

Introduction to Game Design

Introduction to Game Design

- Game fundamentals
- Design principle
- Design rule

Computer Game Fundamentals

What's computer game

- A Computer Game is a Software Program
- is a type of [video game](#) played on a [personal computer](#)
- Is kind of leisure or entertainment form in virtual world
- Play in new world according to some rules

What is game

- Adams: Fundamentals of Game Design (pdf,book)
A game is a form of interactive entertainment where players must overcome challenges, by taking actions that are governed by rules, in order to meet a victory condition.
- Salen& Zimmerman:
A game is a system in which players engage in artificial conflict, defined by rules, that results in a quantifiable outcome

Basic elements in game

- **Story, at least process, activity**
- **Rules**
- **Goal**
- **Interaction**
- **Competition**

Crawford opinion

- Representation
 - Create a virtual environment to express designer the idea
- Interaction
 - Get involved in game and control sth
- Conflict
 - Challenge, enemy or opponents
- Experience
 - Experience safety and risk psychology

Game master say

“When a designer is asked how his game is going to make a difference I hope he ... talks about gameplay, fun and creativity – as opposed to an answer that simply focuses on how good it looks”

gameplay: playability (可玩性)

the quality or state of being playable

challenge and action

What a Game is Not

- A bunch of cool features
 - Necessary, but not sufficient
 - May even detract, if not careful, by concentrating on features not game
- A lot of fancy graphics
 - Games need graphics just as hit movie needs special effect ... but neither will save weak idea
 - Again, may detract
 - Game must work without fancy graphics
 - Suggestion: **should be fun with simple objects**

- A series of puzzles
 - All games have them
 - But not gameplay in themselves
 - Puzzles are specific, game systems spawn more generic problems
- An intriguing story
 - Good story encourages immersion
 - But will mean nothing without **gameplay** (可玩性)

What is fun

- Dictionary, enjoyment, a source of amusement
- Important to consider underlying reason
- Pleasure
 - think about fun in term of measurable cause and effect

Finding the fun factor?

- Adams & Rollings

- Gameplay comes first
 - give people fun things to do
- Get a feature right or leave it out
- Design around the player
- Know your target audience
- Abstract or automate parts that aren't fun
- Be true to your vision
- Strive for harmony, elegance, and beauty

Type of game

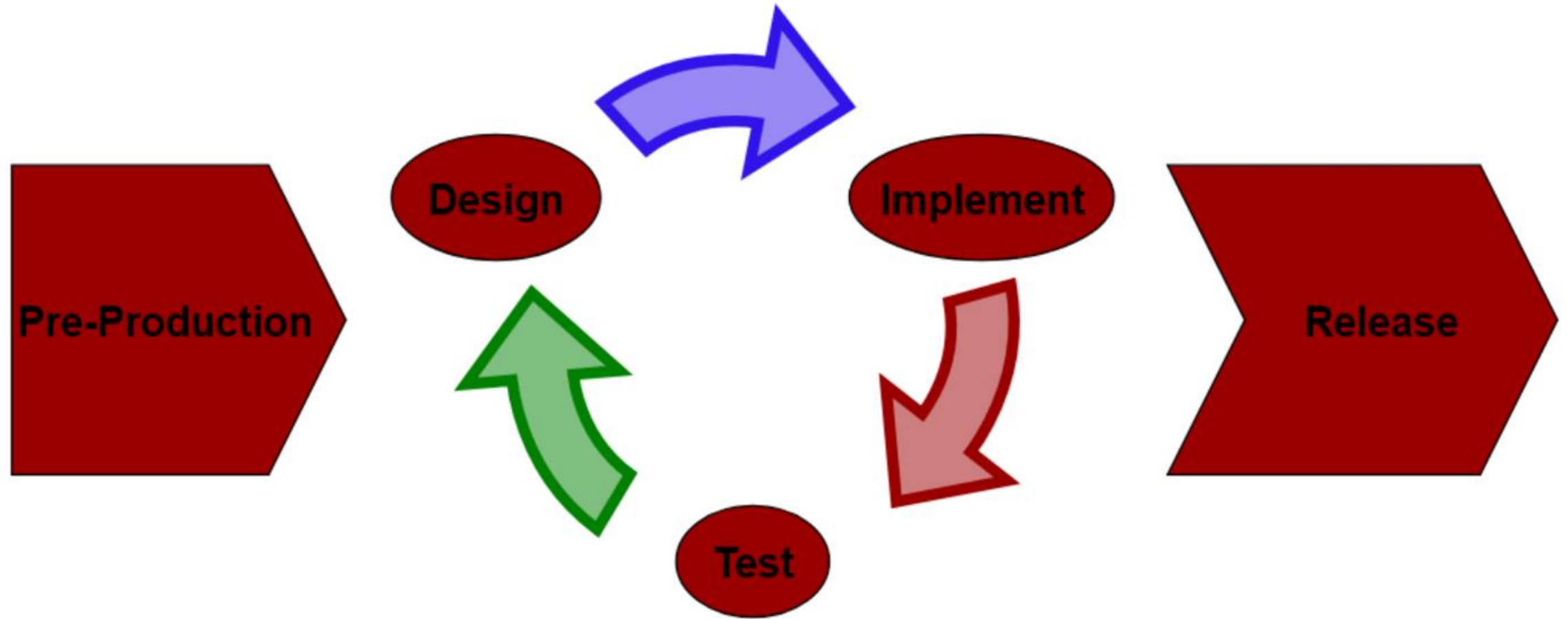
- Action: ACT (Super marie)
 - Fight for Sth
- Adventure, AVG(Tomb Raides, 古墓丽影)
 - Solving puzzles or problems
- Role playing game: RPG(The legend of sword and fairy, 仙剑奇侠传)
 - Improve abilities, stress on complete storyline
- Sports game: SPG(Racing car)
- Strategy simulation game, SLG
 - Gain territory
 - Play god, or build virtual city or world
 - Play chess
 - Need more strategies and think hard
-



What's the steps for game development

- Design (it's your stage now)
 - Story: theme, character, background, goal, rule
 - Art, drawing, picture, actor, scenery, animation
 - Music, sound effect
 - Game level
 - Report
- Implement
 - Technology, software function design, software engine design
- Test
- Release

Development Process Review



Where to start design

Overview of design

- Come up with a good idea
 - may start with a simple concept, such as “running, climbing, jumping”
- Create a storyboard
 - Rough sketch, game world, character, and action
- List all details and take all into account further, refine it
- Write a design document

How to get a good idea

- Go to an idea extreme along one dimension of a game
 - Deep thinking and research in some points
- Mix idea from several games
 - Integrated creativity
- Use idea from books, films, comics, etc.
- Take a good idea and make it better
 - Improve sth, improve graphics, AI, etc.

Brainstorming

- Make sure everyone participate in meeting and get involved
- Ensure a free interchange of idea
- Make goal clear
- Stay focus-don't allow distraction
- Make sure everyone is heard
- Take notes

Design focus

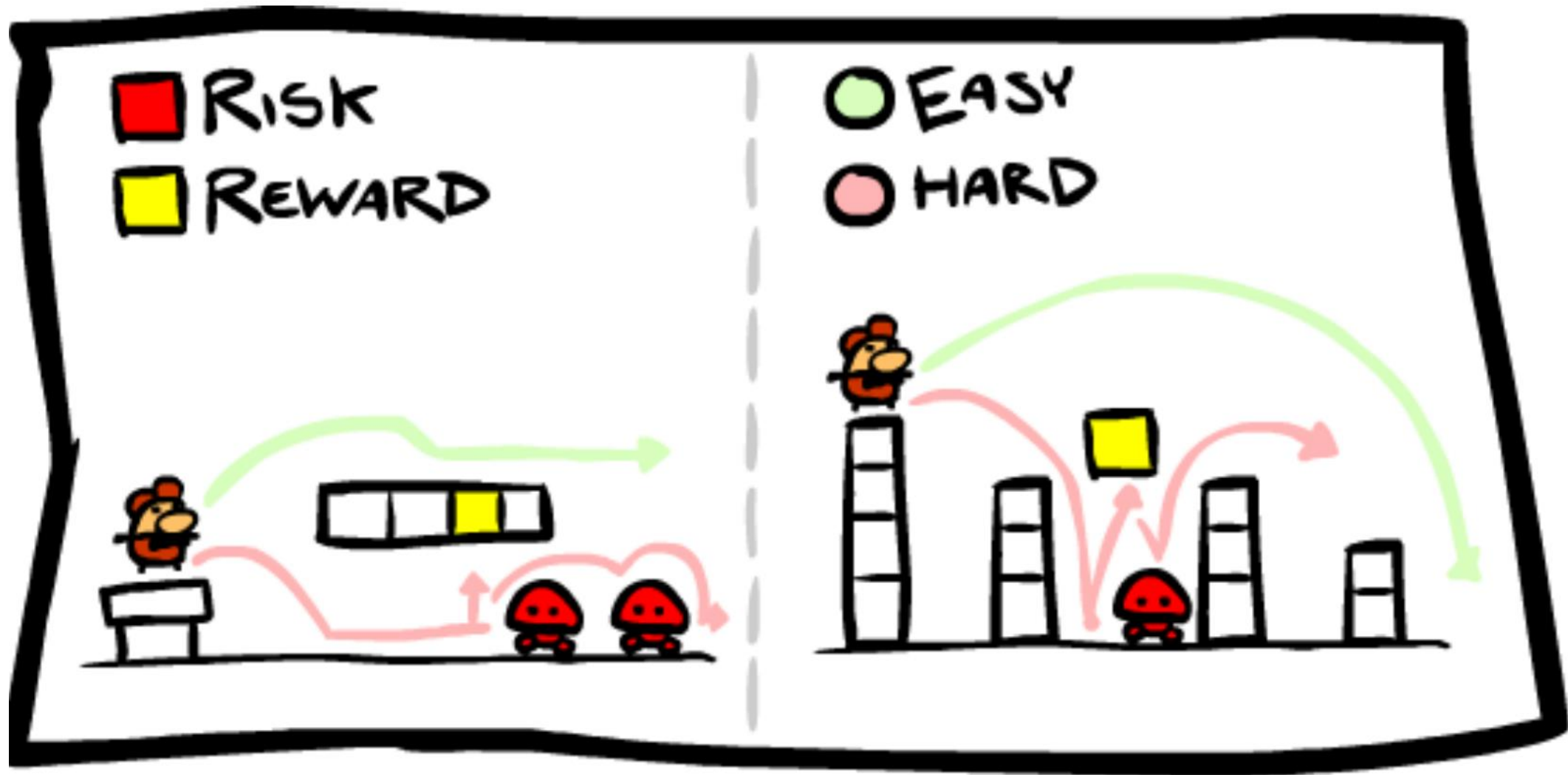
- Gameplay: what make game compelling
- Goals: what does the player trying to accomplish
- Rules: how can the player can achieve the goal?
- Challenge: what obstacles block the goal?
- What sort of emotion does the game try to evoke in the player
- What should the player can take away from the game

Create a storyboard

Lifted: Player Mode Sketch



Diagramming Action





Time
00:07:88



**Earth-snails make
a delightful meal!**

**Main
Menu**

**Level
Select**

**Restart
Level**

Level 7

Implement

- Represent and animate the physical objects
- Provide world dynamic
 - Physics
 - Artificial intelligence
- Support the user interaction
 - Graphics
 - Sound
 - Input device
 - Network

Model represent things

- Metal/cognitive

- Concepts
- Belief
- Map

Mathematical

- equation
- formulas
- algorithm

Tools

- Sound digitizer
- Music editor
- Graphics tools: photoshop
- Video digitizer
- Graphics library
- Game engine

New technology in game

- 3D tech
 - Motion capture, sense of reality
- Virtual reality
 - Improve the interaction device, sense of immersion
- Good AI
 - Allow game to react to users dynamically
 - Builds really good opponents

Game Design Principles

What Are We Trying to Do?

- Help you think about and design your game
- Help you complete your Design Report
- Look at some **Game Principles**
 - you may want to build into your game
- ..and **Game Rules**
 - that shape how the game is played and may determine whether any of your principles get realized

Game Design Principles

- Usually, there are no right or wrong answers as to what are good design principles
- It depends on the game itself (different genres), and the intended audience (who do you anticipate playing this game?)
- It also depends on the resources you have (e.g. number of people developing the game, amount of time available, hardware, software, budget available) – principles cost money..
- Difference between Primary and Secondary Principles?

So What Principles Make A Good game?

1. Pursuing and achieving goals (challenges)
2. Interactivity
3. Feedback about position relative to goals
4. Interesting choices required to achieve goals
5. Consistency and fairness
6. Avoid repetition

But the central principle is FUN – of some kind..

What is involved in making games fun?

Adams & Rollings, Fundamentals of Games design

- 50% Avoiding errors--bad programming, bad music and sound, bad art, bad user-interfaces, bad game design. "Basic competence will get you up to average."
- 35% Tuning and polishing--attention to detail
- 10% Imaginative variations--level design
- 4% True design innovation--the game's original idea and subsequent creative decisions
- 1% An unpredictable, unanalyzable, unnamable quality--"luck, magic, or stardust"

Making games fun

Adams & Rollings

- 50% Avoiding errors
- 35% Tuning and polishing
- 10% Imaginative variations
- 4% True design innovation
- 1% Luck, magic, or stardust

Implications:

- A well-tuned game with no major problems and interesting levels but no new ideas could be 95% fun.
- A novel game idea that is (very) poorly executed could be only 4% fun.

1. Pursuing and Achieving Goals

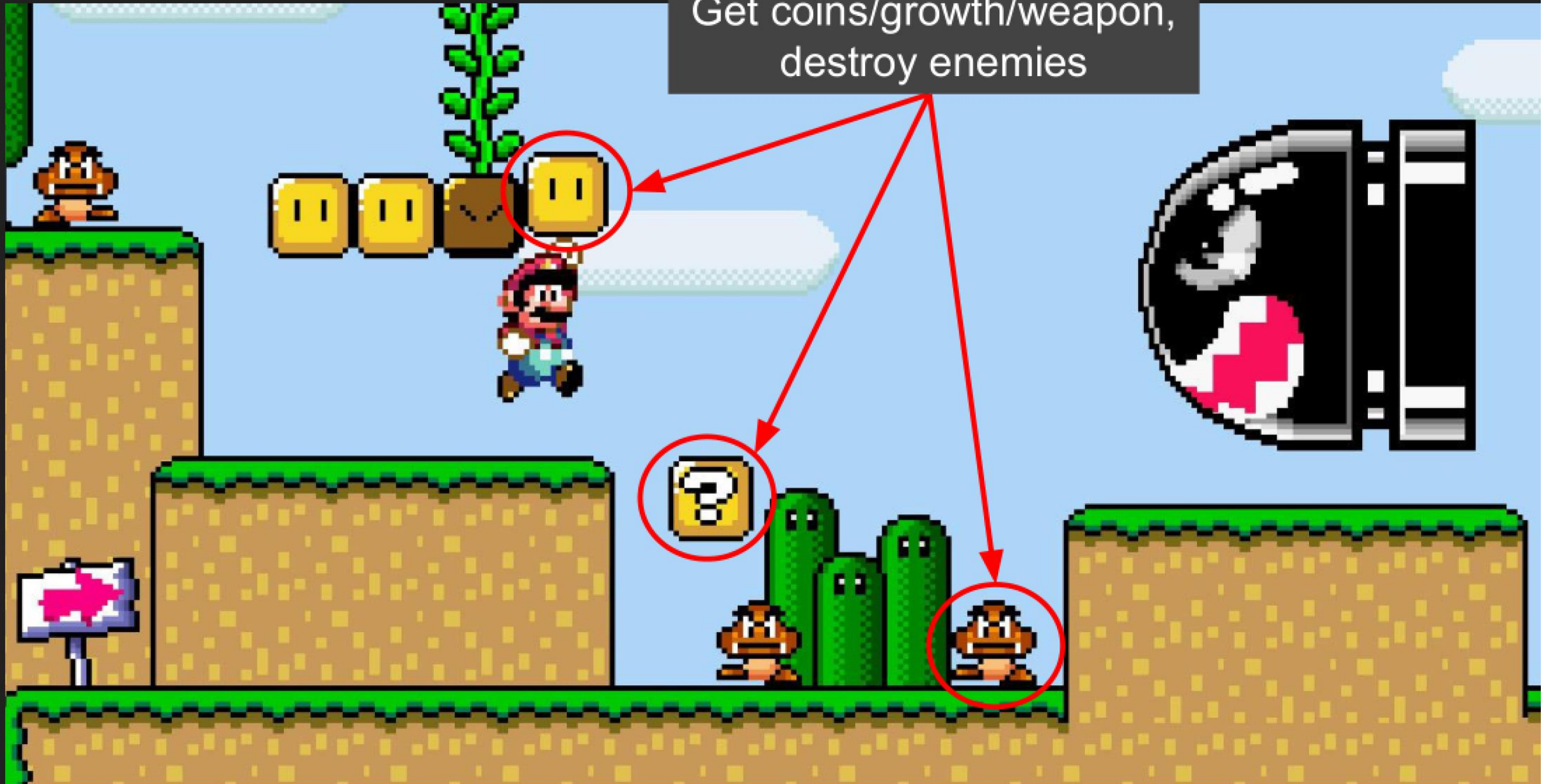
- Always something to achieve
- Always achieving something
- Not too easy or too hard
- Often at least three levels of goals with rewards
 - Long--term goal [complete game]
 - “I can conquer the world.”
 - Medium--term goal [10--30 minutes]
 - “I can take over a city.”
 - Short--term goal [seconds to minute]
 - “I can win a battle.”

1. Pursuing and Achieving Goals



Always something to achieve...

Get coins/growth/weapon,
destroy enemies



1. Pursuing and Achieving Goals contd.

Not too easy, not too hard...



- Push up the brick, there is mushroom, coin, eat it and get big
- Eat a coin, one more life is given
- If eat two mushroom can attack directly
- Also step on turtle to attack

1. Pursuing and Achieving Goals contd.

At least **three levels of goals with rewards...**

Short-term goal (up to 1min)
Wild mushroom for extra life



Mid-term goal (~10-30 min)
New level, new characters



Long-term goal
Save the princess



1. Pursuing and Achieving Goals contd.

Goals in different genres...

Sport - score



Racing - getting first



Simulation - play god, or
build virtual city/world



Strategy: gain territory

Role-playing: improve abilities

Adventure: solve puzzles or problems

2. Game Interactivity

- Player is not just a passive observer (which can be fun, but is different kind of entertainment)
 - Always ask: What is the player going to do?
- Player's decisions determine success/outcome
 - At least the player thinks their actions do
 - Avoid allowing for decisions that aren't related to success of some goal
- User interface should not get in the way of interactivity
 - Simple, consistent

2. Game Interactivity

Always ask: What is the player going to do?

Brush cows

Water plants



2. Game Interactivity contd.

Player's decisions determine success/outcome

Cow happy -> better
milk -> more money

Soil wet -> faster
growth



1. player continuously provides some input

2. ...which visually or not changes game state



3. ...and then sees view of world with updated game state

...story and characters are important too!

3. Feedback

- Feedback at all levels so players
 - Know where they are
 - Know where they are relative to other players
 - Map; High score list
 - Know where they are relative to goal
 - Dead and don't even know it
 - Know what they need to achieve
 - Know what is important in the world
 - Can use knowledge to make choices
- Game should not be about
 - how to get information out of the interface
 - how to randomly explore the world (unless that is “fun”)
 - how to recall what just happened

3. Feedback

Feedback at all levels so players...



know where they are

3. Feedback

Feedback at all levels so players...



know where they are

know where they are
relative to other players

4. Gameplay Variety

- Must develop & execute different strategies/tactics to achieve goals
 - Applies across all levels of goals
- Interesting decisions to achieve goals
 - Avoid tedious goals/decisions: micromanagement
 - Let computer do those
 - Ask – if you take out the tedious activity, what decisions are left?
- New decisions enabled as game progresses
 - Few, simple decisions at first, and then more and more
 - Decisions have impact on how game turns out

5 Gameplay consistency and fairness

- Consistency of action and outcomes
 - A reason to each failure or success
 - Good player can anticipate and make plan
 - Don't solve the problem by unlikely action
- Fairness
 - Player believe they have a fair chance
 - Don't allow to be won by single simple approach
 - Plot can be twist, but must be explainable.

5. Gameplay Consistency and Fairness

- There is consistency in the actions and associated outcomes for trying to achieve goals
 - Must be a reason for failure (or success)
 - Not arbitrary: Players know what to expect and can plan
 - A pinball game uses “pinball” physics all the time
 - Not solve problems by unique, unlikely actions
 - Don’t break suspension of disbelief (no “dead man” walking)
- Fairness
 - Player thinks they have a fair chance – game balance
- Can still be plot twists, but must be explainable

6. Avoid Repetition

- Allow user to skip parts already seen
 - Skip “cut scenes” (or allow option to skip)
 - Save feature
- User must not do same thing over and over again
- User must not wait too long for action to be completed

Game Design Sins

- We just looked at some “good” design principles
- Now we look at some “bad” design examples
(coming from these good principles)

Gameplay and game design sin

- Poor production
 - Bad writing, long time loading....
- Linear plot
 - Player action don't affect how the plot progresses
- Micro management
 - Player is forced to do meaningless task
- Repetition
 - Player must do the same action over and over again
- Doesn't track user learning curve
 - Should stay easy and get harder as game progresses

Gameplay/Game Design Sins

- Poor game balance/consistency
 - Same strategy always works
 - Trial and error is not fun gameplay
- Not enough variety
 - Same graphics, objects, monsters, level design, sounds...
- Awkward user interface
 - Must do lots of mousing to do simple task

- Limited feedback
 - Player is confused about goals
 - Player is confused about current progress to goals: no map
- Inconsistency in story
 - There are not compelling and consistent goals for the player

What make games boring

- Repetition
- Micro management
- Technical issue
- Too easy and too hard
- Copy cat stuff
- Poor ending
- Weak storyline

Costikyan Principles

- **Decisions** - "The thing that makes a game a game is the need to make decisions."
- **Goals** - "If you have no goal, your decisions are meaningless."
- **Opposition** - "A game without struggle is a game that's dead."
- **Managing Resources** - "If the game has more than one 'resource,' decisions suddenly become more complex."
- **Game Tokens** - "To give a player a sense that he controls his destiny, that he is playing a game, you need game tokens."
- **Information** - "The interface must provide the player with relevant information. And he must have enough information to be able to make a sensible decision."

Sid Meier opinion

- Player should have fun, not designer, programmer, or computer
- Great game-play is a stream of interesting decisions that the player must resolve
- The inverted pyramid of decision making
 - have few decisions to deal with first, and then let them multiply, the player is totally engrossed
- Put the player in his dreams, where he or she is the hero

Some Different Design Principles

- Start with a simple concept
 - “running, climbing, jumping”
- Design around the computer’s limitations
- Minimize the player’s confusion
 - What to do should be clear without consulting a manual
- The importance of play testing
- Incorporate a smooth learning curve
- Accommodate all skill levels

Friday group activity

Continue to design