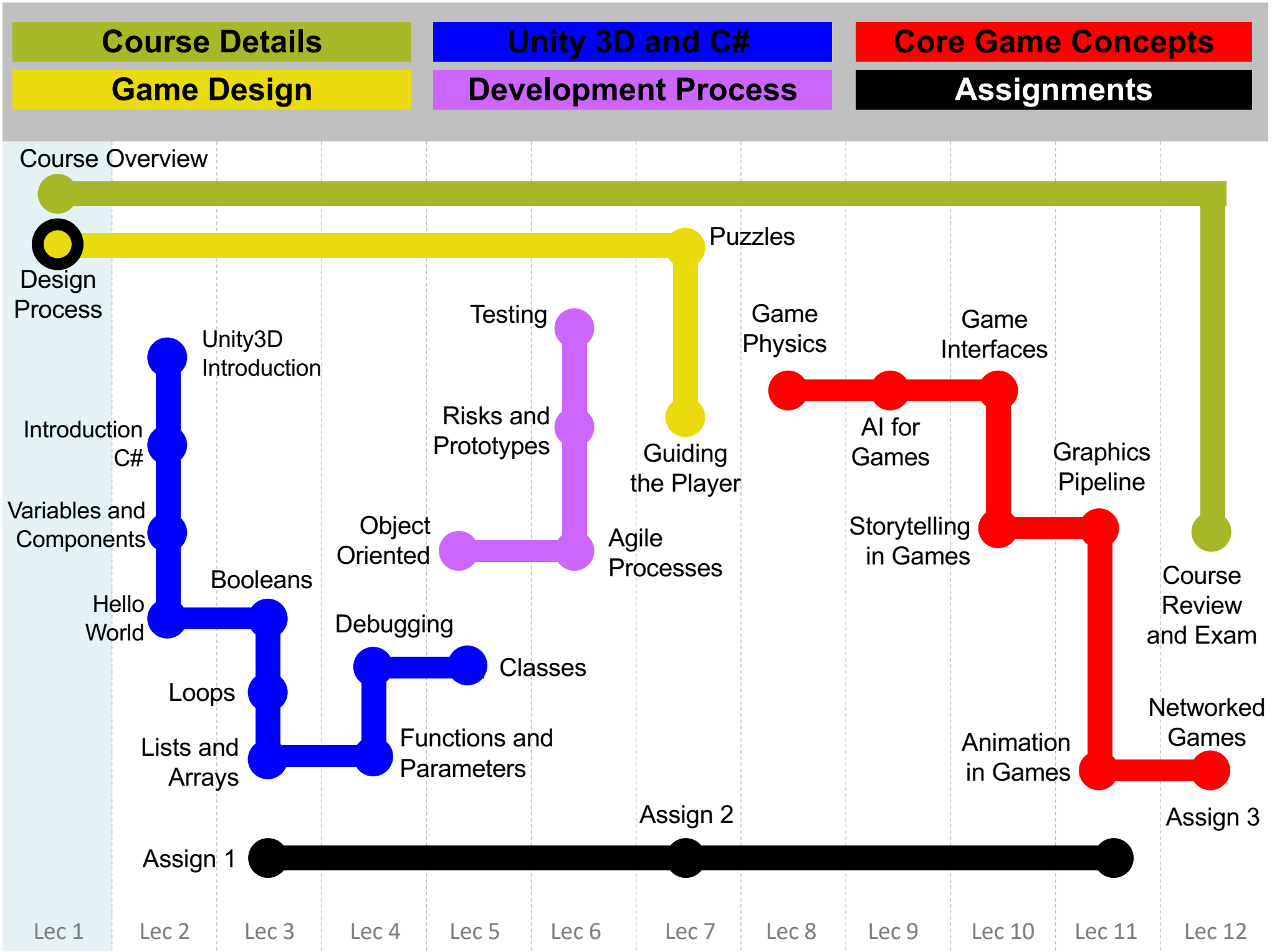
Course Overview

Lec	Start Week	Modules	Topics	Assignments
1	3 Aug	Mod 1.1, 1.2	Course Overview, Design Process	
2	10 Aug	Mod 2.1, 2.2, 2.3, 2.4	Unity3D Introduction, Introduction C#, Variables and Components, Hello World	
3	17 Aug	Mod 3.1, 3.2, 3.3	Booleans, Loops, Lists and Arrays	Assign 1 21 Aug, 11:00 pm
4	24 Aug	Mod 4.1, 4.2	Functions and Parameters, Debugging	
5	31 Aug	Mod 5.1, 5.2	Classes, Object Oriented	
6	7 Sep	Mod 6.1, 6.2, 6.3	Agile Processes, Risks and Prototypes, Testing	
7	14 Sep	Mod 7.1, 7.2	Puzzles, Guiding the Player	Assign 2 18 Sep, 11:00 pm
8	21 Sep	Mod 8.1	Game Physics	
9	12 Sep	Mod 9.1	AI for Games	
10	19 Oct	Mod 10.1, 10.2	Game Interface, Storytelling in Games	
11	26 Oct	Mod 11.1, 11.2	Graphics Pipeline, Animation in Games	Assign 3 1 Nov, 11:00pm
12	2 Nov	Mod 12.1, 12.2	Networked Games, Course Review	


Course Details
Unity 3D and C#
Core Game Concepts
Game Design
Development Process
Assignments
Course Overview
Design Process
Puzzles
Unity3D Introduction
Introduction C#
Variables and Components
Hello World
Booleans
Loops
Lists and Arrays
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Risks and Prototypes
Object Oriented
Agile Processes
Guiding the Player
Game Physics
AI for Games
Game Interfaces
Storytelling in Games
Graphics Pipeline
Animation in Games
Networked Games
Course Review and Exam
Assign 1
Assign 2
Assign 3
Lec 1
Lec 2
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Lec 8
Lec 9
Lec 10
Lec 11
Lec 12

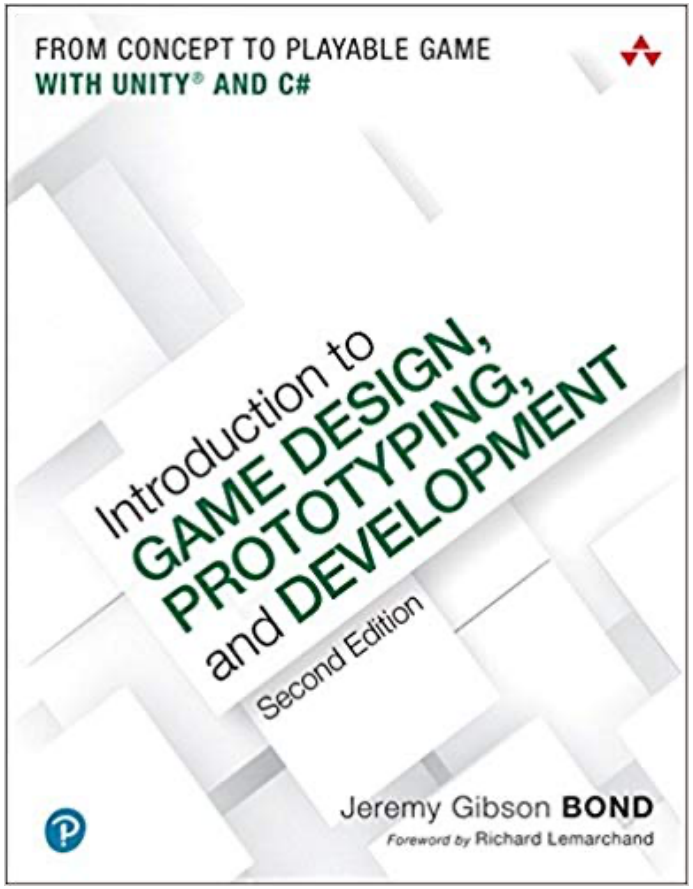
INFT3960 – Game Production

Week 01

Module 1.2

Design Process

Game Design – (Chapter 7)



Acting Like a Designer

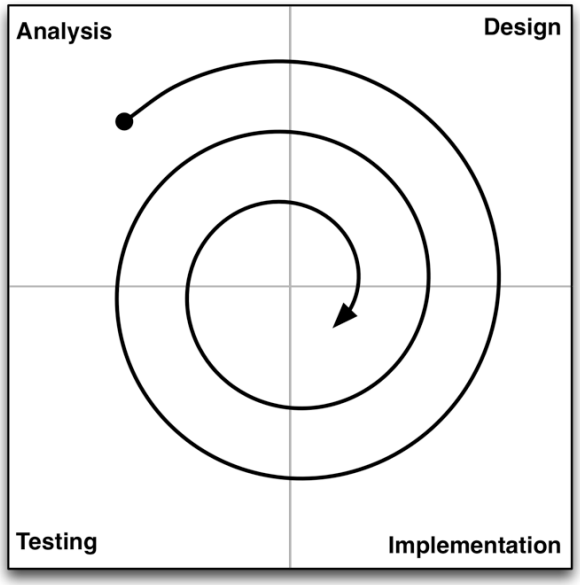
Design Process – Topics

- The Iterative Process of Design
  - Analysis
  - Design
  - Implementation
  - Testing
  - Iteration
- Innovation
- Brainstorming and Ideation
- Changing Your Mind
- Professional Development Phases
- Scoping

Iterative Design Process

“Game design is 1% inspiration and 99% iteration"

Chris Swain



Iterative Design Process

Analysis

Understand where you are and what you want to accomplish

Think about your available resources and time

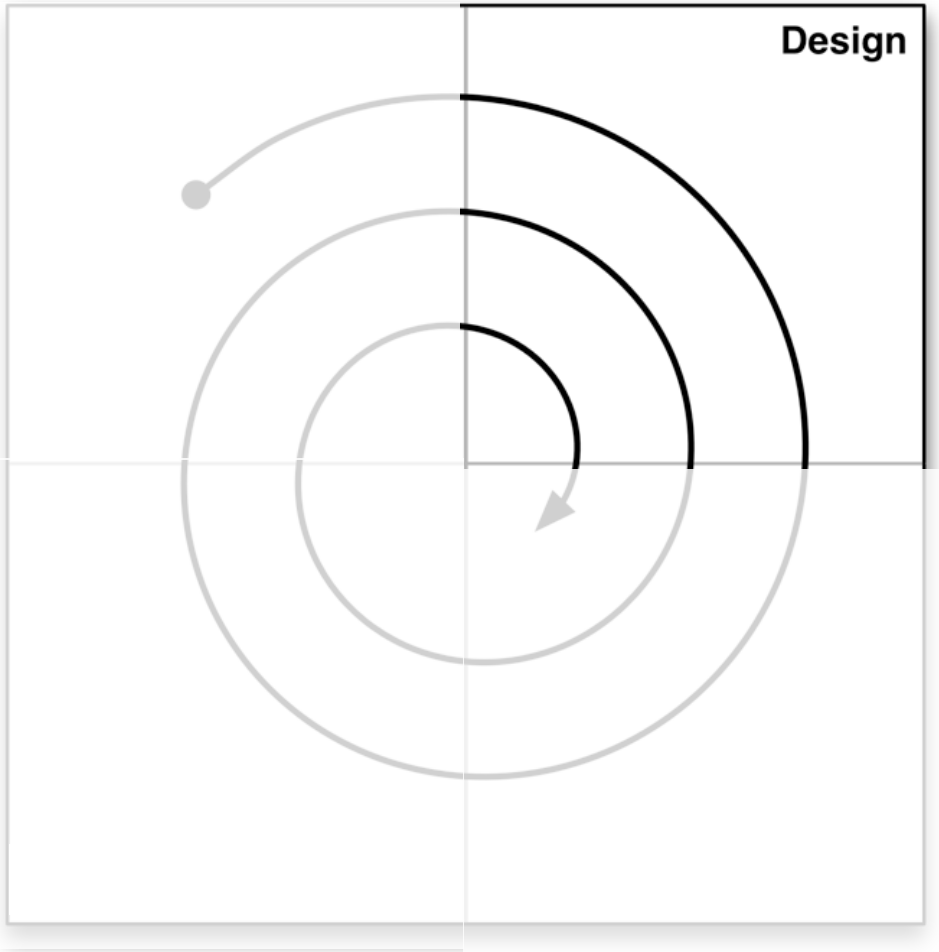
Iterative Design Process

Design

Create a design that solves the problem or fits the opportunity

Starts with brainstorming.

Ends with a plan for implementation.



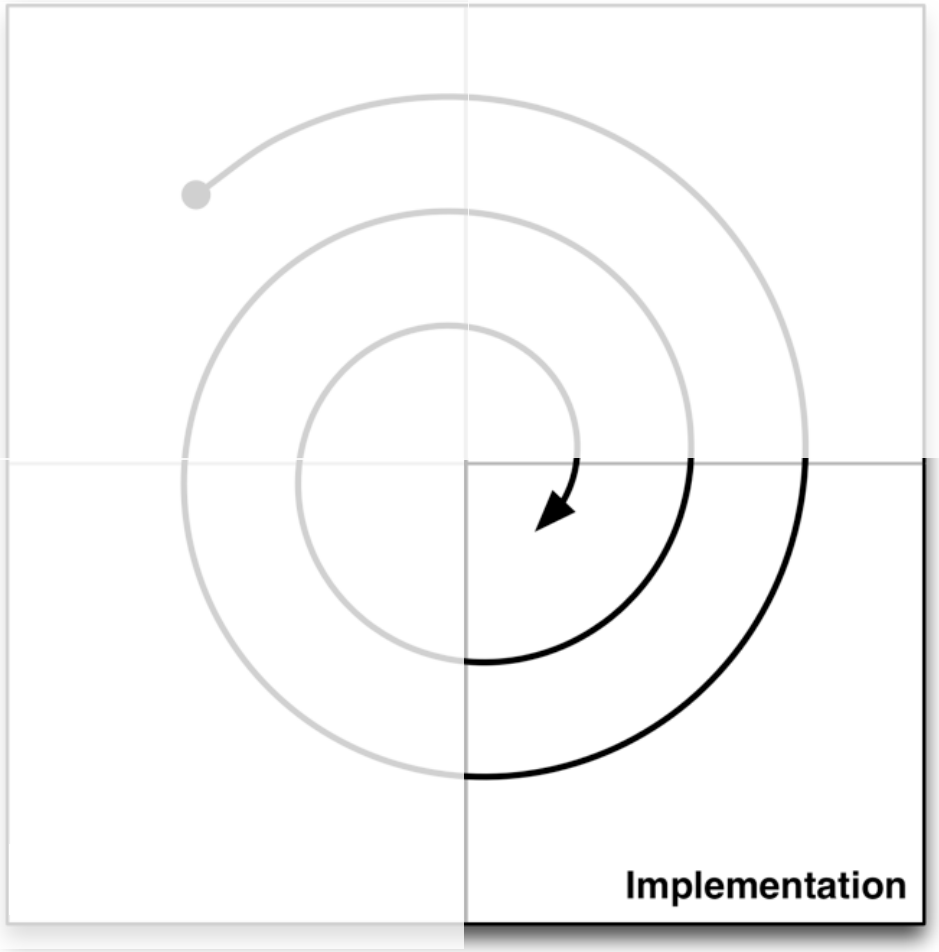
Iterative Design Process

Implementation

Execute on your plan.

Make a working game prototype.

What is the shortest path to something playable / testable?

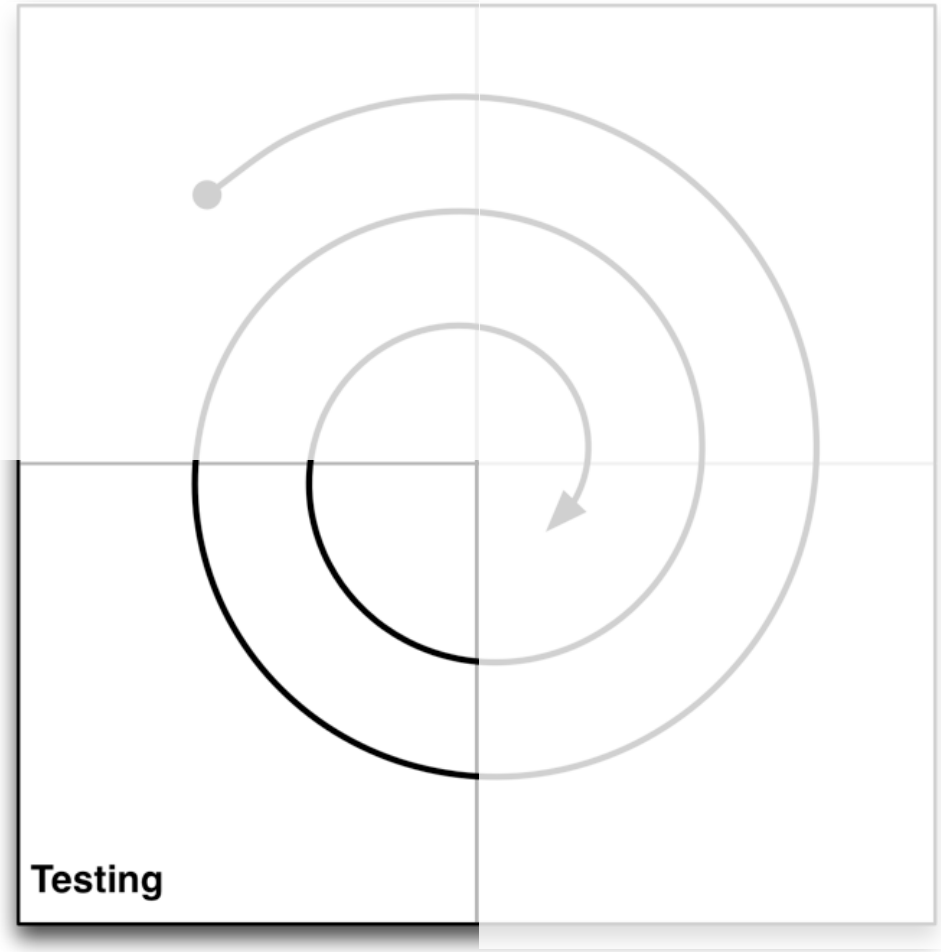


Iterative Design Process

Testing

Have people actually play your game and get reactions!

Testing is critically important to this process!

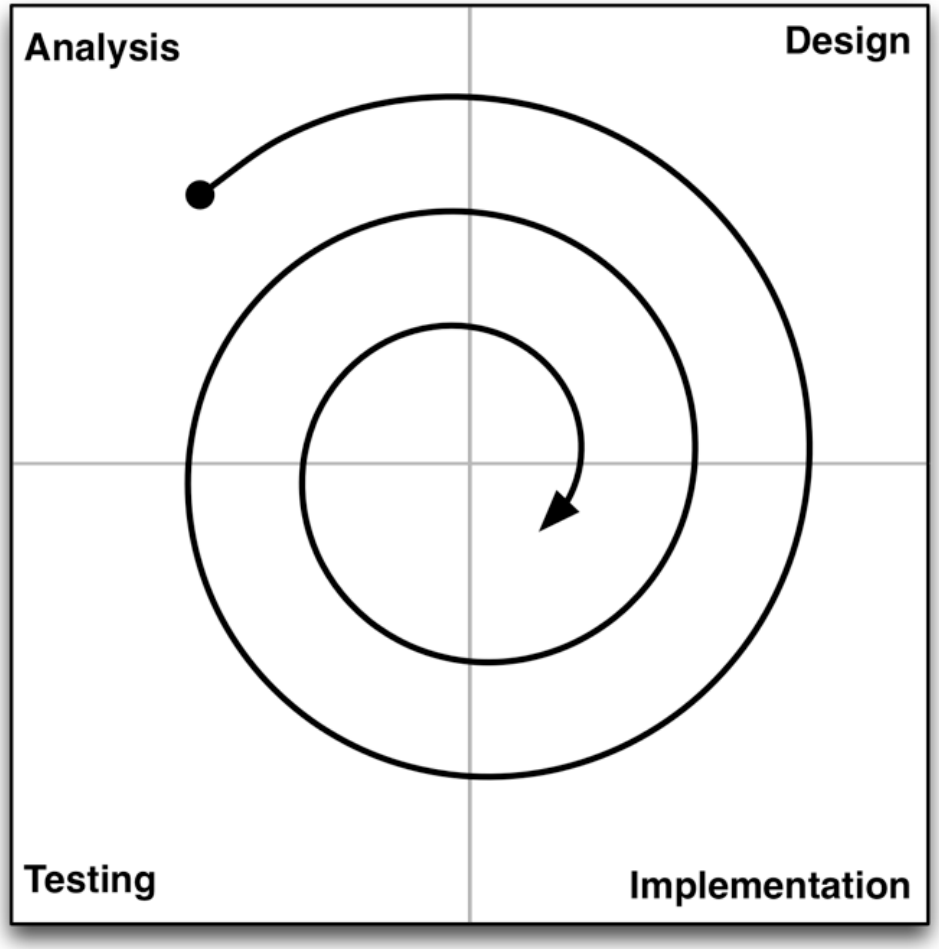


Iterative Design Process

Iteration!

Analyze the results of your game testing

Modify your design, implement, test again!



Iterative Process - Analysis

Analysis is a about asking the right initial questions

For whom are you designing this game?

- Demographic information
- Target platform
- You're almost never designing the game for yourself!

What are your resources?

- Team members, budget, timeline
- Time is the most important resource!

Iterative Process - Analysis

Analysis is a about asking the right initial questions

What prior art exists?

- What other games exist in this space?
- Often ignored by novice designers, but it's critical!

What is the fastest path to a playable and testable game?

- How can you get your game up and running ASAP?
- Mechanics are absolutely the most important element in this phase

Iterative Process - Design

A lot of design is about having an attitude of listening

Listen to your audience

- Think about your audience when designing a game
- Listen to their feedback when you get it

Listen to your team

- Listen to the other people who are working with you
- Especially when they disagree with you

Iterative Process - Design

A lot of design is about having an attitude of listening

Listen to your client

- If someone is paying you to design a game, you need to listen to them
- This often makes them more likely to pay you and hire you again

Listen to your game

- Some brilliant ideas just don't fit in the game you're currently designing
- Save these for later

Iterative Process - Design

Analysis is a about asking the right initial questions

Listen to yourself

- Listen to your gut – Sometimes you'll get a gut feeling about something before you consciously figure it out.

Iterative Process - Design

Analysis is a about asking the right initial questions

Listen to yourself

- Listen to your health – Take care of yourself and stay healthy
  - Pulling all-nighters and stressing out decreases your creativity
  - Eat well and exercise
  - Take breaks when you need to

Iterative Process - Design

Analysis is a about asking the right initial questions

Listen to yourself

- Listen to how you sound to other people
  - When you say things out loud, think about how you're coming across
  - Do you sound respectful?
  - Do you sound like you care about the other person?
  - People who demonstrate care and respect for others tend to do better in life, especially in creative fields

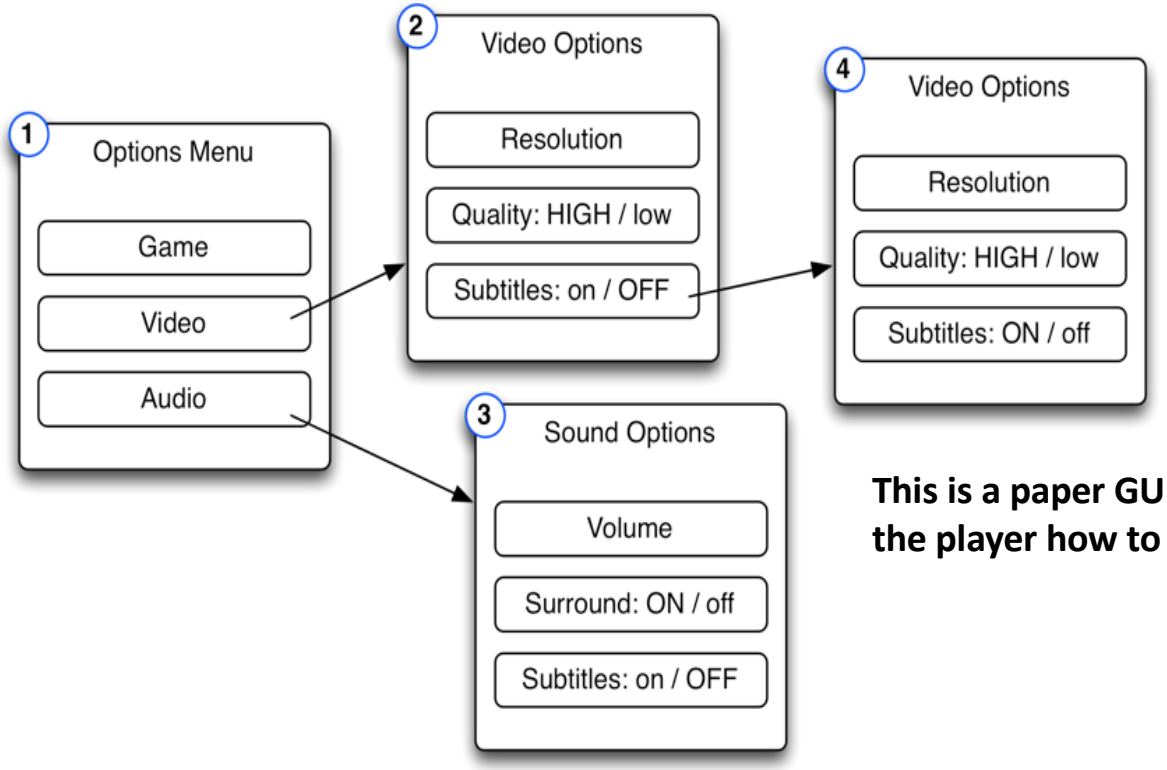
Iterative Process - Implementation

The goal of implementation is to get from design to testing as quickly and efficiently as possible

- Sometimes you don't even have to make a digital prototype
- For GUI (Graphical User Interface) testing, sometimes a paper prototype will do just fine
- Make pages showing various states of your menu system and test them on people

Iterative Process - Implementation

The goal of implementation is to get from design to testing as quickly and efficiently as possible



This is a paper GUI prototype for asking the player how to turn on subtitles

Iterative Process - Implementation

The goal of implementation is to get from design to testing as quickly and efficiently as possible

- When making digital prototypes, focus on the Mechanics
- The most important thing to test in a digital game is usually the Mechanics
- The Mechanics are also the inscribed element that can't be tested by other means
- The Technology of your prototype will often be replaced by production code in the future

Iterative Process - Testing

You won't know anything about your game until someone else plays it

- Because you are the designer, your view of the game is drastically biased
- You need other people to play the game and give you feedback
- People will often try not to hurt your feelings

Iterative Process - Testing

You won't know anything about your game until someone else plays it

- Schell recommends saying….

  "I need your help. This game has some real problems, but we're not sure what they are. Please, if there is anything at all you don't like about this game, it will be a great help to me if you let me know."

Iterative Process - Testing

Take good notes

- Where did the comment happen?
- What did the playtester actually say?
- What do you think she meant?
- How severe is the issue? Not all issues can be fixed
- What is your proposed solution

Iterative Process - Testing

Take good notes

Where	Feedback	Underlying Issue	Severity	Proposed Solution
Boss1	"I didn't know what to do after the first boss." "Where do I go now?" "Ok, now what?"	Players are not sure what the next step is after the first boss fight. The play has been really directed up to this point, but now they don't know what to do.	High	The mentor character could return after the boss is defeated and give the player her 2nd mission.

Iterative Process - Iteration

Board game projects at USC were four weeks long

- Week 1: Students are assigned to teams of four people
- Week 2: Students arrive in lab with a playable game

  The game is tested by various players for two hours
- Week 3: Students bring a 2nd iteration of the game to lab
- Week 4: Students bring a 3rd iteration of the game to lab
- Then students had a weekend to finalize the game

Even for a student board game project, we iterated on the game four times before it was turned in

- Digital games take much more iteration!

Iterative Process - Iteration

After testing, analyze the feedback and iterate!

Most games will go through this process many times

You will be required to produce a design and 2 prototypes

You should aim to retest every tutorial!

Innovation

In The Medici Effect, Frans Johansson writes about two kinds of innovation:

Incremental - Making something slightly better

Example: The improvements in the Pentium chip in the 1990s

Pros: Easy to convince investors that it will work, Predictable

Cons: Only a slight innovation, Nothing revolutionary, Predictable

Intersectional - combination of two different ideas

Example: Magic: The Gathering combined card games and collecting

Pros: Has the potential to create something new and exciting

Cons: High chance of failure, People won't believe it 'till they see it

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Innovation

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Johansson believes that the innovation in the renaissance was a result of the **intersection** of Eastern and Western cultures due to increased trade

Intersectional - combination of two different ideas

Example: Magic: The Gathering combined card games and collecting

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Brainstorming and Ideation

“"The best way to have a good idea is to have a lot of ideas and throw out all the bad ones."

Linus Pauling

Pauling is the only person to have won both the Nobel Prize in Chemistry and the Nobel Peace Prize as an individual.

Brainstorming and Ideation

This brainstorming process is based on intersectional innovation

It has worked well in both large and small groups

5 Steps

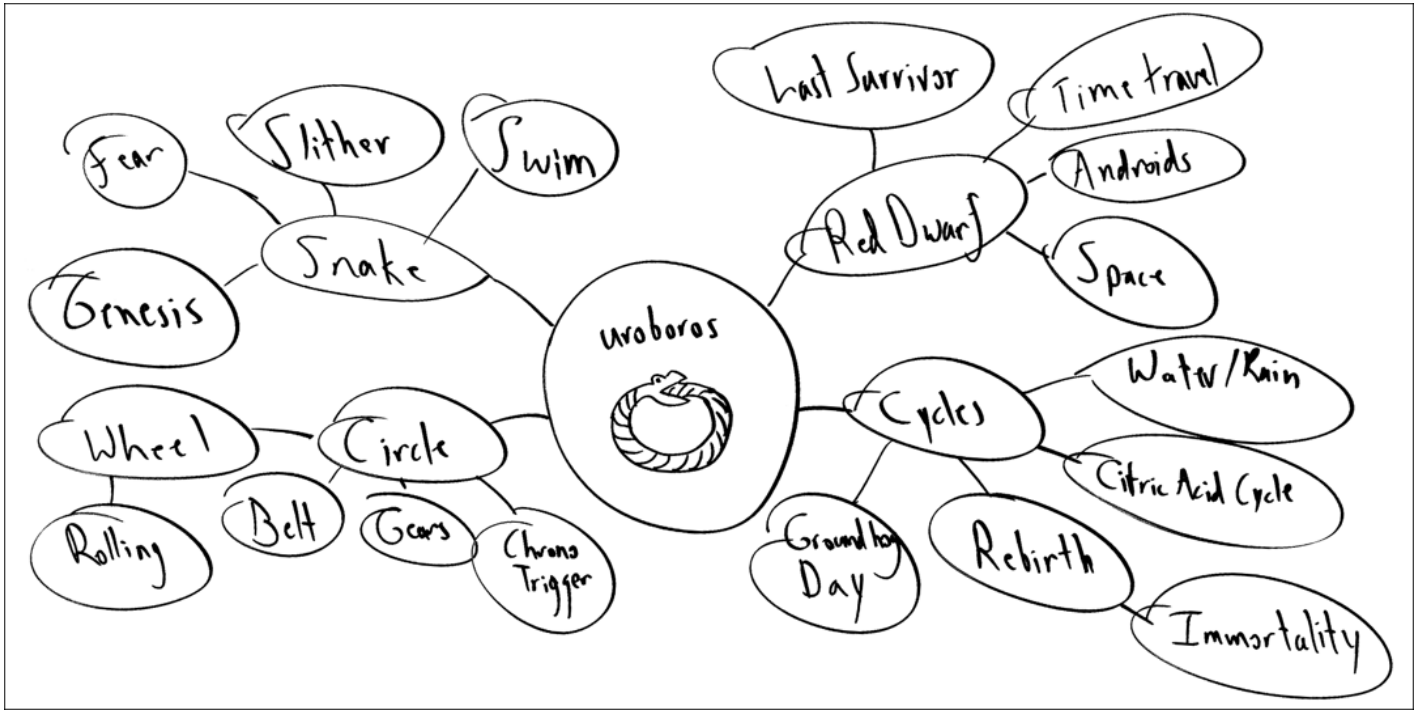
- Step 1: Expansion
- Step 2: Collection
- Step 3: Collision
- Step 4: Rating
- Step 5: Discussion

Brainstorming - Expansion

Start with the core theme of your brainstorm in the middle of a whiteboard

Create as many ideas as possible around it

Don't censor at all in this phase



Brainstorming - Collection

Write down each node of the expansion phase on a 3x5 note card or a Post-it note

These are "idea cards

A Joke

This lithium atom walked into a bar and the barman said “Why the long face?”

The lithium atom said, “Phil, I think I lost an electron at the last bar”

The barman said, ”Are you sure?

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The barman said, ”Are you sure?

“Yes”, said the lithium atom, “I’m positive!”

The fun of new ideas

Jokes (even bad jokes) are another form of intersectional innovation

Your brain is thinking in one direction and then is forced to make a connection between that and something unrelated

There is joy in that connection, which we perceive as humor

Creating new, innovative ideas is pleasurable in the same way

Brainstorming - Collision

Shuffle all the idea cards together

Deal 2 to each person in the group

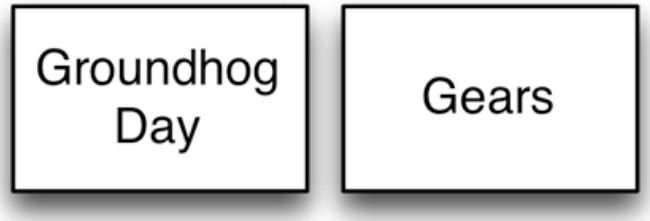
Each person takes the 2 idea cards up to the whiteboard and reveals them to group

The group collectively comes up with three game ideas inspired by the collision of the two cards

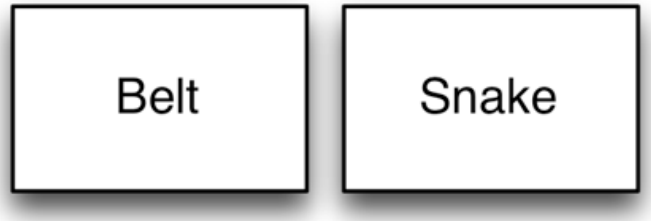
Again, don't censor too much in this step

Brainstorming - Collision

Examples:



1. Gardener building crazy contraptions to trap a groundhog that's been eating her garden.
2. Gears of War-style shooter where soldiers must relive a battle until they get it perfect (like in the movie Groundhog Day).
3. A time-management game (e.g. Diner Dash) where the player must manage the weather so that each season accomplishes its goals and transitions to the next on time.



1. Classic game of Snake (snake eats apples and grows but must avoid running into itself), but on a moving conveyor belt.
2. A snake must move across a room camouflaged as people's belts by jumping from waist to waist.
3. A snake hypnotizes a person but can only control them to do very simple things. As the person's belt, the snake must swing and platform them through a dangerous level to escape the zoo.

Brainstorming - Rating

Each person should pick the two ideas from Step 3 that she feels have the most merit and write them on the whiteboard

If someone has already written one of your top ideas, just write your 3rd choice

Wait for everyone to finish doing this

Then, each person in the group should simultaneously put a mark on the board next to the three ideas that they like the most

Some ideas will have many marks next to them, while others will have only a few

Brainstorming - Discussion

Given the information from Step 4, start discussing ideas

Start with the most popular ideas, but don't be afraid to mix in some of the other ideas as well

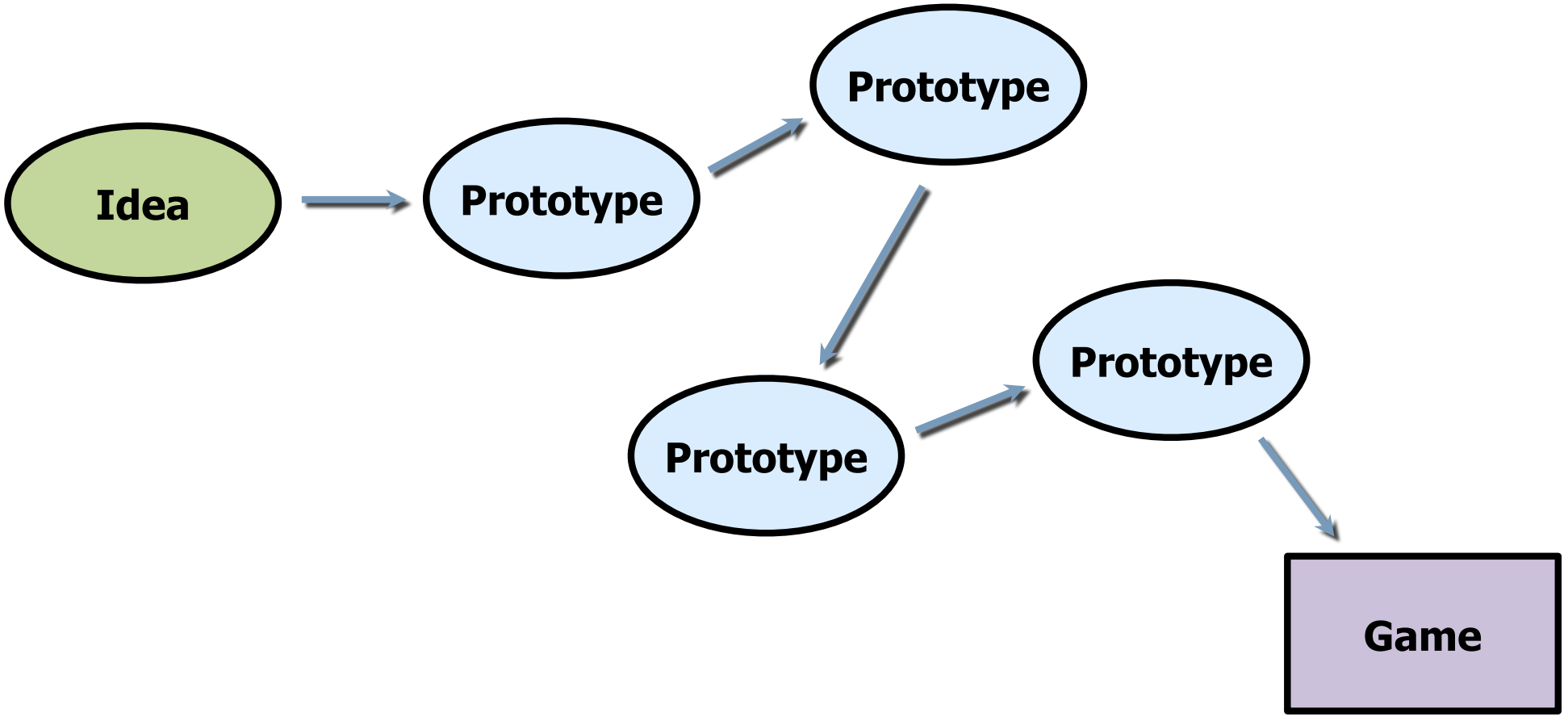
Combine the best ideas into something really great!

Changing your Mind

No one every goes directly from idea to game

Changing your Mind

The real process involves a lot of iteration and changing your mind



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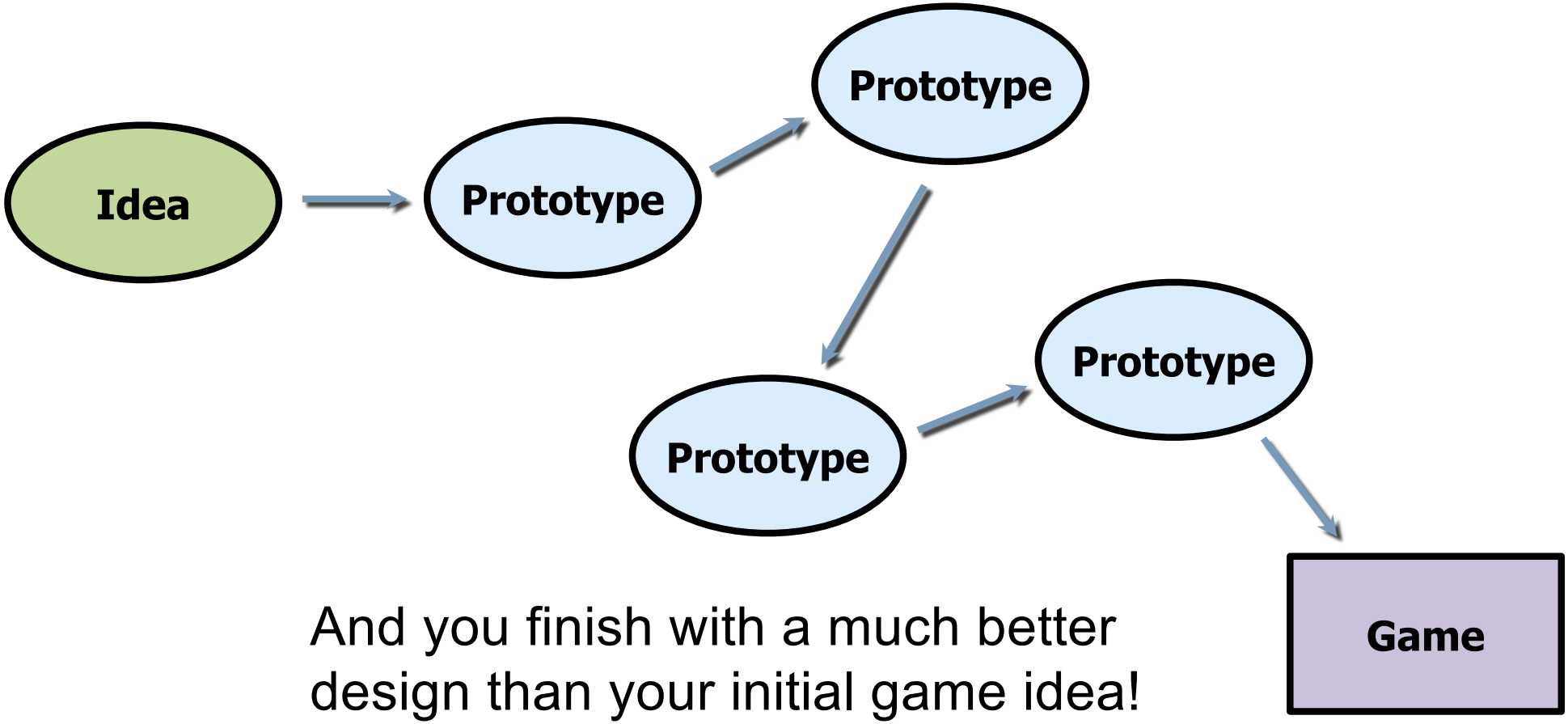

And you finish with a much better design than your initial game idea!

Changing your Mind

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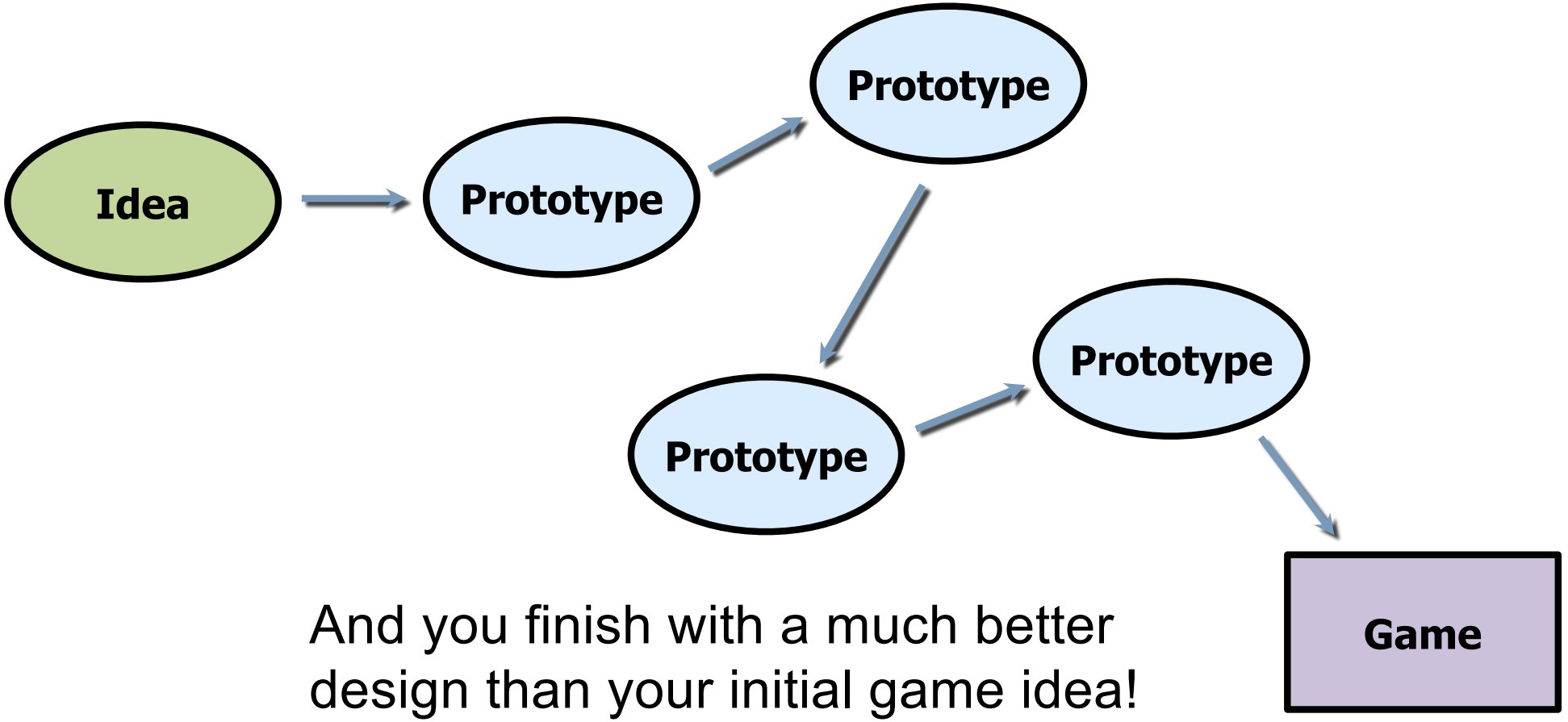

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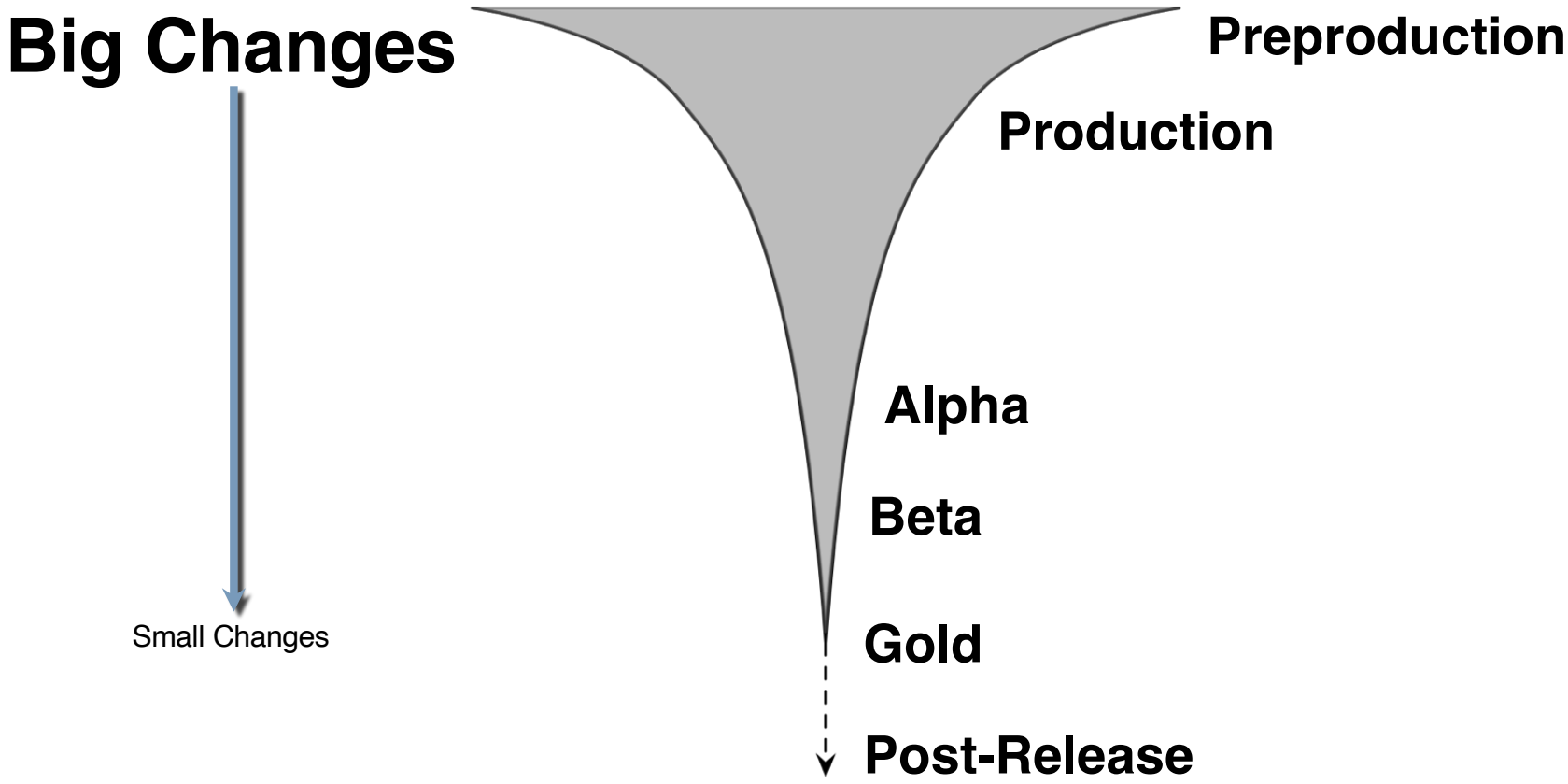
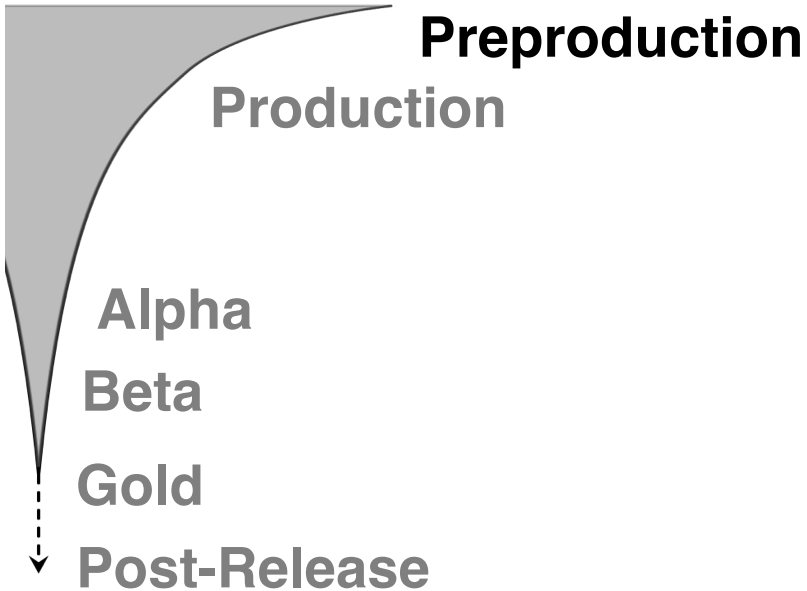
Changing your Mind

However, as the project moves through development phases, you're more locked in to decisions



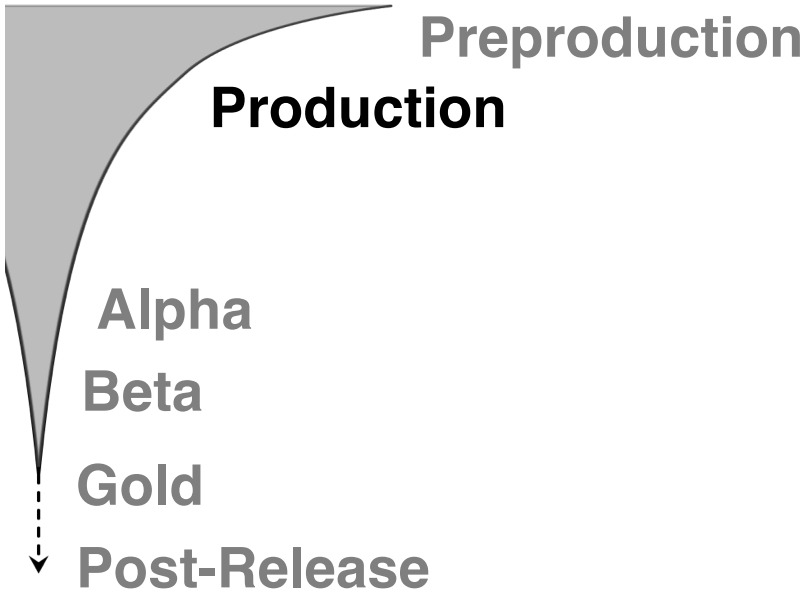
Professional Phases



Preproduction

- Small team (4-16 people)
- Lots of prototyping, lots of changes to ideas
- Lots of playtesting by a trusted audience
- Ends in a high-quality "vertical slice" of the game
- The topic of most of this course

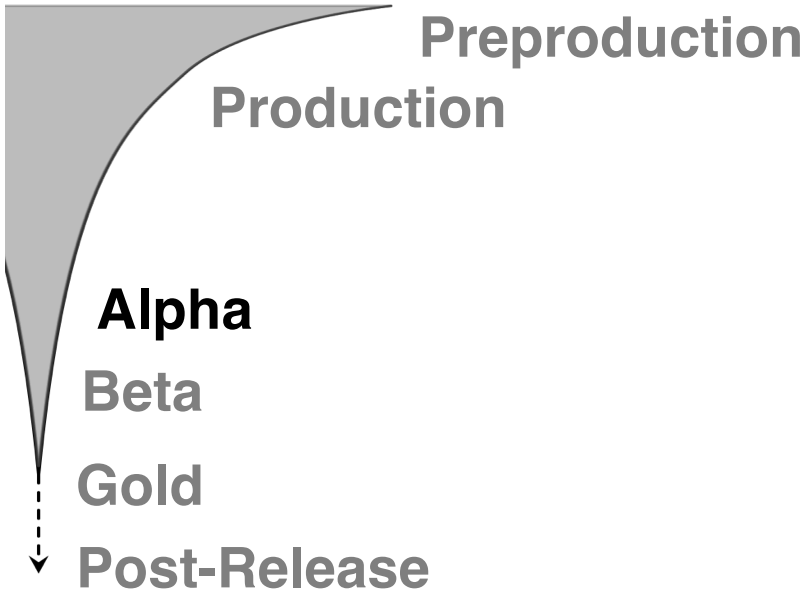
Professional Phases



Production

- Massive team growth (up to 100-300 people)
- Systems design needs to be locked down very quickly
- Changes cost a lot more, so there are fewer changes
- Expands the vertical slice quality to the rest of the game
- Playtesting continues (somewhat expanded audience)

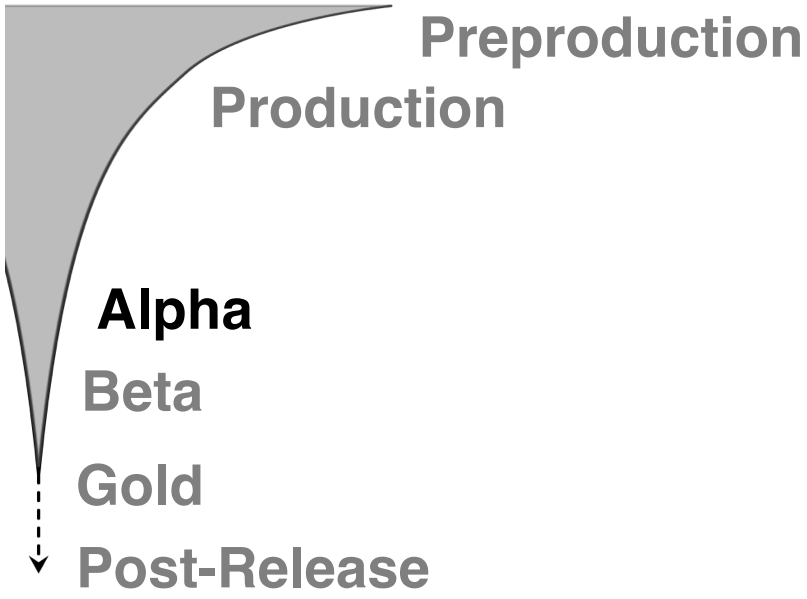
Professional Phases



Alpha

- Functionality and game mechanics are 100% locked
- No more changes to the systems design of the game
- Only make changes in response to specific problems found through testing
- Extensive QA (Quality Assurance) testing in this phase by professional QA teams

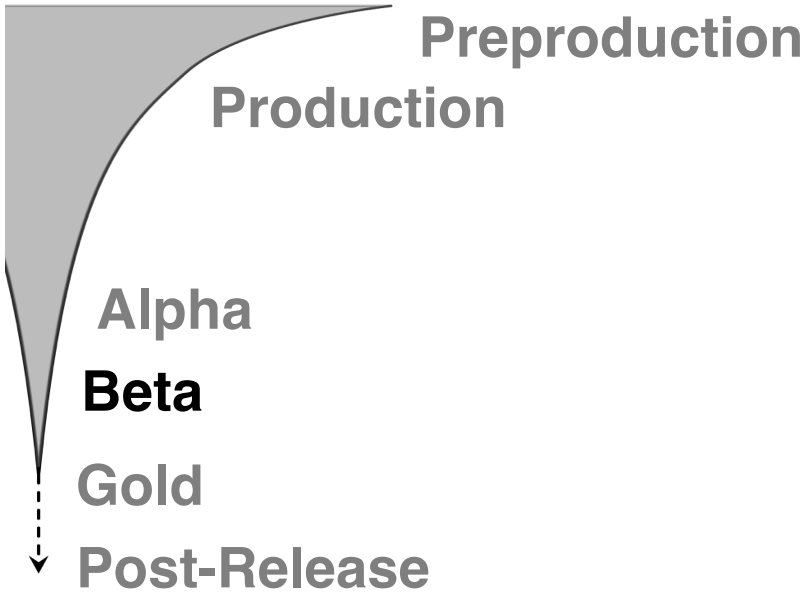
Professional Phases



Alpha

- Some bugs (errors in programming) remain, but all should have been identified
- Alpha ends when you believe that all high-level bugs have been resolved

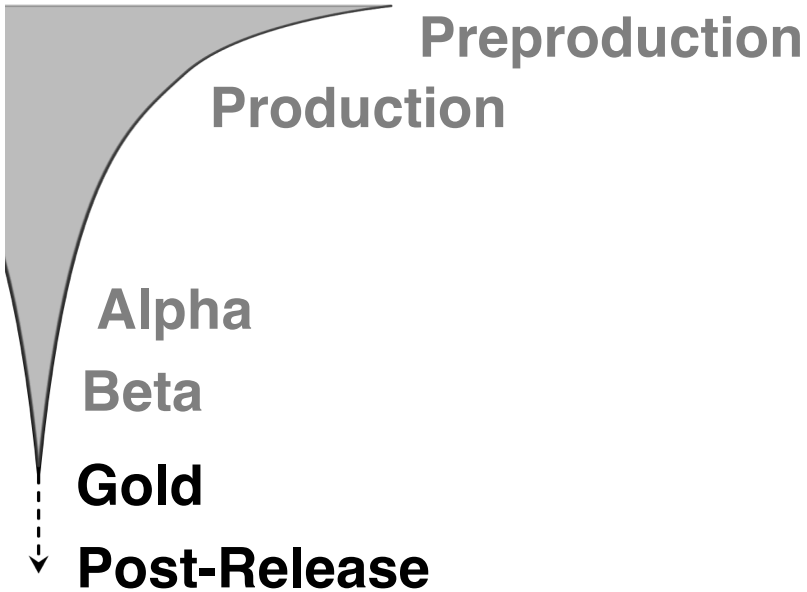
Professional Phases



Beta

- The game is effectively done
- Only minor bugs remain
- Purpose of this phase is to find and fix any remaining bugs
- No design changes, just fixes
- Lots of testing!

Professional Phases



Gold

- The game is ship-ready

Post-Release

- In the Internet age, games can have a post-release phase
- A little bug-fixing for very rare bugs (encountered by players)
- DLC (DownLoadable Content) production

Scoping

Overscoping is the #1 killer of game projects.

Scoping

Scoping is the process of limiting your design to what can be reasonably accomplished with the **time** and **resources** you have available

Most AAA professional games have

- Teams of hundreds of people
- Budgets of millions of dollars
- A two-year development timeline

Think realistically about what you have available when making your games

Summary

The Iterative Process of Design is the key to good design

Great innovations can come from combining disparate ideas - A good brainstorming process can help you do this

Prototypes exist to help you hone your designs

But you can only make major design changes early in the game development process

Carefully consider the scope of your game design!