

Small Steps in the Dark:

Embracing the Continuous Prototyping Mindset

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PART I

PROTOTYPING: A WORD WITH 1000 MEANINGS

That One Room...



The Room Full of Crazy

← → ↻ tvtropes.org/pmwiki/pmwiki.php/Main/RoomFullOfCrazy

Room Full of Crazy

*"I hate the serial killer wall of death."
— Seeley Booth, *Bones**

One of the standard symptoms of insanity as it is portrayed in television and film media is paranoia accompanied by graphomania, usually expressed by writing on walls, tables, body parts, etc. It can be the same phrase written dozens of times, or an elaborate theory detailing a supposed conspiracy. Confessions, mathematical equations, rants, and screeds are also popular. These can be supplemented with pictures, newspaper articles, official documents, etc. Usually, a character will find some room in their environment upon which to fully express the terms of their obsession. And don't expect these characters to be deterred by the fact that they *Couldn't Find A Pen*; they'll write with their own blood if they have to.

Characters who display this kind of behavior are not always dangerous or even fully insane, but they are always obsessed.

A detective/doctor/family member can stumble across rooms full of these kinds of paranoid obsessive ramblings and realize that they are *Alone with the Psycho*. It's not unusual for this moment of discovery to be quickly followed by an attempt on the discoverer's life by the owner of the room. These rooms can be also be susceptible to cases of *vanishings* as well. (Curse you, Pine Sol!)

It should be noted that a character doesn't have to cover the walls with writing to make this an effective trope. A neatly typed room of crisp white paper reading "All work and no play makes Jack a dull boy" will work just as well.

If the *Room Full of Crazy* is specific enough, for example, only part of a wall is covered with photos of the same subject, it may be a *Stalker Shrine*. A *Shrine To Self* may likewise double as a *Room Full Of Crazy* for *Omnipidal Maniacs* and the like. If the room is used for plotting a conspiracy theory, it's a *String Theory*. The *Black*



Curse you, Exposition Fairy!

No Shared Design Language

- Game designers lack a [shared lexicon](#)
- Makes it difficult to talk about design with each other
- Everyone has a different dialect

Words Are Ideas

- Words control our thoughts (see 1984)
- The meanings we give words can change how we approach design
- Let's define 'prototype'...

Engineer's Definition

“One of the first units manufactured of a product, which is tested so that the design can be changed if necessary before the product is manufactured commercially.”



Wikipedia's Definition

“An early sample or model built to **test** a concept or process or to act as a thing to be replicated or **learned** from.”

“Prototype”: Common Usage

- First stage of developing a game
- Preliminary/early version
- Hastily-made (building-is-on-fire!)
- Cheaply-made
- Incomplete
- Embarrassingly broken

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- These are side effect, not motivations!**

Motivations For Prototyping

- *Pioneering*
 - Explore a new idea
- *Provisioning*
 - Check viability before committing
- *Marketing*
 - Gauge interest/marketability

“Prototyping”: A Useful Definition

Prototype (*n*) an interactive experiment that is used to gather information

It's more than a definition;
it's a mindset.

PART II

CONVENTIONAL PROTOTYPING

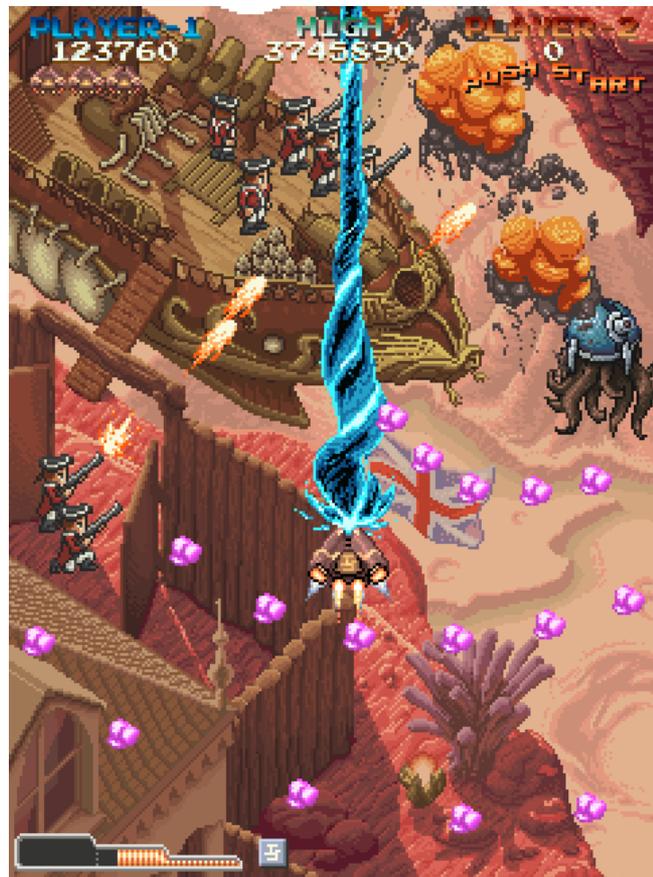
Conventional Prototyping

- The prototyping 'phase'
- 2-24 weeks at the outset
- Helps understand the game
- Generally accepted as a good practice
- Both a demo and a prototype



Developing Jamestown

- 21 month dev cycle
- 3 full-time developers
- Custom engine (5 months)
- Conventional prototype
 - Made using Flash



Purpose of Prototype

- Fill in gaps of knowledge
- Deconstruct magic tricks
 - Camera
 - Weapons
 - Pacing
- Actual code is disposable



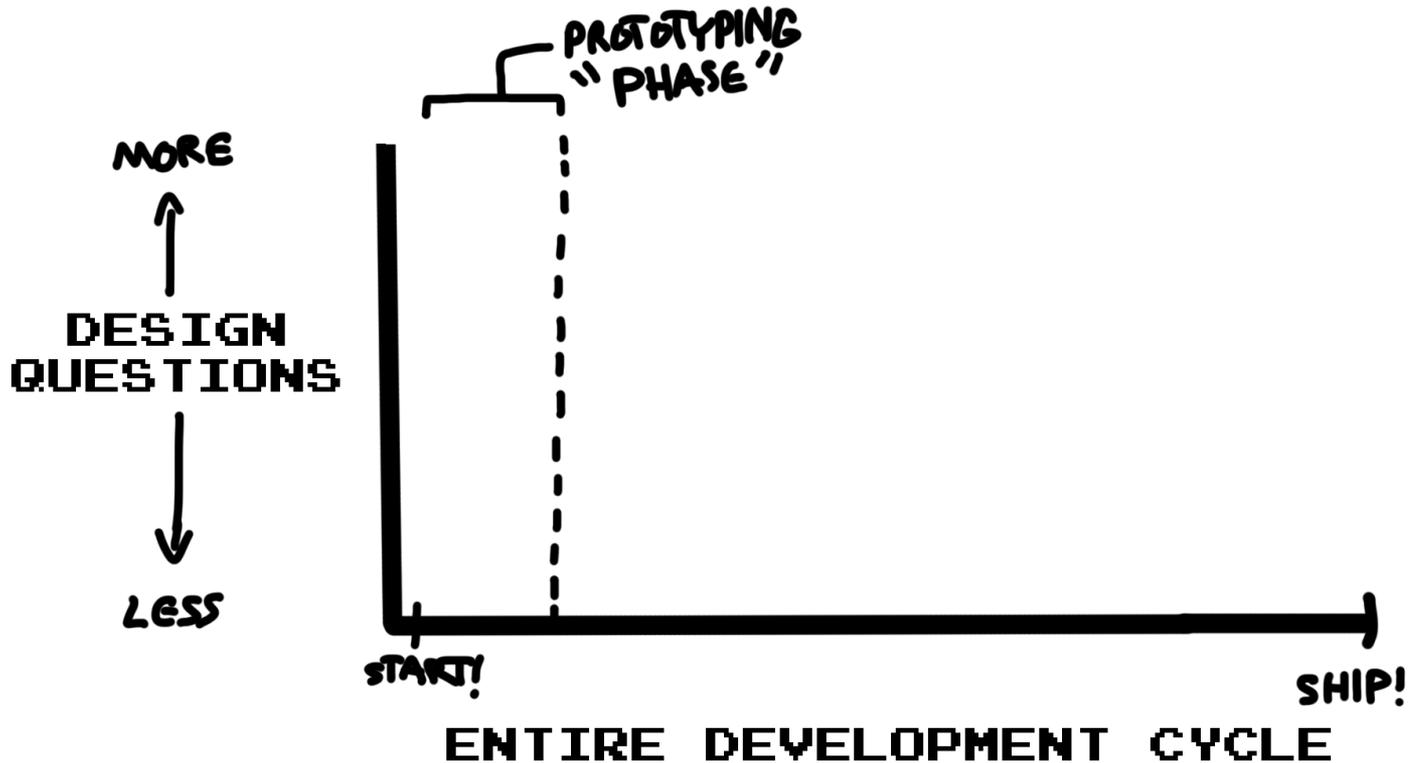
Prototype Outcomes

- Unified our vision/concept (touchstone)
- Porting to new engine took 2 weeks
- Threw old code away
- Many algorithms and designs survived
- (Aside: Didn't need to demo to a publisher)

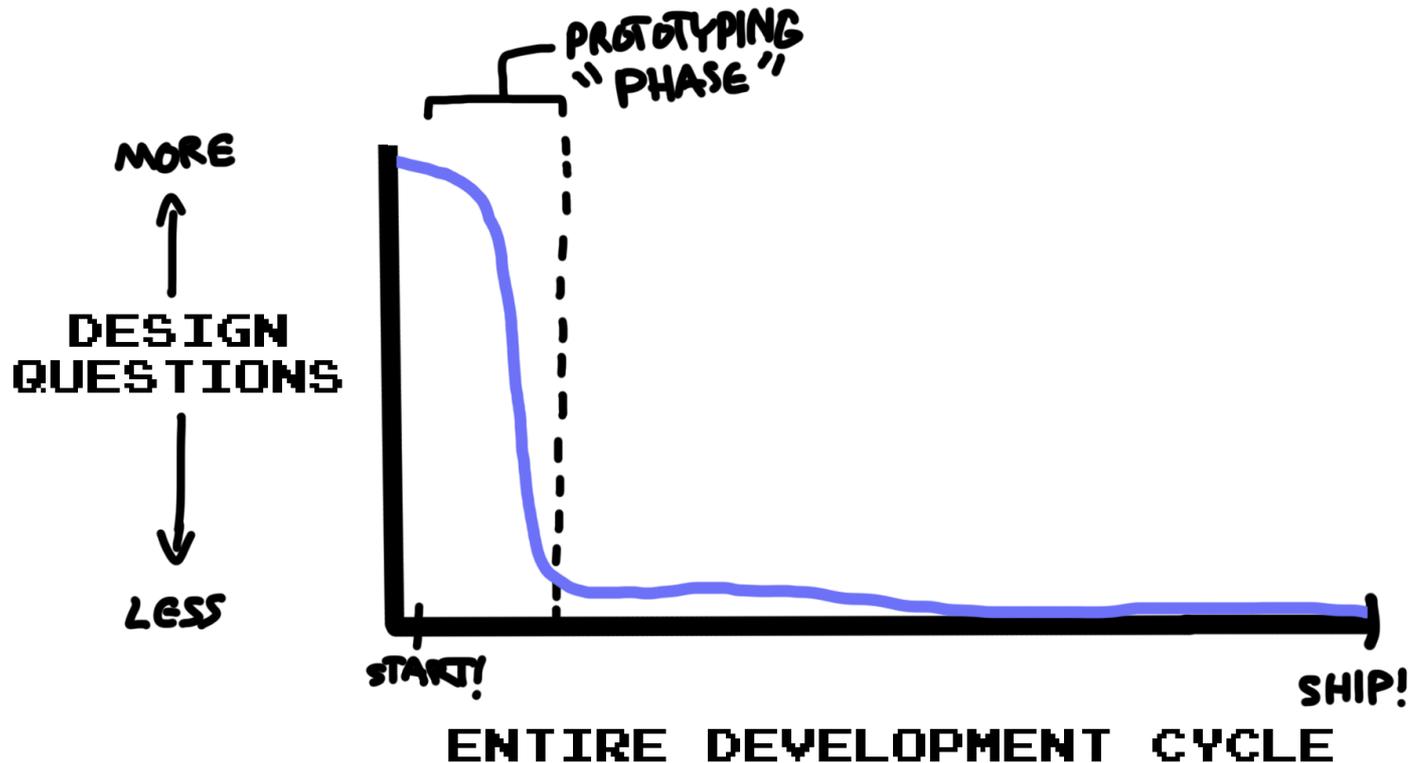
So What's the Problem?

- Prototyping phases are great, but...
- Problems keep appearing, even after 2-24 weeks
- Too many assumptions
- **When first phase ends, prototyping should not**

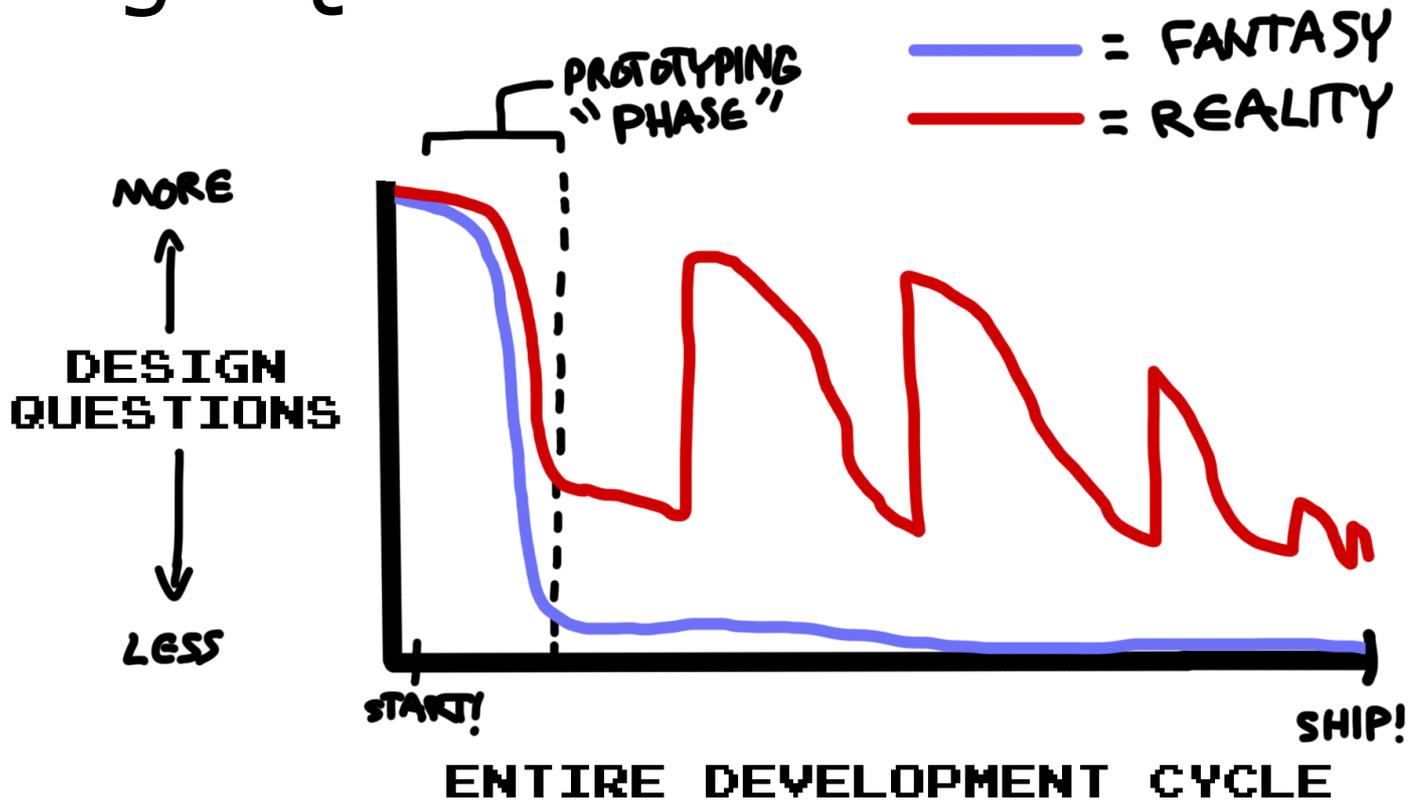
Design Questions



Design Questions



Design Questions



Level-Specific Content

- Every level brings unique challenges
- Scaling a vertical slice horizontally
- Jamestown: >1 new idea per 15 seconds
- Even with 2 levels done, faced problems
- Level-specific design is just as volatile as core mechanics

Unknown Unknowns

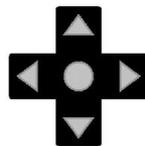
- Can't only prototype up-front
- When you innovate, new unexpected questions are presented
- Respect and expect unknown unknowns
- Prototype major features pre-committing

PART III

A NEW MINDSET: CONTINUOUS PROTOTYPING

Stance-Based Shooter

- People love interesting choices
- Let players switch mid-game
- Prior art
 - Fighting games
 - Ikaruga, Radiant Silvergun
- Safe bet?



Stance-Based Shooter

- Sounded like guaranteed fun (prior art!)
- Built a lot of design plans on top of this
- Prototype revealed misconceptions
- Fun isn't guaranteed until you feel it

Unknowable Systems

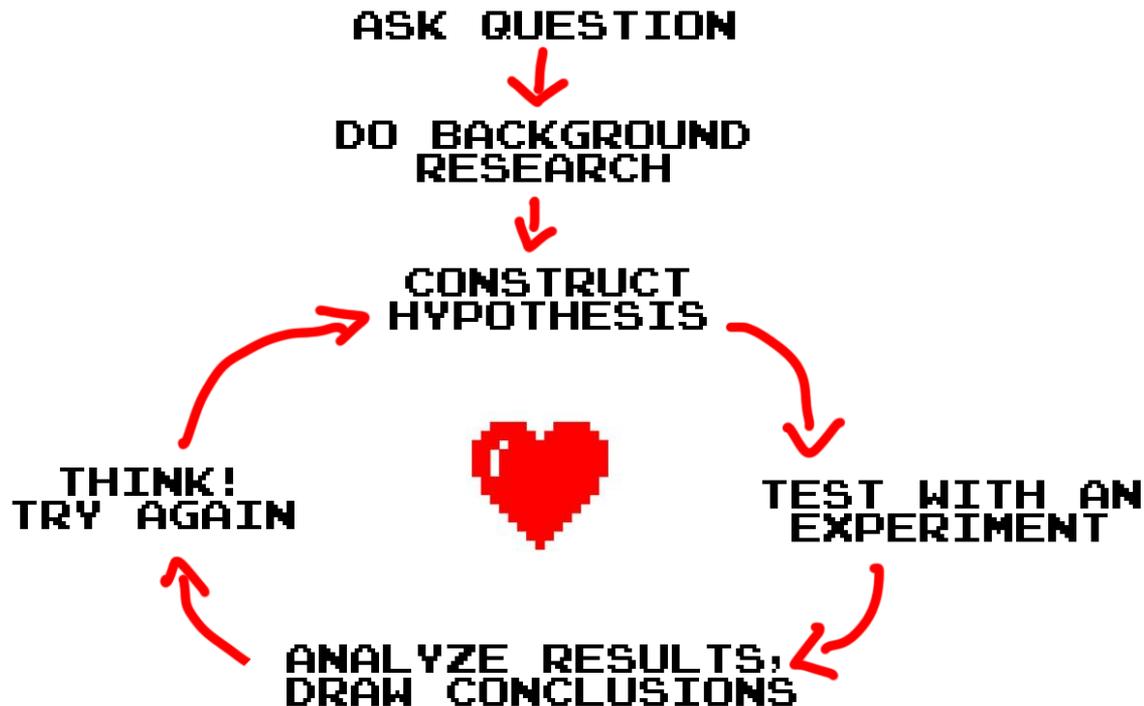
- Complex and unknowable
 - Human psychology
 - Global economics
 - Weather systems
- Approximate models refined via experimentation
- Game design or “fun” is equally complex



The Scientific Method



The Scientific Method



The Value of Information

- Good decisions rely on information
- Commit to solution, or gather more info?
 - Recoverability (slidesha.re/ajudo8)
 - More info -> less risk
- Information is the currency of design discussions
 - More specific info is more valuable

Shooting It Both Ways

Story Time (feat. Frank Miller!)

- Difficult design decisions and disagreements plague designers
- Prototyping allows you to “shoot it both ways” and remove the speculation



Prototype for Information

- Think of prototypes as “information generators”
- Means < Ends
- Gather as much info as possible...
- ...as quickly as possible



EXAMPLE: Player Speed/Damage

- There are many optimal values
 - One player moves around more than four
 - Damage needs to scale from 1-4 players
- Keybinds tweak player speed
 - Optimized for each number of players
- Tight iteration loop, low setup/overhead

Ask Questions

- Think in terms of questions
 - Will this be fun?
 - How will players behave?
 - What do players expect?
- The right question will lead to the right prototype



STORY: Prototyping Four Players

- Wanted to make a truly co-op shooter
- A question we didn't have info to answer:
 - "Will the gameplay scale to 4 players?"
- Wrote "Party Mode" on the plane to GDC
- Did a series of iterations on the prototype
 - Crowded
 - Too Easy

Doubling Width



320 X 320



640 (512 VISIBLE) X 320

Cost-Benefit Outcomes

- **Costs:** Shoved 4 players into the game, doubled the screen size, divided DPS by player count
- **Benefits:** Gained confidence that 4-player is fun, worth pursuing
- **Conclusion:** Worth it.

Dodging Bullets/Finding Gold

- Two major features
 - Four-player mode
 - Mid-game stance switching
- In both cases, the project was saved by prototyping
- Prototyping became a compulsion

Questions Never Stop

- Every major feature should be prototyped prior to commitment
 - Especially when failure is unrecoverable!
- Can't do it all up-front
 - When you innovate, new questions always present themselves

Continuous Prototyping Mindset

- Identify missing information; anticipate unknowns
- Ask yourself the right questions
- Prototype all features, esp. unrecoverable ones
- Don't be afraid to shoot it both ways
- Prototype proactively and compulsively
- **More Iterations** -> More Information -> Better Design Intuition -> **Better Design Decisions**

PART IV

CREATIVE PROTOTYPING TECHNIQUES

Spend Only What You Need

- Working prototyping into your day-to-day design is daunting
- Requires economical use of resources
- Minimizing cost of prototyping demands creativity
- Fortunately, creativity is what designers do best!

Code Is Not a Requirement

- Prototyping isn't code-centric
- More important to think laterally
- Code is slow and expensive
- Cut corners – only the information matters!

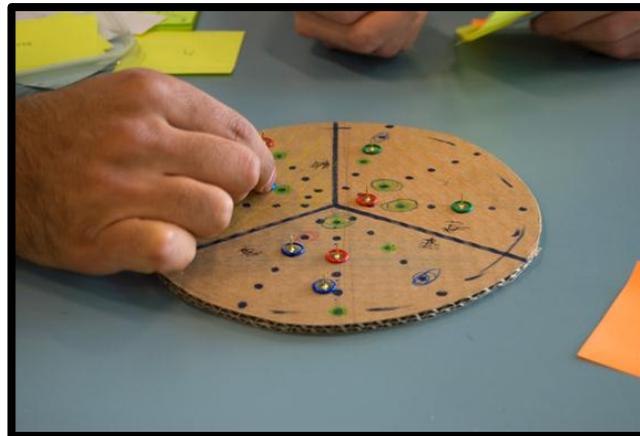


“Gentleman’s Rules”

- *Score Attack*: Told players they lost unless they got above a certain score
- *Gun Jam*: Prototyped by telling players not to press fire
- *Rings*: Prototyped using sprites placed in levels

Use Malleable Media

- Think creatively about your tools
- Physical media (pen/paper/foil/etc...)
- Digital canvas (Photoshop/Flash)
- Keep overhead low
- Don't use hammers on problems that aren't nails



Visual Prototyping



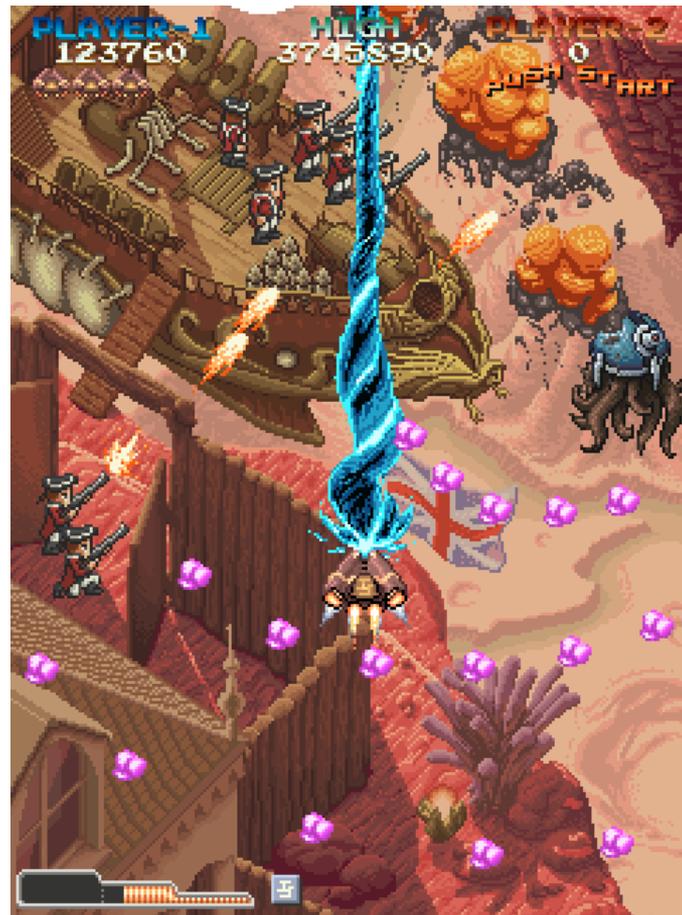
Flash



Photoshop

Visual Prototyping

- Milieu + setting concepts
- Feedback screenshot
- Storyboards
- Touchstones facilitate design and ideation



And Many More...

- These are just a few examples
- It takes a little practice
- Develop techniques that are natural to your process

PART V

SUMMARY/Q&A

Quick Recap

- Prototyping is an ongoing process
- Answer questions via experimentation
- Big/small question = big/small prototype
- Take small steps
- Code optional
- Creativity required

Fin!

QUESTIONS?



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Further Reading

- <http://tvtropes.org/pmwiki/pmwiki.php/Main/VideoGameTropes>
- <http://en.wikipedia.org/wiki/Prototype>
- http://en.wikipedia.org/wiki/Software_prototyping
- <http://www.sciencebuddies.org/engineering-design-process/engineering-design-compare-scientific-method.shtml>
- <http://shmups.system11.org/viewtopic.php?t=9665>