Game Design

Overview

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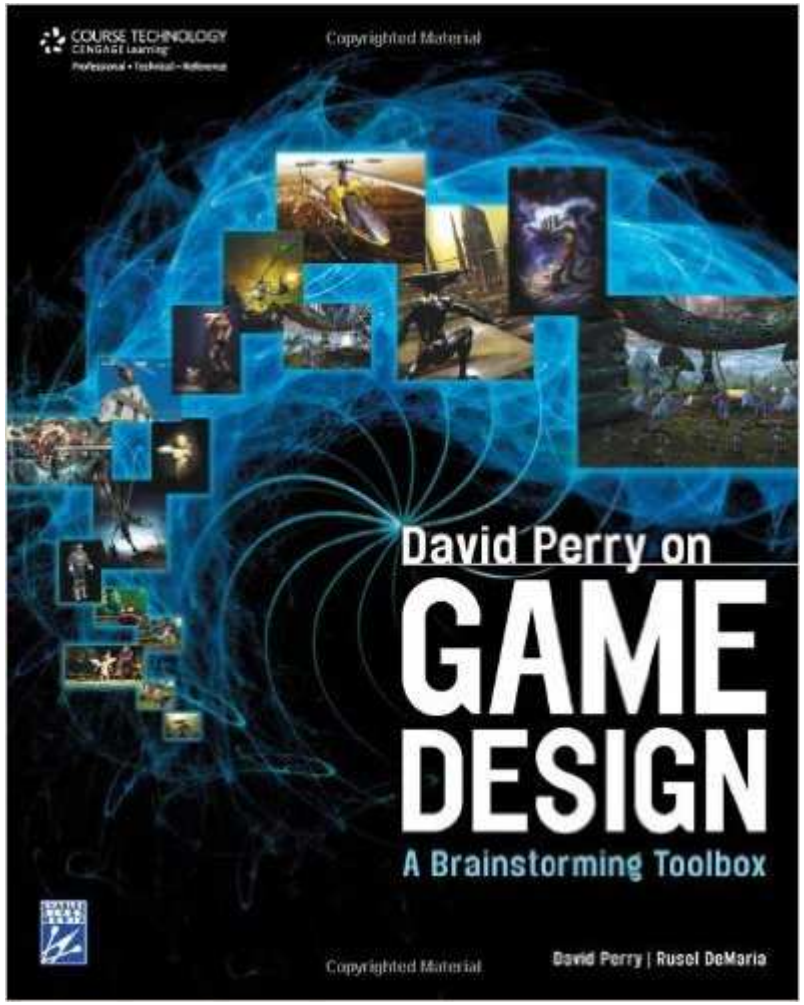
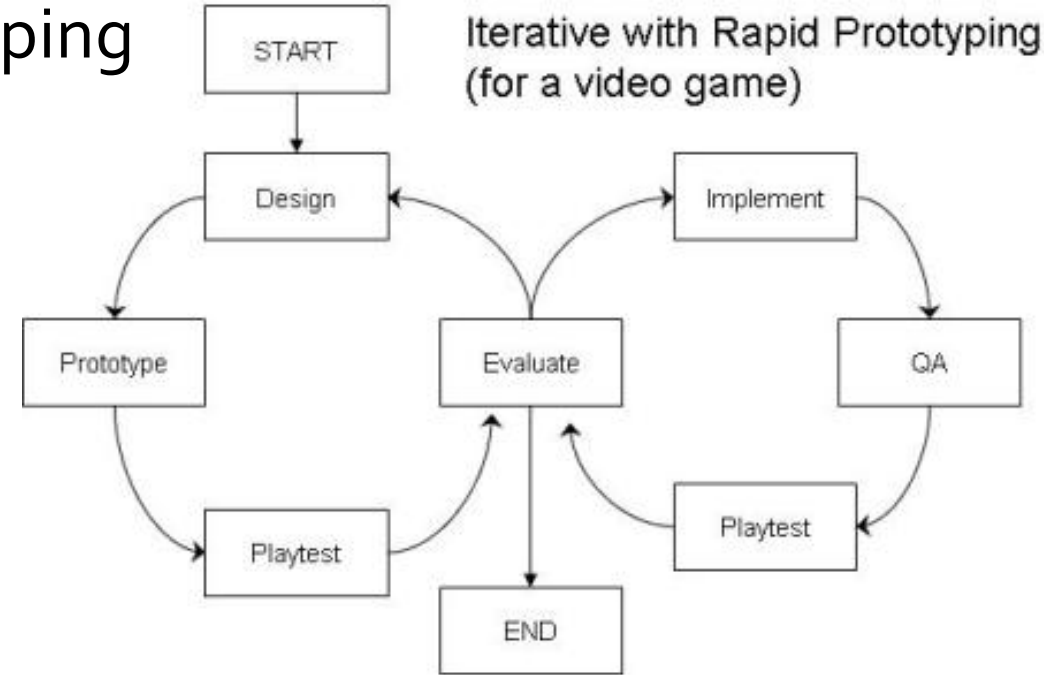
Books on game design

- David Perry on *Game Design: A Brainstorming ToolBox*
- ISBN-10: 1584506687



Steps

1. Game idea → *exercise: lateral thinking*
2. System design → *exercise: rules for your game*
3. *Exercise: paper (board) game version of your idea*
4. Game concept
5. Iterative rapid prototyping



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Game Idea

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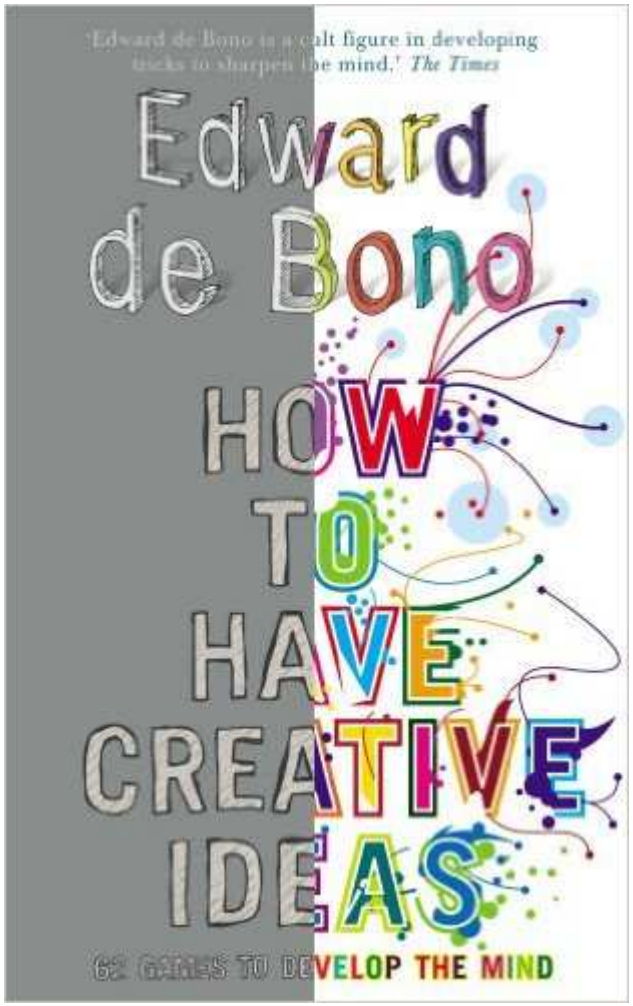
Lateral thinking

- Edward de Bono: *How to Have Creative Ideas: 62 games to develop the mind*
- ISBN-10: 009191048X



You need

- Pen
- Paper
- A device with internet connection
- The will to make a game

Method

- Taken from thelegendofjohnny.com/tutorials/generating-game-ideas
- Lateral Thinking
  - Helps the mind to wander
  - Digs out unusual ideas
  - Keep usually discarded (or wrong) ideas present (useful later)
- Works with random words
  1. Google "random word generator" or creativitygames.net/random-word-generator/randomwords/1 www.randomword.net (with image).
  2. Generate 6 random words (Do not pick a set you like!).
  3. Out of these 6 words find groups of 3 linked words and write down the link in 1-2 sentences
  4. Repeat step 3 a few times with different 3 word groups out of the same 6 words.

Example

- **WORDS:** lasso; escape; toilet paper; reindeer; press; cough
- lasso; escape; toilet paper – *Both lasso and toilet paper could be used to escape from a tall place. Only one of them with chances of success.*
- reindeer; press; cough – *If all Santa Claus' reindeers have a bad case of couch, it will be in all press.*
- lasso; escape; reindeer – *Because a lasso may be used to capture a reindeer, which naturally tries to escape of being captured.*
- toilet paper; reindeer; cough – *A reindeer with human behavior, coughing and using toilet paper to clean its nose.*
- reindeer; lasso; toilet paper – *1 weapon, 1 tool and 1 "trustful companion" to a very strange hero.*
- reindeer; lasso; toilet paper – *A reindeer hero, using a lasso as a tool and toilet paper as a weapon.*

Exercise

- 8 causal links

Example Game 1

- lasso; escape; toilet paper – *Both lasso and toilet paper could be used to escape from a tall place. Only one of them with chances of success.*
- *You're a princess living in a castle, imprisoned by an evil witch. You need to escape through towers and walls. You will use lassos and toilet paper! But there's a problem: you have a limited amount of both. They have different characteristics: toilet paper may be used in different quantities, the more paper the thicker. And the thicker, the more it lasts without ripping. Lasso is indestructible (at least with a princess's weight), but there's not much of it. So, the game is pretty much a puzzle where you have to decide how to use your resources as you go down, risking breaking your neck, going to freedom!*

Example Game 2

- reindeer; press; cough – *If all Santa Claus' reindeers have a bad case of couch, it will be in all press.*
- *A childish hidden object game. The intro shows a newspaper saying all Santa's reindeers have a bad case of couch, which will make it impossible to distribute gifts this year. Kids will have to help Santa as he gets the different ingredients to make a potion which will save Christmas.*

Example Game 3

- lasso; escape; reindeer – *Because a lasso may be used to capture a reindeer, which naturally tries to escape of being captured.*
- *You're a keeper in a natural wildlife park, alone for the weekend, for some reason. This is the weekend all reindeers decided ('a la "Chicken Run"') to make a great escape. You have to use your faithful lasso in different ways to get them all. Humor from the ways they try to escape (steal your jeep, disguise as bunnies, etc).*

Exercise

- 3 game ideas

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System Design

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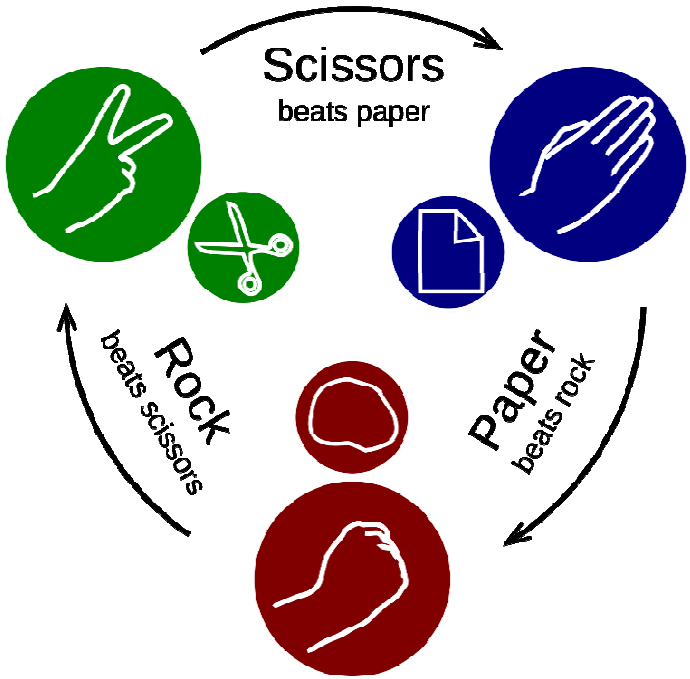
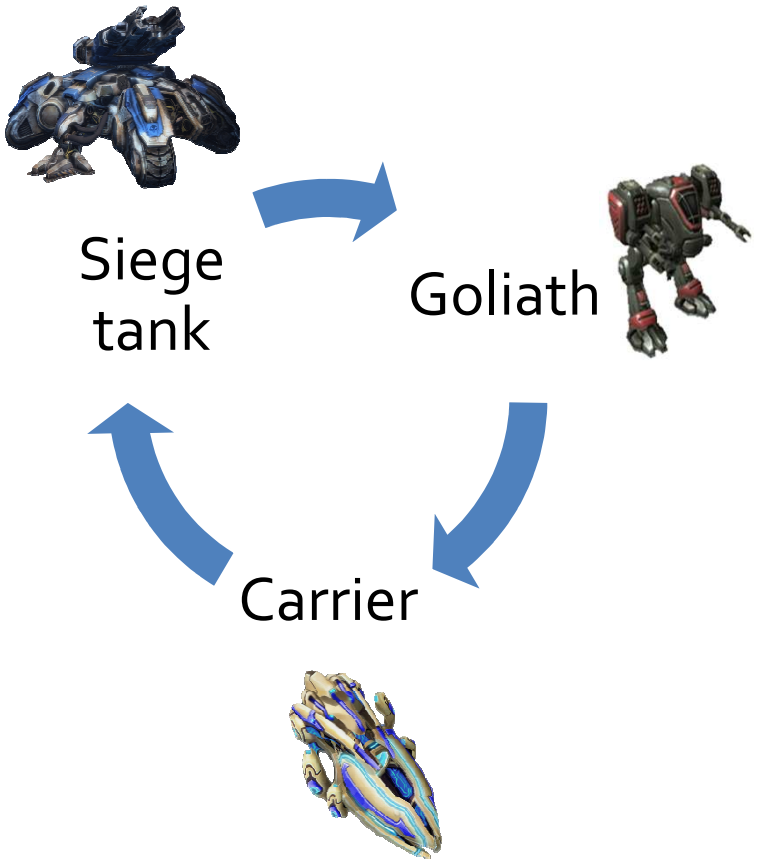
Why is Starcraft like Rock, Paper, Scissors?





System Design

- Define the basic rules of the game
  - What are the pieces?
  - What can you control?
  - What actions can you take on your turn (if there are "turns")?
  - What happens when you take each action?
  - How does it affect the game state?
- In general
  - Rules for **setup**. How does the game begin?
  - Rules for **progression of play**. Once the game begins, what can the players do, and what happens when they do things?
  - Rules for **resolution**. What, if anything, causes the game to end? If the game has an outcome (such as winning or losing), how is that outcome determined?

System Design Example - *Three to Fifteen*

- Players: 2
- Objective: to collect a set of exactly three numbers that add up to 15.
- Setup: start by writing the numbers 1 through 9 on a sheet of paper. Choose a player to go first.
- Progression of Play: on your turn, choose a number that has not been chosen by either player. You now control that number. Cross it off the list of numbers, and write the number on your side of the paper to show that it is now yours.
- Resolution: if either player collects a set of exactly three numbers that add up to exactly 15, the game ends, and that player wins. If all nine numbers are collected and neither player has won, the game is a draw

System Design Example – Tic-tac-toe

- Magic square where every row, column and diagonal adds up to exactly 15

6	7	2
1	5	9
8	3	4

Exercise

- Rules for your Game Idea?
  - Rules for **setup**. How does the game begin?
  - Rules for **progression of play**. Once the game begins, what can the players do, and what happens when they do things?
  - Rules for **resolution**. What, if anything, causes the game to end? If the game has an outcome (such as winning or losing), how is that outcome determined?

Exercise

- Paper (board) Game
  - Use your rule set to create the game on paper
  - Did you find rules you forgot/did not think of?
- Update your "rule book"

Exercise

- Let another group try your board game
  - They have only your rule book
  - Do not help them!
  - “Thinking aloud test”

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Game Concept

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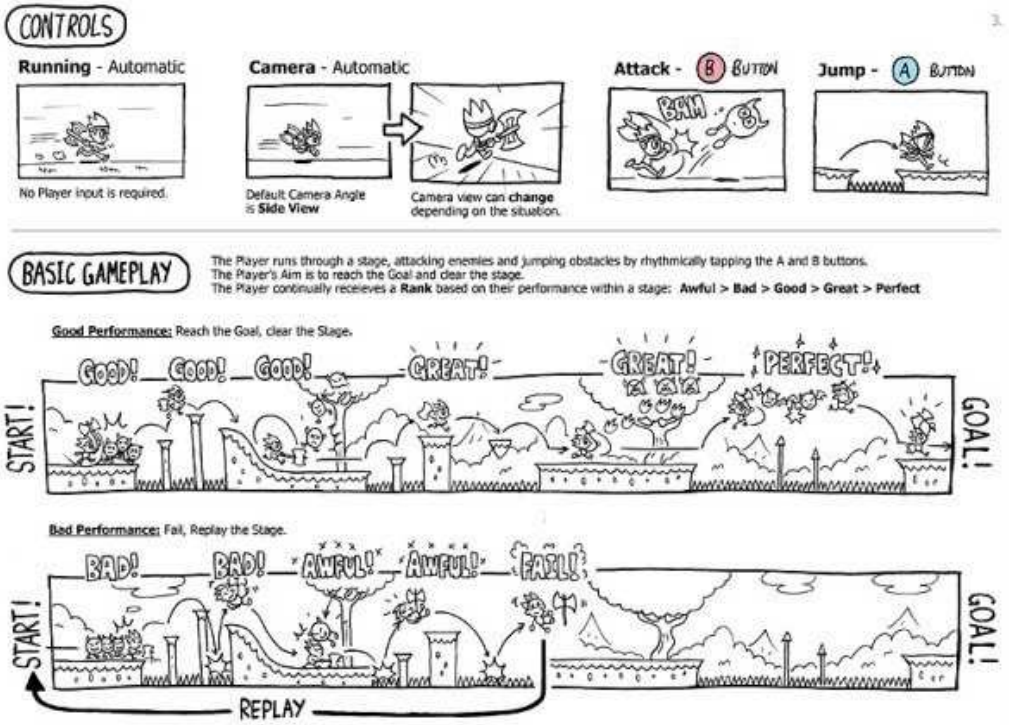
Concept document

- Sell your idea
- Help others to get a clear picture of the game
- Sketches, visualization are worth 1000 words



Concept document – principal points

- ≠ game design document (longer more detailed)
- 2 pages
- Can use MDA taxonomy (later)
- Game title
- Pitch
- Genre
- Design goals
- Player Motivation
- Features

Pitch – examples

- Summarize your game in 1-2 sentences
- Make it come alive
- Sell it
  - *What if MacGyver and Rapunzel had a daughter, and she needed to escape the tallest tower of a castle using only toilet paper and a lasso, and somebody made a game about it?*
  - *In Grand Theft Auto, the player takes the role of a small-time criminal trying to make it big with the mob. Stealing cars, doing jobs for the gangsters and behaving generally anti-social are the way to success.*

Pitch – examples

- *Rampage meets Black and White Creatures in a Fully Destructible Environment*

Features

- Bullet list
- Max 2-3 sentences for each idea
- Describe look and feel of the game
  - Mental image of game
  - How is it to play this game?
- ~ 10 items

Features – examples

- *Control a princess through a 2D side view castle, using the environment, toilet paper, a lasso and other objects you may find to escape an evil witch stepmother. But mind your feet: if you fall from too high, no happy ending for you!*
- *A rich, colorful cartoony look, but with some twists that make it unique, funny, and crazy.* ***It's like Disney's classic princess' movies on LSD.***
- *The lasso stays with you, but can only hold you for so long. The toilet paper is limited, and can be used in different folds, which define the weight it holds. Use it wisely, for the more you fold it, the faster it ends.*
- *Three princesses to chose, three different body masses, three difficulty levels.* ***The fatter the princess, the harder the game****.*

Player motivation

- Player's role and goal
- What type of player will play the game
  - compete, solve puzzles, explore, ….
- Example
  - *The player takes the chosen princess through the entire castle, trying to escape without falling and dying. The princess jumps from platform to platform, and uses the lasso and ropes made of toilet paper, together with other objects she may pick. The player must chose how, where and when to use the toilet paper, avoiding to use it all. Each level gives the player points, which may be used to unlock extras.*

Genre – examples

- *3D point & click adventure*
- *2d hack and slash action game*
- *2D third-person shooter*
- *JRPG (Japanese role-playing video game)*
- *A puzzle, which happens to be a 2D platformer, and has some resources' management.*
- *…*

Design goals

- Define your aims for the game as an experience
- Define briefly how the game will achieve each goal
  - *Comedy: Beginning with a stupid premise that toilet paper can be used as a rope, and building a nonsense environment, with unrealistic yet funny elements, and "pop" references, the game wants to make the player laugh.*
  - *Durable: With three difficulty levels, and different ways to pass the levels, there's a lot of repeating value in this game. Also, the collectibles which the player may unlock with points give the player a new goal.*
  - *"Mobile": A game to be played "on the move", whenever and wherever the player has 5 minutes, with short levels and able to be saved at any time.*

Concept Examples

- http://thelegendofjohnny.com/tutorials/high-concept
- http://eriq.lecture.ub.ac.id/files/2012/03/High-Concept-Documents.pdf
- http://www.jason.cootey.com/highconcept.html
- http://www.gamepitches.com/
- http://www.cs.cornell.edu/courses/cs3152/2013sp/assignments/assignment2.php

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Game Prototyping

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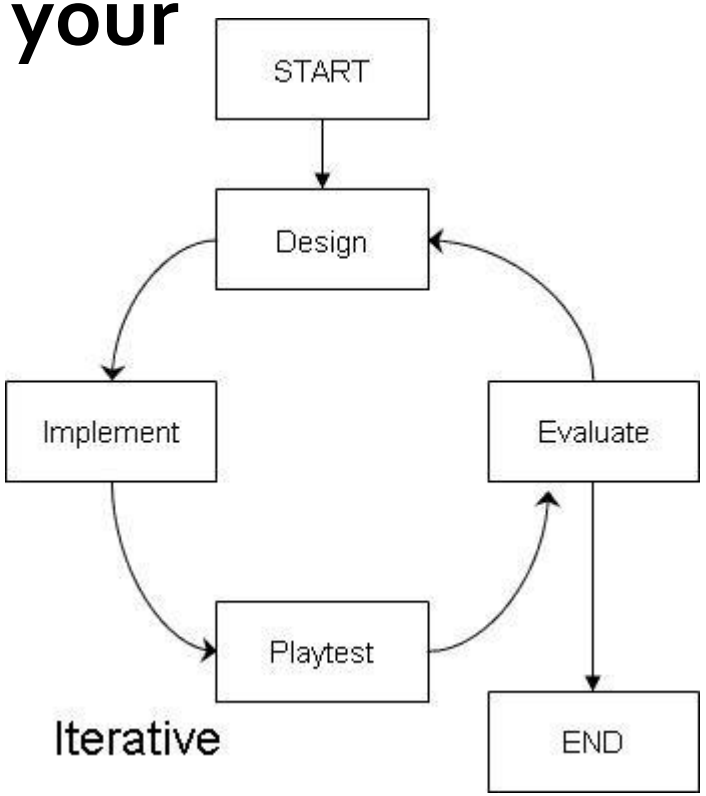
Good Game Designers

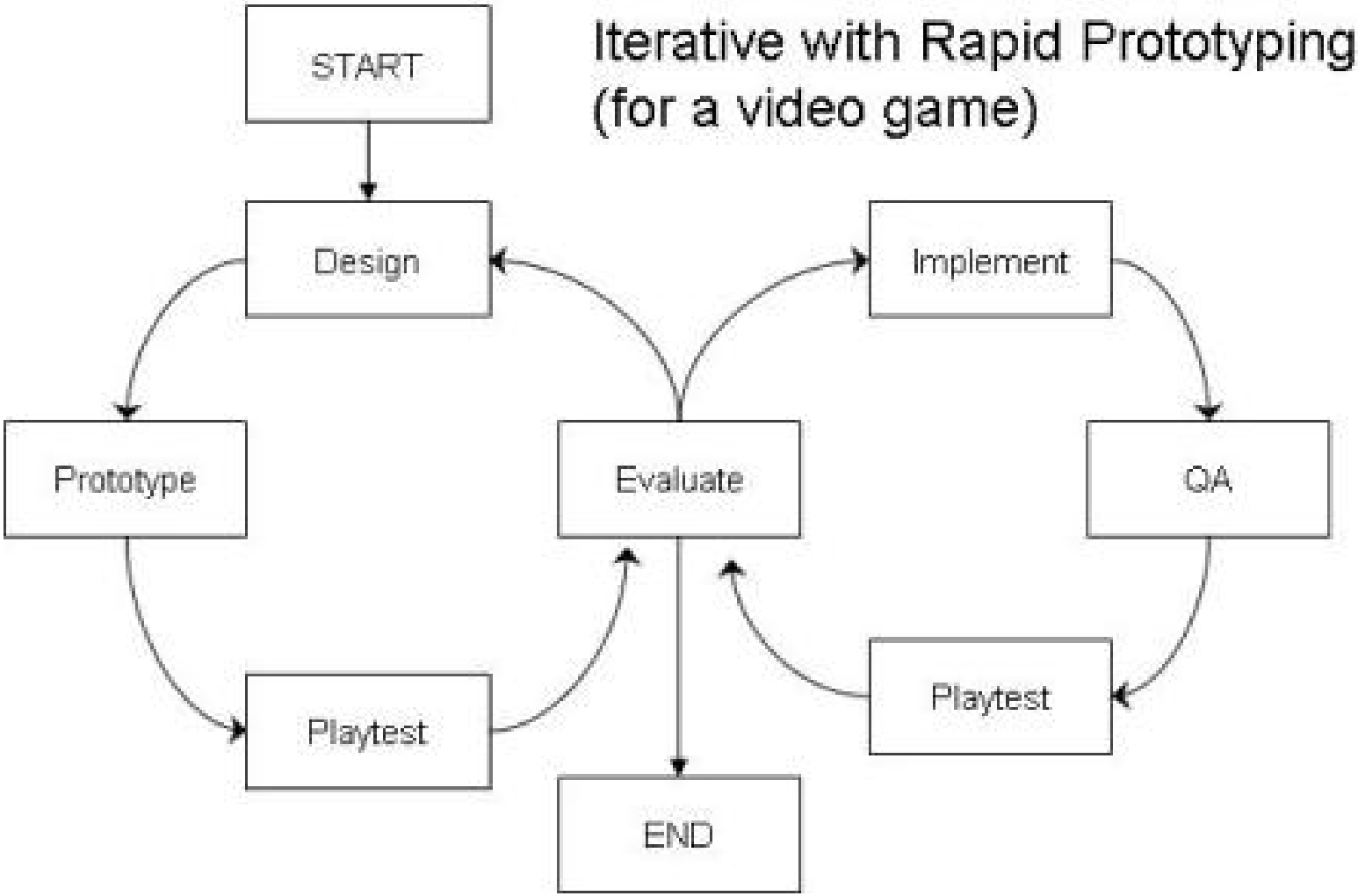
- Are the ones that turn crappy game ideas through iteration into an excellent game!
- All game ideas are crappy at the start

How is a game designed?

The more times you iterate, the better your final game will be.



How to Iterate Faster?



Production Cycle

- Concept design
- Prototyping (Pre-production)
- Production
  - Art concept
  - Storyboarding
  - Writing
  - Level design
  - Modeling and animation
  - Programming, behavior and tools
  - Playtesting
  - Revisions

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Analyzing

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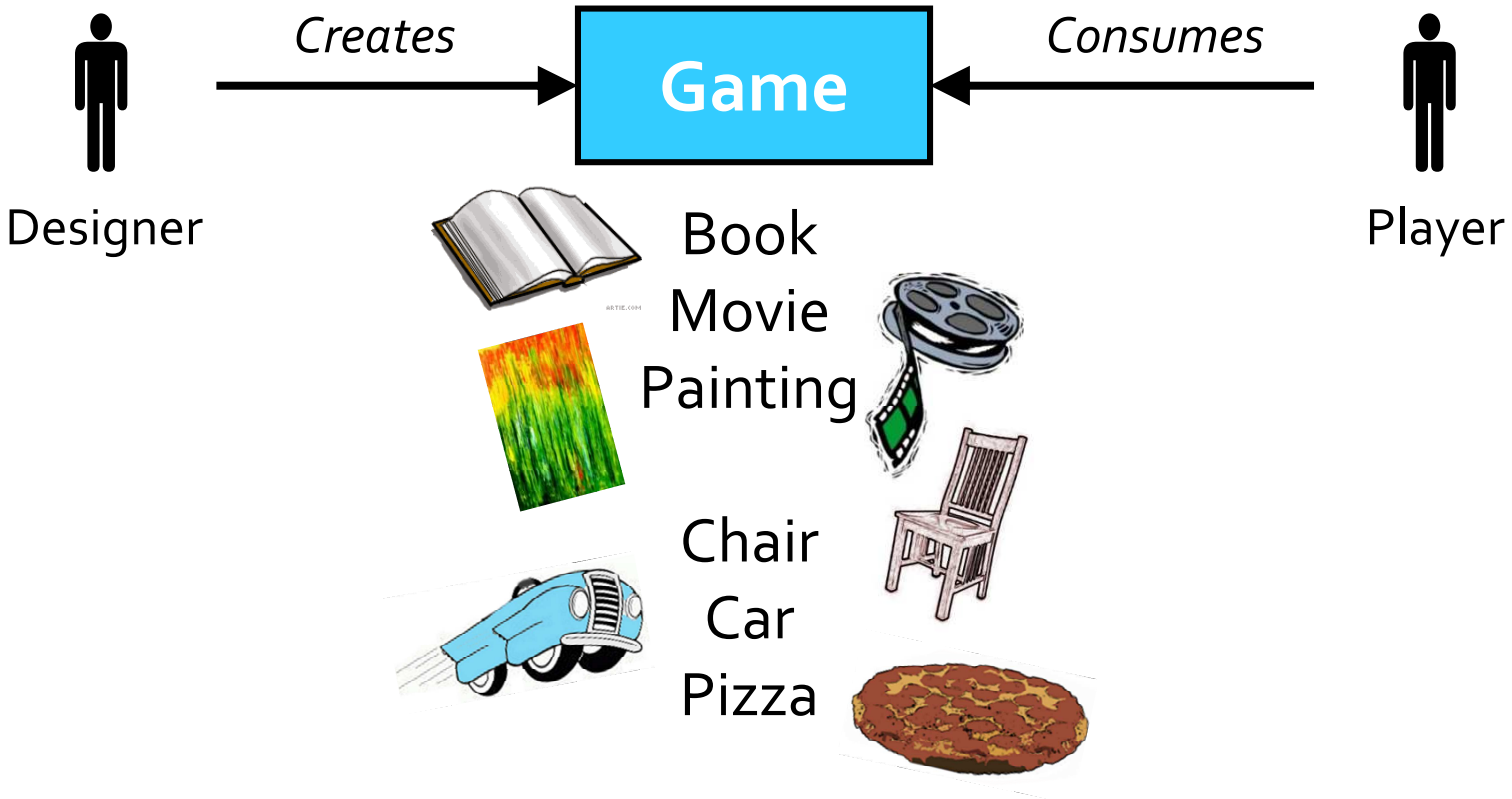
The Designer-Player Relationship



The Designer-Player Relationship

*The difference is the way that games are **consumed**.*

How are Games consumed?

- The designer doesn't know:
  - When will the player play?
  - How often? For how long?
  - Where? With Whom?
- And most importantly…
  - What will happen during the game?

- **A Theatrical Play**
  - "design team" knows:
    - Script
    - Lighting
    - Acoustics
    - Seating
    - Intermissions

Your Favorite game?

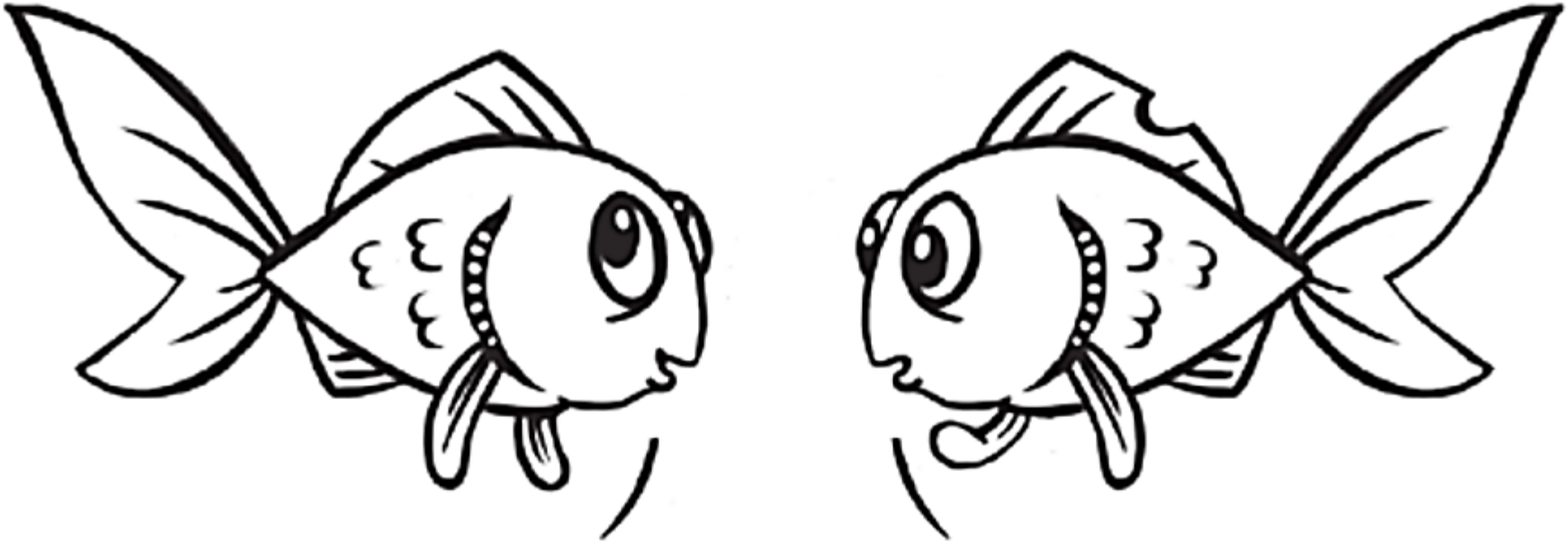
- Why?
  - Number one reason people give: *It's "fun"!*
  - What does it mean to be *"fun"* for a particular game?
  - How will we know a particular kind of *"fun"* when we see it?
- What do you consider good/bad about it?
- What is your most memorable moment? (experience)

Goal of a game designer?

- Designing games?
  - NO!
  - Means to an end
- Designing experience
  - This is what people remember about a particular game

The Game is not the Experience

- The game enables the experience



Lens of Essential Experience

- **Stop thinking about your game**
- **Think about the experience of the player**
- **What experience do I want the player to have?**
- What is essential to that experience?
- Example: *snow ball fight*
  - What is essential?
    - *So much snow, played on the street, cold but sunny, …*
- **How can my game capture that essence?**
  - *It was so cold: breath little puffs, whistling wind, need gloves*

Lens of Essential Experience

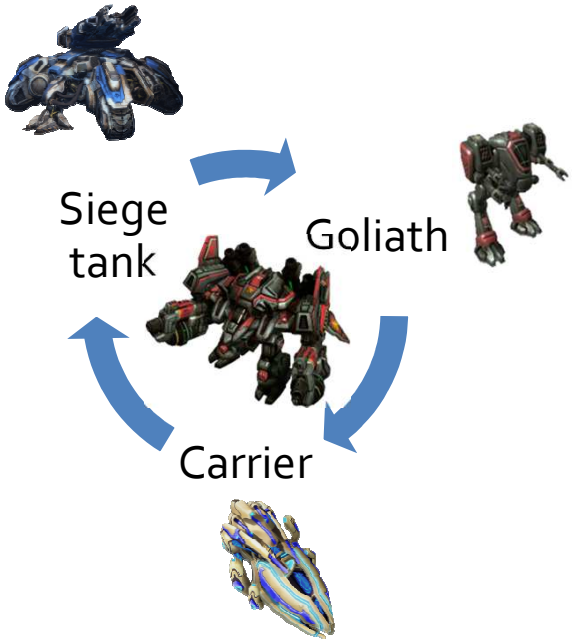
- **Stop thinking about your game**
- **Think about the experience of the player**
- **What experience do I want the player to have?**
- **How can my game capture that essence?**
- Example: *Wii Sports - baseball*
  - *Was intended to be like real baseball*
  - *Time constrains*
  - *Can swing your controller like a bat, …*

Lens of Essential Experience

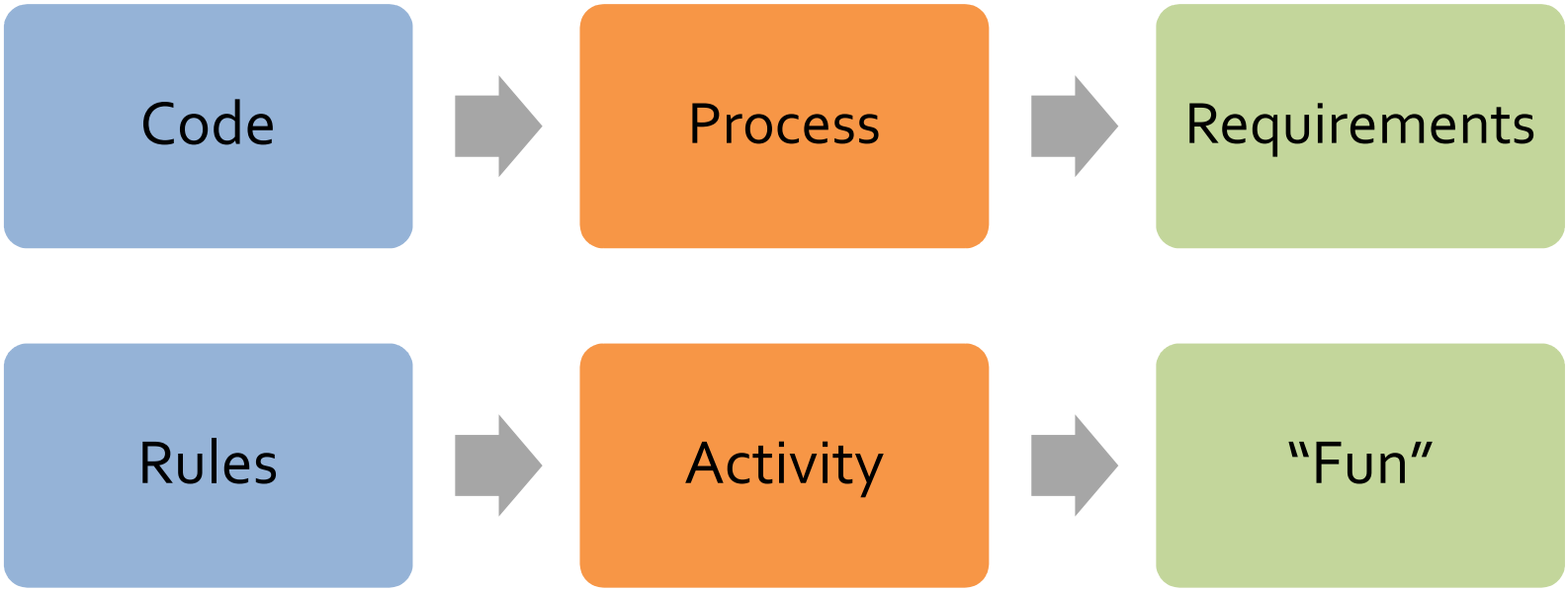
- **Stop thinking about your game**
- **Think about the experience of the player**
- **What experience do I want the player to have?**
- **How can my game capture that essence?**
- Example: *James Bond 007*
  - *Similar games felt like war games*
    - *Risky action is not undertaken if probability of succeeding is to low, but if too high act like superheros*
  - *Budget of hero points*
    - *Can spend on risky actions*

Analyzing games

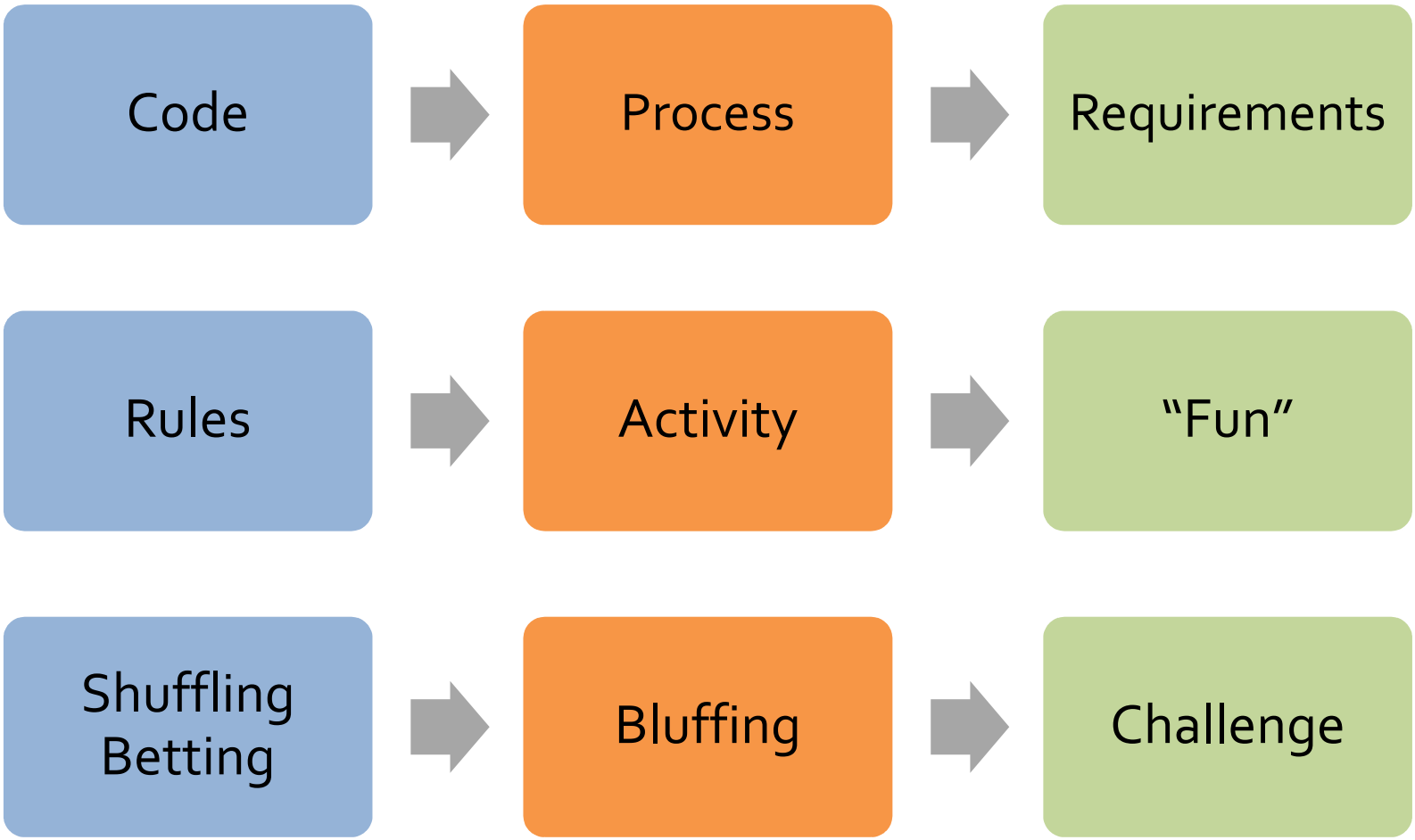
- Analyze *end result* to refine *implementation*
- Analyze *implementation* to refine *end result*
  - Discover interdependencies
  - Understand complex interactions between coded subsystems
  - Breaking changes
- Built a methodology
  - Guide creative thought process
  - Facilitate quality work
  - Vocabulary to talk about games
    - Define game through own props not other games



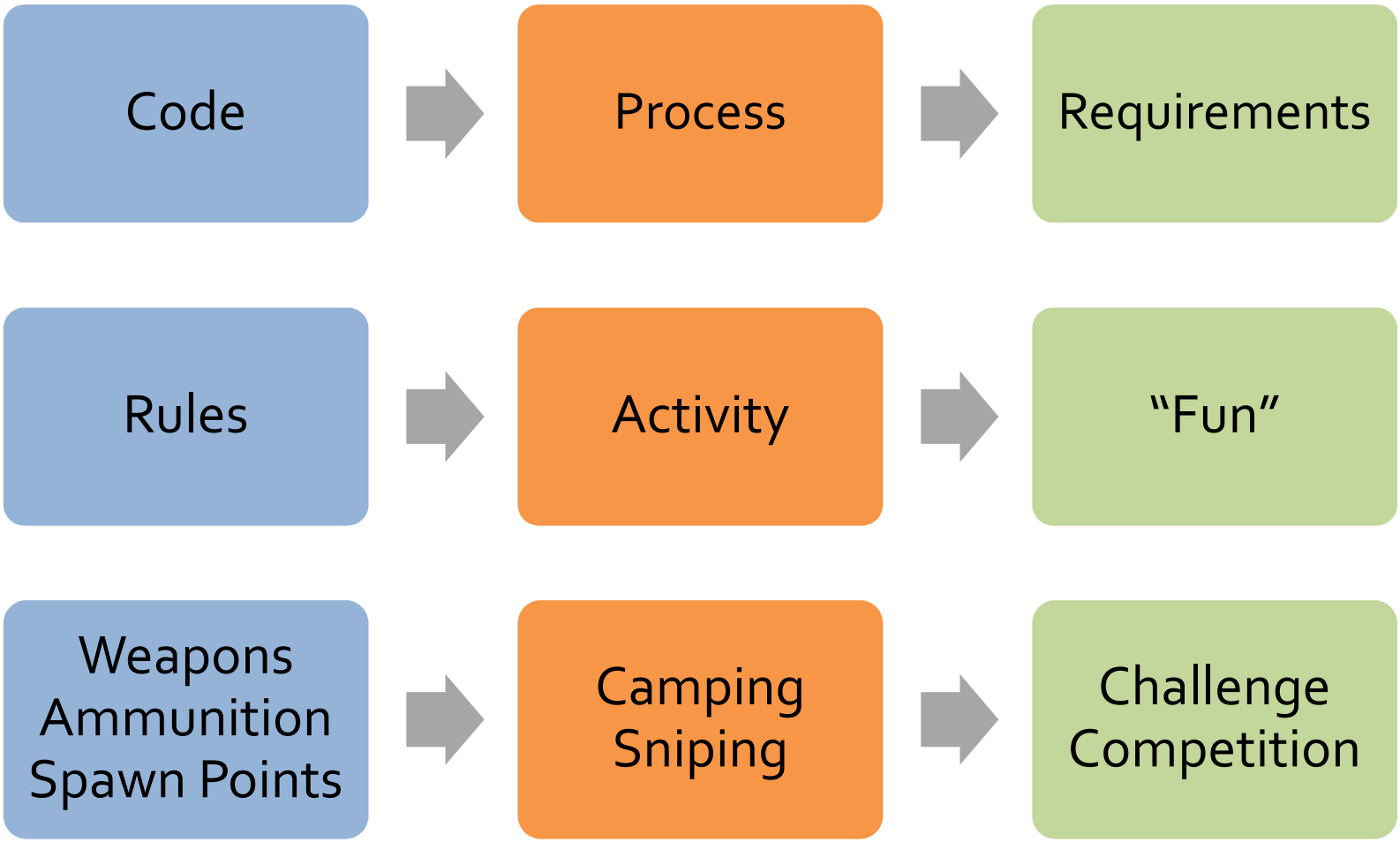
Games as Software



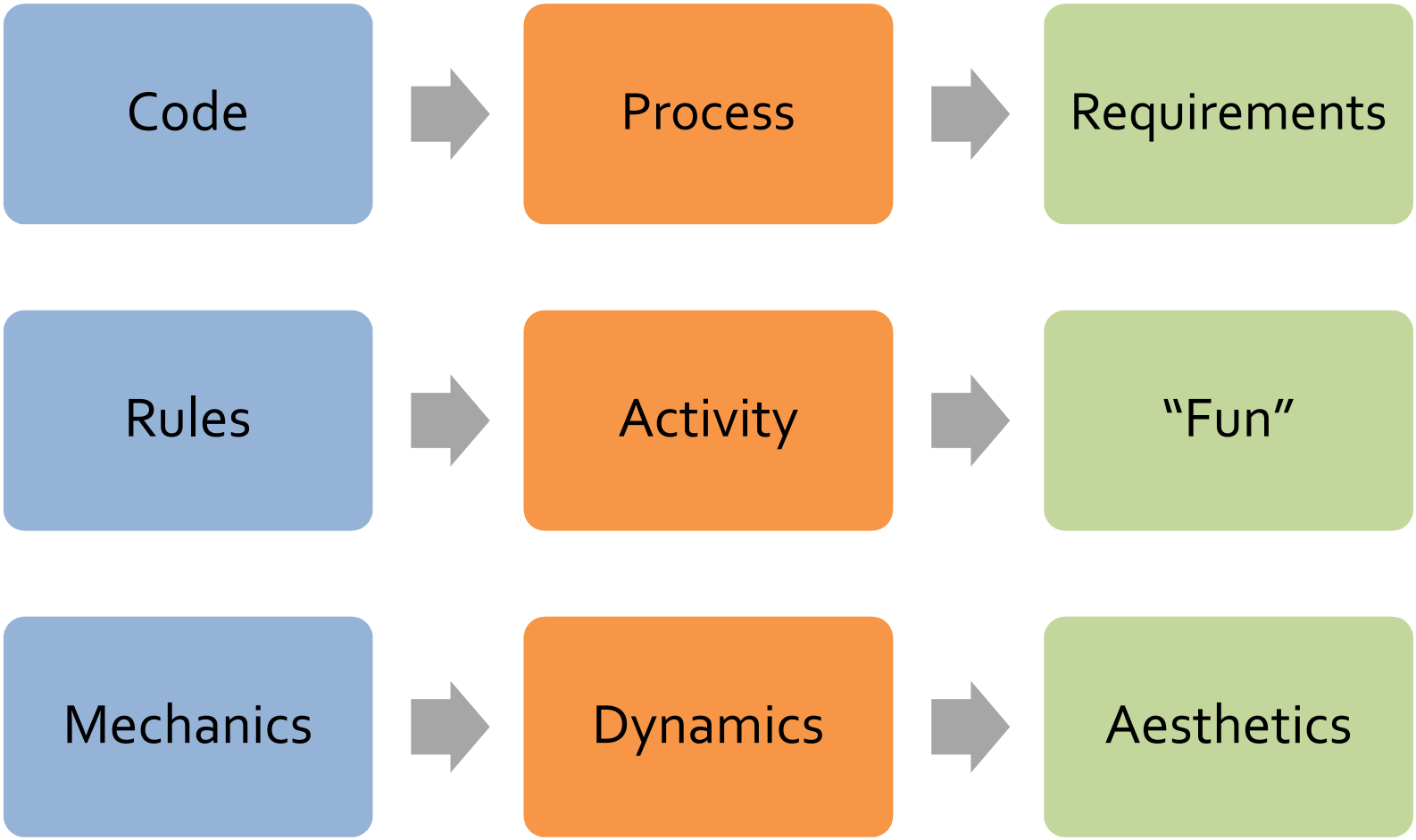
Games as Software – Poker example



Games as Software – Shooter example



A Design Vocabulary



The MDA Framework

- Create a clear vocabulary
- Bridge gap between game design and development
- Decompose, study and design broad class of designs
- Idea: **games are like artifacts**
  - Content of a game is its **behavior**
  - Not the media that streams out of it towards player
- ***Games are systems that build behavior via interaction***

MDA – Definitions

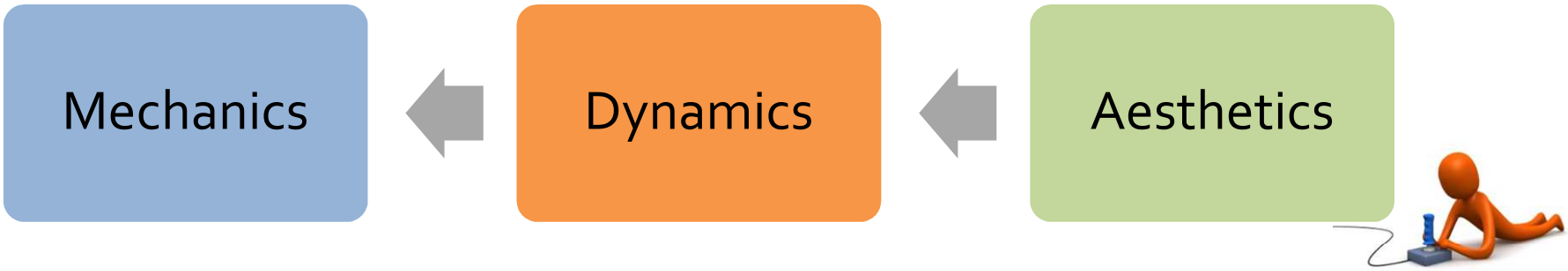
- *Mechanics*: base components of the game - its rules, every basic action the player can take in the game, the algorithms and data structures
- *Dynamics*: *run-time behavior* of the mechanics acting on player inputs and each others' outputs over time.
- *Aesthetics*: *desirable emotional responses* evoked by the game dynamics.

The Designer's Perspective

- Mechanics give rise to dynamic system behavior, which in turn leads to particular aesthetic experiences

The Player's Perspective

- Aesthetics set tone, which is born out on observable dynamics and eventually, operable mechanics.



Three Perspectives of Games

- But they are causally linked
- Changes potentially affect other perspectives
- Designer's perspective *feature-driven*
- Player's perspective *experience-driven*

Mechanics — Dynamics — Aesthetics

Understanding Aesthetics

- What makes a game "fun"?
  - How will we know a particular kind of "fun" when we see it?
  - Uninformative vocabulary

- What kinds of "fun" are there? – a classification

Eight Kinds of "Fun"

1. Sensation	*Game as sense-pleasure*
2. Fantasy	*Game as make-believe*
3. Narrative	*Game as unfolding story*
4. Challenge	*Game as obstacle course*
5. Fellowship	*Game as social framework*
6. Discovery	*Game as uncharted territory*
7. Expression	*Game as self-discovery*
8. Submission	*Game as mindless pastime*
9. …	

Clarifying Our Aesthetics

- Charades is "fun"
  - *Fellowship, Expression, Challenge*
- Quake is "fun"
  - *Challenge, Sensation, Competition, Fantasy*
- Final Fantasy is "fun"
  - *Fantasy, Narrative, Expression, Discovery, Challenge, Masochism*
- The Sims is "fun"
  - Discovery, Fantasy, Expression, Narrative

Clarifying Our Goals

- Each game pursues multiple aesthetics, in varying degrees.
- As designers, we can (and should) choose certain aesthetics as goals for our game design.
  - To know your goals
  - Can help to achieve these goals

What is an "Aesthetic Model?"

- A rigorous definition of an aesthetic goal
- States criteria for success and failure
- Serves as an "aesthetic compass"

Some examples…

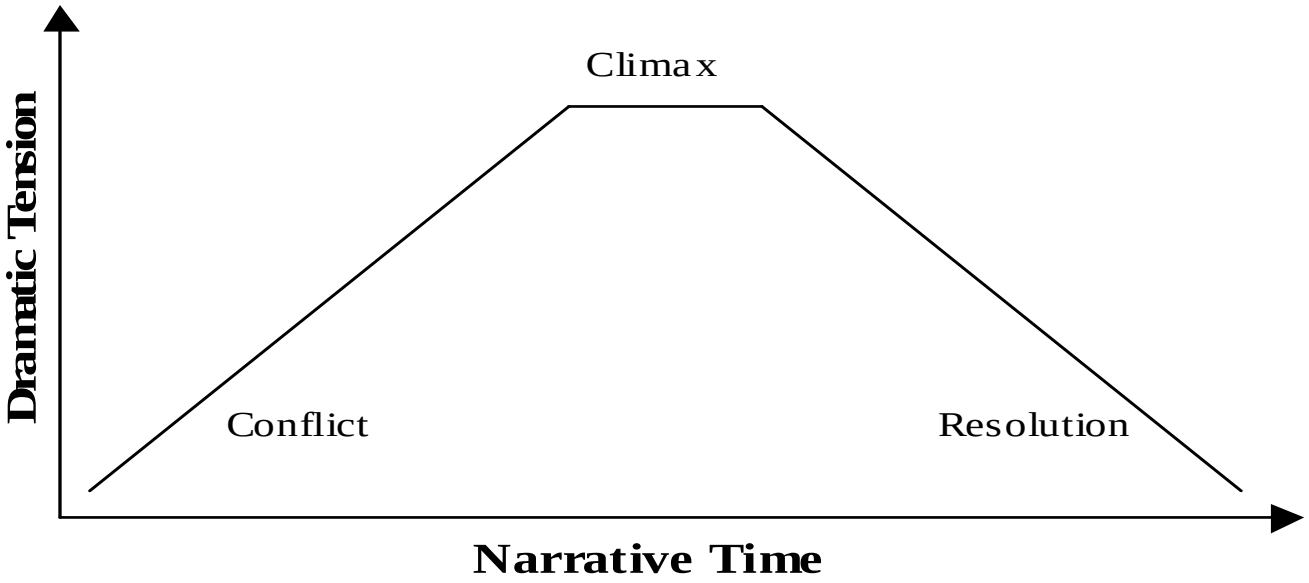
Goal: Competition

- Model: A game is **competitive** if players are **emotionally** invested in defeating each other.
- Success:
  - Players have adversaries.
  - Players want to win.
- Failure:
  - A player feels that he can't win.
  - No feedback about who is winning

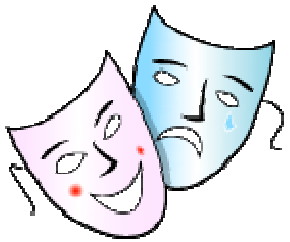
- Examples:
  - Quake: against computer; win or die; alive at end of level; …
  - Charades: teams compete; winning is socially rewarding; …

Goal: Drama

- Model: A game is **dramatic** if:
- Its central conflict creates **dramatic** tension.
- The dramatic tension builds towards a **climax**.



Goal: Drama



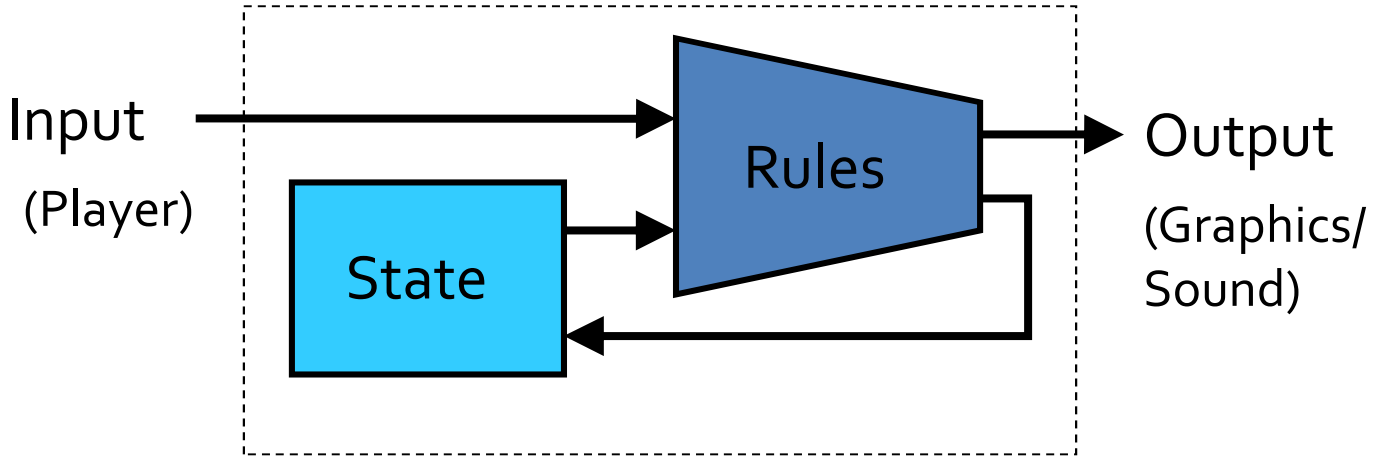
- Success:
  - A sense of **uncertainty**
  - A sense of **inevitability**
  - Tension increases towards a climax
- Failure:
  - The conflict's outcome is obvious **(no uncertainty)**
  - No sense of forward progress **(no inevitability)**
  - Player doesn't care how the conflict resolves

on to Dynamics…

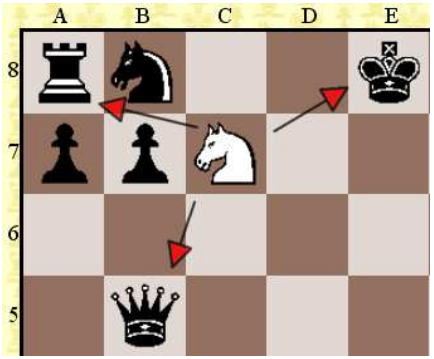
Understanding Dynamics

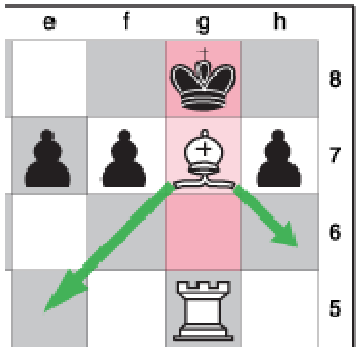
- Dynamics work to create aesthetic experiences
  - *Challenge: time pressure, opponent play*
  - *Fellowship: sharing information across a team, winning easier in team (capturing enemy base)*
  - *Expression: encourage users to leave their mark (purchasing, building, modding, personalized characters)*
  - *Drama: rising tension - a release - denouement*
- What about the game's behavior can we predict before we go to playtest?
- How can we explain the behavior that we observe?

Formalizing Game Dynamics



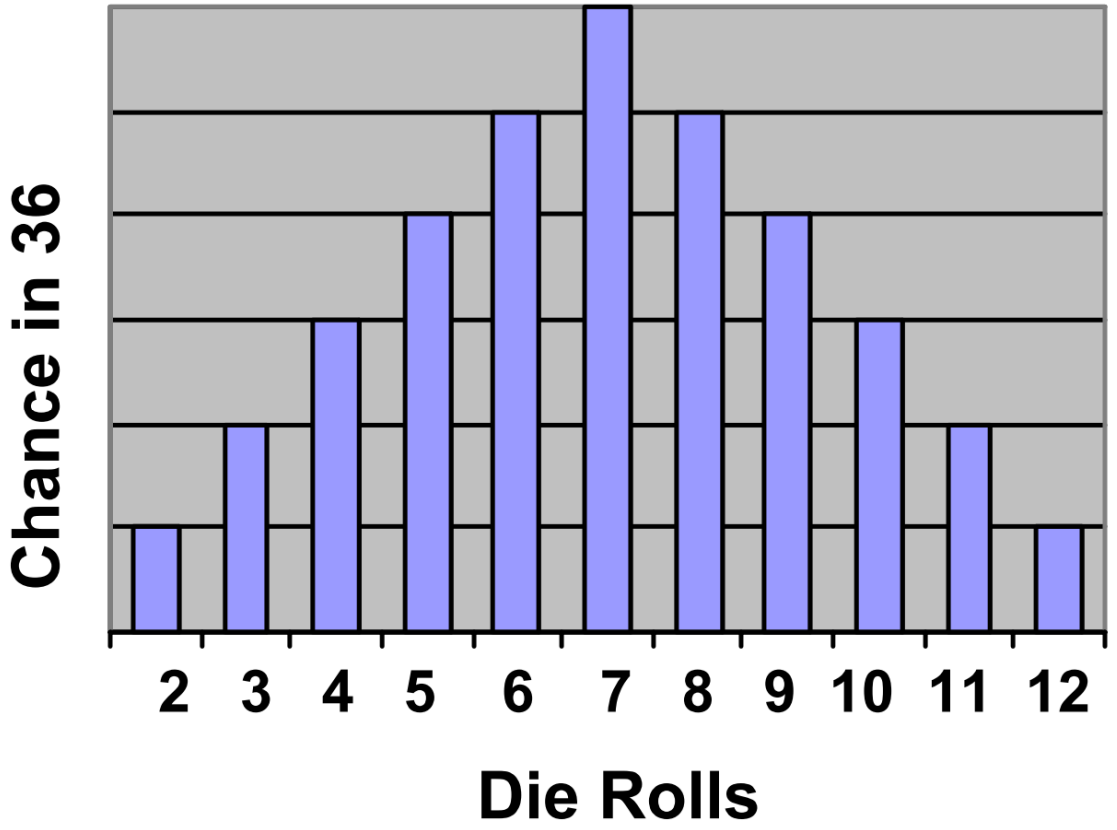
The "State Machine" Model





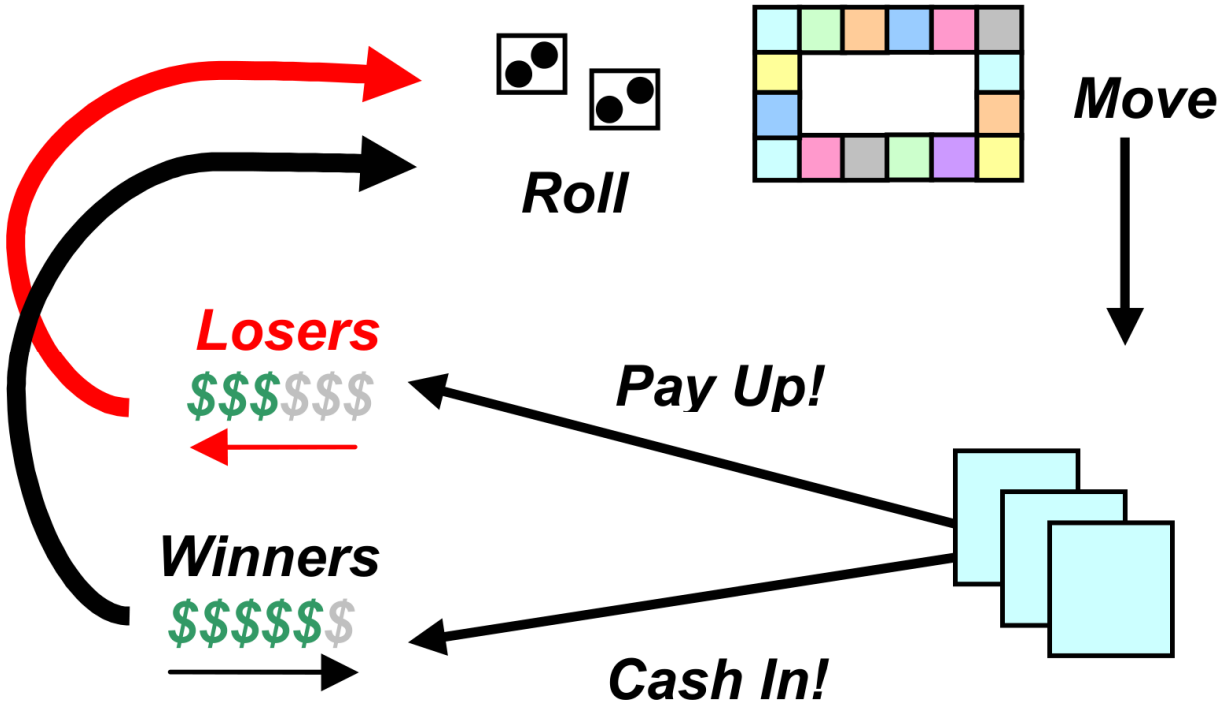
Example: Random Variable 2d6

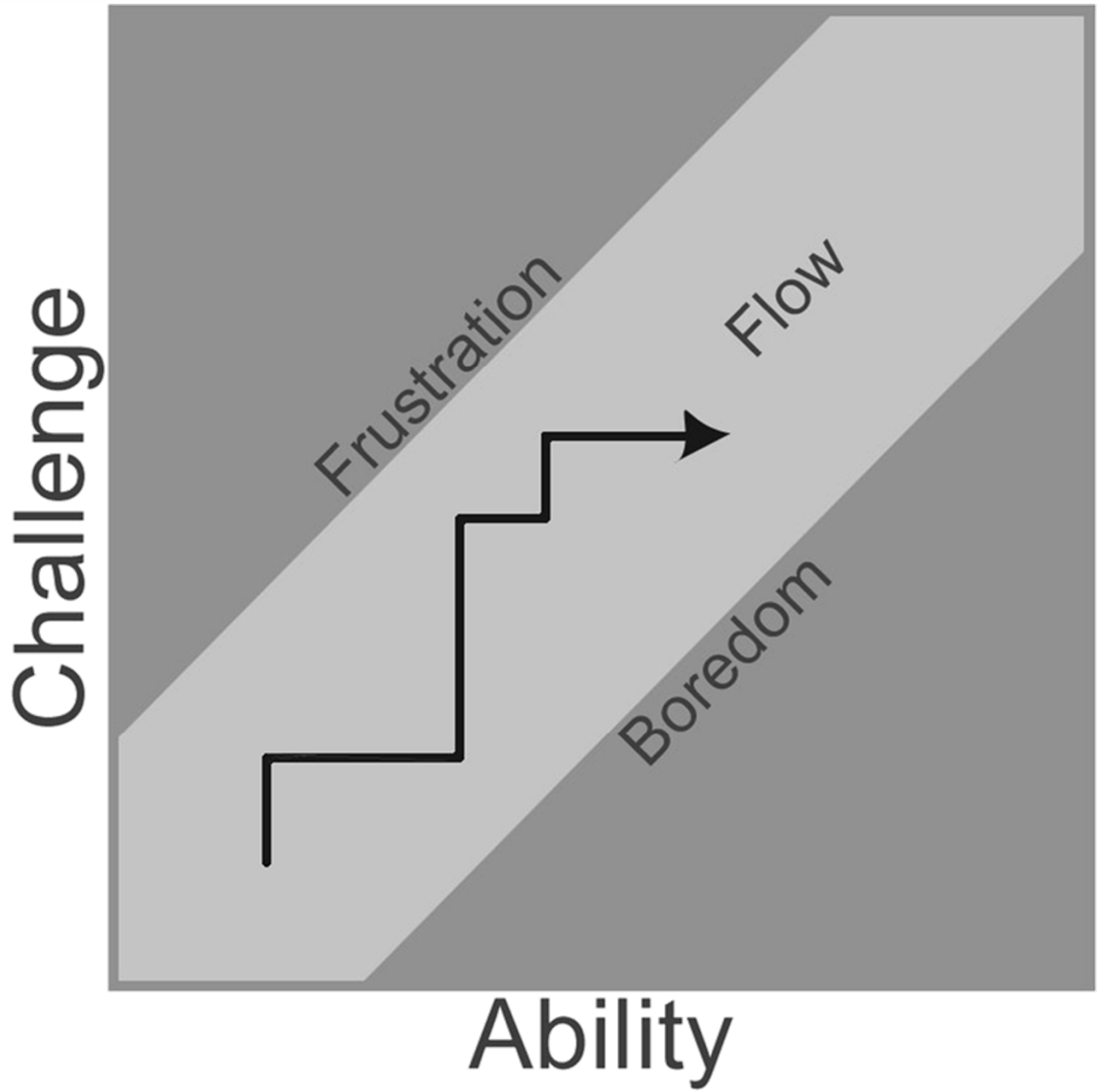
- Monopoly board: average progress around board



Example: Feedback System

- Monitors and regulates its own state
- Monopoly: poor become poorer, rich become richer
  - Win for poor unlikely → less players emotionally invested
  - Fix: reward poor players, taxes, …




Challenge
Frustration
Flow
Boredom
Ability

Avoid Dominant Strategies

- Are strategies that gives you a win no matter what.

- E.g.

	Wife Birthday	Not Wife's Birthday
Buy Flowers	10	20
Don't Buy Flowers	-100	0

Where Models Come From

- Analysis of existing games
- Other Fields:
  - Math, Psychology, Engineering…
- Our own experience

On to Mechanics…

Understanding Mechanics

- There's a vast library of common game mechanics.

Examples

- Cards
  - Shuffling, Trick-Taking, Bidding
- Shooters
  - Ammunition, Spawn Points
- Golf
  - Sand Traps, Water Hazards

Mechanics vs. Dynamics

- There's a grey area
  - Some behaviors are direct consequences of rules.
  - Others are indirect.
  - "Dynamics" usually means the latter.
- Dynamics and Mechanics are different views of games.
- Dynamics emerge from Mechanics.

Example: Time Pressure

- "Time pressure" is a dynamic.
- It can create dramatic tension.
- Various mechanics create time pressure:
  - Simple time limit
  - "Pace" monster
  - Depleting resource

How do you design a good game?

- Do a lot of research
  - Other games (memorable moments), field, history, …
- Prototypes (small, use all tools possible)
- You can use some of the frameworks around
  - MDA framework (Mechanics, Dynamics, Aesthetics)
  - Game balance, fit to an old model (e.g. rock, paper, scissors)
  - But keep it simple
    - Rock, paper, scissors, lizard, spock
    - Total Annihilation vs. Starcraft
  - …
- **Test, test, test**
- **It's an iterative process**

Design Examples and Links

- Darknet: www.gamasutra.com/blogs/EMcNeill/20140818/223585/Narrative_and_the_MDA_Framework.php
- I Have No Words & I Must Design www.costik.com/nowords.html
- Game design concepts gamedesignconcepts.wordpress.com/2009/06/29/level-1-overview-what-is-a-game
- Understanding games games www.kongregate.com/games/pixelate/understanding-games-episode-1