Turning 100,000,000 Friends Into Game Developers:

Adding User Generated Content to Poptropica
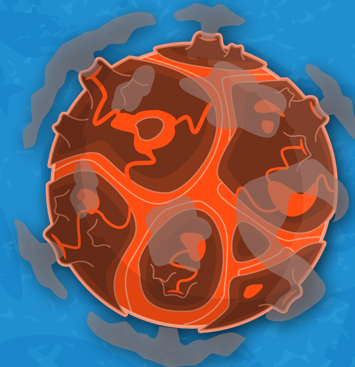
Christopher A. Barney
Systems Engineer and Game Designer

GDC 'Eu

Wait, what's a Poptropica?

- Web based side scrolling adventure platformer
- For kids from 6 to 15 years old
- Conceived in mid 2006 by Jeff Kinney
- Launched on the first of September 2007
- There are now 50 Poptropican Island adventures
- Narrative focus with each island telling a story
- Also a social game:
  - Common rooms for 8 players on every Island
  - Chat / Emote
  - Head to head mini-games

So, it's cool, but is it BIG?!?

- 500,000,000+ characters created
- 8,000,000 active users per month
- 28 minutes on the site each visit
- 3.25 visits a month
- That's 12,133,333 kid hours a month.
- 1,385 kid years … every month…
- 99,726 years spent playing our game since launch…
give or take a thousand years…

How could this happen?!?

- Great Writing
- Great game play
- Easy access
- Free
- Secret Ingredient
- Luck?

At what cost?

1. We live on an endless content production treadmill.
2. New content production has diminishing returns.
3. Success makes innovation harder.

Goals

Realms was created to give the players :

1. A new gameplay experience that still feels like part of Poptropica
2. A new way to express themselves
3. Something fun to do that never ends!
4. Let the players share their creativity with others

Challenges

Our basic design must:

- Create an interesting procedural world
- Relate new gameplay to our core island experience
- Provide a natural cohesive way to access vast amounts of content
- Incorporate new engine features in a way that adds to the experience (sound design, cinematic)
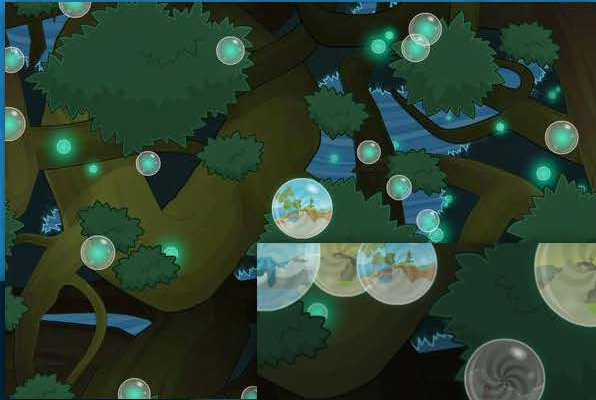
More Challenges

Above and beyond the normal challenge of adding user generated content we must …

- maintain COPPA compliance (PII & TTP)

- protect the privacy of our users

- maintain the level of simplicity and clarity that are the foundations of the Poptropica experience

COPPA - Children's Online Privacy Protection Act

How to comply with Children's Online Privacy Protection Act

The Children's Online Privacy Protection Act, effective April 21, 2000, applies to the online collection of personal information from children under 13. The new rules spell out what a Web site operator must include in a privacy policy, when and how to seek verifiable consent from a parent and what responsibilities an operator has to protect children's privacy and safety online.

The Federal Trade Commission staff prepared this guide to help you comply with the new requirements for protecting children's privacy online and understand the FTC's enforcement authority.

Who Must Comply

If you operate a commercial Web site or an online service directed to children under 13 that collects personal information from children or if you operate a general audience Web site and have actual knowledge that you are collecting personal information from children, you must comply with the Children's Online Privacy Protection Act.

- To determine whether a Web site is directed to children, the FTC considers several factors, including the subject matter; visual or audio content; the age of models on the site; language; whether advertising on the Web site is directed to children; information regarding the age of the actual or intended audience; and whether a site uses animated characters or other child-oriented features.

- To determine whether an entity is an "operator" with respect to information collected at a site, the FTC will consider who owns and controls the information; who pays for the collection and maintenance of the information; what the pre-existing contractual relationships are in connection with the information; and what role the Web site plays in collecting or maintaining the information.

Personal Information

The Children's Online Privacy Protection Act and Rule apply to individually identifiable information about a child that is collected online, such as full name, home address, email address, telephone number or any other information that would allow someone to identify or contact the child. The Act and Rule also cover other types of information -- for example, hobbies, interests and information collected through cookies or other types of tracking mechanisms -- when they are tied to individually identifiable information.

Basic Provisions

Privacy Notice

Placement

An operator must post a link to a notice of its information practices on the home page of its Web site or online service and at each area where it collects personal information from children. An operator of a general audience site with a separate children's area must post a link to its notice on the home page of the children's area.

The link to the privacy notice must be clear and prominent. Operators may want to use a larger font size or a different color type on a contrasting background to make it stand out. A link in small print at the bottom of the page -- or a link that is indistinguishable from other links on your site -- is not considered clear and prominent.

Content

The notice must be clearly written and understandable; it should not include any unrelated or confusing materials. It must state the following information:

- The name and contact information (address, telephone number and email address) of all operators collecting or maintaining children's personal information through the Web site or online service. If more than one operator is collecting information at the site, the site may select and provide contact information for only one operator who will respond to all inquiries from parents about the site's privacy policies. Still, the names of all the operators must be listed in the notice.

- The kinds of personal information collected from children (for example, name, address, email address, hobbies, etc.) and how the information is collected -- directly from the child or passively, say, through cookies.

- How the operator uses the personal information. For example, is it for marketing back to the child? Notifying contest winners? Allowing the child to make the information publicly available through a chat room?

- Whether the operator discloses information collected from children to third parties. If so, the operator also must disclose the kinds of businesses in which the third parties are engaged; the general purposes for which the information is used; and whether the third parties have agreed to maintain the confidentiality and security of the information.

- That the parent has the option to agree to the collection and use of the child's information without consenting to the disclosure of the information to third par

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- That the parent has the option to agree to the collection and use of the child's information without consenting to the disclosure of the information to third parties.

- That the operator may not require a child to disclose more information than is reasonably necessary to participate in an activity as a condition of participation.

- That the parent can review the child's personal information, ask to have it deleted and refuse to allow any further collection or use of the child's information. The notice also must state the procedures for the parent to follow.

Direct Notice to Parents

Content

The notice to parents must contain the same information included on the notice on the Web site. In addition, an operator must notify a parent that it wishes to collect personal information from the child; that the parent's consent is required for the collection, use and disclosure of the information; and how the parent can provide consent. The notice to parents must be written clearly and understandably, and must not contain any unrelated or confusing information. An operator may use any one of a number of methods to notify a parent, including sending an email message to the parent or a notice by postal mail.

Verifiable Parental Consent

Before collecting, using or disclosing personal information from a child, an operator must obtain verifiable parental consent from the child's parent. This means an operator must make reasonable efforts (taking into consideration available technology) to ensure that before personal information is collected from a child, a parent of the child receives notice of the operator's information practices and consents to those practices.

Until April 2002, the FTC will use a sliding scale approach to parental consent in which the required method of consent will vary based on how the operator uses the child's personal information. That is, if the operator uses the information for internal purposes, a less rigorous method of consent is required. If the operator discloses the information to others , the situation presents greater dangers to children, and a more reliable method of consent is required. The sliding scale approach will sunset in April 2002 subject to a Commission review planned for October 2001.

Internal Uses

Operators may use email to get parental consent for all internal uses of personal information, such as marketing back to a child based on his or her preferences or communicating promotional updates about site content, as long as they take additional steps to increase the likelihood that the parent has, in fact, provided the consent. For example, operators might seek confirmation from a parent in a delayed confirmatory email, or confirm the parent's consent by letter or phone call.

Public Disclosures

When operators want to disclose a child's personal information to third parties or make it publicly available (for example, through a chat room or message board), the sliding scale requires them to use a more reliable method of consent, including:

- getting a signed form from the parent via postal mail or facsimile;

- accepting and verifying a credit card number in connection with a transaction;

- taking calls from parents, through a toll-free telephone number staffed by trained personnel;

- email accompanied by digital signature;

But in the case of a monitored chat room, if all individually identifiable information is stripped from postings before it is made public -- and the information is deleted from the operator's records -- an operator does not have to get prior parental consent.

Disclosures to Third Parties

An operator must give a parent the option to agree to the collection and use of the child's personal information without agreeing to the disclosure of the information to third parties. However, when a parent agrees to the collection and use of their child's personal information, the operator may release that information to others who uses it solely to provide support for the internal operations of the website or service, including technical support and order fulfillment.

Exceptions

The regulations include several exceptions that allow operators to collect a child's email address without getting the parent's consent in advance. These exceptions cover many popular online activities for kids, including contests , online newsletters , homework help and electronic postcards .

Prior parental consent is not required when:

- an operator collects a child's or parent's email address to provide notice and seek consent;

- an operator collects an email address to respond to a one-time request from a child and then deletes it;

- an operator collects an email address to respond more than once to a specific request -- say, for a subscription to a newsletter. In this case, the operator must notify the parent that it is communicating regularly with the child and give the parent the opportunity to stop the communication before sending or delivering a second communication to a child;

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stop the communication before sending or delivering a second communication to a child;

- an operator collects a child's name or online contact information to protect the safety of a child who is participating on the site. In this case, the operator must notify the parent and give him or her the opportunity to prevent further use of the information;

- an operator collects a child's name or online contact information to protect the security or liability of the site or to respond to law enforcement, if necessary, and does not use it for any other purpose.

October 2001/April 2002

In October 2001, the Commission will seek public comment to determine whether technology has progressed and whether secure electronic methods for obtaining verifiable parental consent are widely available and affordable. Subject to the Commission's review, the sliding scale will expire in April 2002. Until then, operators are encouraged to use the more reliable methods of consent for all uses of children's personal information.

New Notice for Consent

An operator is required to send a new notice and request for consent to parents if there are material changes in the collection, use or disclosure practices to which the parent had previously agreed. Take the case of the operator who got parental consent for a child to participate in contests that require the child to submit limited personal information, but who now wants to offer the child chat rooms. Or, consider the case of the operator who wants to disclose the child's personal information to third parties who are in materially different lines of business from those covered by the original consent -- for example, marketers of diet pills rather than marketers of stuffed animals. In these cases, the Rule requires new notice and consent.

Access Verification

At a parent's request, operators must disclose the general kinds of personal information they collect online from children (for example, name, address, telephone number, email address, hobbies), as well as the specific information collected from children who visit their sites. Operators must use reasonable procedures to ensure they are dealing with the child's parent before they provide access to the child's specific information.

They can use a variety of methods to verify the parent's identity, including:

- obtaining a signed form from the parent via postal mail or facsimile;

- accepting and verifying a credit card number;

- taking calls from parents on a toll-free telephone number staffed by trained personnel;

- email accompanied by digital signature;

- email accompanied by a PIN or password obtained through one of the verification methods above.

Operators who follow one of these procedures acting in good faith to a request for parental access are protected from liability under federal and state law for inadvertent disclosures of a child's information to someone who purports to be a parent.

Revoking & Deleting

At any time, a parent may revoke his/her consent, refuse to allow an operator to further use or collect their child's personal information, and direct the operator to delete the information. In turn, the operator may terminate any service provided to the child, but only if the information at issue is reasonably necessary for the child's participation in that activity. For example, an operator may require children to provide their email addresses to participate in a chat room so the operator can contact a youngster if he is misbehaving in the chat room. If, after giving consent, a parent asks the operator to delete the child's information, the operator may refuse to allow the child to participate in the chat room in the future. If other activities on the Web site do not require the child's email address, the operator must allow the child access to those activities.

Timing

The Rule covers all personal information collected after April 21, 2000, regardless of any prior relationship an operator has had with a child. For example, if an operator collects the name and email address of a child before April 21, 2000, but plans to seek information about the child's street address after that date, the later collection would trigger the Rule's requirements. In addition, come April 21, 2000, if an operator continues to offer activities that involve the ongoing collection of information from children -- like a chat room -- or begins to offer such activities for the first time, notice and consent are required for all participating children regardless of whether the children had already registered at the site.

Safe Harbors

Industry groups or others can create self-regulatory programs to govern participants' compliance with the Children's Online Privacy Protection Rule . These guidelines must include independent monitoring and disciplinary procedures and must be submitted to the Commission for approval. The Commission will publish the guidelines and seek public comment in considering whether to approve the guidelines . An operator's compliance with Commission-approved self-regulatory guidelines will generally serve as Asafe harbor" in any enforcement action for violations of the Rule.

Enforcement

The Commission may bring enforcement actions and impose civil penalties for violations of the Rule in the same manner as for other Rules under the FTC Act. The Commission also retains authority under Section 5 of the FTC Act to examine information practices for deception

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Enforcement

The Commission may bring enforcement actions and impose civil penalties for violations of the Rule in the same manner as for other Rules under the FTC Act. The Commission also retains authority under Section 5 of the FTC Act to examine information practices for deception and unfairness, including those in use before the Rule's effective date. In interpreting Section 5 of the FTC Act, the Commission has determined that a representation, omission or practice is deceptive if it is likely to:

- mislead consumers; and

- affect consumers' behavior or decisions about the product or service.

Specifically, it is a deceptive practice under Section 5 to represent that a Web site is collecting personal identifying information from a child for one reason (say, to earn points to redeem a premium) when the information will be used for another reason that a parent would find material -- and when the Web site does not disclose the other reason clearly or prominently.

In addition, an act or practice is unfair if the injury it causes, or is likely to cause, is:

- substantial;

- not outweighed by other benefits; and

- not reasonably avoidable.

For example, it is likely to be an unfair practice in violation of Section 5 to collect personal identifying information from a child, such as email address, home address or phone number, and disclose that information to a third party without giving parents adequate notice and a chance to control the collection and use of the information.

References: http://www.ftc.gov/bcp/conline/pubs/buspubs/coppa.htm

Design:

- Moved from a single infinite random world to many discrete worlds
- Settled on the Metaphor of Realms
- In game world editing
- Gameplay loop economy
- Progression of tools and powers
- Create an interactive world
- Launch early and iterate!

Monetization

Contribute to our bottom line without negatively impacting the user's experience

- Integrated advertising as part of the Realms offering

Restrict some of the friends content to members

- Members can create more Realms.
- Members have more 'biome' types (Lava, Crystal)
- Members can Share their Realms
- Members get exclusive building materials

Technology:

Our technology is remarkably unremarkable

- Apache web servers running on Centos
- Our code is in PHP
- Database is just MySQL
- Our multi-player servers run on Red5 on Tomcat
- The game client is Flash
- We use Akamai as our content delivery network
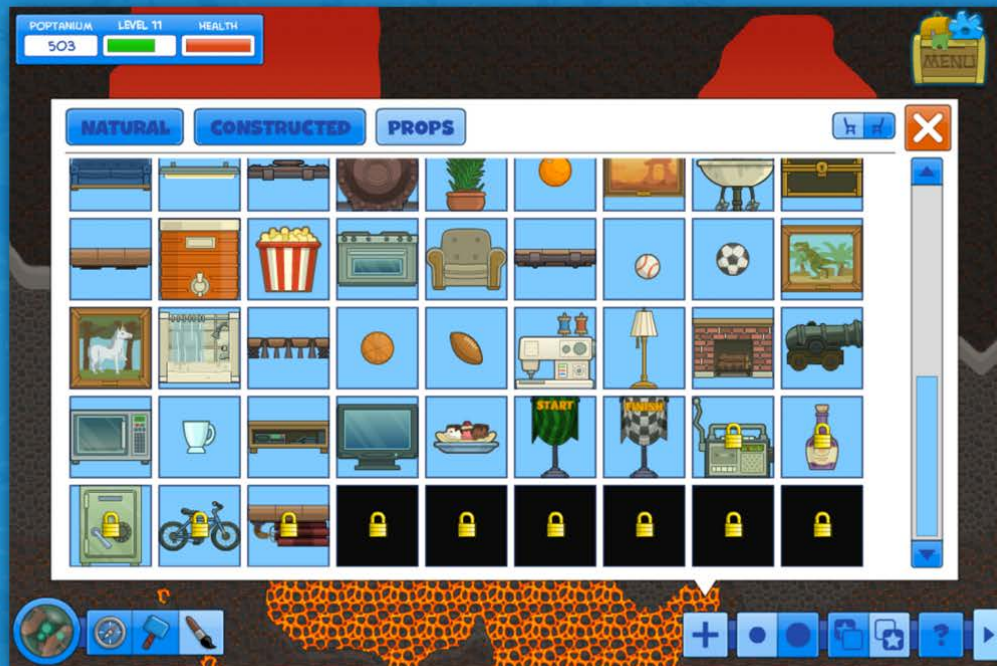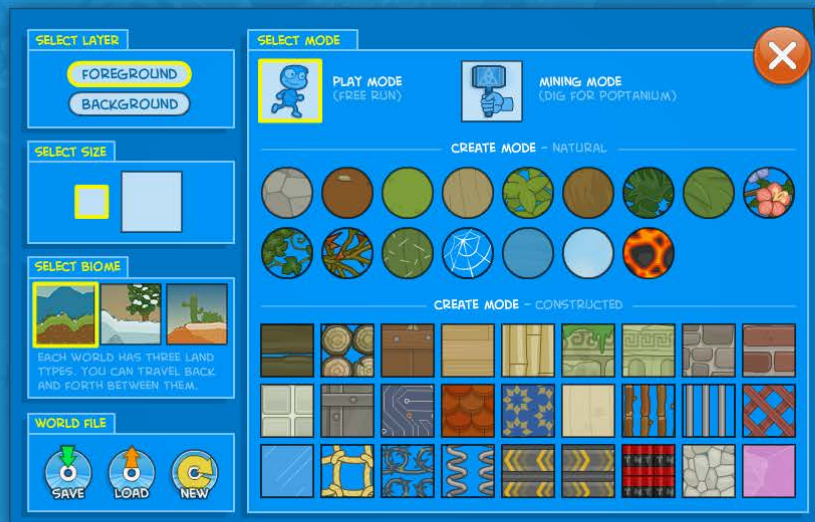
Technology Challenges

Q: Where should we store saved world files for millions and millions of users?

A: Amazon S3

Q: How do you Minimize the size and number of files you save?

A: Save only the differences from the procedural seed and save only scenes that have been modified.

Issues of Scale

- Potential user base > 100,000,000
- Between 3 and 20 Realms each
- Realms between 10 and 60 scenes wide.
- Thumbnail files for each Realm in addition to the save files.
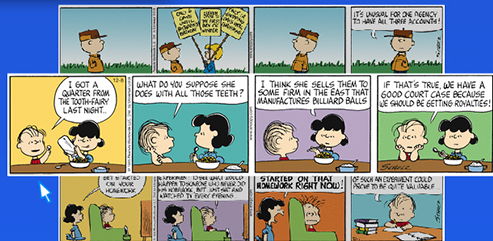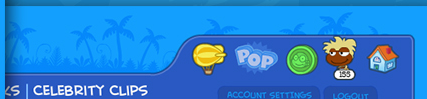
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Technical Success!

- Our internal back end held up and S3 proved very effective
- Features added with zero downtime
- Zero data loss (Saving and loading was not interrupted)*
- Continuous integration testing of codebase during development
- Full deployment testing
- Hot launch is difficult and maybe not worth it for others
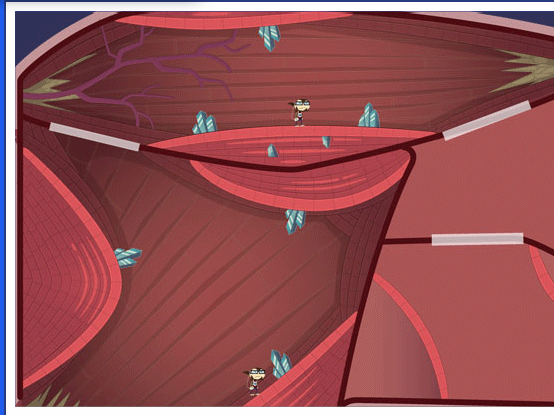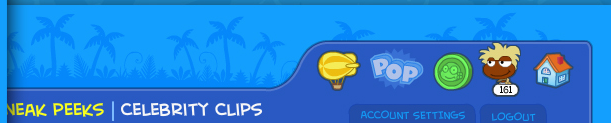
Pitfalls: Learning Curve

While our end design looks cohesive and conforms to the high level goals of or product we don't always get it right on the first try...

- Prototypes had no tutorial
- Initial intro section too long
- Second intro too short
- Initial interface obscured important features

Pitfalls: Monetization

- Identified methods of ad delivery
    - Ad scenes
    - Ad Items/Textures
- Advertisers often don't understand the value of a unique offering
- Advertisers often ask for or 'insist on' things that will negatively impact gameplay.
- Raising our (under age) players desire for membership does not increase their parent's desire to buy it for them.

Pitfalls: General Design

● First design: Written in AS2, technically impressive but missed the mark on art style and would have been difficult to save.

● Second design: Better art and gameplay, lacked player progression.

● Third design: Gained progression, resource gathering based, lacked motivation to build.

●Public Launch: Incorporated building into the progression, lacked narrative direction
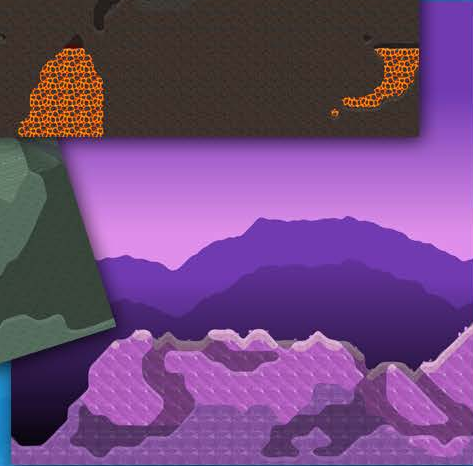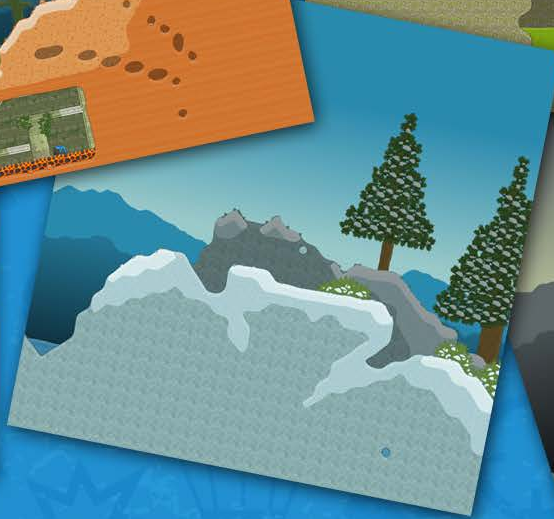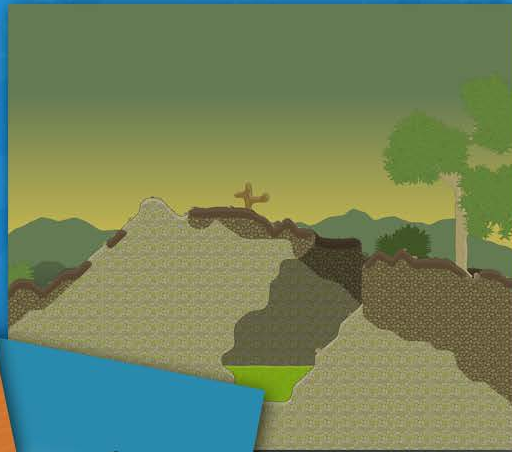
Pitfalls: Limited Features

- Need to iterate on core features
- Push to hit an aggressive launch date
- Lack of player testing prior to launch window meant we needed to be able to adjust direction to match post launch player feedback
- Resulted in there not being a lot to do if you were not a very creative/creation oriented player.
- We went from crunch back to development of new features immediately post launch.

NEAT TIGER

MAD COMET

POPTROPICAWORLD.COM
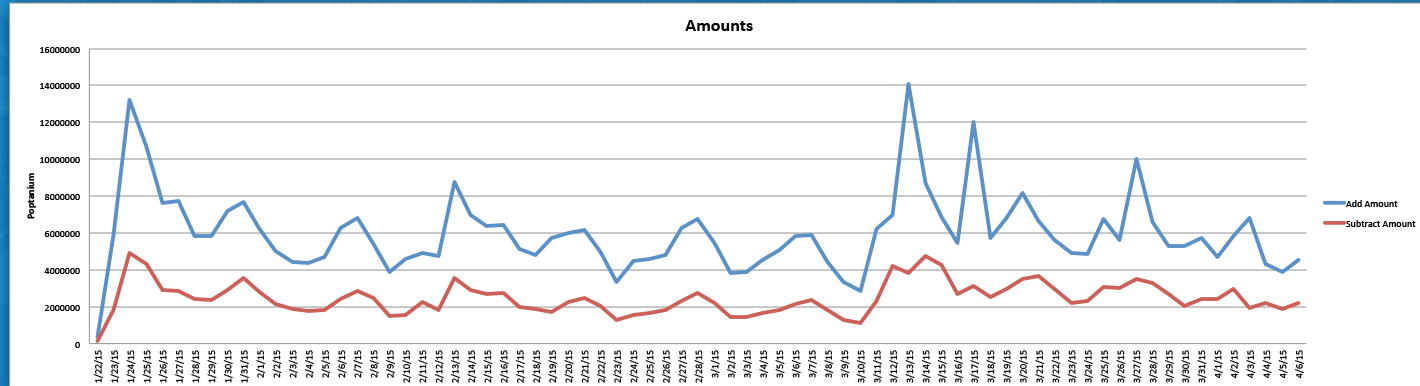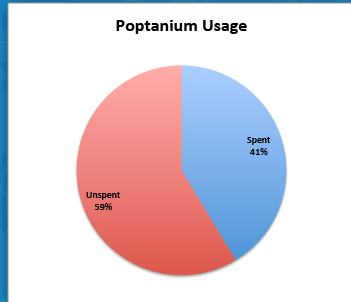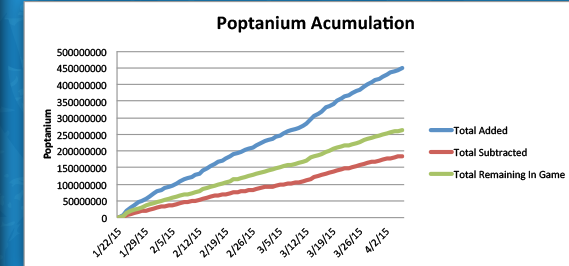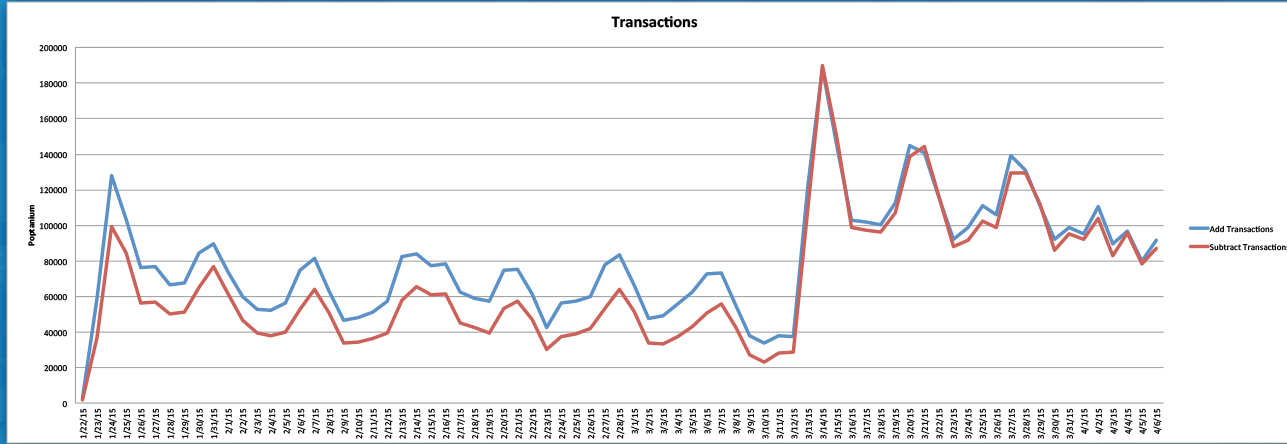
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Outcome: Time on site

● Realms users have a session length of about one hour, the average user of islands has a session of less than half that.
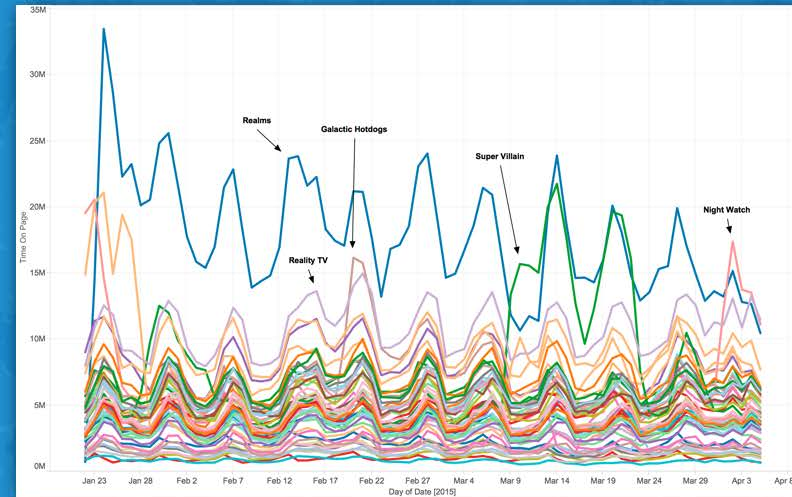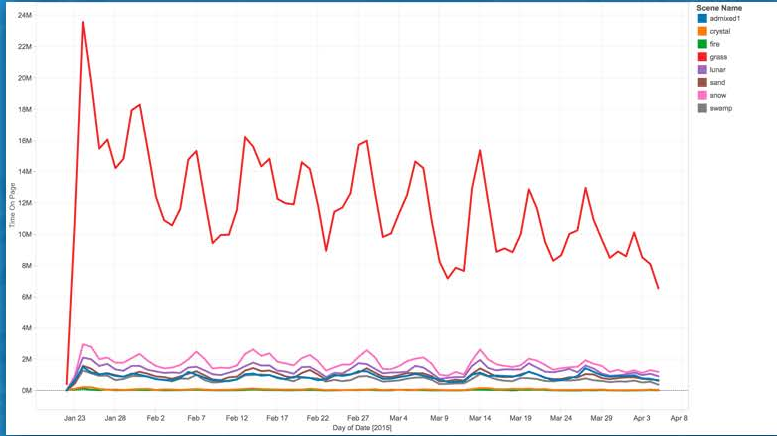
Outcome: Metrics

- 180 Days since launch
- 1,400,000 Realms Users
- 2,000,000 Realms Created
- 18,000,000 Scenes Saved
- 1,000,000,000 Poptanium Mined
- More than 40% of Poptanium spent

Phase 2: Sharing Your Realms!

We knew this was important... why did we wait?

Maintaining COPPA compliance means a manual approval process
- **That process required a whole new Realms display engine**
- BUT with a single front-end developer we had to complete core functionality first
- **The back-end was built with the need to share in mind**
- BUT we knew it would require a single developer several months to develop

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Goal:

Allow users to share their creations with other players.

Design:

- From the Realms screen you can share your Realm.
- Shared Realms go into a queue to be reviewed by the developers
- Limit sharing to members as a membership driver and to make the workload manageable
- Disable building tools in shared Realms
- Custom review tool that can render a small version of a Realm on a single screen
- Public Realms view with sets of 10 shared/approved Realms
- Users have the ability to page through more screens of Realms
- Users have the ability to rate (like) Realms from the public Realms screen

Urausdill

VISIT   SHARE

Realm ID: 645903   username: jacob72696   Refresh
Realm Name: Shib   pending: 35

Approve   Reject   Next >>   Make Popular and Approve

Painting scene id: 7 (8/10)
Painting scene id: 8 (9/10)
Painting scene id: 9 (10/10)
All scenes painted.

The Flaming Gauntlet

VISIT   RESHARE

Shared on Sat Jul 18 2015 04:50:17 PM and approved.

736   REALM CODE: 9jr6d

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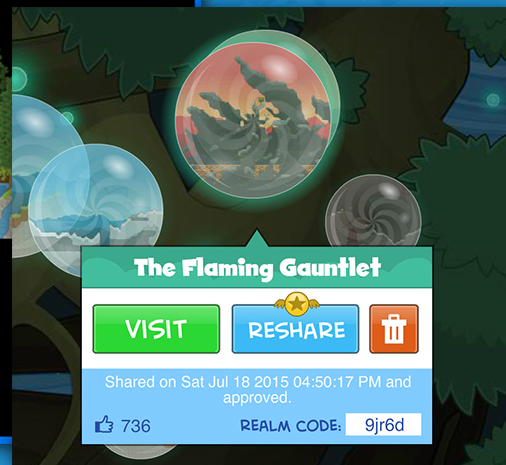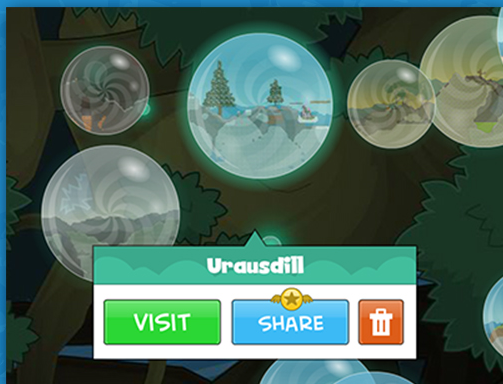
Implementation:

- Multiple versions of each Realm have to be saved
  - Private version that the creator can continue to build in after submitting
  - Pending version waiting for review
  - Public version that has been approved
- Public Realms mix
  - 5 random popular Realms (the cutoff will change, we started with 20 likes)
  - 3 random new Realms (shared in the last week)
  - 2 random Realms
- Random is expensive in a large table
  - We cache a larger chunk of results, page through it and refresh the cache every few minutes

Results of Phase 2

- Thousands of Realms shared in the first month.
- About half a million public Realms visited in the first month.
- Only about 30,000 users have visited public Realms...
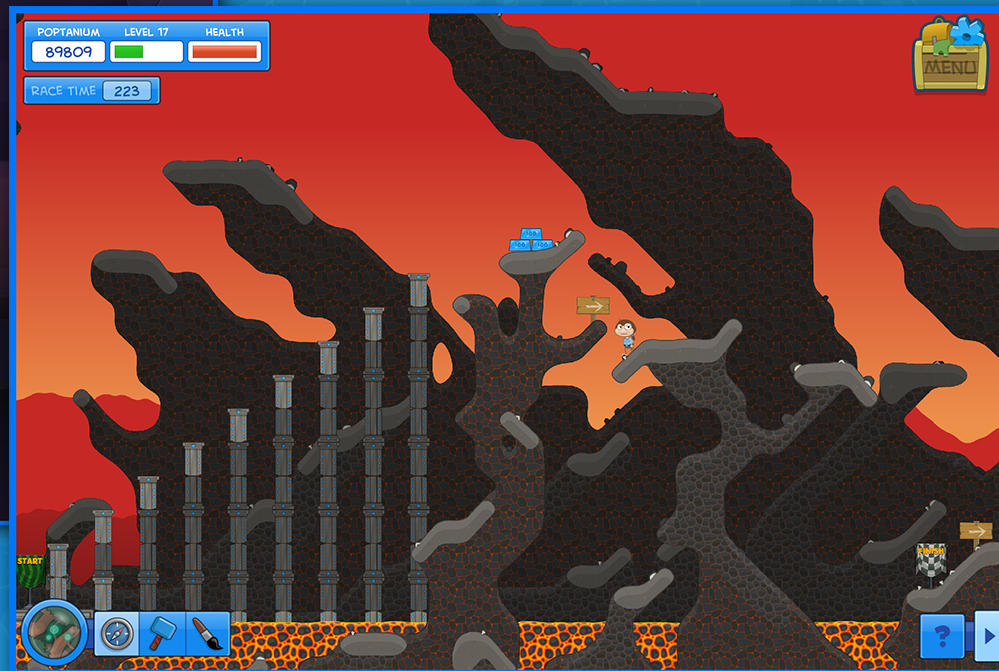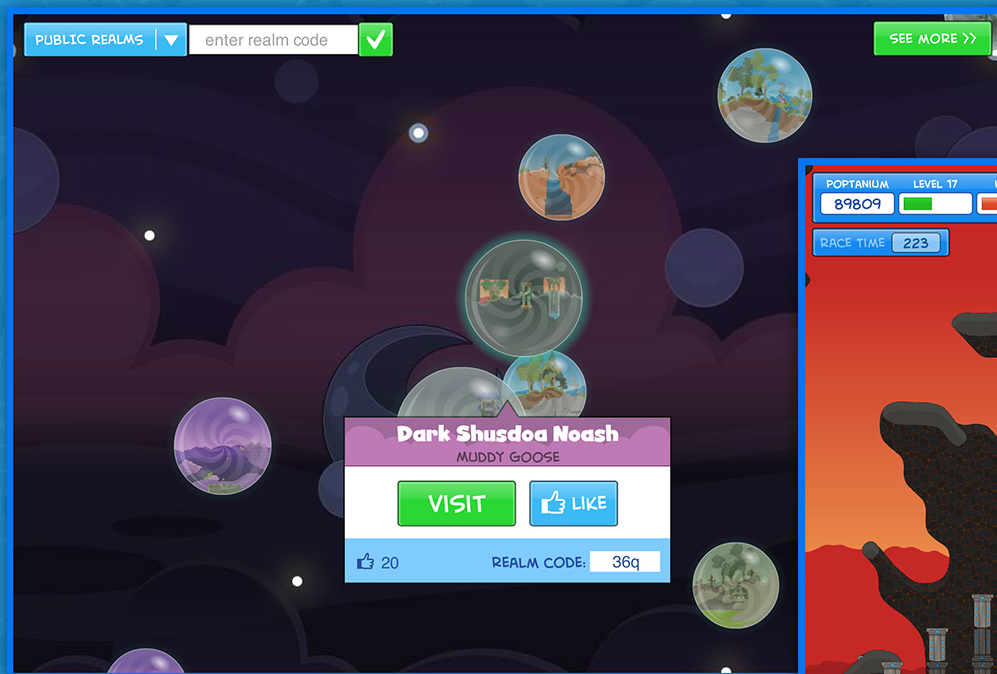
Future Plans

- Tie visiting Realms directly to your Friends
- Cater to more player types.
- Give a reason to explore that is independent of building.
- More interactive props
- More interactive animals
- Multi-user Realms
- Tie island gameplay to Realms

Vague General Takeaway

● Our answers are specific to our problem... and that is the most important takeaway.

● Look at your user base and your product.

● Make sure that the answers you find fit them and not you, your development team or your company.

Substantive Takeaway

● Building a progression system that is tied to gameplay is critical and hard: it should be part of your design from the beginning.

● Look at the level of complexity of your solutions and make sure they match your audience. What works for you as a 35 year old game developer may not be what a 6 year old wants or needs to enjoy your game.

● When adding to an existing game make sure your additions complement what is already loved about your game.

COOL
SPONGE

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Substantive Takeaway

● Limit the amount you alter your game in with each addition and assess how it is received. Change direction if needed. The first iterations of PopLabs were vastly different than the final Realms release.

● Be prepared for failure. We limited the resources dedicated to Realms (a mostly dedicated team of 4 out of 40 or so developers) so that our other game development could move forward and the game would not fail if Realms was not a success.
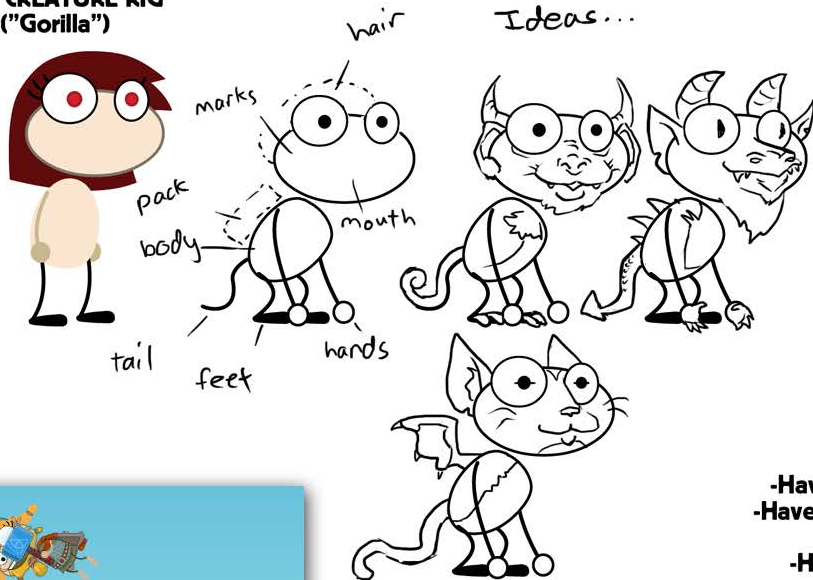
Substantive Takeaway

● Be prepared for success. Our hardware resources are very limited, and though we did everything we could to minimize additional load, we could not know how our servers would hold up to real usage patterns. We mitigated the risk by launching only to members and observing the load they incurred, extending sharing only to members, and caching our expensive queries.

February 13

An artifact has recently come into my possession which has caused me great excitement. Let me explain.

Ancient Norse legend tells of a Master Builder, whom the gods hired to build the walls of Asgard. They promised him the sun and the moon if he could accomplish this task in a certain amount of time, secretly believing the task to be impossible. To their surprise, the Master Builder was able to accomplish the task, thanks to the help of Svadilfari, which experts have long believed to be a horse of incredible strength.

But I am now led to believe that Svadilfari was something else entirely: a mystical tool holding great power.

Which brings us back to the artifact. It was found washed up on the northern shore of Scotland. Carbon dating confirms that it is of ancient origin. It depicts an enormous man building the walls of Asgard. No horse stands at his side, but rather an enormous hammer.

April 5

It's been a difficult week at sea. I had hoped to find something by now. The crew of the ship refuses to navigate towards the location I believe to be most promising, mumbling something about the area being cursed.

April 10

I've decided to take matters into my own hands. After dark I'll slip away in the ship's raft. I see a dark storm brewing to the north, but it's now or never.

Asgard awaits!

March 4

Unbelievable! To my surprise, a string of additional discoveries have been made! More artifacts of ancient Norse origin have been found on the shores of Scotland, Iceland, and Norway, which strengthen my conclusions about the nature of Svadilfari.

I am also convinced that the artifacts have all come from a single geographical source, located somewhere in the Norwegian Sea. I'll be taking passage on a shipping vessel to see what I can learn. We depart tomorrow at sunrise.

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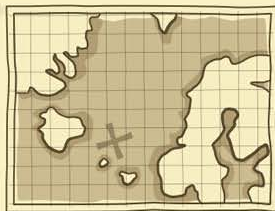
Substantive Takeaway

● Just because you 'can' put an ad there doesn't mean you 'should.' Consider your user's experience and the long term health of your game and brand.

● Evolve your technology. If the technical response to a proposed feature is 'We can't do that with our technology,' investigate expanding your tool set. Our back end was unsuited to managing a huge set or user files but using Amazon S3 turned out to be painless... well mostly painless.

● Improvise, iterate, but have a design

SNOW   DESERT   FOREST   FIRE

LUNAR   CRYSTAL   SWAMP

Poptropica Realms
Biome Hats
MEMBERS ONLY

COSTUMIZE

Poptropica Realms
Biome Hats

FREE

COSTUMIZE

Poptropica Realms
Realms Builder

COSTUMIZE

Master Creator!

Go forth and change the world!
Access Super Jump in Mine Mode.

COSTUMIZE

Substantive Takeaway

● Design the tools you will need to use for management of your new features. We didn't and I have spent a lot of time 'fixing' things for users that write into customer service. That could have been avoided by taking the time to update the user management tools that our CS reps would need before they needed them!

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Substantive Takeaway

● Build in metrics! Within minutes of launching I began to receive requests for metrics. We built a high volume aggregate metrics system that works off of parsing the server logs, and also designed our production databases to allow ad hoc queries. Having user data available through a data warehouse is also highly recommended; there are just some things that you can't ask a 500,000,000 row production table without setting fire to the server.

● Have a cross check on your metrics; when your code meets reality it may do strange things including messing with metrics.

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IF YOU HAVE ANY QUESTIONS FEEL FREE TO EMAIL ME:

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