on that curve – has a level of difficulty assigned to it.



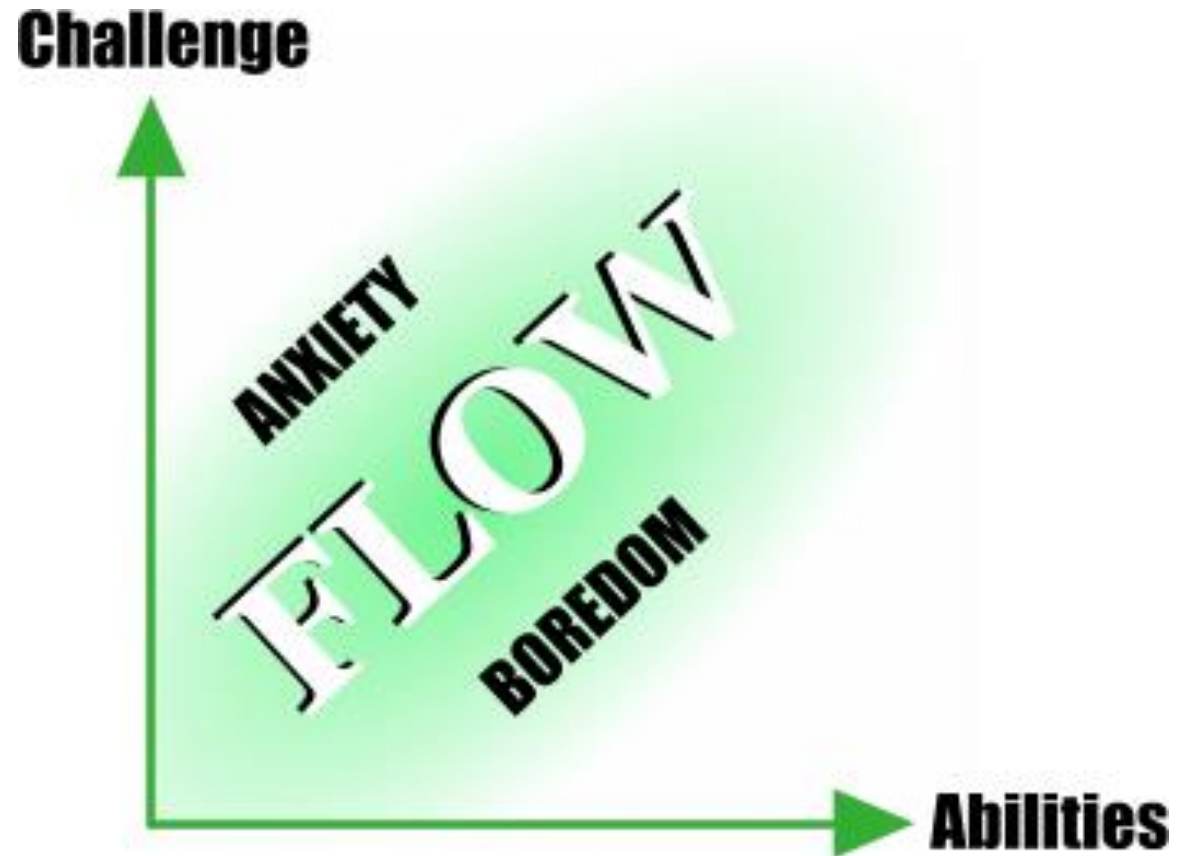
# Level Balancing

1. No. of Objectives.
2. Balancing Moves.
3. Mastery Star values.
4. No. of colours in the level.
5. Balancing no. and level of blockers.





# Flow Theory



Source: <http://www.jenovachen.com/flowingames/flowtheory.htm>

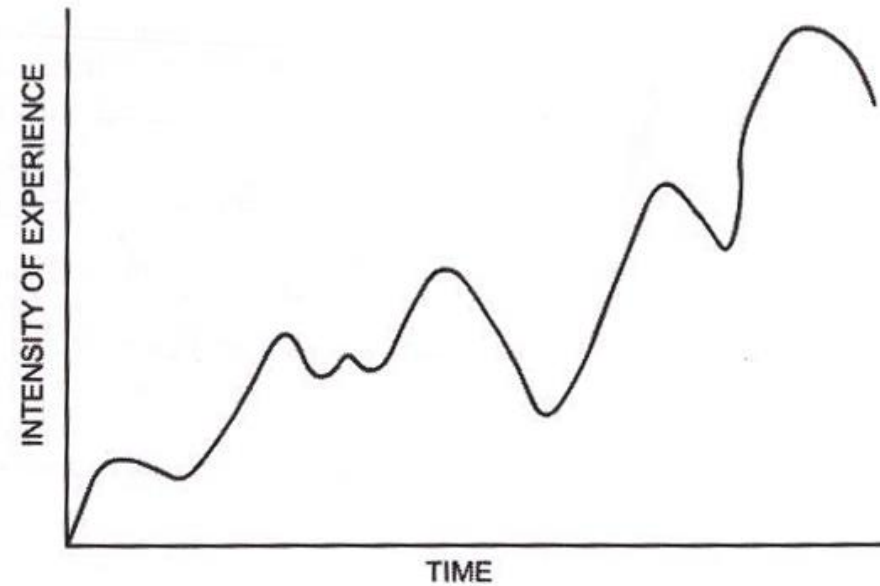




# Plotting the Player Experience

## Factors

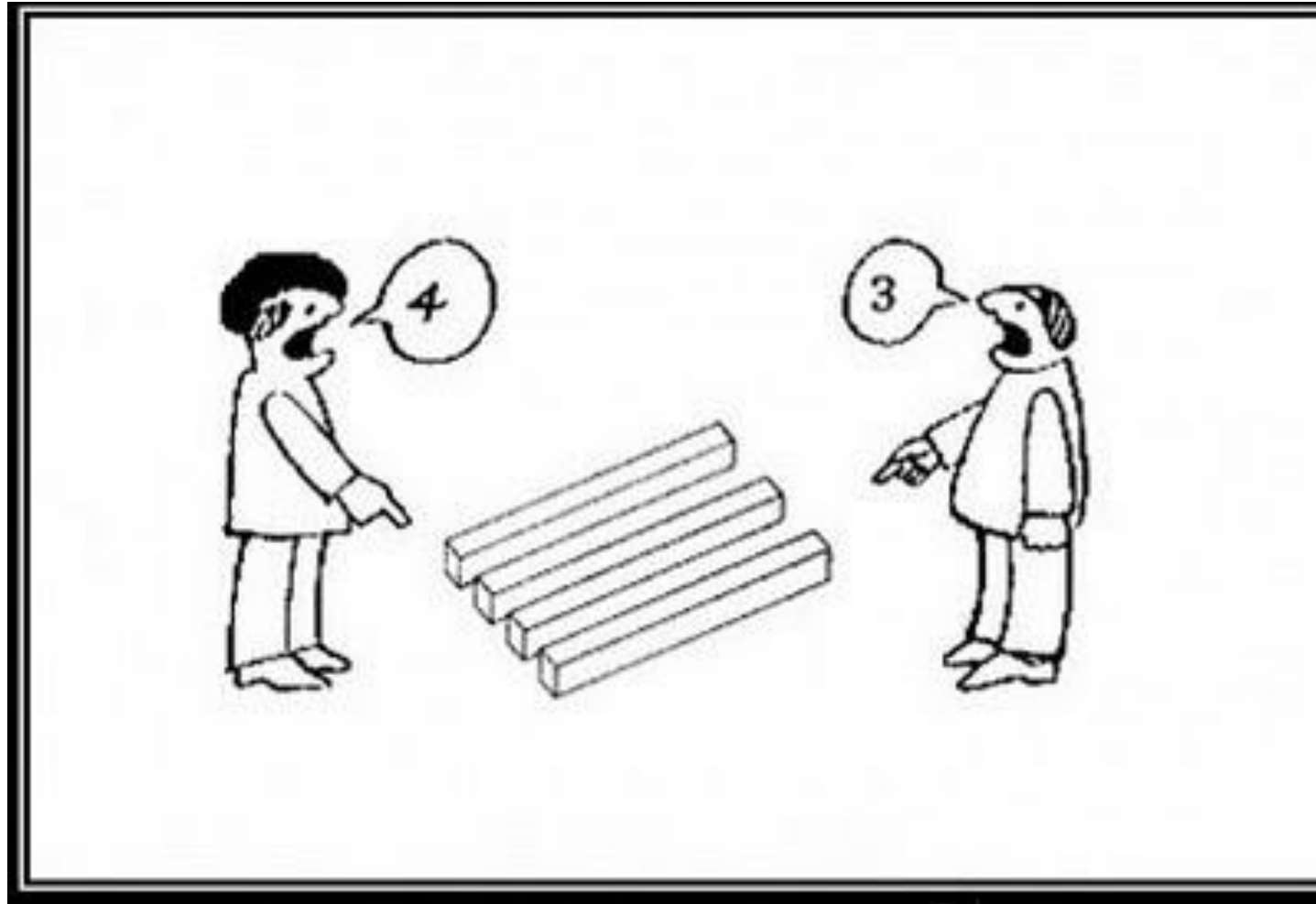
- Different Game Modes.
- Hard Levels vs. Easy Levels.
- Short Levels vs. Long Levels.
- Pace of introducing new content.



**FIGURE 4.3** An example rhythm graph for an average game.



# A Matter of Perspective...





# Level Testing and Balancing

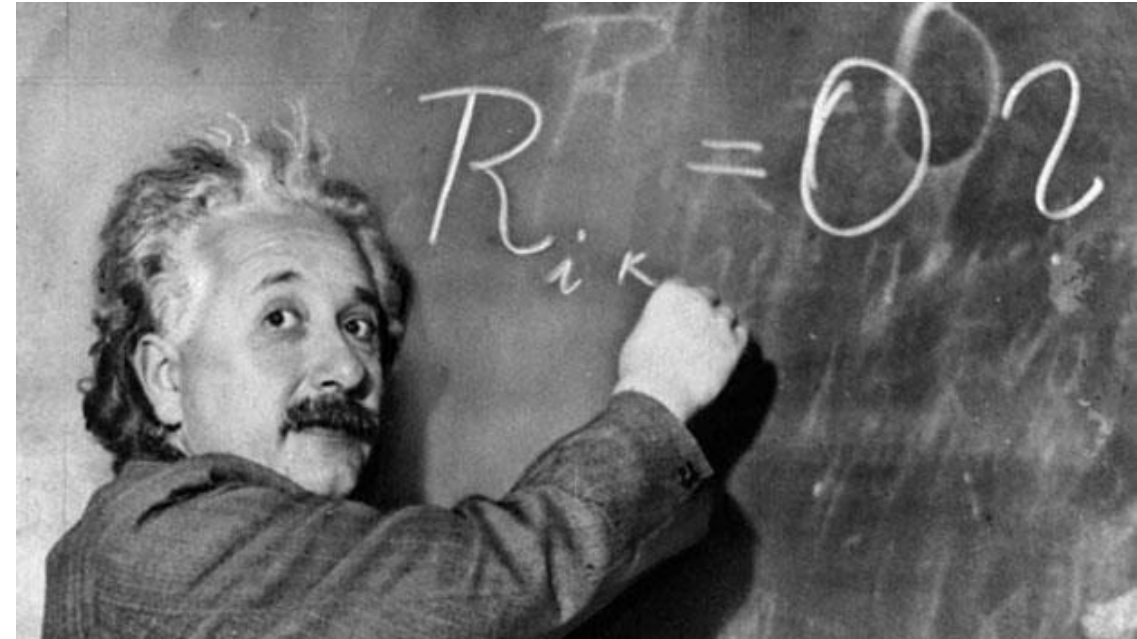
Self-Testing (by Designer)

Internal Testing (with other team members)

Qualitative User Test

Playtest Releases

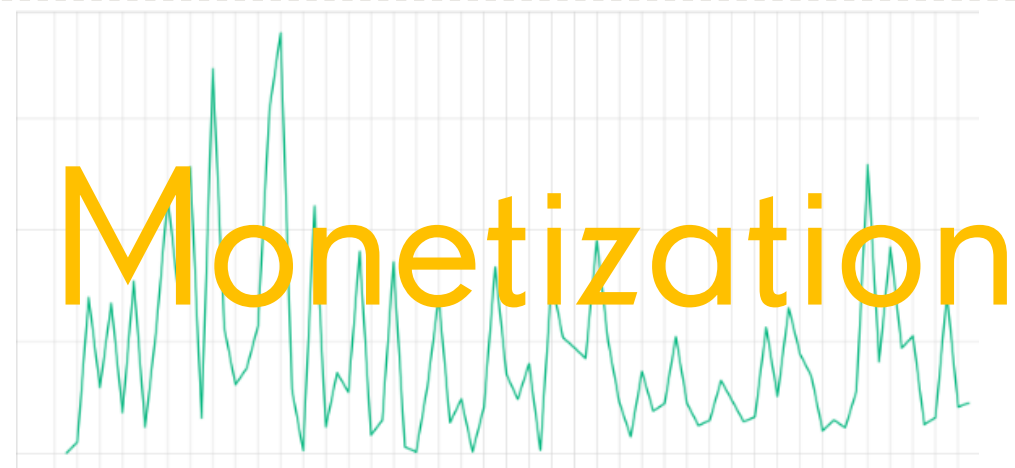
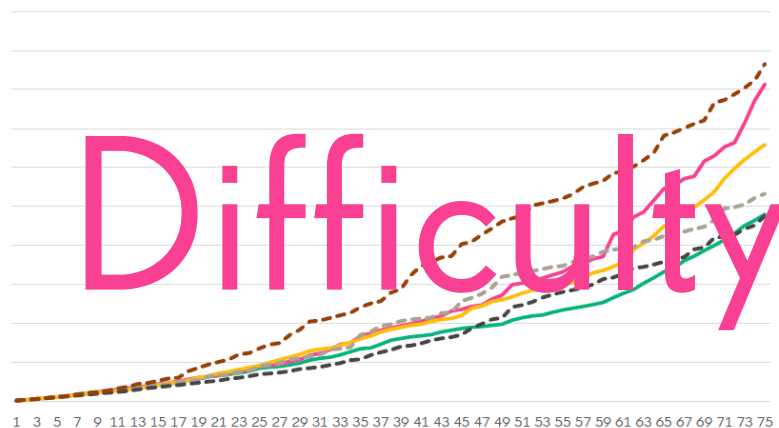
# Level Testing and Balancing



*"Where the Magician meets the Mathematician"*

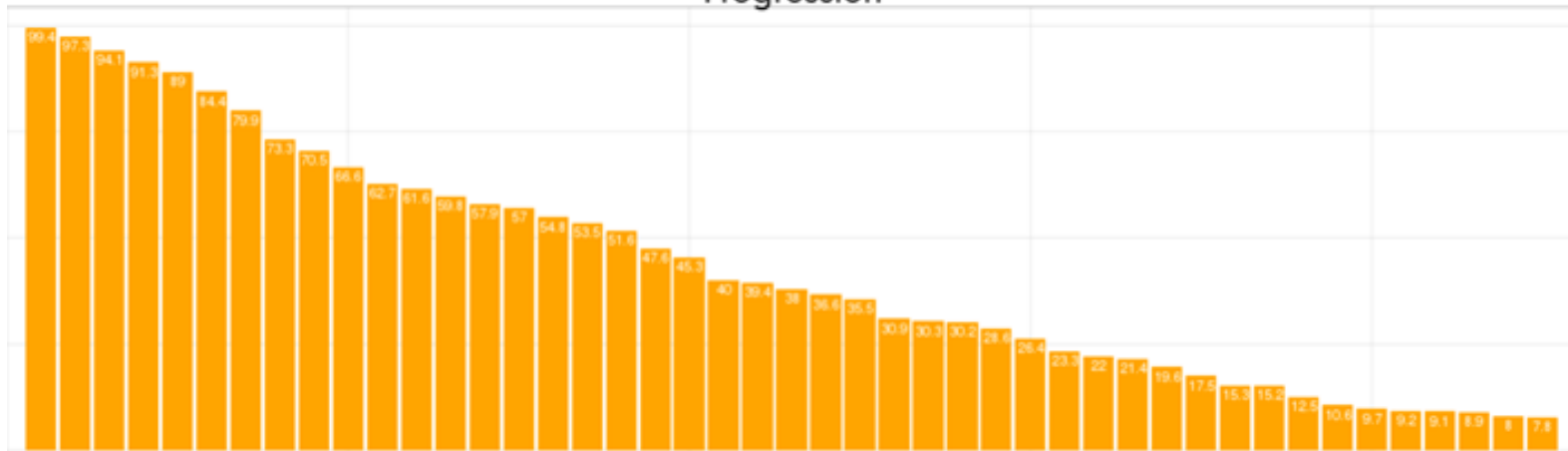


# KPIs and Measurements

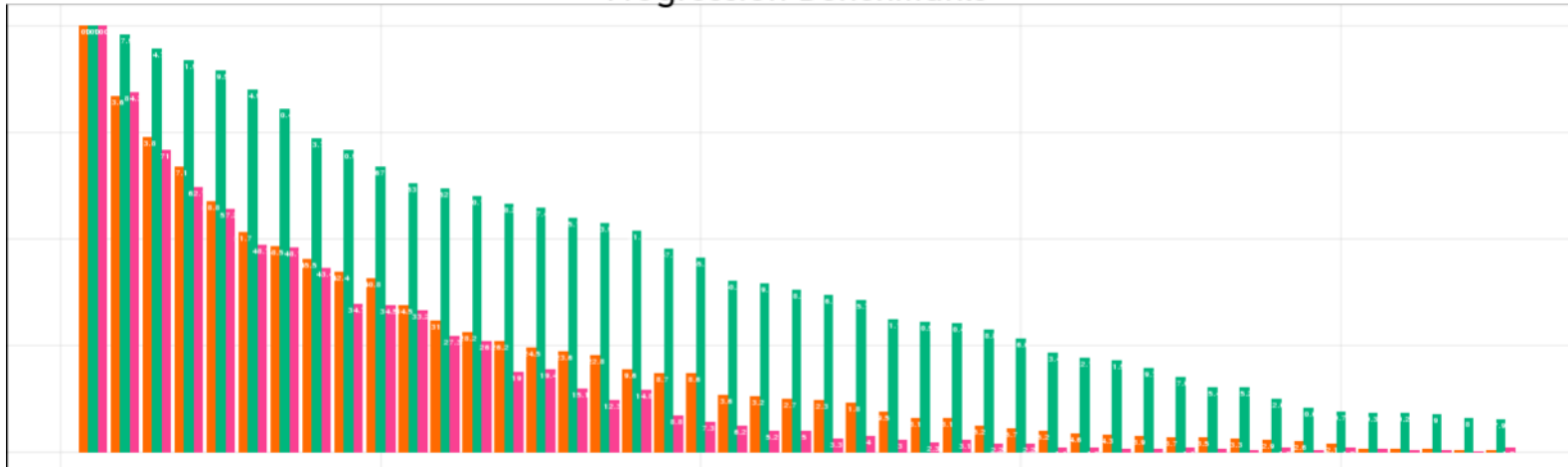


# Measuring Player Progression

Progression



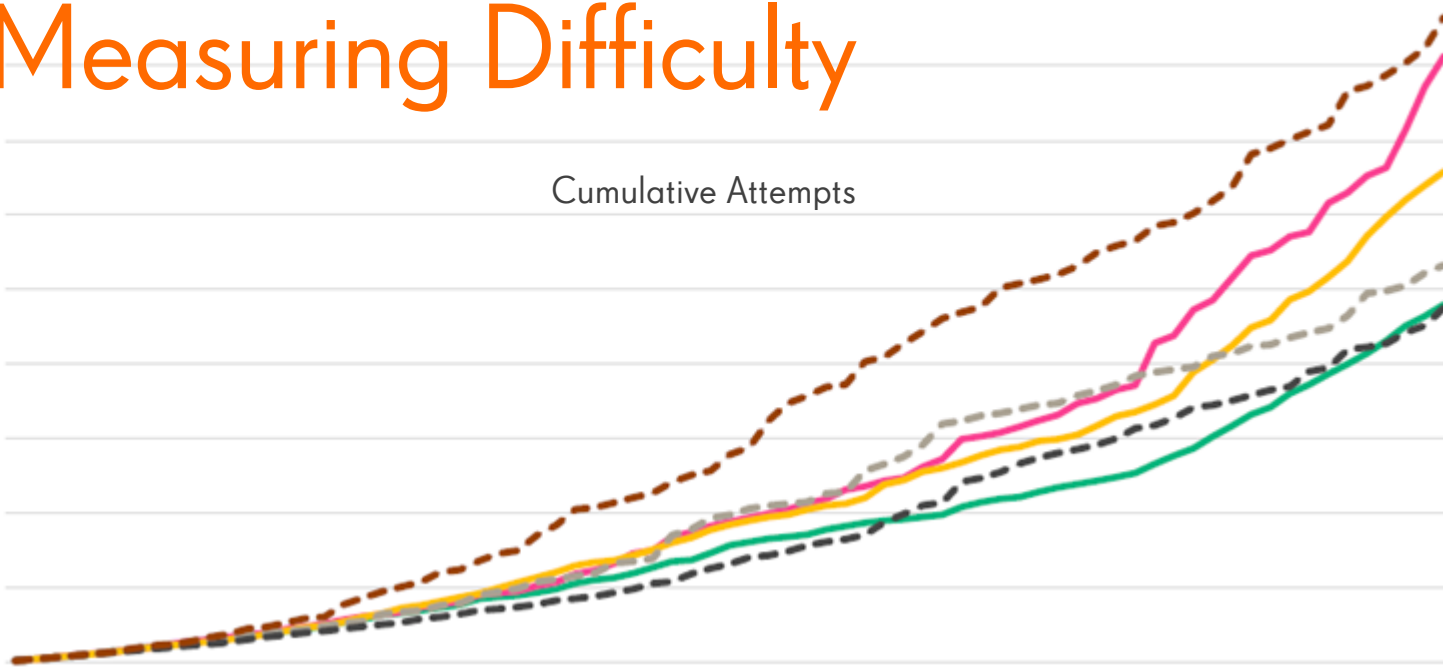
Progression Benchmarks



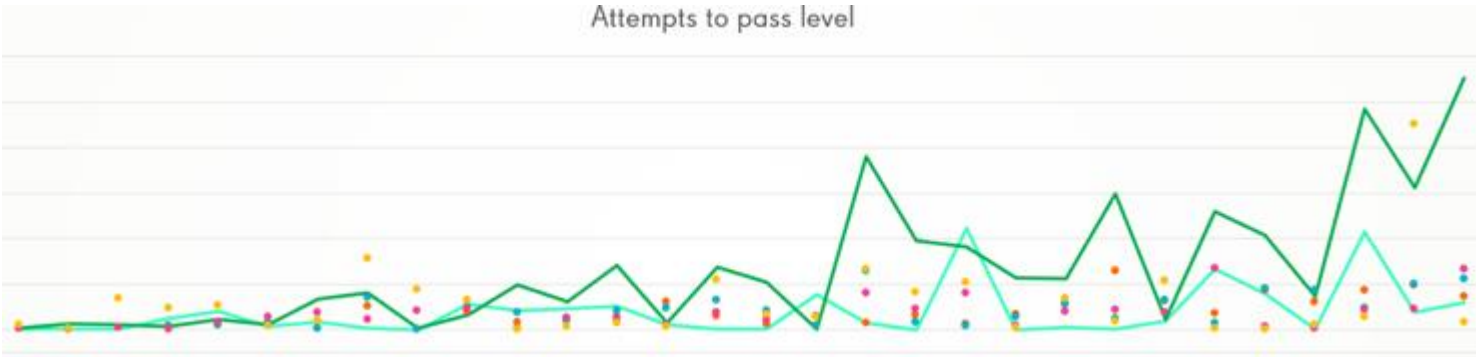


# Measuring Difficulty

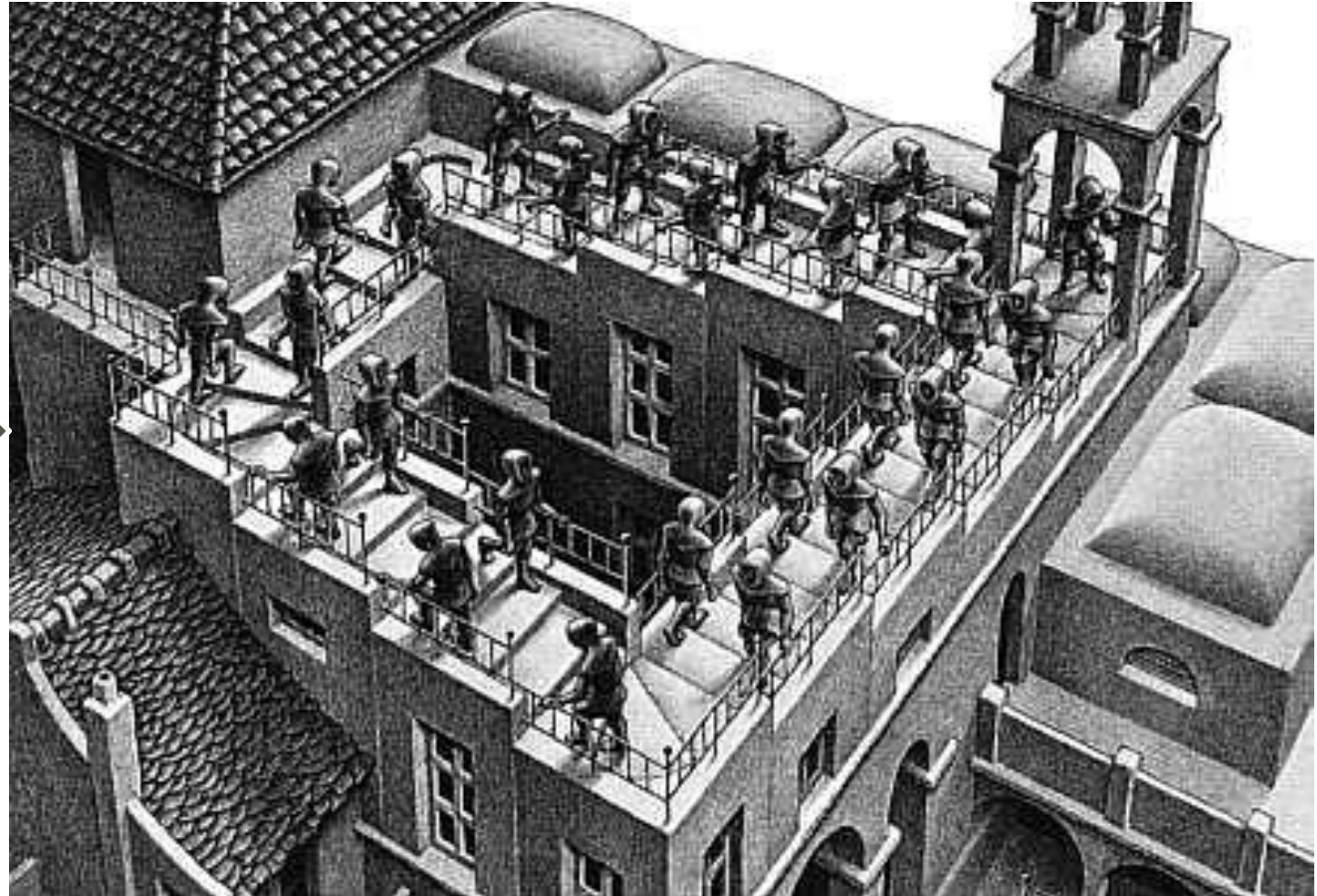
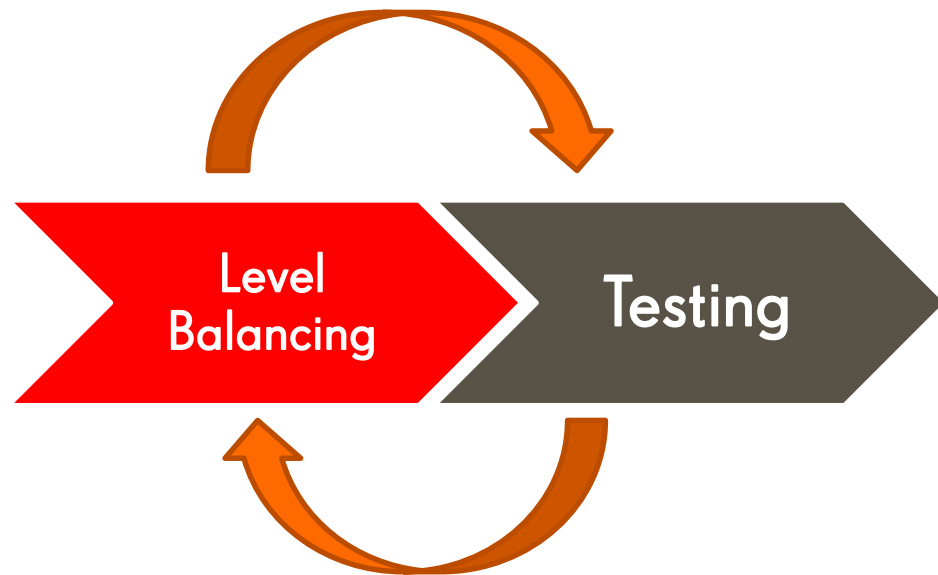
Cumulative Attempts



Attempts to pass level



# Level Testing and Balancing





# Level 65

*"18% of people answered that 65 was the most difficult level."*

<https://geekdad.com/2013/09/hardest-level-candy-crush/>

*"Sure, there were other levels that were on the most dreaded list, but 65 bubbled up to the top as the most dreaded board."*

<https://geekdad.com/2013/09/hardest-level-candy-crush/>

*"This level sucks and there isn't any nicer way to describe it... Really, it's not you. This level just sucks."*

<http://www.stirup-queens.com/2013/09/advice-to-pass-along-level-33-level-65-and-level-97-of-candy-crush/>

*"This used to be one of the difficult levels until it was modified and now it is one of the fun levels."*

<http://candycrushsagaallhelp.blogspot.de/2014/06/candy-crush-saga-most-fun-levels.html>

[http://candycrush.wikia.com/wiki/Level\\_65/Versions](http://candycrush.wikia.com/wiki/Level_65/Versions)





# Recap | 4Ts

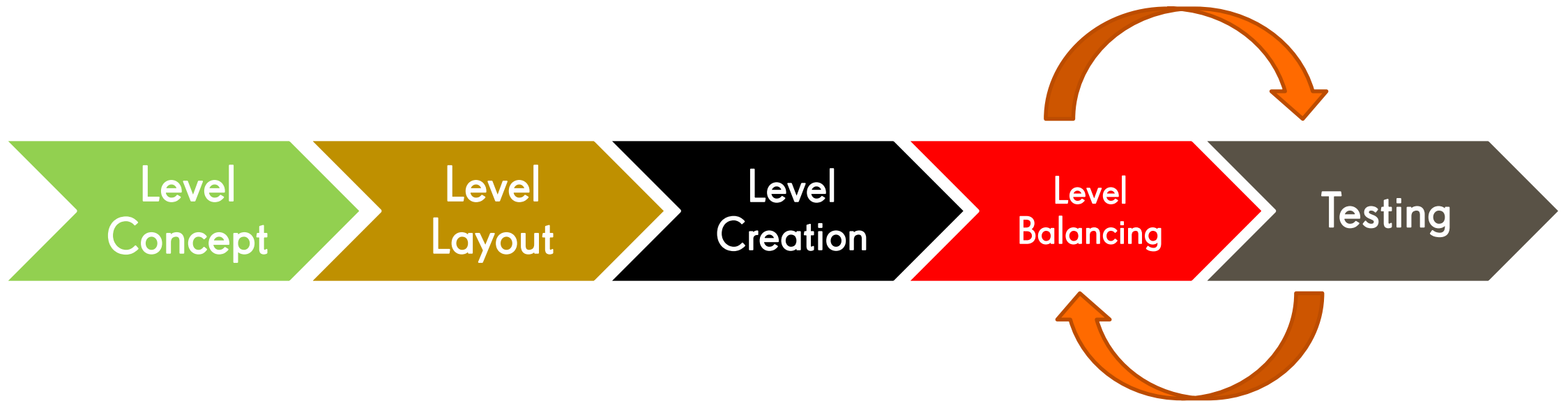
THEORY | Level Design Overview

THOUGHT | Level Design Principles

TOOLS | Building a Saga

TESTING | Tweaking and Tinkering

# Recap | Level Design Process





# Level Design Principles

## Difficulty

*Keeping Players Challenged*

## Rhythm

*Varying the Player Experience*

## Flow

*Keep Players moving towards the Goal*

## Hooks

*Making Levels Different*

# Questions?

Jeremy Kang | Principal Game Designer | King, Berlin | [jeremy.kang@king.com](mailto:jeremy.kang@king.com)

Thank you!