



# CS/INFO 4154:

## Analytics-driven Game Design

Lecture 1:

Overview

# Course Staff

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- me
- Primary TA: Kelvin Jin
- Consultants: Bobby Zhou, Alice Xia

# Today

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- Why should you take this class?
- How is this class structured?
- How will you be evaluated?
- What are the first assignments?

# Today

---

- Why should you take this class?
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# Why should you take this class?

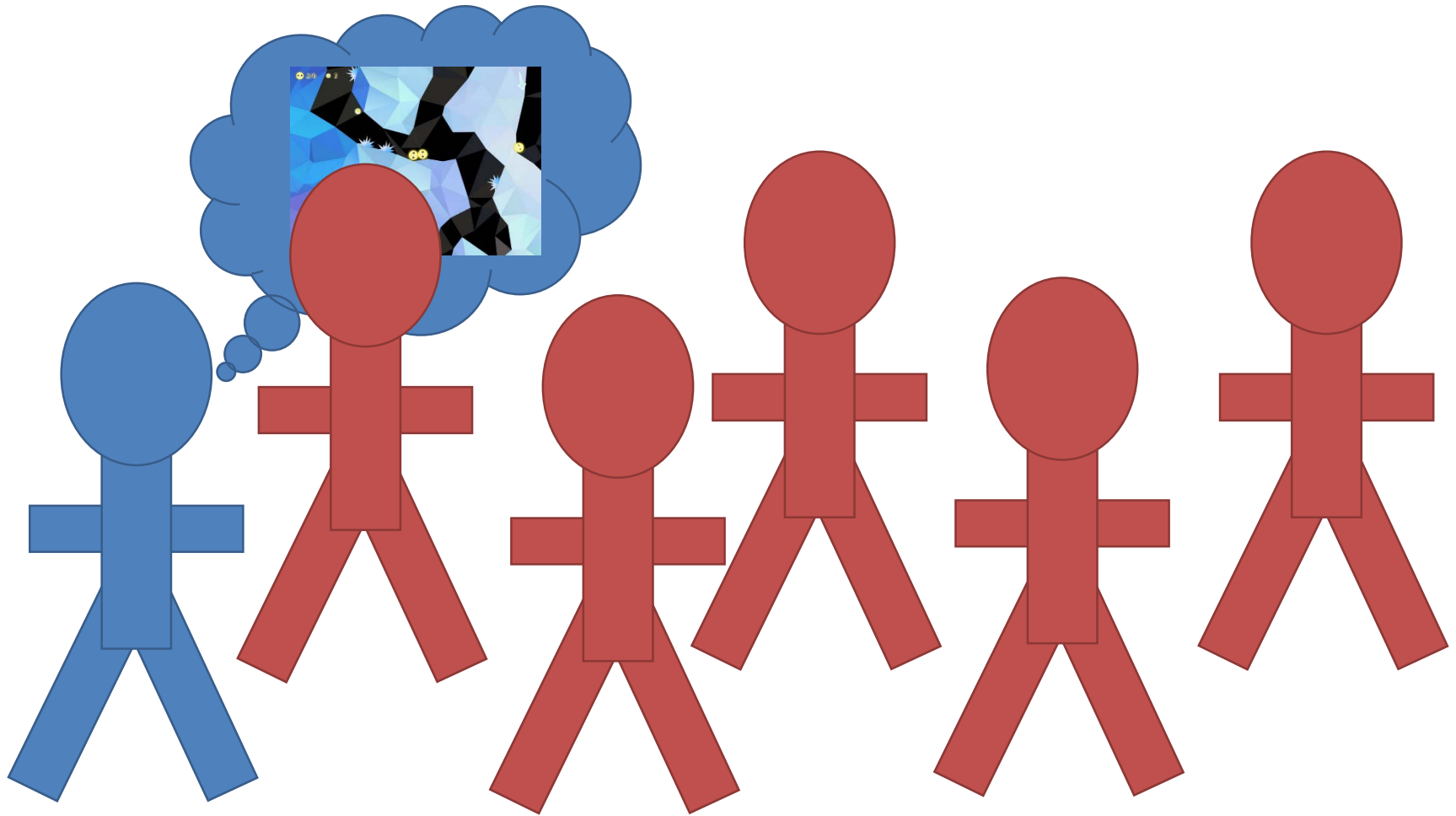
---

- you get to make a game!

2/6

3





You

Your teammates

**Box**



**Nameless**



**Thermo**



**Pyrokid**



**That's How We Roll**



**Zombify**



**Epic's Epic Epic**



**Sleep Fighter**



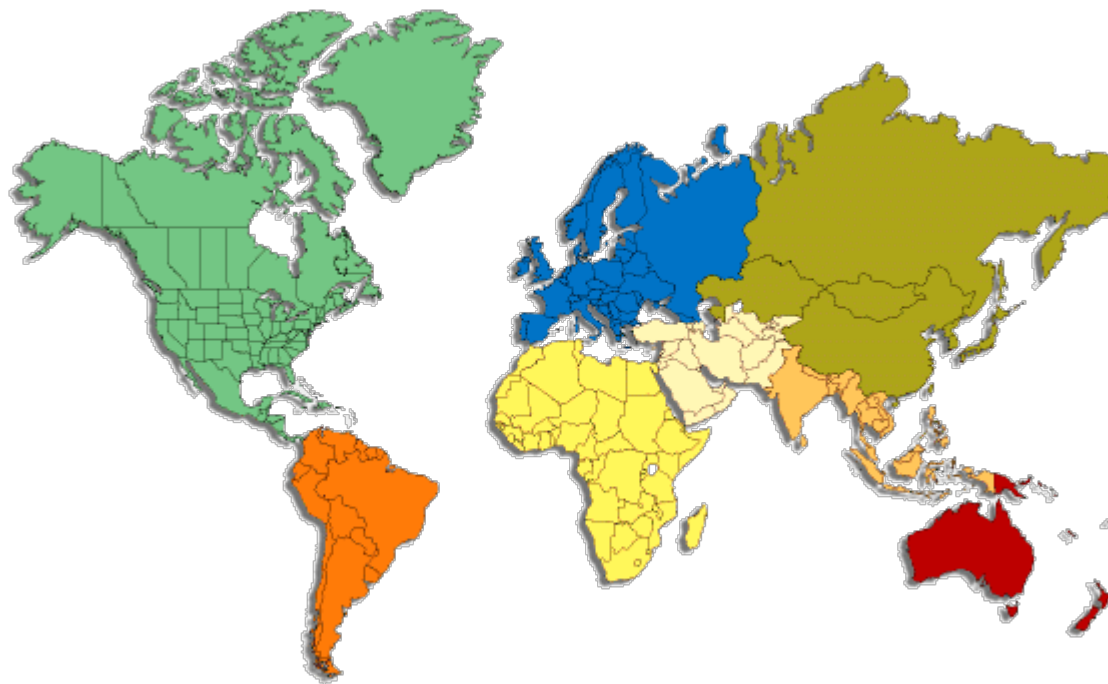
# Why should you take this class?

---

- you get to make a game!
- real-world impact

# Impact

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# Releases

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facebook



**KONGREGATE**





## FEATURED GAMES



To collect this week's Kongpanion:  
**Saturn**




Complete the *Badge of the Day* in  
[The Soul Driver](#)

**PLAY NOW »**

[Learn more about Kongpanions »](#)

TRENDING [\(see all\)](#)**The Soul Driver**

CAR POLICE

## BADGE OF THE DAY

Earn **Double**  
the points »

## LEVEL UP!

**jflat06**

is now level 3!



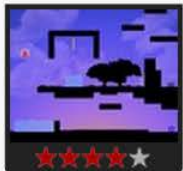
Say congrats »

**Incursion 2: The Artif...**

TOWER DEFENSE

**Cedgta 16**

First Defense

HOT NEW GAMES [\(see all\)](#)**Thermo**

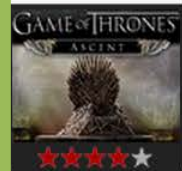
PUZZLE PLATFORM

A unique water-based puzzle  
platformer where you must  
use...**BOX!**

PUZZLE BOX BLOCK

Build, break, and twist your way  
to victory in this mind-...**That's How We Roll**

ACTION CUTE GRAVITY

That's How We Roll is a fast-  
paced adventure-platformer g...RECOMMENDED GAMES [\(see all\)](#)**Game of Thrones Ascent**

MMO MULTIPLAYER FANTASY

Because you rated [Free Traders](#)  
highly.**Contract Wars**

UNITY MULTIPLAYER

Because you rated [Time Decay](#)  
highly.**Tyrant Unleashed**

CARD MMO MULTIPLAYER

Because you rated [Free Traders](#)  
highly.Free lifetime  
printer service.Available on all  
desktop printers with  
Xerox eConcierge®**get one now****xerox**

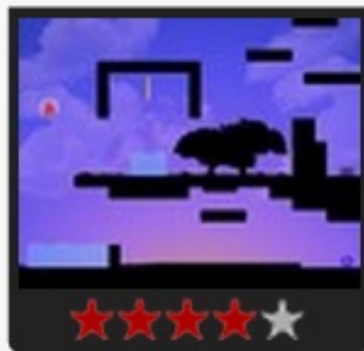
## SPONSORED LISTING

**Fuel up for Battle**

Make Your Codes Count!

[get the goods »](#)

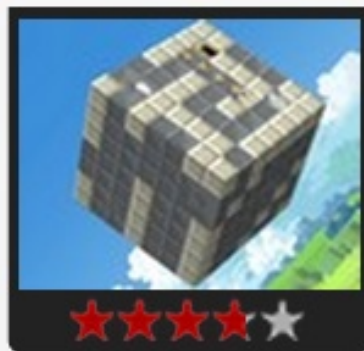




### Thermo

PUZZLE PLATFORM

A unique water-based puzzle platformer where you must use...



### BOX!

PUZZLE BOX BLOCK

Build, break, and twist your way to victory in this mind-...



### That's How We Roll

ACTION CUTE GRAVITY

That's How We Roll is a fast-paced adventure-platformer g...

# External Reviews!

[Review](#) 


## Box!

By Kimberly | December 30, 2014 | [Add to Favorites](#)


 Rating: 4.1/5 (41 votes)

**Platform:** [Flash](#)

Categories: [bchoi](#), [browser](#), [flash](#), [free](#), [game](#), [jsytryn](#), [kma](#), [ndiebold](#), [platform](#), [puzzle](#), [rating-y](#), [rsong](#), [schen](#), [wpeck](#)

[f Like](#) 0 [t Tweet](#) 0 | [Comments \(6\)](#) | Views (4,505) 



 It's the classic story. Boy goes adventuring, boy gets trapped in a cube (nevermind how), boy faces danger and must use his wits and never-ending supply of crates to escape. Though really it's your cleverness that is needed to get the boy out in **Box!** an interesting and engaging **puzzle platform** game created by Jeremy Cytryn, Renchu Song, Sam Chen and Will Peck, with art by Kevin Ma and Natalie Diebold, and music from Brigid Choi. Use the [arrow] keys to walk and jump. Press [space bar] to deploy a box in the direction you are facing, and again to destroy a box you are looking at, including ones above and below you. Use [WASD] to look around the corners of the cube to see what's ahead, or to make sure you won't die a fiery death if you drop down.

[Review](#) 

## Thermo

By Satori | December 17, 2014 | [Add to Favorites](#)


 Rating: 4/5 (35 votes)

**Platform:** [Flash](#)

Categories: [awolfers](#), [browser](#), [dcarpenter](#), [flash](#), [free](#), [game](#), [gren](#), [jgross](#), [kjin](#), [platform](#), [puzzle](#), [rating-y](#), [rnason](#)

[f Like](#) 0 [t Tweet](#) 0 | [Comments \(13\)](#) | Views (4,863) 



 In water, heat rises and cold sinks. That's the premise behind **Thermo**, the temperate and mercurial new **platformer** by **Andrew Wolfers**, **Daniel Carpenter**, **Grace Ren**, **Joel Gross**, **Kelvin Jin**, and **Robyn Nason**. (Did I leave anybody out?) In each of the 30 levels you need to first open the exit portal and then get to it... somehow! The activator and portals aren't necessarily where you can get to them, and that's where water comes in. Floating masses of water are strategically-placed throughout the levels allowing you to use your special abilities, if you have them. Passing between red contacts heats you up, enabling you to rise if you start out in water. You'll continue to rise until you hit an overhead surface at which point you'll fall just as you ordinarily would, though you can steer your descent. Blue contacts let you create an ice platform under you while in water. Yellow contacts enhance either ability... you can create up to three ice platforms in water if you're cold, and walk on the ceiling if you're hot! Dull grey contacts return your temperature to normal, but leave any platforms or ceiling-walking abilities if they're active.

190,000 people

# Hello Worlds!

---



# Hello Worlds!

---

**1.**

**le**



# The internet is cruel...

---

“Fez rip off”

“graphics are ugly and too pixelated”

“stupid controls make the game stupid”

“shitty dev should know better”

# ... but occasionally rewarding

---

“i hope you’re happy.... you made a game soo good i ignored my important english paper all day just to play it... I hope you’re proud of yourself =p 5/5”

# Why should you take this class?

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- you get to make a game!
- real-world impact
- data-driven design



# Making pots

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no \$5 fame



1 hour

no \$100 fame

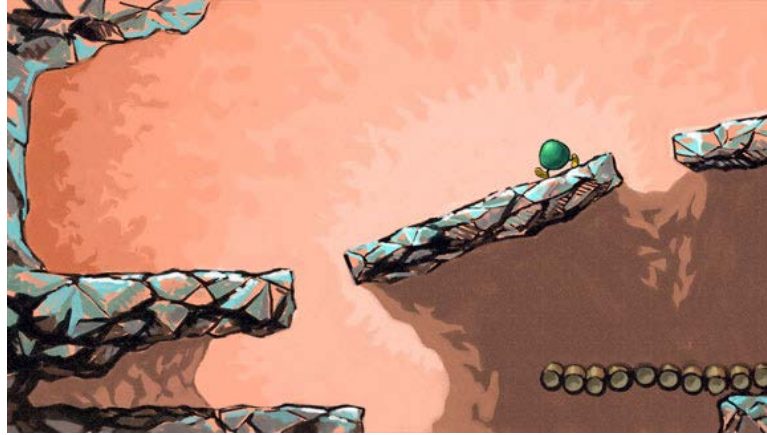


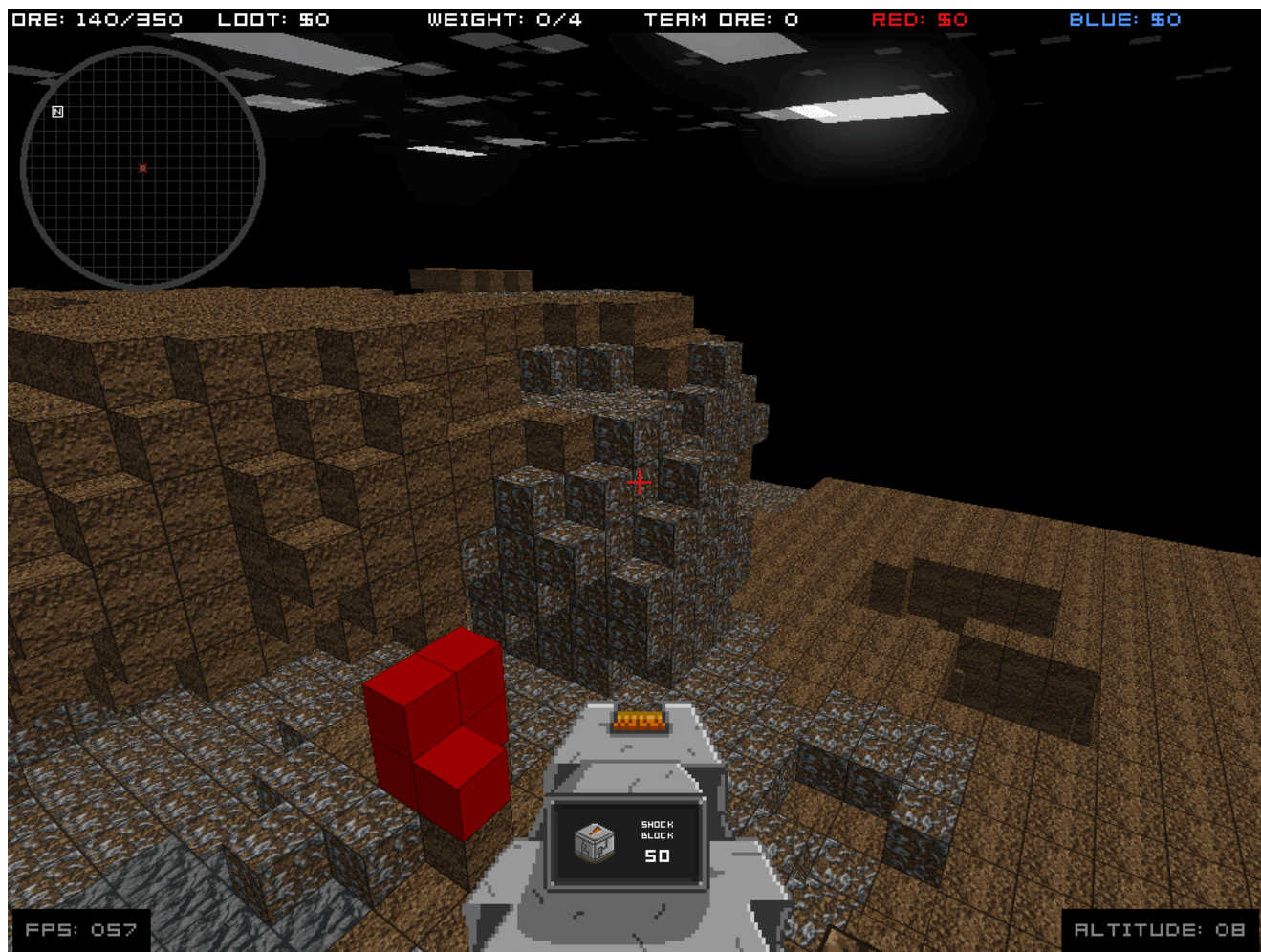
10 hours

lot \$500 fame



100 hours



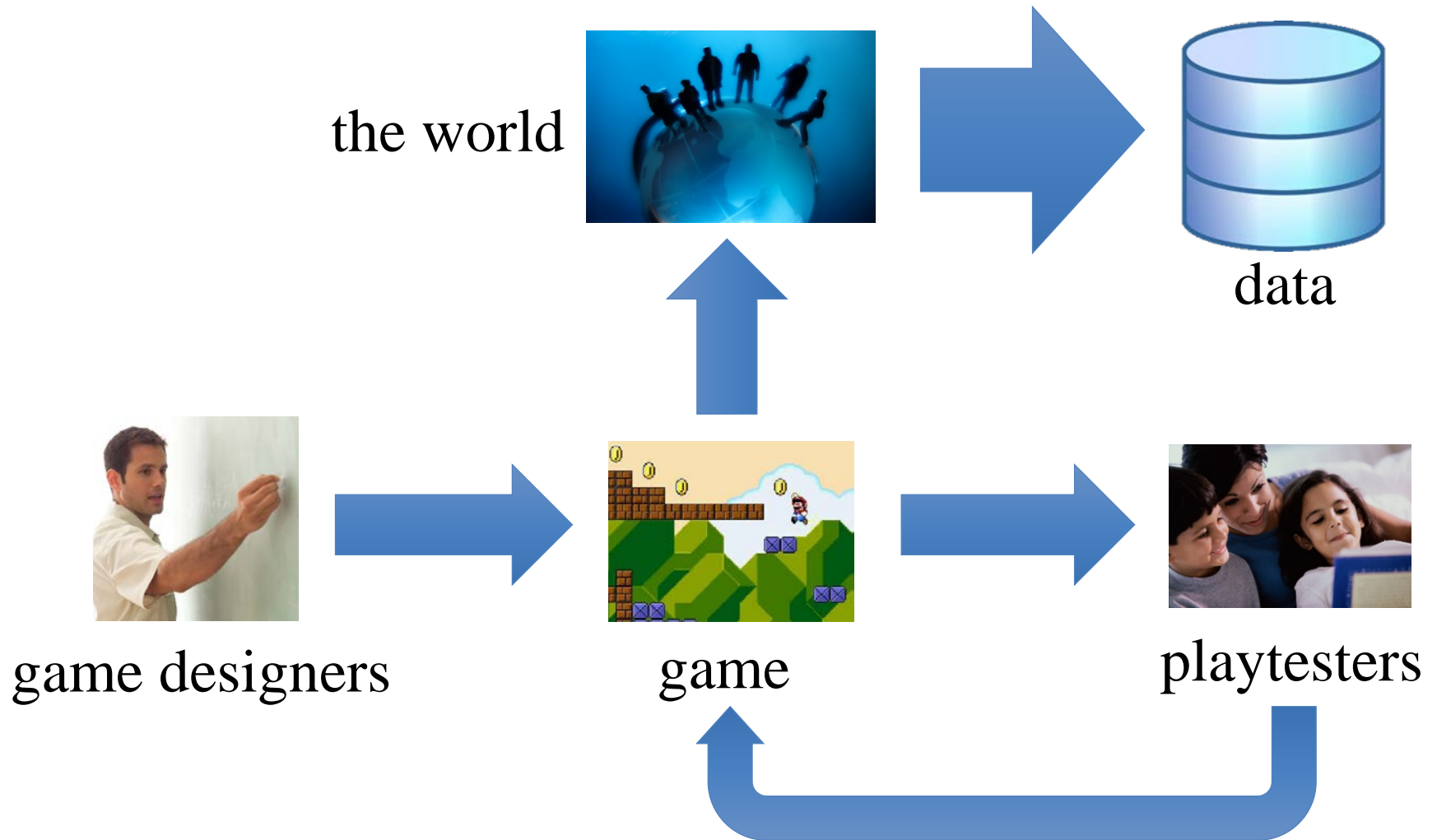






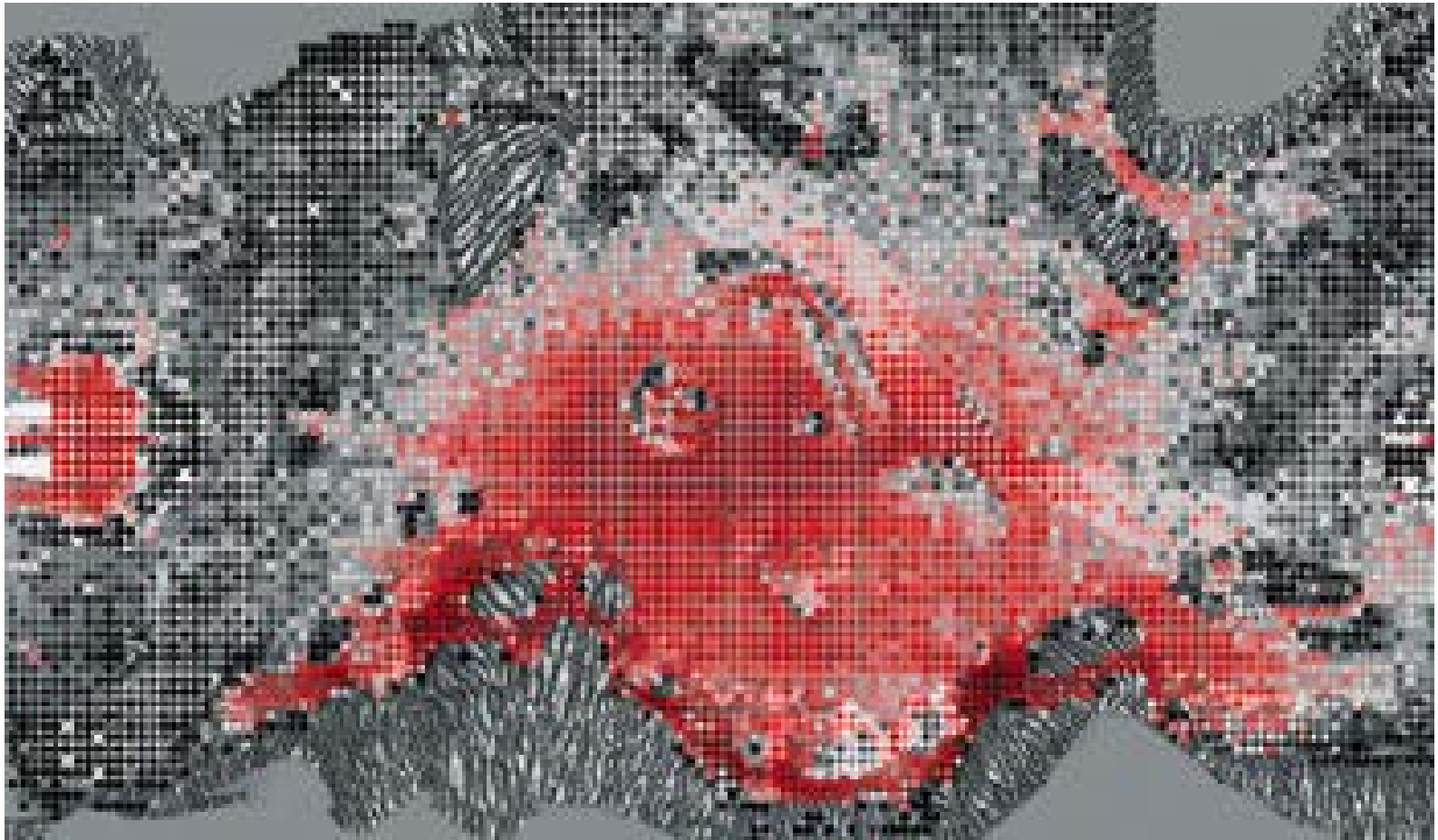
# Game Design Workflow

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# Heatmap of Deaths

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# Heatmap of Crashes

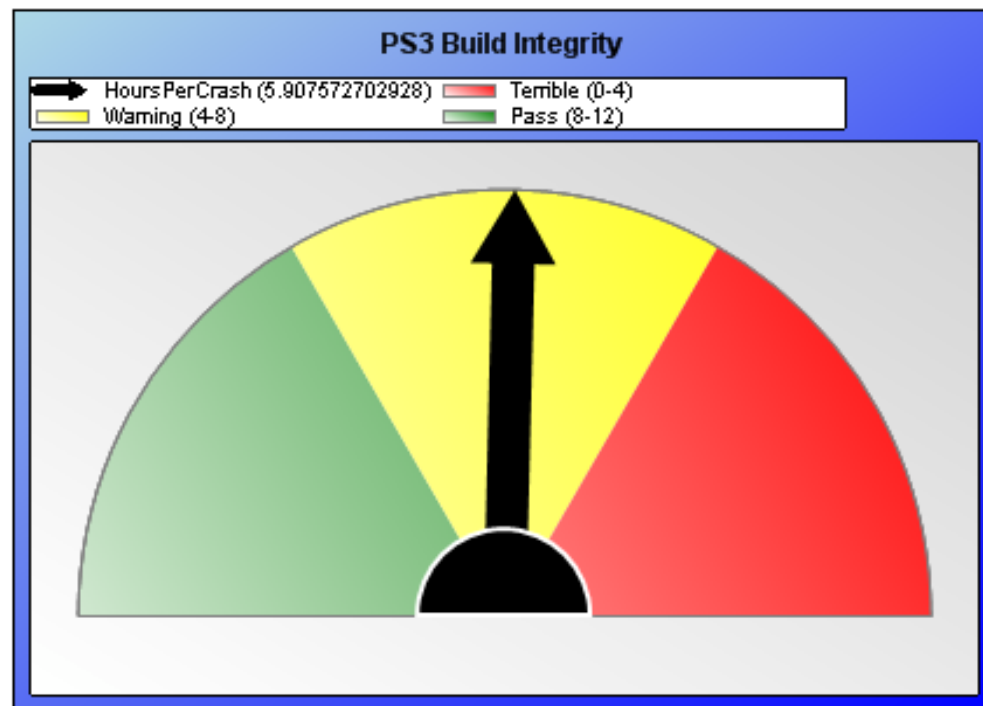
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Source: Georg Zoeller, “Game Development Telemetry” GDC 2010

# Crash Meter

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Source: Georg Zoeller, "Game Development Telemetry" GDC 2010x



# How do I...

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Source: Georg Zoeller, "MMO Rapid Content Iteration" GDC Online 2011x

# The road less traveled

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68% of players go right

# New York Times League of Legends

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# GSN Games A/B Testing





# GSN Games A/B Testing



# GSN Games A/B Testing



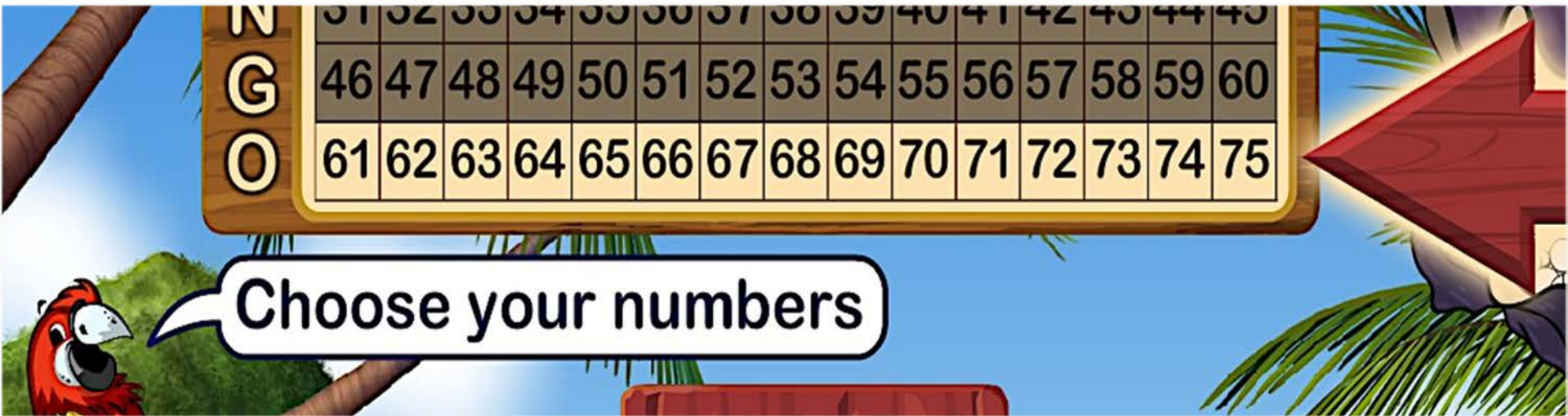
Revenue +12.3%

Bounce Rate -25.8%



# GSN Games A/B Testing

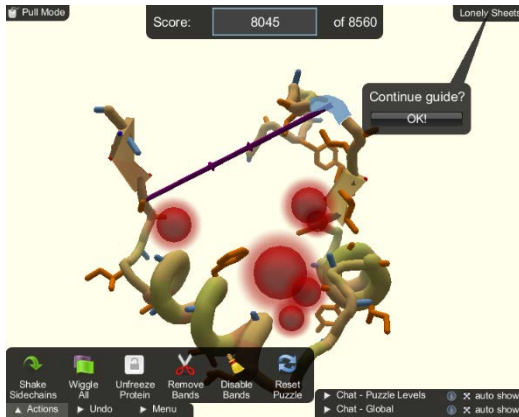
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Revenue +11%

# 4 Experiments

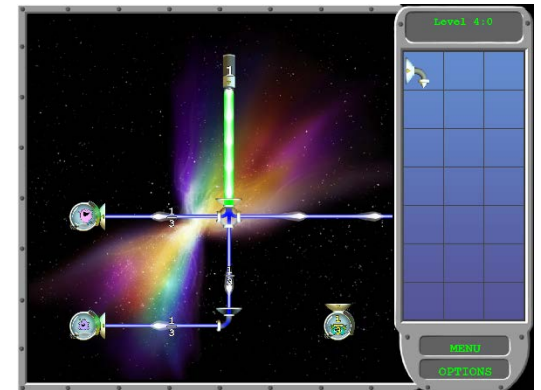
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Foldit



Hello Worlds



Refraction



# Metrics

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- Progress
- Time played
- Return rate

# Experiment #1: Audio

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# With audio, engagement...

---

- A) increased
- B) decreased
- C) increased AND decreased
- D) didn't change

# With audio, engagement...

---

- A) increased
- B) decreased
- C) increased AND decreased
- D) didn't change**

# Experiment #2: Animations

---



# With animations, engagement...

---

- A) increased
- B) decreased
- C) increased AND decreased
- D) didn't change

# With animations, engagement...

---

A) **increased**

B) decreased

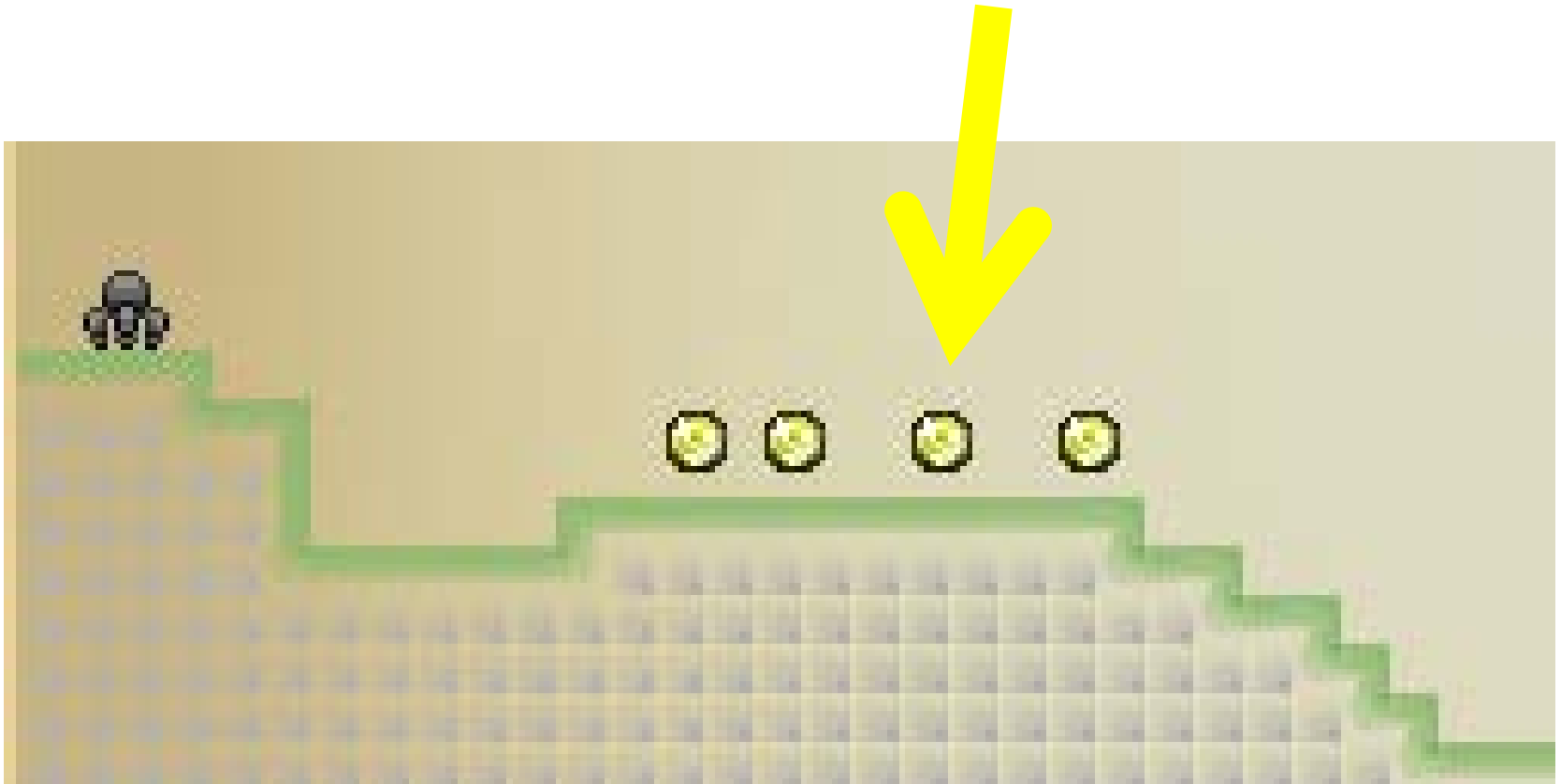
C) increased AND decreased

D) didn't change



# Experiment #3: Secondary Objectives

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# With secondary objectives, engagement...

---

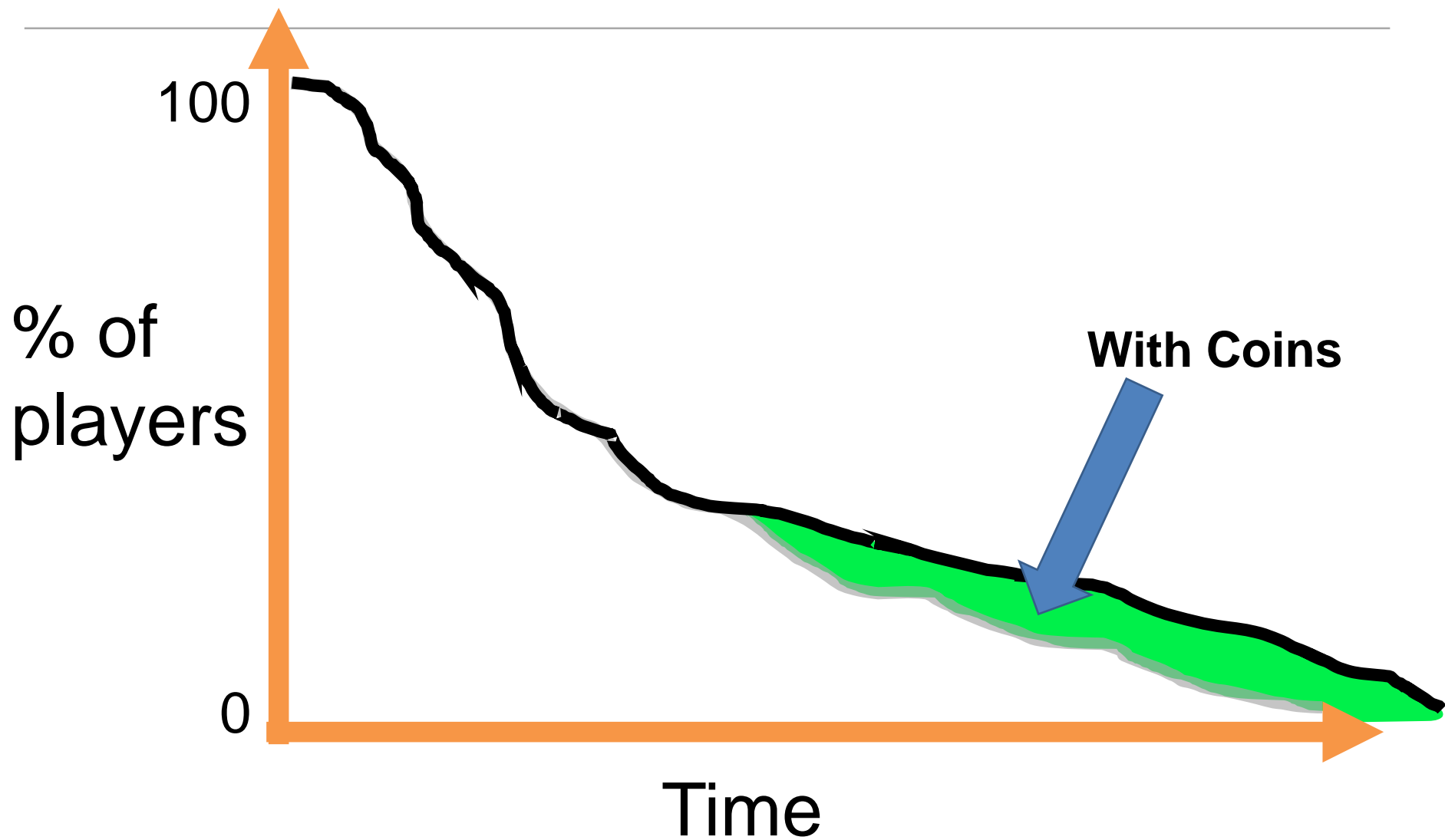
- A) increased
- B) decreased
- C) increased AND decreased
- D) didn't change

# With secondary objectives, engagement...

---

- A) increased
- B) decreased
- C) increased AND decreased**
- D) didn't change

# The Hope



# Reality

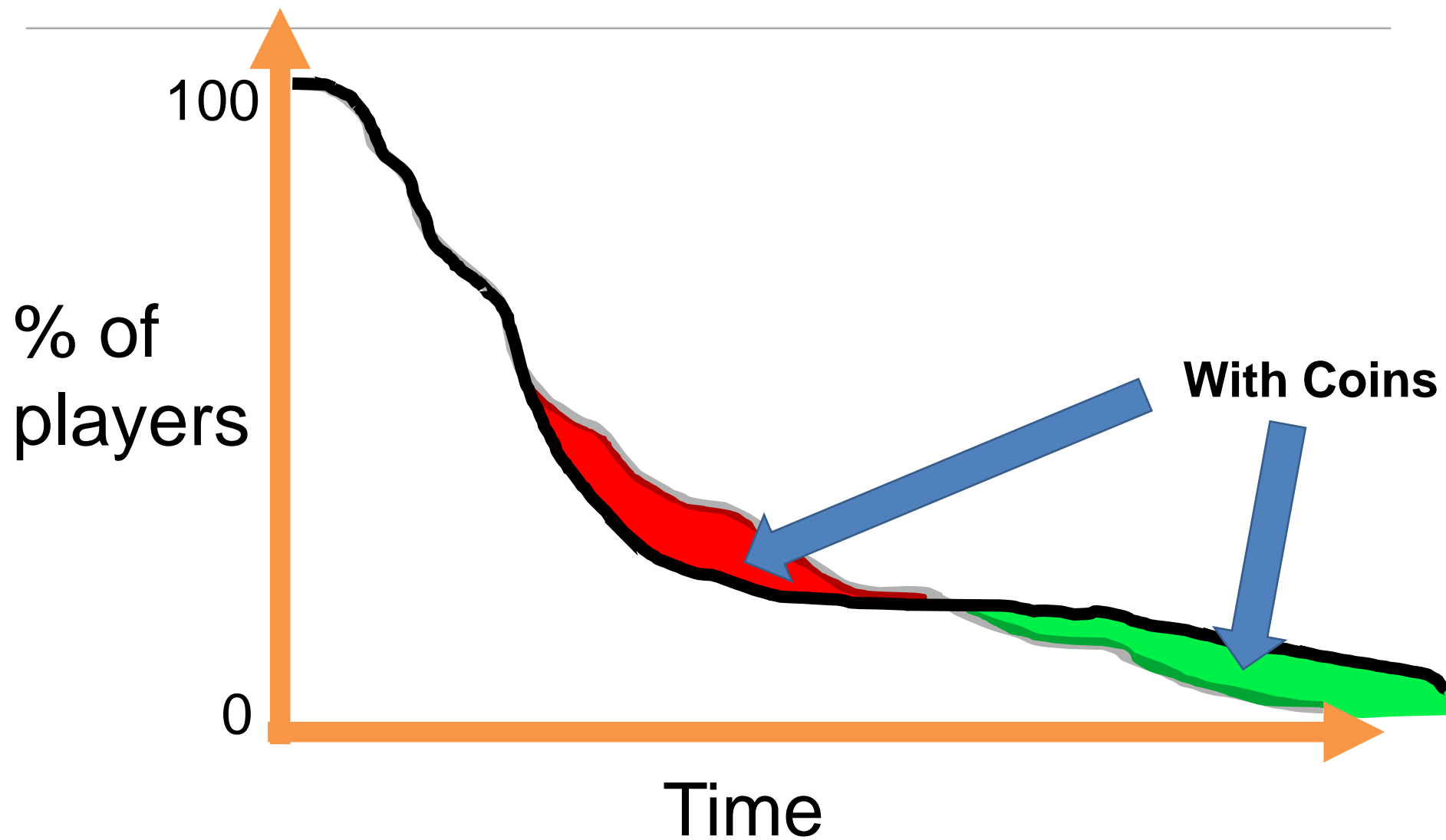
100

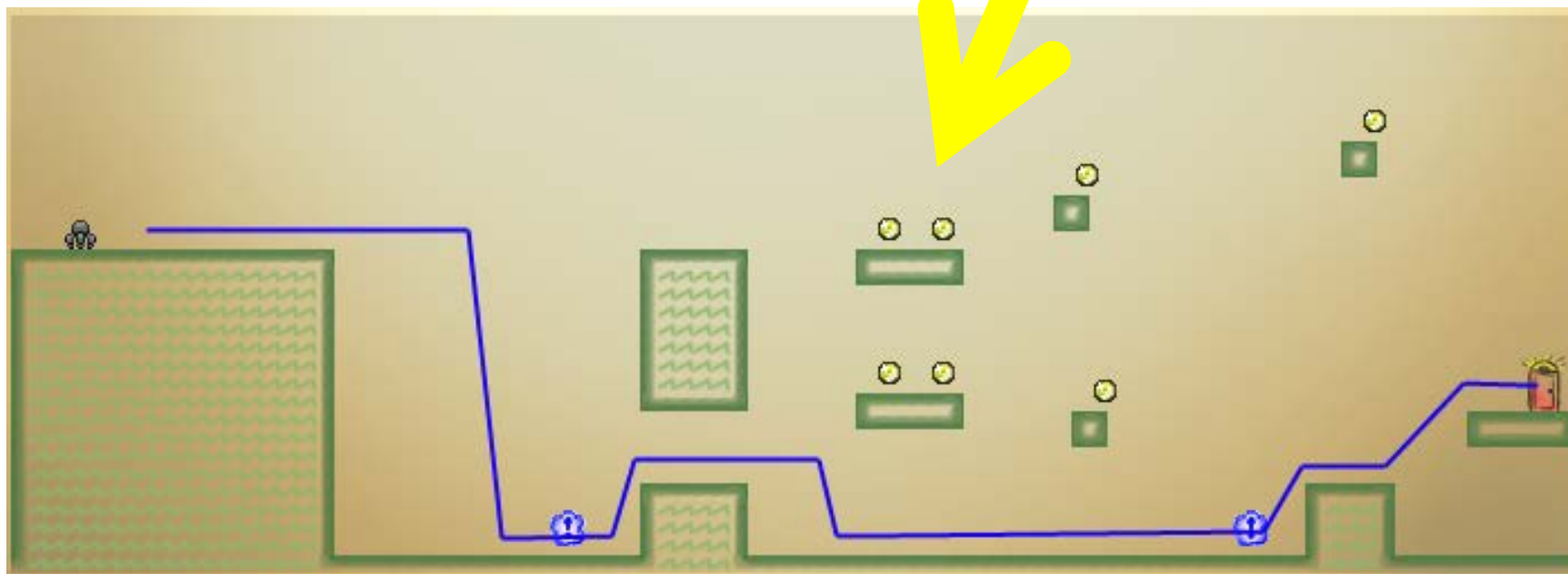
% of  
players

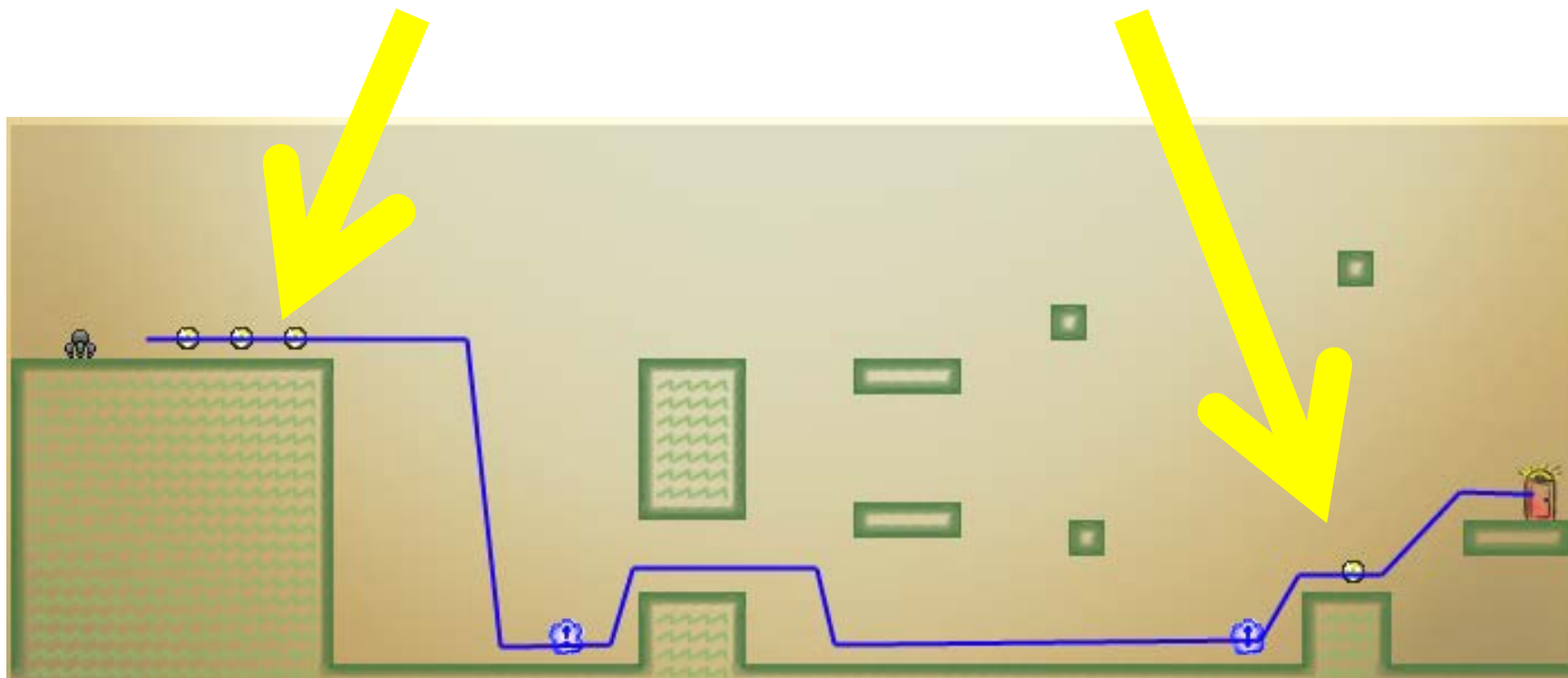
0

Time

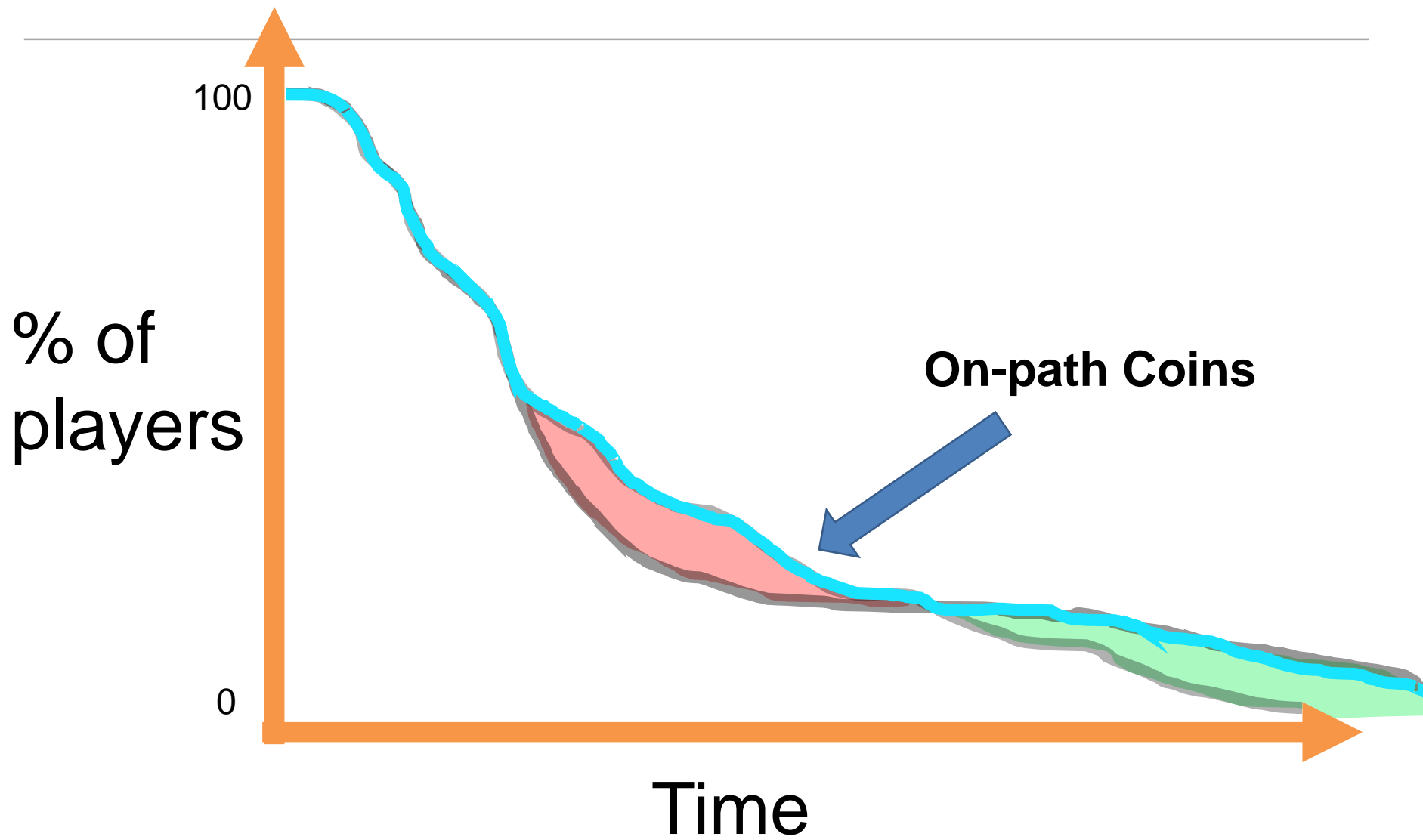
With Coins











# Experiment 4: Tutorials

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# With tutorials, engagement...

---

- A) increased
- B) decreased
- C) increased AND decreased
- D) didn't change

# With tutorials, engagement...

---

**A) increased**

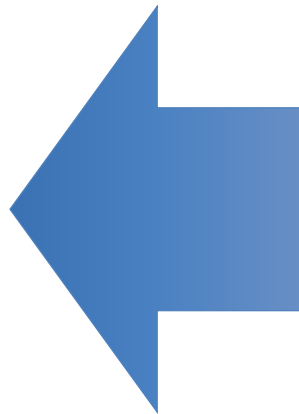
B) decreased

C) increased AND decreased

**D) didn't change**

# Analytics in this class

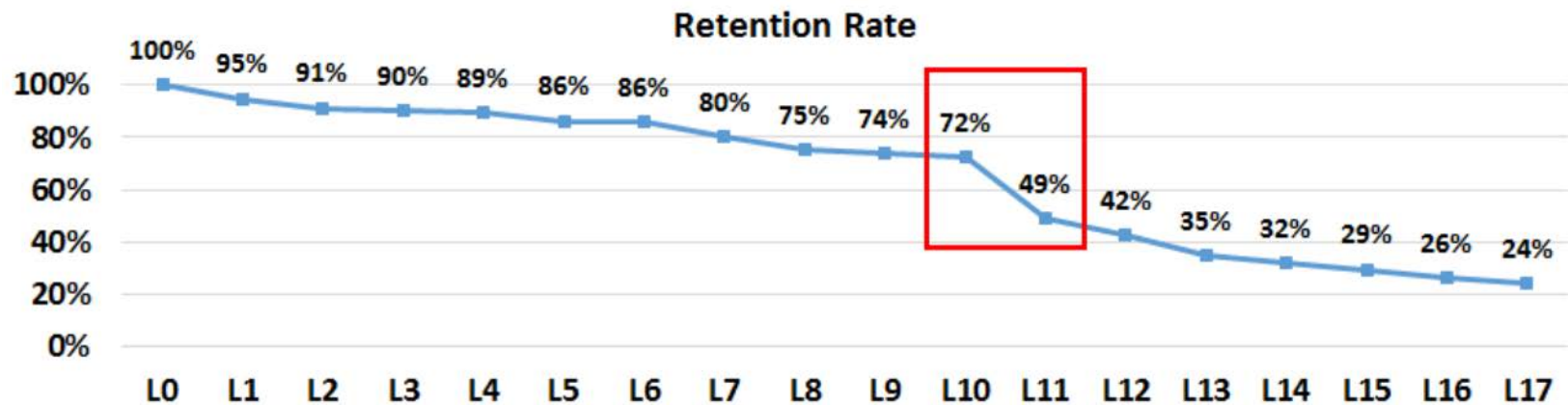
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`gdiac.cs.cornell.edu`

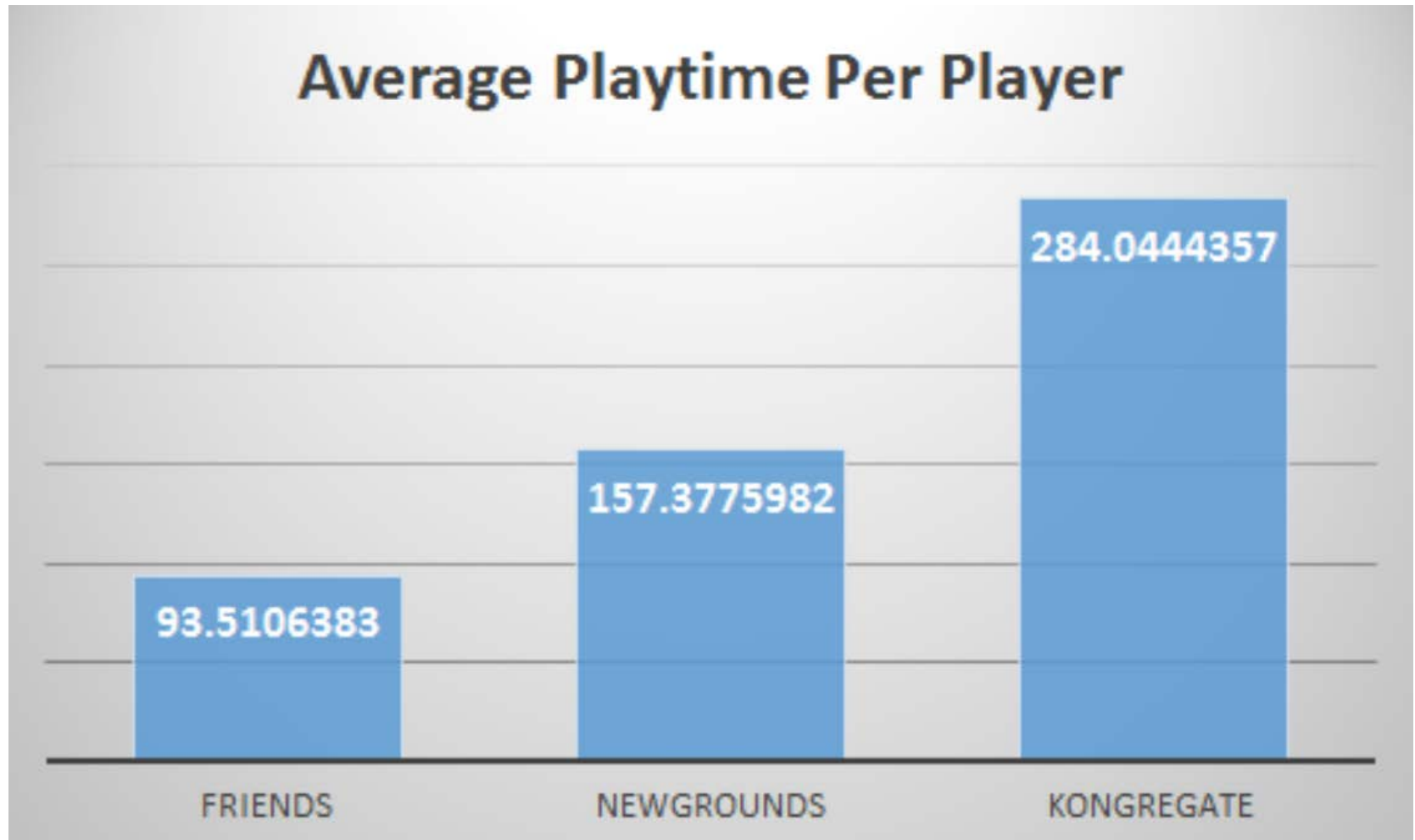
# Friction points

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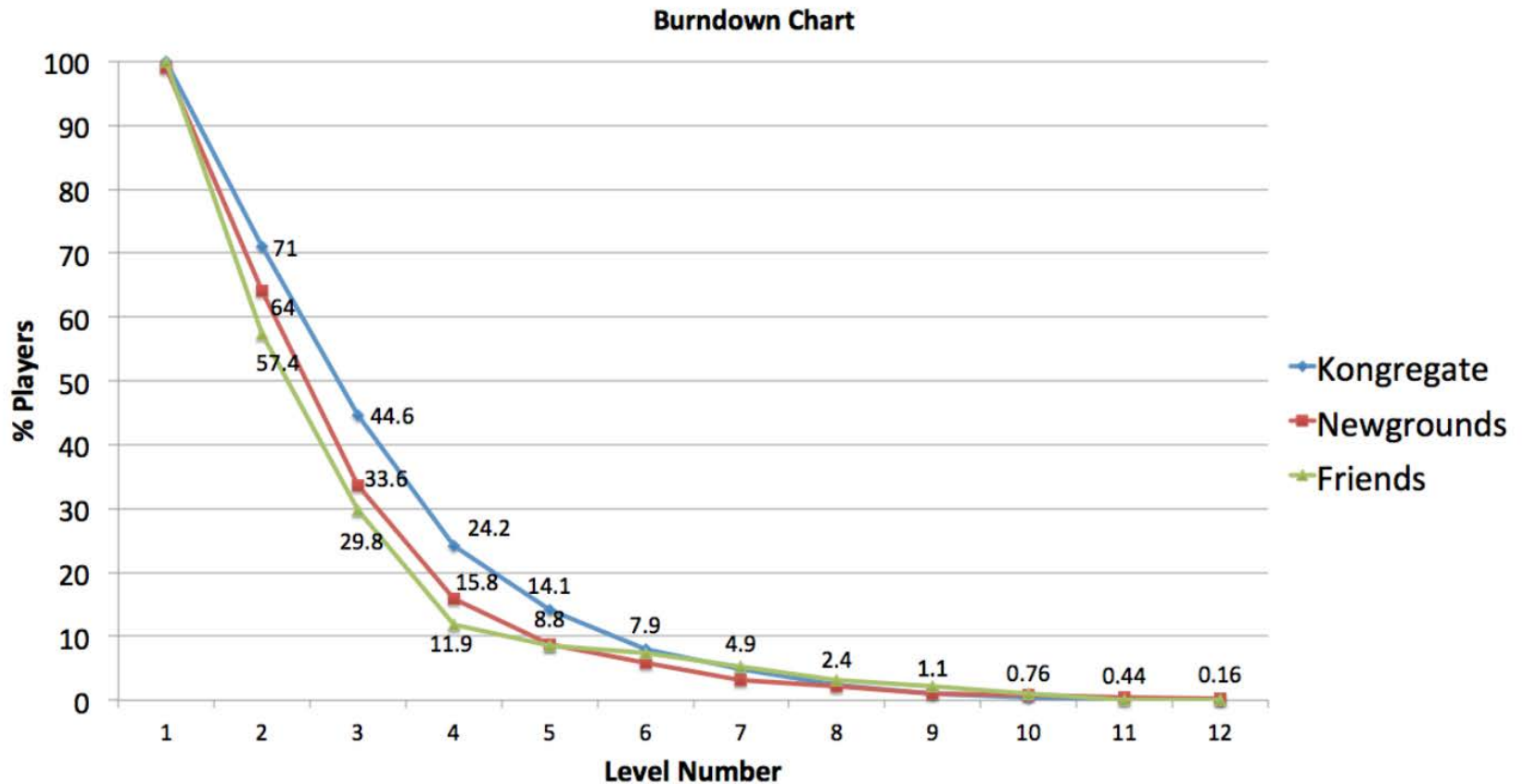
# Improvement across releases

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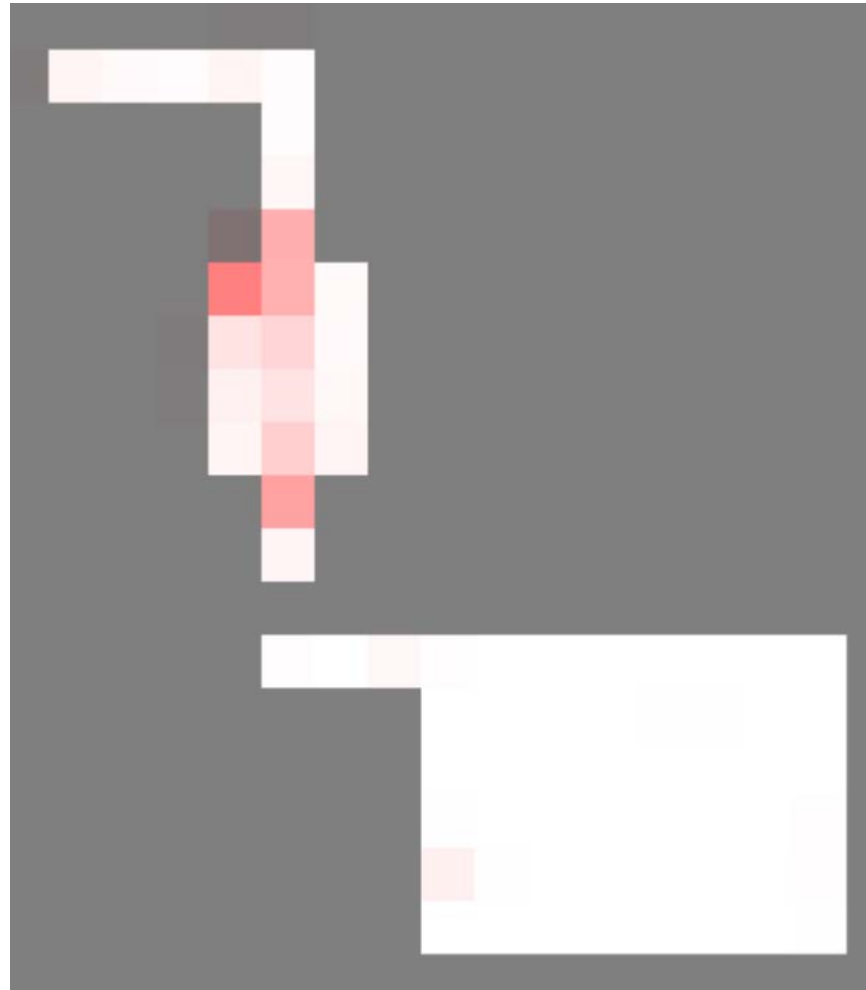


# Improvement across releases



# Heatmaps

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# Course Website

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- <http://www.cs.cornell.edu/courses/CS4154/2015fa/>
- Syllabus information is here
- Should be up-to-date within a 2-week horizon
- Ask me if it's further in the future

# Game Requirements

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- Must be...
  - Fun
    - Your grade depends on how much people like it!
  - Novel
    - Cannot be a clone of an existing game
  - Feasible in one semester
    - Avoid full RPGs and real-time strategy games
    - Game can have elements of these
  - Single-player
    - Networking is too painful

# Game Requirements

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- **Deploy to Newgrounds and Kongregate**
- In Flash (ActionScript3), HTML5, or Haxe
- FlashDevelop is a great free IDE for Flash
- Phillips 318 has Adobe Flash Builder 4
- See website for help and resources



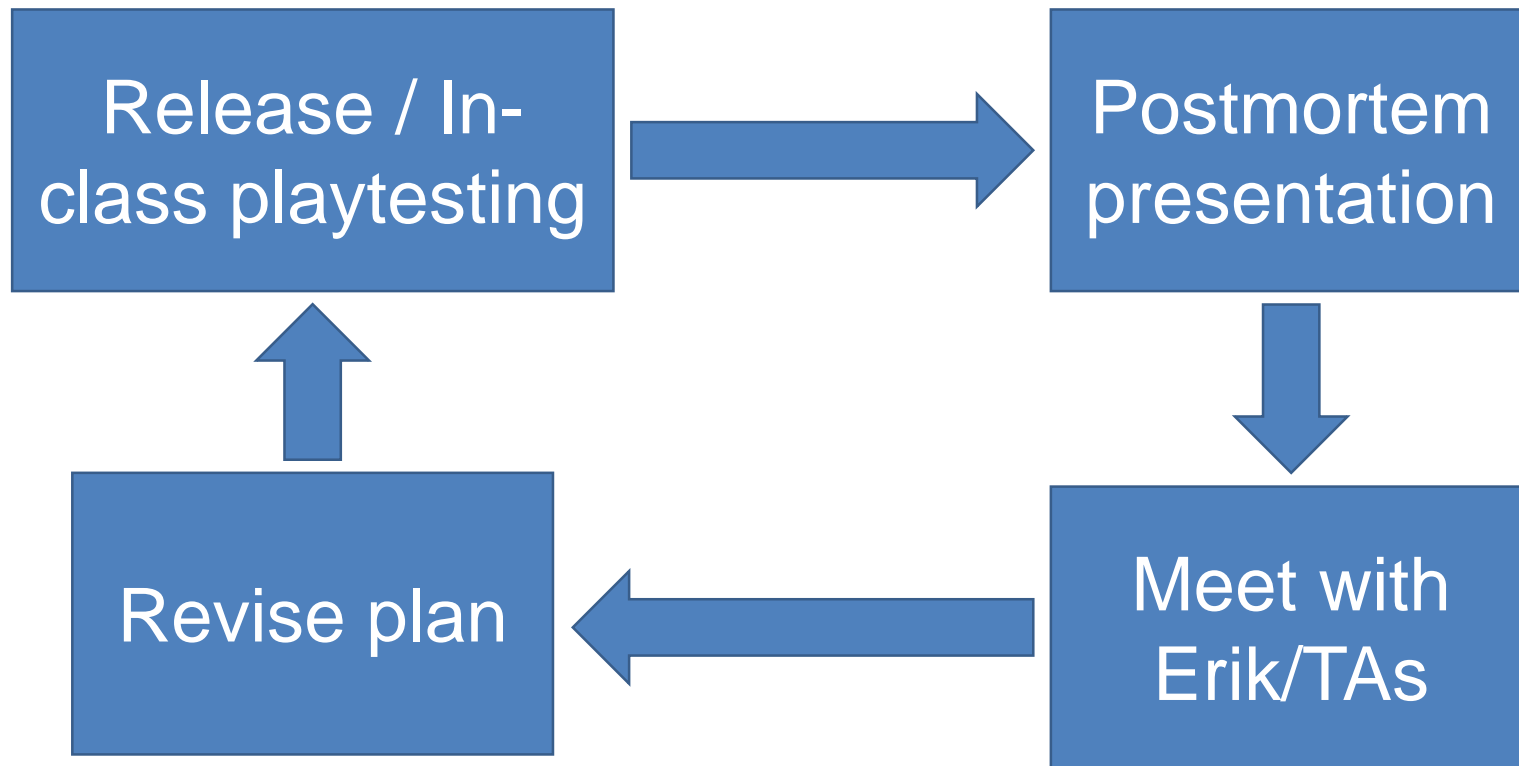
# Intellectual Property

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- Your **group** retains all ownership
  - You can commercialize it later
  - You can make derivative works
  - Individual ownership is your responsibility
- But Cornell gets a non-exclusive license
  - Non-commercial use of final version submitted
  - We can post this version on our website
  - We claim no other rights to your game


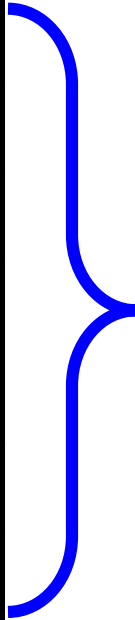
# Development cycles

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# Semester Schedule

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<b>Week 1</b>	Form Groups	8/24	 Pre-production
<b>Week 2</b>	<b>Paper Prototyping</b>	8/31	
<b>Week 3</b>	<b>Design Document</b>	9/7	
<b>Week 4</b>	Development	9/14	 Development
<b>Week 5</b>	<b>Throwaway Prototype</b>	9/21	
<b>Week 6</b>	<b>Alpha Prototype</b>	9/28	
<b>Week 7</b>	Development	10/5	
<b>Week 8</b>	Development	10/12	
<b>Week 9</b>	<b>Beta Prototype</b>	10/19	
<b>Week 10</b>	Development	10/26	

# Semester Schedule

---

<b>Week 10</b>	Development	10/26	 Release
<b>Week 11</b>	<b>Friends Release</b>	11/2	
<b>Week 12</b>	<b>Friends Postmortem</b>	11/9	
<b>Week 13</b>	<b>Newgrounds Release</b>	11/16	
<b>Week 14</b>	<b>Newgrounds Postmortem</b>	11/23	
<b>Week 15</b>	<b>Kongregate Release</b>	11/30	
<b>Week 16</b>	<b>Final Presentations</b>	<b>12/12?</b>	

THIS CLASS WILL USE  
THE FINAL EXAM PERIOD

# This course is a lot of work!

---

- Expect **10 hours/week** outside of class
- Releases are particularly intense
  - Players come in a burst
  - If something goes wrong, *you must deal with it immediately*

# A note on dropping

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# Today

---

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---

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# Grading

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- Game (60%)
  - Newgrounds Release (20%)
  - Kongregate Release (40%)
- Analytics (30%)
  - Friends Postmortem (5%)
  - Newgrounds Postmortem (10%)
  - Final Postmortem (15%)
- Participation (10%)
  - Playtests, postmortems, labs, documents (10%)

# Game grades

---

- Opinion of the course staff (60%)
  - does it meet the requirements?
  - is it fun? groundbreaking?
- Evidence of real-world impact (40%)
  - rating
  - number of players
  - average length of play
  - return rate
  - other impact (comments, walkthroughs, blog posts)

# Game grades

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Grade	Characteristics	Impact
A+	Experience of a lifetime	Is featured, wins prizes, game of the week/month/year, hundreds of thousands of players
A/A-	Very fun, addictive, imaginative, polished	Gets to front page, attracts external attention, tens of thousands of players
B/B+	Sometimes fun and interesting, but lacks polish and has minor flaws	Good but not a standout, thousands of players
C+/B-	Complete and playable but fun only occasionally, not original, clearly flawed, team ignored feedback	Average, hundreds of players
C-/C	Complete, not playable, not fun, crashes	Excessive ragequitting
D/F	Not complete	Nonexistent

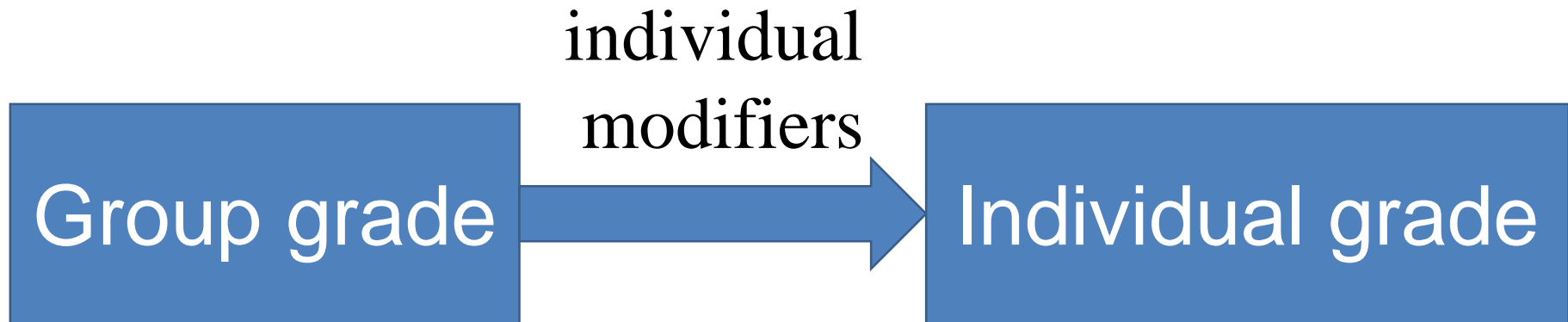
# Analytics (presentation) grades

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- Opinion of the course staff (60%)
  - does it meet the requirements?
  - clarity
  - diction
  - slide composition
- Peer evaluations (40%)
  - did the class understand key details?
  - was the class convinced by your analysis?

# Grading Process

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# Individual modifiers

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- Based on **peer evaluations** and **observations of course staff**
- Two peer evaluations: middle and end of course
- Being MVP will increase grade
- Slacking off will decrease grade
- Abandoning team entirely will result in C/D/F

# Attendance is mandatory on:

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- Playtesting days
  - Paper, Throwaway, Alpha, Beta, Friends, Newgrounds, Kongregate
- Postmortems
  - Alpha, Beta, Friends, Newgrounds, Final (Kongregate)
  - Absent from postmortem = **-33% of that postmortem**



# Academic integrity

---

- Please do not misrepresent work
  - Work expected to be done by you
    - programming, design, art
    - OK:
      - borrowing ideas from other games
      - properly attributed music, sound effects, libraries, etc.
  - Work expected **NOT** to be done by you
    - player data
    - OK:
      - voting up your games
      - commenting on your own games
      - encouraging people to promote your games
      - testing your own game while recording is active

# Today

---

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# Today

---

- Why should you take this class?
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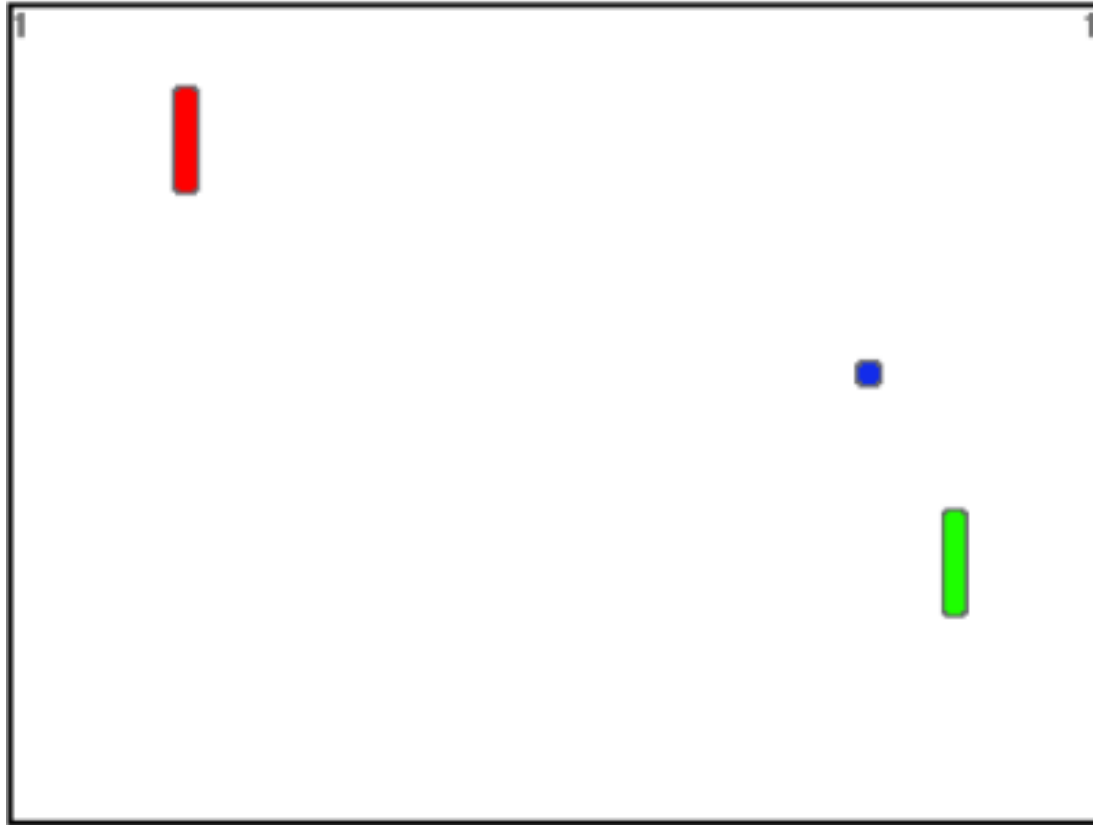
# Assignment 1

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- Your name
- Updated list of people you wish to work with
- Programmers: preferred programming language
- Designers: preferred design contributions
- Any other information you would like us to consider
- Due: **TODAY**, Aug. 25<sup>th</sup>, 11:59pm via CMS

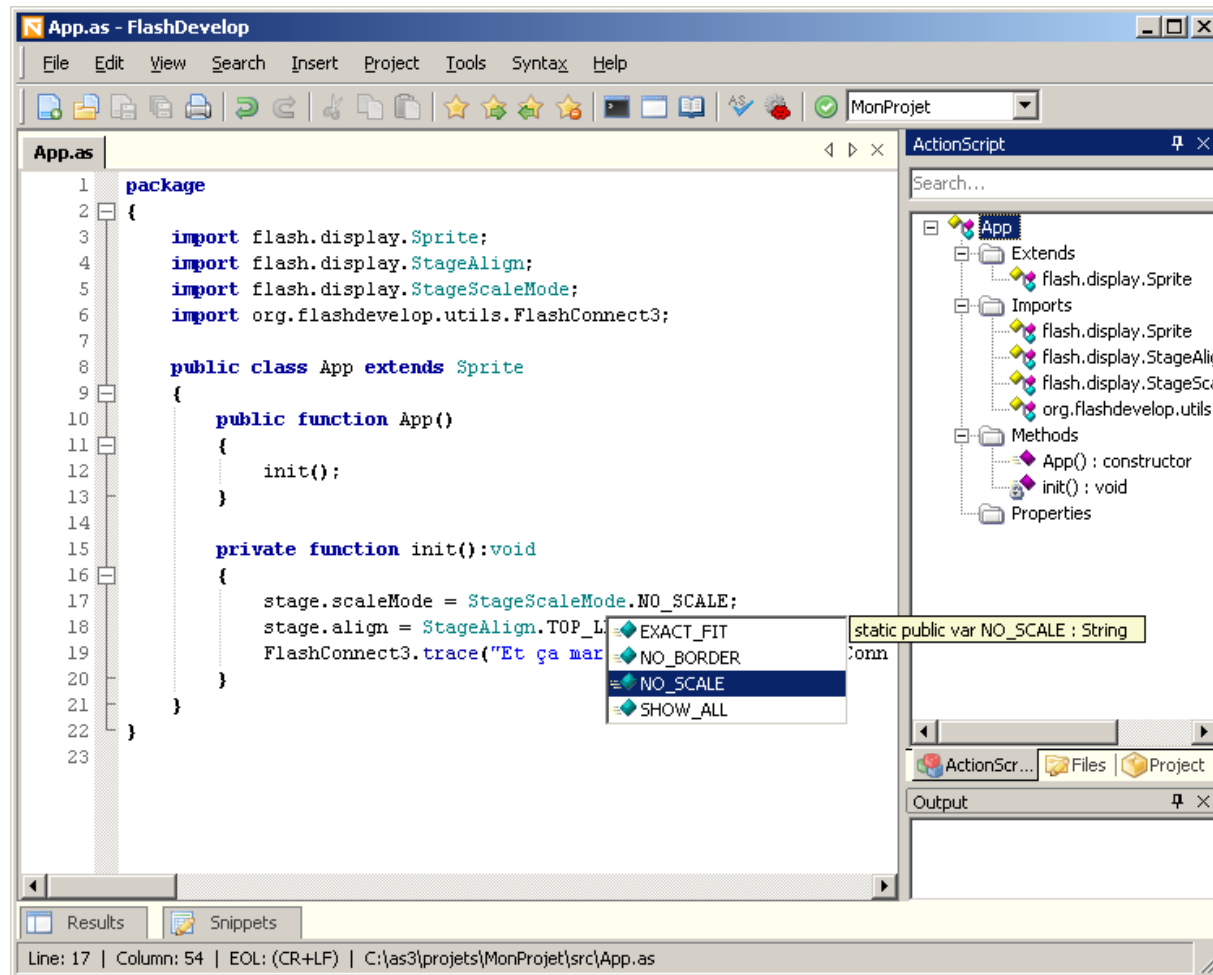
# Assignment 2: Programmers

---



Implement Pong in Flash/HTML5/Haxe

# FlashDevelop



# Flash (ActionScript 3)

---

```
package yourgame {  
    public class YourClass extends OtherClass {  
        private var x:int;  
  
        public YourClass(input:int) {  
            x = process(input);  
        }  
  
        public override function process(y:int):int {  
            return y;  
        }  
    }  
}
```

# Flash ( ActionScript 3)

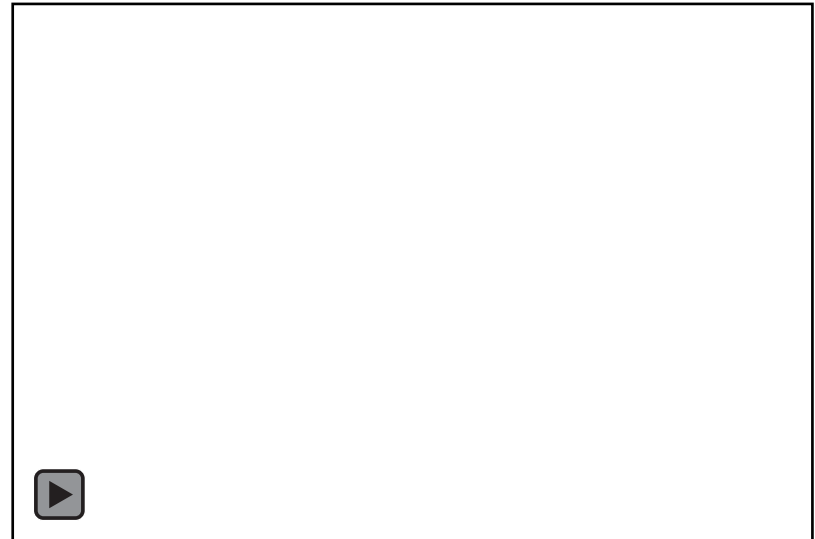
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```
package yourgame {  
  
    public class YourClass extends Sprite {  
  
        public YourClass() {  
            addEventListener(MouseEvent.CLICK, move);  
        }  
  
        public function move(e:MouseEvent):void {  
            x = x + 10;  
        }  
    }  
}
```



# Assignment 2: Designers

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Draw and animate a character

# Assignment 2

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- Due: **NEXT TUESDAY**, Sep. 1<sup>st</sup>, 11:59pm via CMS

# If you think this is hard...

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# Coming soon...

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- Thursday: Game mechanics
- Next Tuesday: Brainstorming and Prototyping
- Next Thursday: **Paper Prototyping**

# Homework for Thursday

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- Play three Kongregate games:
  - Mu Complex: Episode 1
  - Clicker Heroes
  - The Company of Myself

# Pair Activity

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