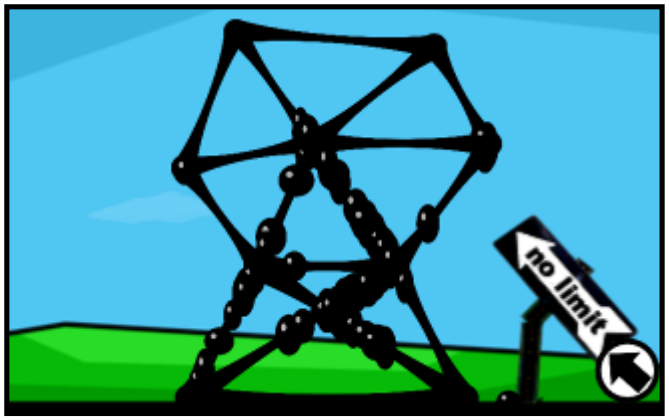


CS 672: Spring 2010

Game Programming and Design

http://experimentalgameplay.com/blog/games/

Rapid prototyping

MDA framework

Prototype design

MDA Framework

Hunicke, LeBlanc, Zubek

MDA: A Formal Approach to Game Design and Game Research

Games *as* Software

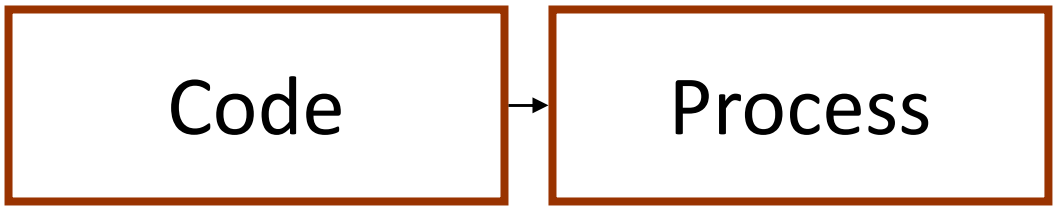
MDA Framework

Code

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Games *as* Software

MDA Framework



Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

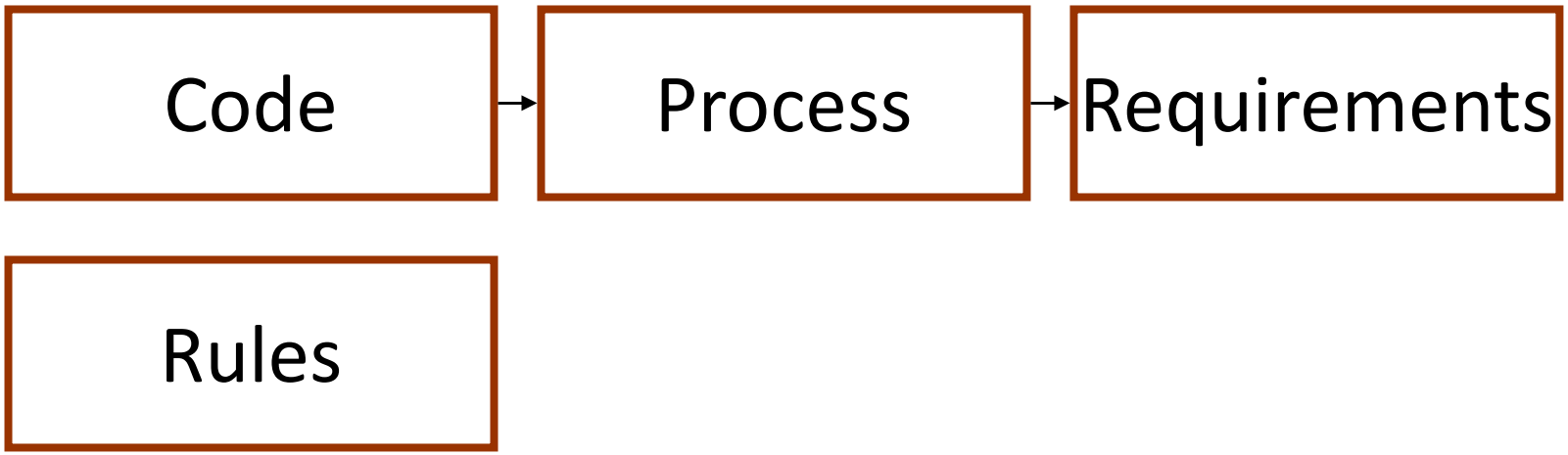
Games *as* Software

MDA Framework

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Games *as* Software

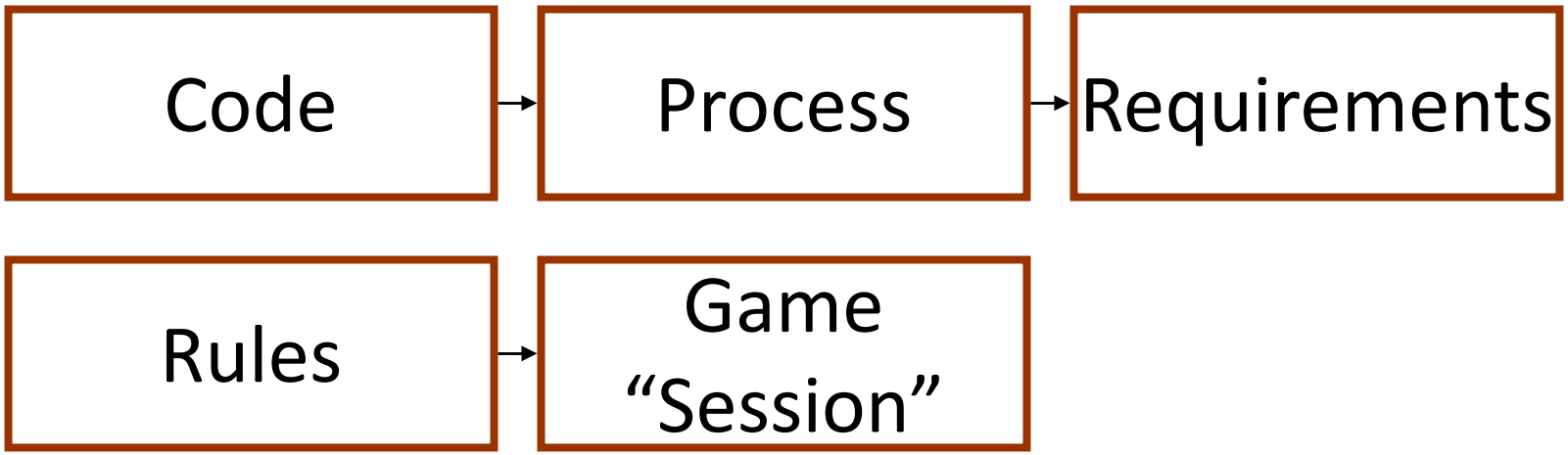
MDA Framework



Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Games *as* Software

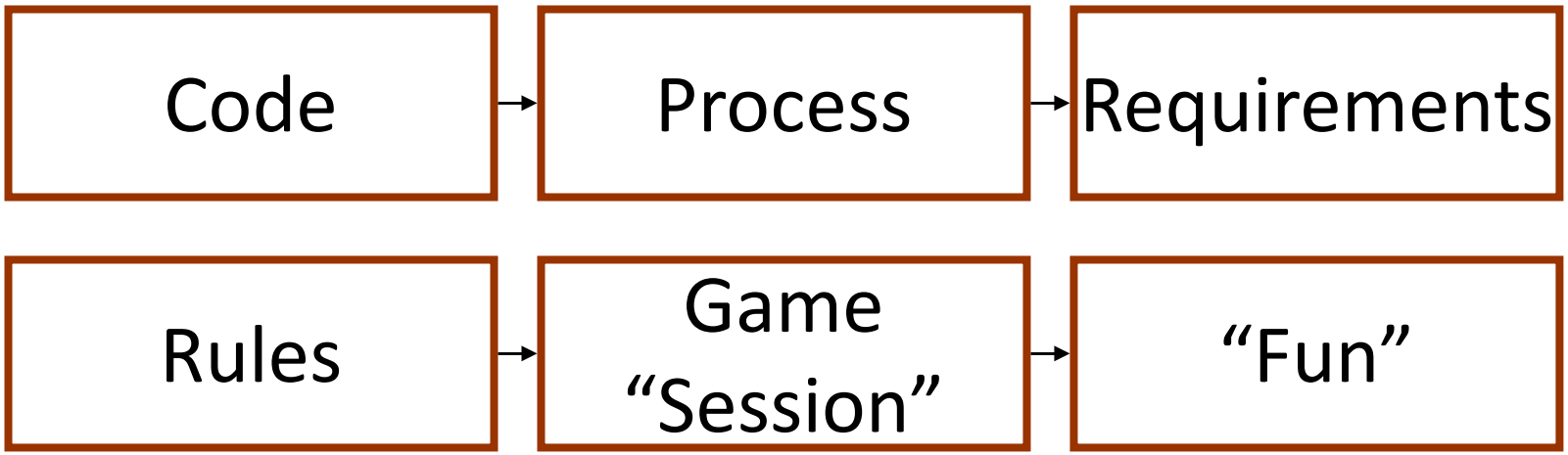
MDA Framework



Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Games *as* Software

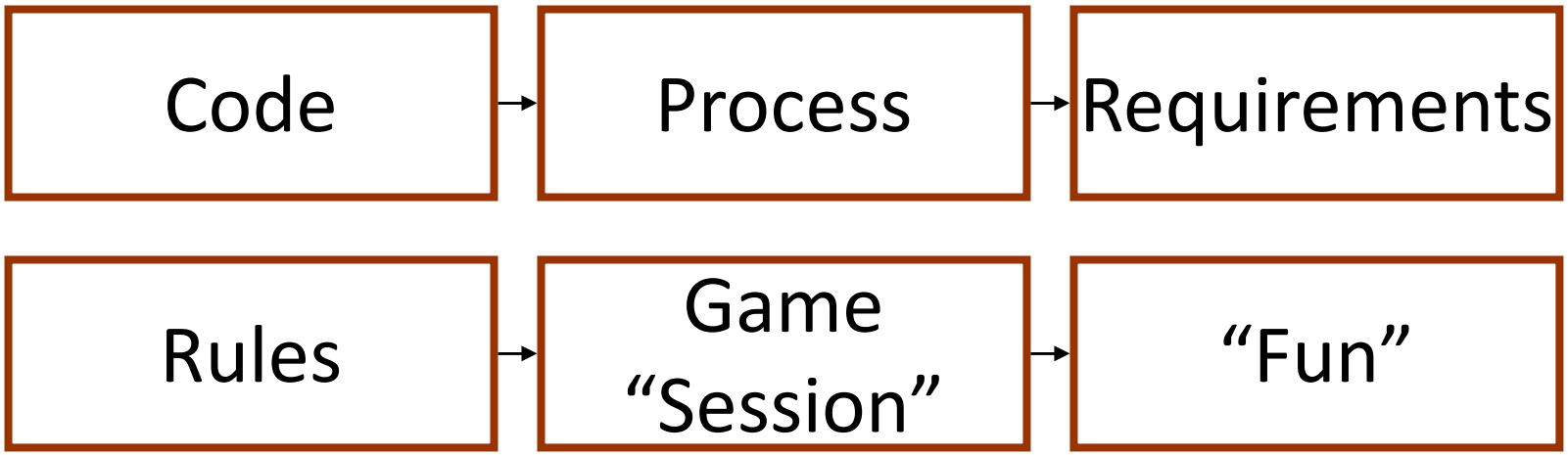
MDA Framework



Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

A Design Vocabulary

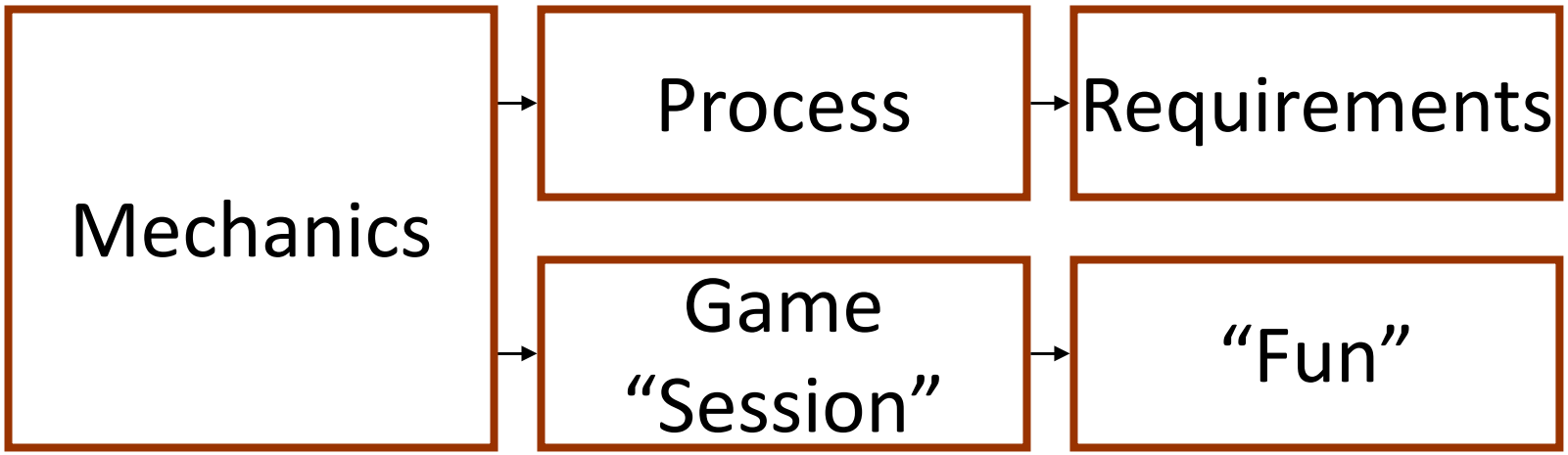
MDA Framework



Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

A Design Vocabulary

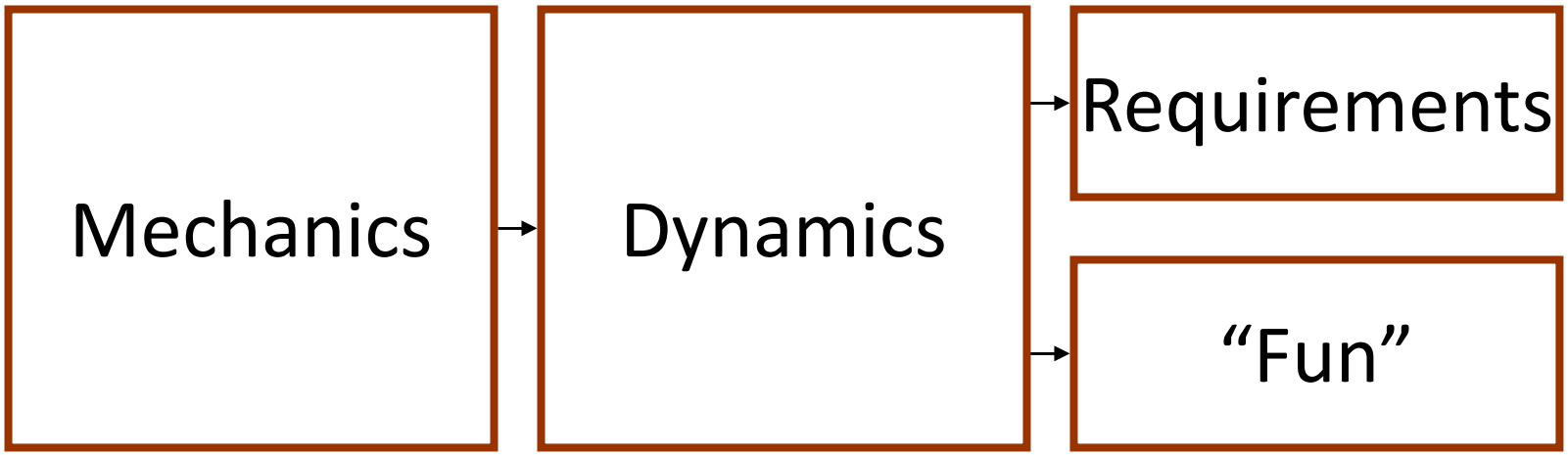
MDA Framework



Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

A Design Vocabulary

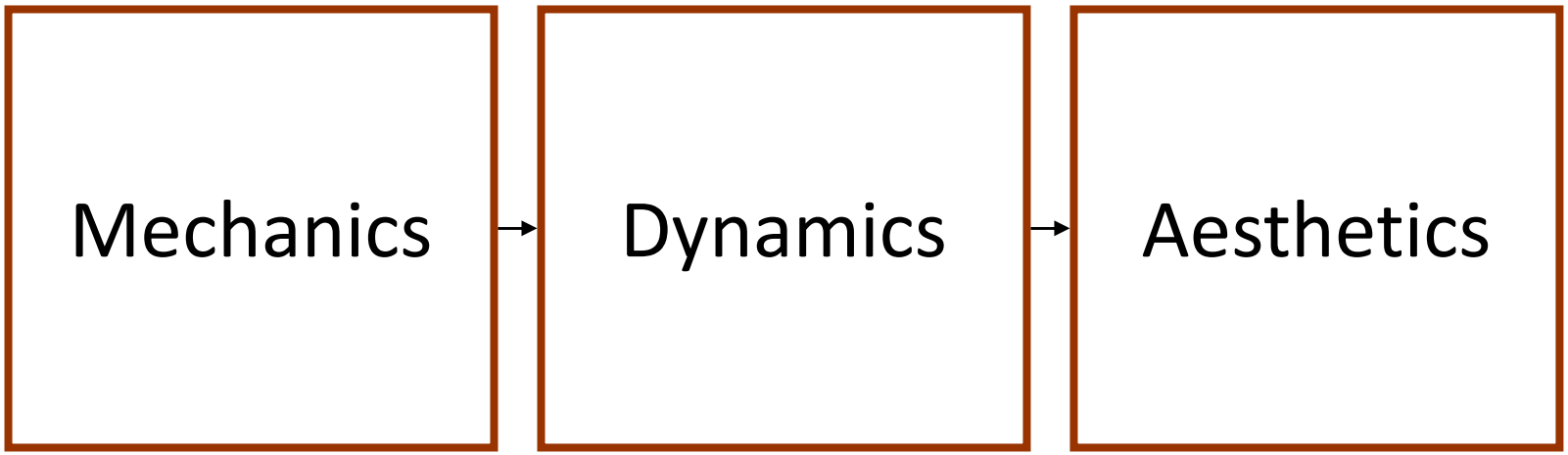
MDA Framework



Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

A Design Vocabulary

MDA Framework



Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Definitions

MDA Framework

- Mechanics: The rules and concepts that formally specify the game-as-system.
- Dynamics: The run-time behavior of the game-as-system.
- Aesthetics: The *desirable emotional responses* evoked by the game dynamics.

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

The Player's Perspective

MDA Framework

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

The Designer's Perspective

MDA Framework

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Aesthetics

- **Emotional** requirements of the Software

- Questions
  - How to get past words like **fun** and **gameplay** ?
  - What kinds of **fun** are there?
  - How to recognize a particular kind of **fun** when we see it?

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Aesthetics

Eight Kinds of Fun

1. Sensation
   Game as sense-pleasure
2. Fantasy
   Game as make-believe
3. Narrative
   Game as drama
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 pastime

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Aesthetics

Clarifying Aesthetics

- **Quake** is fun.
- **Final Fantasy** is fun.

- **Quake**: Challenge, Sensation, Fantasy
- **Final Fantasy**: Fantasy, Narrative, Expression, Discovery, Challenge

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Aesthetics

Clarifying Goals

- As designers, one can choose certain aesthetics as goals for the game design.
- As with other software, the process is driven by requirements, not features.

- However, one word is not enough to describe a goal.

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Dynamics and Mechanics

- **Dynamics:** state machine(s), feedback systems
- **Mechanics:**
  - **Shooters:** Ammunition, Spawn Points
  - **Golf:** Sand Traps, Water Hazards
- Mechanics vs. Dynamics
  - Dynamics and Mechanics are different *views* of games.
  - Dynamics *emerge* from Mechanics.

Hunicke, LeBlanc, Zubek.
MDA: A Formal Approach to Game Design and Game Research

Prototype design

Basic “how to”

Protoype Programming

- What is important
  - Agility
    - Quick rethinking of ideas and easy change
  - Velocity
    - Throw away and rebuild from scratch fast
    - Try out many ideas very fast
- What is **not** important
  - Robustness
  - Elegance and/or optimal code (important later ☺)
  - Do **not** fall in love with your idea and/or tech !

[Gingold 2006]

Rapid Protoyping

www.experimentalgameplay.com

- **Setup:** "Rapid" is a State of Mind
  - Embrace possibility of failure
  - Develop in parallel
- **Design:** Creativity and "Myth of Brainstorming"
  - Formal brainstorming = 0% success rate
  - Gather art + music to create emotional target
  - Simulate in your head: pre-prototype the prototype
- **Development:** Nobody knows how you made it, and nobody cares
  - Build the toy first
  - Fake it. Nobody cares about your great engineering
- **General Gameplay:** Juicy Fun
  - Complexity does not equal fun
  - Create a sense of ownership for the player
  - Build toward a well defined goal

Rapid Protoyping

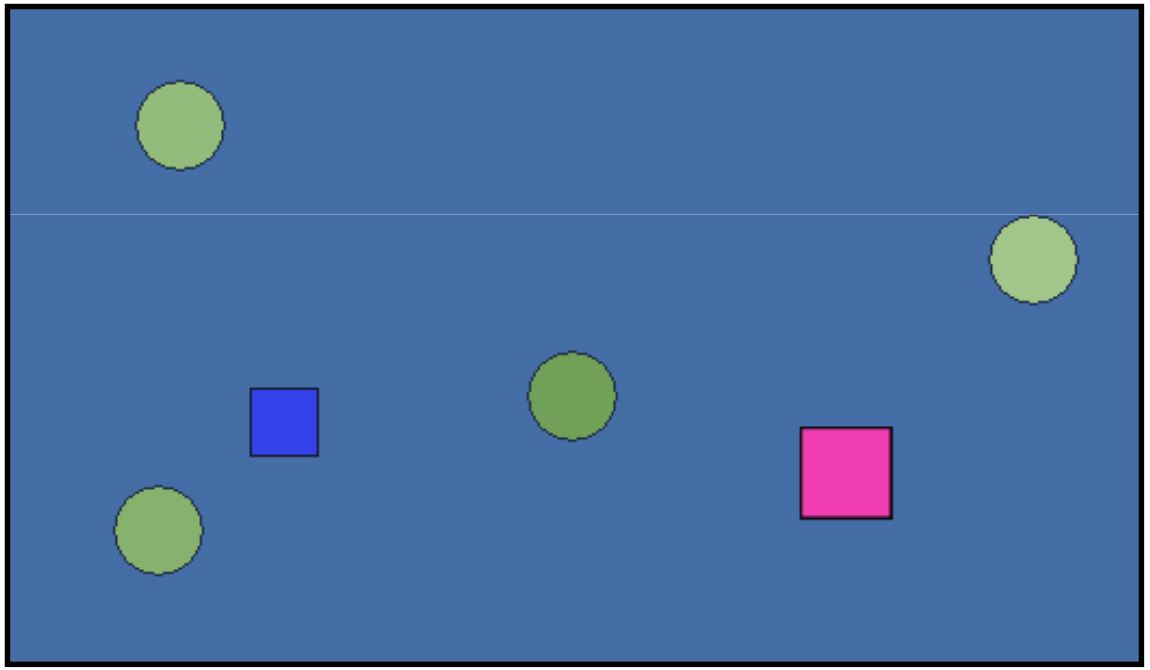
Failure is not the end of the world

- Shigeru Miyamoto:
  - ... and Miyamoto himself would say that he did not want any documents. He would just say, "Find the fun, and I'll be back in three months to take a look at what you have."
- The „Lessons“
  - Give yourself a short period of time to 'find the fun' in a design
  - If the fun isn't there, move on
  - If you do fail, it isn't the end of the world

[Lost Garden 2007]

Examples (1)

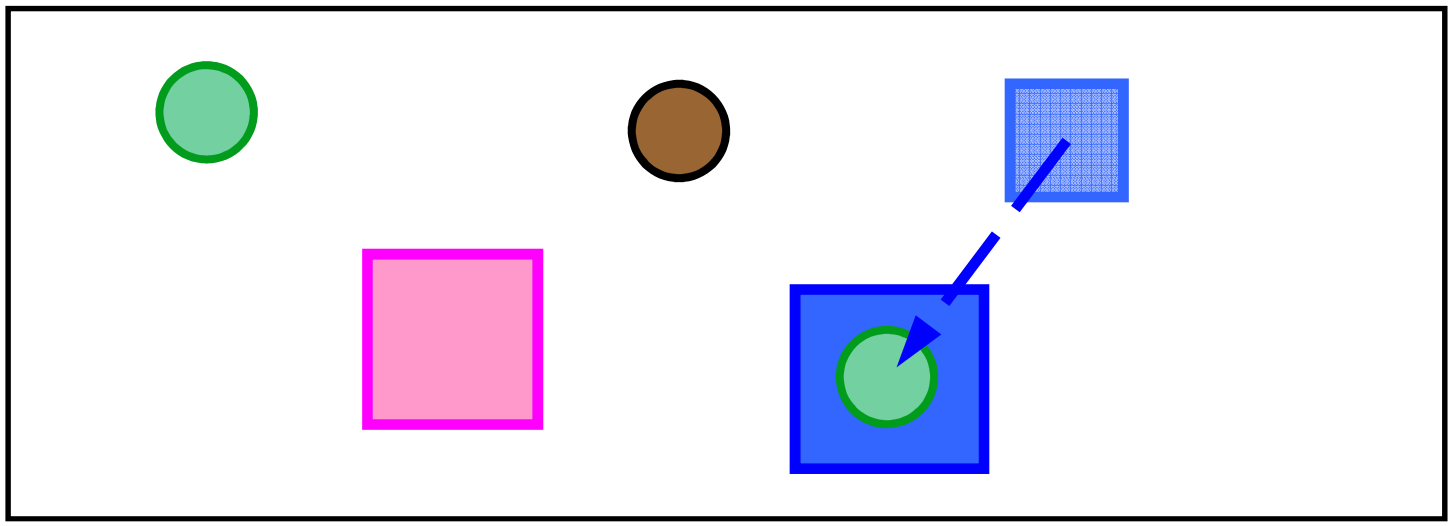
- The Marriage



http://www.rodvik.com/rodgames/

Gameplay Mechanics (1)

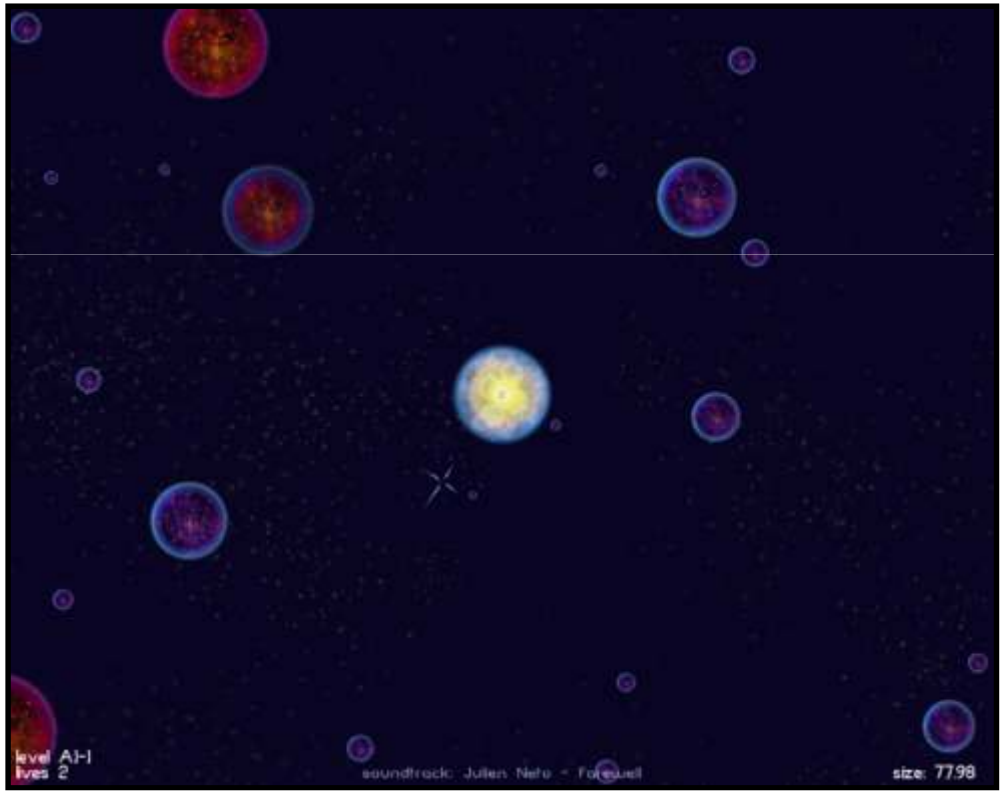
- **Situation:**
  - Need to keep both partners  happy



  - Takes some learning and „interpretation“
  - Interaction is minimal, but very interesting
  - „Winning“ is not as simple as it looks

Examples (2)

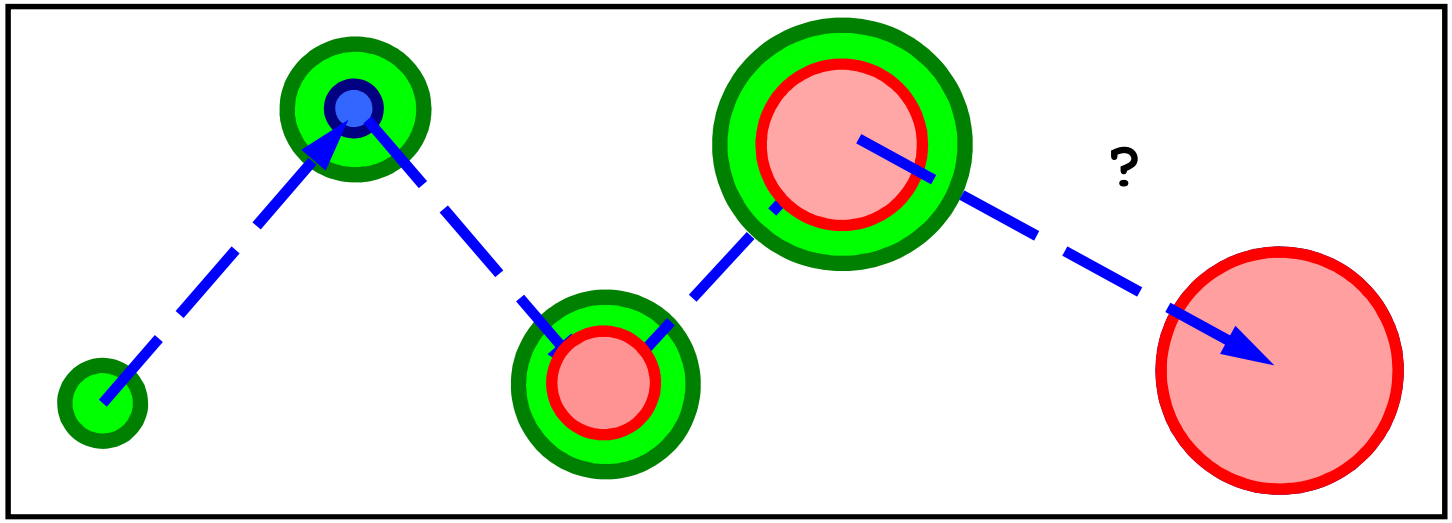
- Osmos



http://www.hemispheregames.com

Gameplay Mechanics (2)

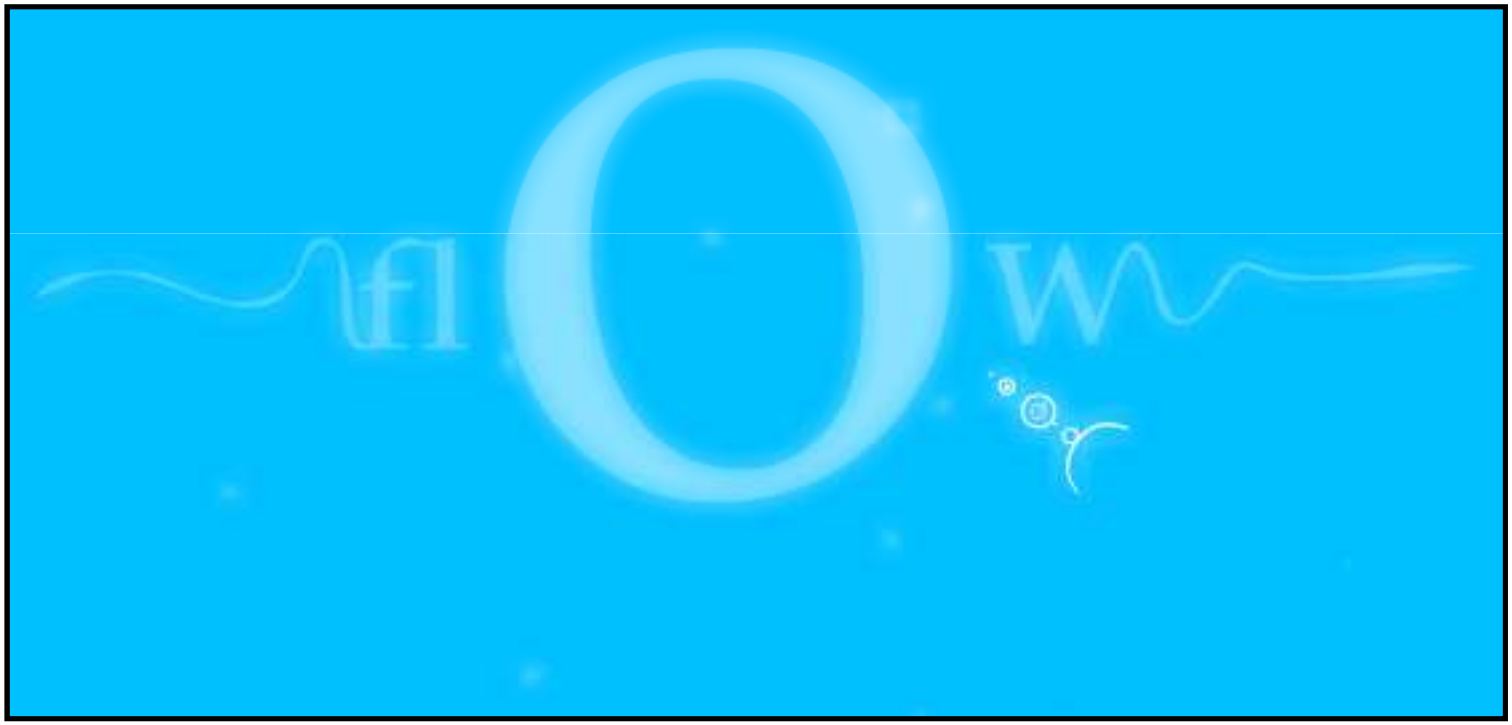
- **Situation:**
  - Need to eat all , and travel by preservation of linear momentum



  - Introduces trade-off (speed/direction vs. size)
  - Ambient sound and visuals
  - Small change in design = large difference in gameplay
  - Compared to ?

Examples (3)

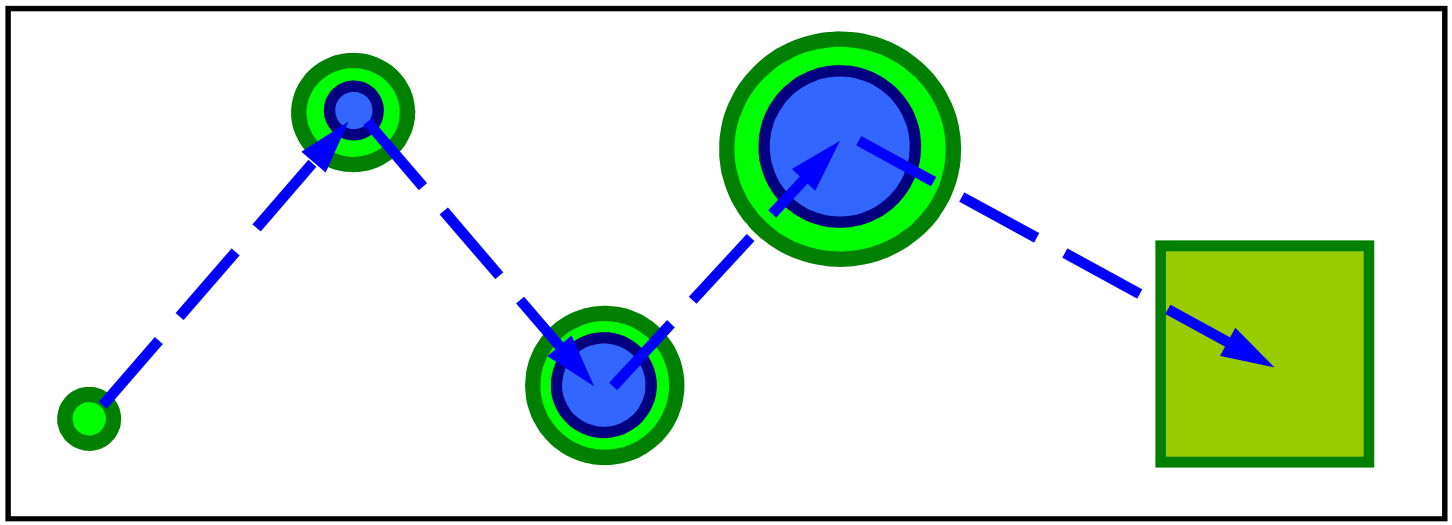
- flOw



© Jenova Chen

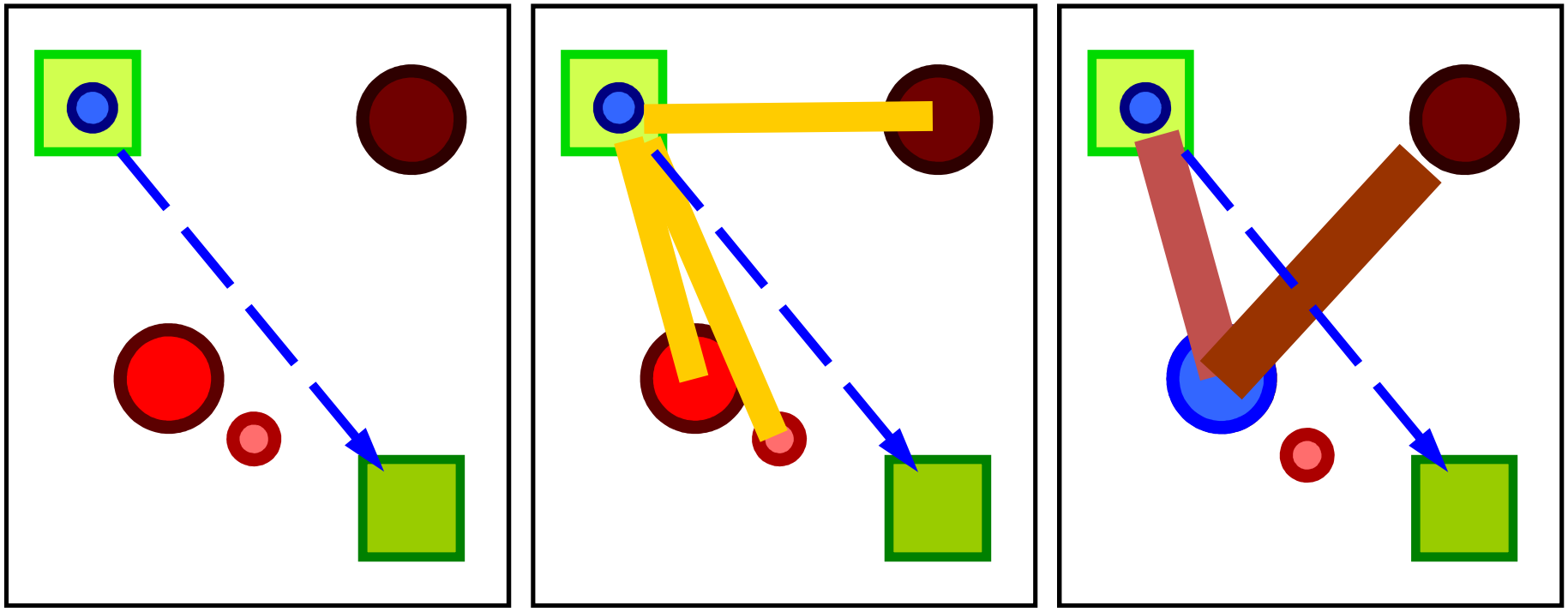
Gameplay Mechanics (3)

- **Situation:**
  - Need to eat  and progress to  in order to evolve



Start with Abstraction (1)

- **Situation:**
  - Need to get from  to  , while avoiding enemies 



Problem (Trivial) Solution Other Solution

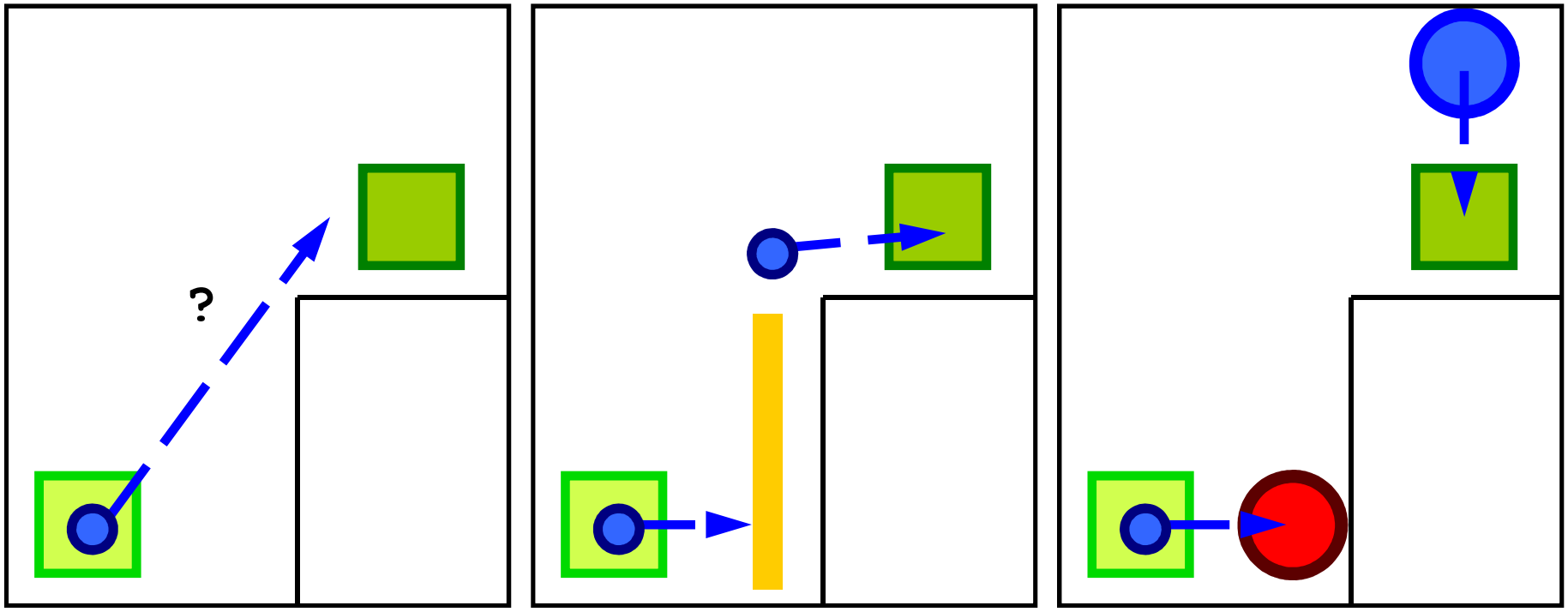
Implementation Example (1)

- This principle is implemented in some games
  - Example: **Bioshock** (August 2007)

© Irrational Games

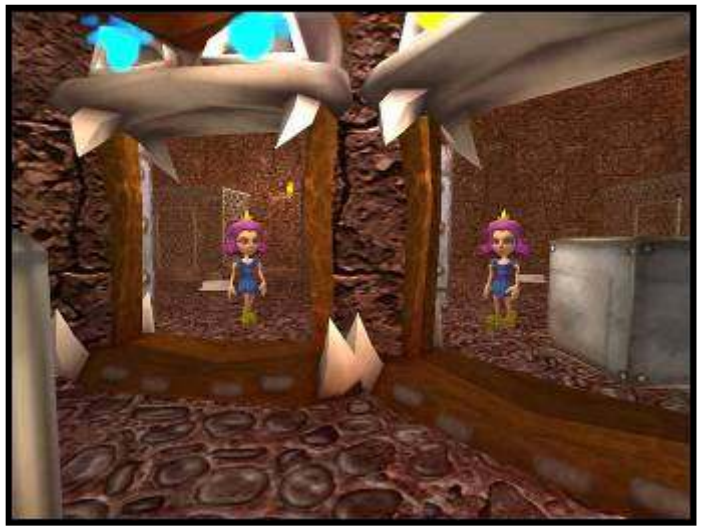
Start with Abstraction (2)

- **Situation:**
  - Need to get from  to  , in possession of 2 „doors“ 



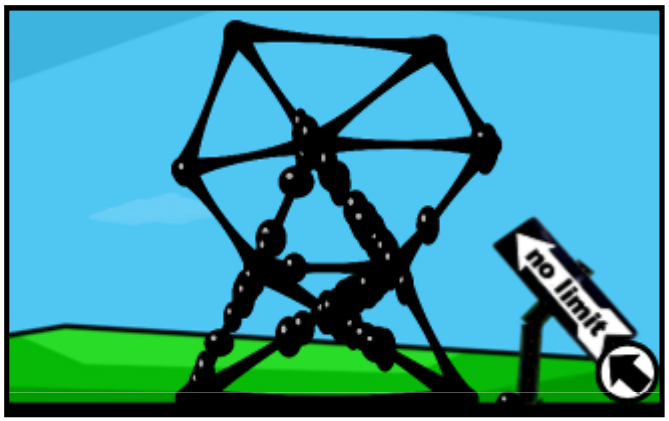
Implementation Example (2)

- This principle is implemented in Narbacular Drop, also known as Portal



Prototype vs. Final Game

- Prototype:
  Tower of Goo
  (Demo)



`http://www.gamasutra.com/features/20051026/gabler_01.shtml`

- Final:
  World of Goo
  (Video/Demo)

`http://www.2dboy.com`

Abstraction vs. Actual Game

- Is an abstraction less playable and/or fun ?

DEMO

- Discuss:
  - Why is this still ok ? Is this still ok ?
    - Familiar music, character, and/or setting ?
    - Game balance is independent of rendering ?
    - Player control is more important than visuals ?

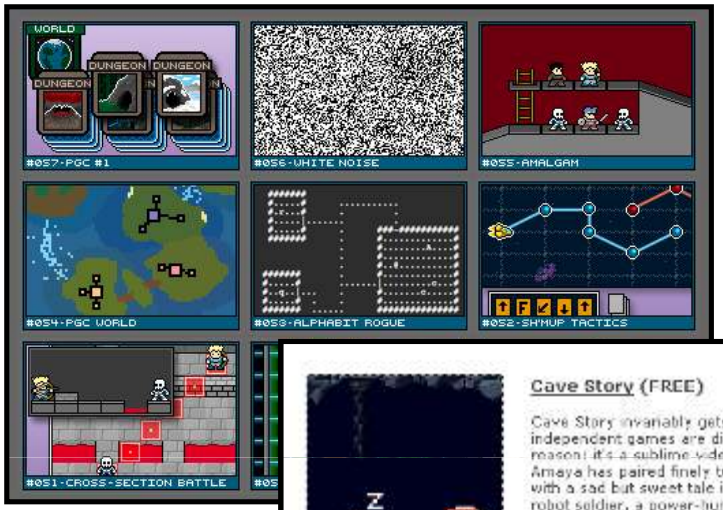
Ideas are Everywhere

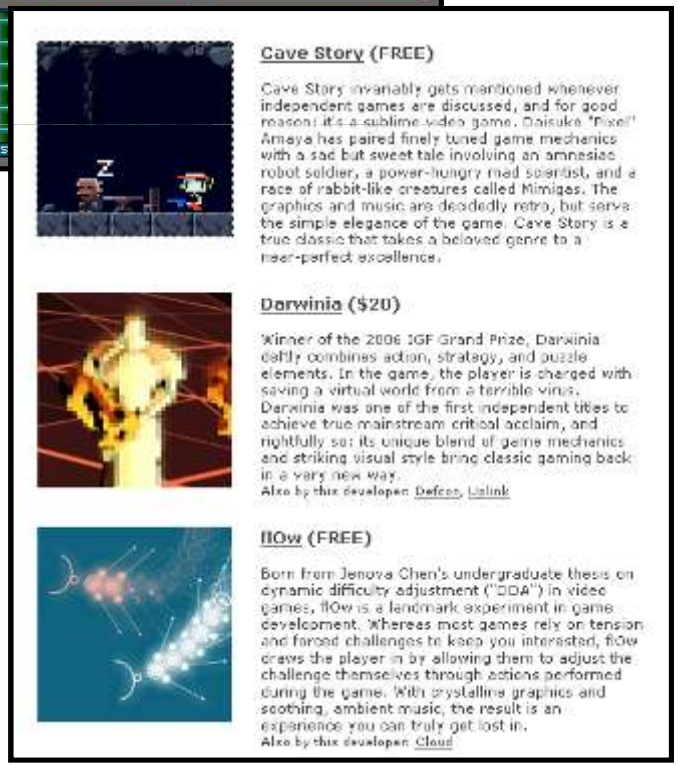
- „Three Hundred“ Mechanics
  http://www.squidi.net/three/

- 400 Rules list
  http://www.theinspiracy.com/Current%20Rules%20Master%20List.htm

- Indie Game List(s)
  http://www.indiegames.com/play.htm

  http://www.gametunnel.com/articles.php?id=620





Further Reading

- Rules of Play
  - Unit 1: Core Concepts (but the ideas are interspersed throughout the book)
- The Chemistry Of Game Design
  `http://www.gamasutra.com/view/feature/1524/the_chemistry_of_game_design.php?print=1`
- Flow in Games
  `http://jenovachen.com/flowingames/thesis.htm`
- Library of Game Mechanics (page 385)
  `http://acta.uta.fi/english/teos.phtml?11046`
- MDA Framework
  `http://www.cs.northwestern.edu/~hunicke/pubs/MDA.pdf`
- Formal Abstract Design Tools
  `http://www.gamasutra.com/view/feature/3357/formal_abstract_design_tools.php?print=1`