

# Safe Space and Knowledge Discovery

## A Guidebook to Virtual Space for Junior Ranger Tweens

### of the National Parks Service

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Project Sponsored by the University of Maryland Future of Information Alliance and Deutsch Foundation



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## **Part 1: Introduction**

This is a resource designed in a partnership with the National Park Service (NPS) as an early effort in planning a social media space for their Junior Ranger community, specifically ages nine to twelve. This age group will be referred to as tweens (Rideout, 2007).

Online spaces with social media engagement opportunities can provide critical learning environments in which new media literacies can be developed (Jenkins et al., 2006; Ito et al., 2010). Recent studies have shown that tweens and teens from diverse backgrounds, including those with limited access to Internet at home, are likely to use social media (Ahn, 2011; Lenhart, Purcell, Smith & Zickuhr, 2010). Virtual engagement also represents one means of engaging tweens from diverse backgrounds in science, technology, engineering and mathematics (STEM) disciplines where minority students have been historically underrepresented (Subramaniam, Ahn, Fleischmann, & Druin, 2012; Subramaniam, Ahn, Waugh, Taylor, Druin, Fleischmann, & Walsh, in press).

Although social media represents a learning environment accessible to diverse populations, there are limited opportunities for tweens to legally take part in social media due to restrictions targeting those under age thirteen (Grimes & Fields, 2010). The Children's Online Privacy and Protection Act (COPPA) requires site operators who target kids to obtain verifiable parent consent if any personal information is collected. This results in most mainstream social media sites not allowing users who self-report an age under thirteen to use the site. On the other hand, sites that allow tweens to use their site often choose to not collect any personal information and do not require parent consent. By not allowing any personal information to be disclosed, the engagement options on kid-targeted sites often do not include many opportunities for sharing or collaboration among users. Tweens therefore have limited access to these learning environments or lie about their age in order to use sites that are not targeted towards kids (Lenhart et al., 2011). Even when parents support their child's use of social media, there are limited opportunities for tweens to take part in age appropriate social networks (boyd, Hargittai, Schultz, & Palfrey, 2011). Participation in social networks is not only important for the collaborative learning experiences they provide, but age appropriate online social networks can also provide a space where kids under thirteen can learn about privacy practices. Recent surveys show that teens are making much more personal information public now than they did six years ago, due to both the development of social media platforms and changing social norms online. (Madden et al., 2013). In this evolving social media environment, there also need to be efforts to introduce tweens to social media in a manner that keeps them safe and empowers them to be safe online. Using a sociocultural approach to learning (Ford & Forman, 2006), this guidebook will provide recommendations for a virtual space that promotes online literacy, educational enrichment, and safety for tweens.

This guidebook provides recommendations for the NPS in building a virtual space that will achieve the following goals:

1. Create an engaging environment for tweens.
2. Provide opportunities for informal science learning connected to NPS content.
3. Initiate and sustain a safe and positive community culture.

### **1.1 How was this guidebook created?**

This guidebook draws information from relevant literature, cooperative inquiry activities, and focus groups in order to construct recommendations that align with the NPS's goals of providing a safe, educational, and engaging space for tweens. Pertinent literature regarding new media literacy, science education, and online privacy practices for kids formed the foundation of the investigation into how a virtual Junior Ranger space should be constructed. The guidebook was distinctly shaped by the input of tweens and their parents through cooperative inquiry methods (Druin, 1999, 2005; Guha et al., 2005) and focus group discussion. The first of two research sessions brought seven families to Kenilworth Park and Aquatic Gardens to participate in activities inspired by the park's Junior Ranger activity booklet. Following these activities in the physical park space, the tweens took part in co-design (cooperative inquiry) activities that allowed them to create a prototype of a virtual space that would act as an extension of their experiences in the park. A concurrent focus group generated parent discussion regarding their perspective on tween engagement in social media, safety concerns, and family practices.

A second session reconvened the tweens to take part in more specific design activities inspired by their ideas from the first meeting and prompted them to reflect on their ideas about social media, science engagement, and online privacy practices. During this session, parents took part in a member check of drafted guidebook sections in which they provided feedback that helped to refine the recommendations provided.

### **1.2 How can learning institutions use this guidebook?**

The research team decided to focus its efforts on understanding tween and parent perspectives by narrowing the scope of the study to science content related to one park within the NPS. The project intent, however, is to use the project findings to develop recommendations that can be adapted across various NPS locations, learning institutions, and content areas.

The information in this guidebook can be used by other learning institutions seeking to engage a tween user group virtually, but institutions should be aware that recommendations were designed with the following contextual elements of the NPS in mind:

- The NPS currently engages kids through an in person badge earning program, Junior Rangers, which kids of all ages can participate in at parks across the country.
- The NPS has an existing individual online activity center, WebRangers, where kids of all ages can earn virtual badges.

- Tweens participating in the WebRangers program have tried to use the guest book and “question of the day” features of the platform to connect to other Junior Rangers and generate discussion.
- Many NPS sites are rich in science related content.
- The NPS has limited staff resources available for monitoring and maintaining a social media space

### **1.3 Overall Recommendations**

#### *Engagement Recommendations*

1. Make dynamic content available - information is frequently added and updated by park professionals and tweens. Suggested features that incorporate such dynamic content include:
  - a. A virtual scavenger hunt in the form of an interactive game
  - b. A personal newsfeed that is updated with national and local events, the activities of connected users, and updates on topics tweens are interested in
  - c. Live webcams in the park
  - d. Community discussion forums where tweens can interact with each other and park professionals regarding a variety of topics
2. Incorporate opportunities for personalization in areas of the site such as:
  - a. Avatars
  - b. Profiles
  - c. A scrapbook where tweens can save original work or media from different parts of the site on their own customizable scrapbook pages
3. Facilitate connected learning between types of park content. Tweens expressed interest in two key types of connections:
  - a. Connecting science content to specific parks through features like a park profile where content links to pictures from a specific park or relevant events
  - b. Connecting different features of the site (i.e. the ability to add items from the virtual scavenger hunt section of the site to their personal scrapbook)

#### *Privacy Recommendations*

4. Layer community spaces that allow freedom to interact socially with media and peers within a structure that encourages tweens to evaluate their behavior and assume responsibility for managing their privacy:
  - a. Public space
  - b. Customizable personal space

- i. Interest Connections – these connections take the form of one-way subscriptions that will affect the tween’s newsfeed information
    1. User interest connection
    2. Topics interest connection (forums, park profiles, tags)
  - ii. Inner circle connections – these reciprocal connections will require parent approval and will allow users to share personal information such as pictures with faces to those they choose to be in their inner circle.
5. Empower tweens by giving them the power to create community rules and flag problematic and/or inappropriate content.
6. Create a positive parent culture through involvement in managing setting and inner circle connection and promote transparency of tween activity through customizable parent digests.

The following sections on *Learning as a Social Enterprise*, *Online Engagement*, and *Online Safety* will highlight key considerations for social media implementation and provide discussion related to how recommendations were constructed.

## **Part 2: Learning as a Social Enterprise**

Related literature revealed several principles of learning that complement the findings from the co-design activities with tweens and focus group discussions with parents.

- Learning must be personally relevant.
- Learning requires a social connection.
- Learning leads to empowerment.
- Learning must be fun.

### **2.1 Learning must be personally relevant**

During a focus group session, one parent described how the visit to the national park served as a reminder of how close to home nature and science content is, even for those living in an urban setting. Demonstrating how science content is personally relevant is one key goal of creating a virtual space for the NPS. Lin, Hong, & Huang (2012) discuss how students feel disconnected from science because they find it to be impenetrable and abstract with no relevance to day-to-day life. Being able to situate science learning in issues that are personally and culturally connected to learners is vital (Bell, Lewenstein, Shouse, & Feder, 2009; Bybee & McCrae, 2011; Lin et al., 2012).

The idea of creating science content that is personally relevant is in fact one of the core shifts in focus represented by the Next Generation of Science Standards (Achieve, Inc., 2013). This shift will affect curriculum development in public schools and represents a greater focus on how science education can reflect science in the real world, highlighting the interconnected nature of science.

Similarly, recent informal learning research presents ways in which new media literacies can be developed through tween and teen behavior in social media spaces (Jenkins et al., 2006; Ito et al., 2009). A virtual space with integration of social media elements therefore serves as a critical learning environment where tweens are motivated by personal interests and friendships to participate in educational activities.

### **2.2 Learning requires a social connection**

Involvement in social media is now a daily fact of life for many American kids (Lenhart et al., 2011; Madden et al., 2013). Research on the use of social media also finds that engagement in interactive online spaces has positive effects on new media literacy development (Jenkins et al., 2006; Ito et al., 2009; Ahn, 2013). “Participatory culture” describes spaces that promote learning by being easy to join and promoting engagement, creation, mentorship, and collaboration (Jenkins et al., 2006). Learning institutions such as the NPS can therefore drive their online initiatives towards creating a space that not only attracts tweens, but provides a dynamic learning environment.

By taking part in participatory culture through different social behaviors, tweens learn core new media literacies that are also integral to science discovery (see Table 1).

*Table 1: New Media and Science Literacy*

<b>Selected New Media Literacies</b> (Jenkins et al., 2006)	<b>Core Principles of Science Learning</b> (Achieve, Inc., 2013)	<b>Guiding questions for developing a virtual learning space</b>
Play – The capacity to experiment with one’s surroundings as a form of problem-solving <b>Pl</b>	Asking questions <b>Qu</b> Planning and carrying out experiments and investigations <b>Ei</b>	Does your system give tweens the ability to experiment, play, and explore? Is it interesting, engaging, and fun?
Simulation - The ability to interpret and construct dynamic models of real-world processes <b>Si</b>	Developing and using models <b>Mo</b>	Does your system allow tweens to interact with realistic models that demonstrate the dynamic elements of science?
Performance - The ability to adopt alternative identities for the purpose of improvisation and discovery <b>Pe</b>	Enabling students to identify as experts rather than novices through empowering them with a mastery of core science principles. <b>Id</b>	Does your system allow tweens to assume the roles of scientists, park rangers, and explorers as they develop a virtual identity through interaction with science content?
Judgment - The ability to evaluate the reliability and credibility of different information sources. <b>Ju</b>	Engaging in argument from evidence <b>Ar</b>	Does your system allow tweens to engage in conversations where they can critically assess and verify various sources of information?
Collective Intelligence - The ability to pool knowledge and compare notes with others toward a common goal <b>Ci</b>	Obtaining, evaluating, and communicating information <b>Ec</b>	Does your system allow for tweens to share their thoughts, opinions, and experiences with each other?
Networking - The ability to search for, synthesize, and disseminate information <b>Ne</b>	Obtaining, evaluating, and communicating information <b>Ec</b> Analyzing and interpreting data <b>Ai</b>	Does your system provide tools for tweens to browse through large amounts of user submitted data, synthesize it, and then share these results with others?
Appropriation - The ability to meaningfully sample and remix media content <b>Ap</b>	Problem Solving - Constructing explanations and designing solutions <b>Ps</b>	Does your system provide opportunities for tweens to use or remix information from the learning institution and peers to collectively and individually create solutions, solve problems and produce original content?

Furthermore, the presence of a community of peers who are interested in scientific inquiry and content can provide both the intellectual challenge and social support needed to nurture the student's engagement (Tan, Calabrese, Varley, & Turner., 2012).

### **2.3 Learning Leads to Empowerment**

The recommendations are designed to give tweens the tools they need to be empowered users of online information in a social media space geared towards science engagement. A virtual space can empower tweens by providing the freedom to share media and personal information and give them the power to moderate and assume responsibility for the quality of the virtual space with tools such as peer flagging. Providing freedom is essential to empowering tweens to take ownership over their online behaviors, even if methods of surveillance such as flagging and moderation are employed (Regan & Steeves, 2010). The recommendations allow for the development of a collaborative and social environment where administrative, peer, and parent moderation also play a role. In this way, tweens can share, create, and interact with each other and dynamic online content while remaining honest about their identity as a tween.

Although this virtual space development is now focused on new media and science related perspectives and content, creation of an empowered community will be a starting point for further engagement of a variety of educational disciplines also related to NPS content. Evidence of such a transformation in an online community for tweens can be observed in Scratch, a social media programming space designed by MIT that has branched out from a computer programming focus to include focuses on graphic design, creative writing, and more.

### **2.4 Learning must be fun**

Finally, this site seeks to create an environment that is conducive to learning by making it comfortable and enjoyable (Gee, 2003; Squire & Jenkins, 2003). The sort of learning offered by games is a very powerful tool for both engagement and identity formation as a science learner. Games are effective in these regards because they are fun (Koster, 2005). There are a variety of ways in which gaming affords good learning, including situating the learning in meaningful contexts and offering first-hand experiences to make abstract concepts more concrete (Gee, 2003). Games let learners experience success in the controlled environment of virtual worlds (Squire & Jenkins, 2003) which helps to develop their identity as both learners and scientists (Schaffer, 2006).

The NPS is already using games to teach content about nature and science in their badge-oriented Junior Rangers and WebRangers activities. However, with further adaptation of such games to an inclusion of an online and interactive environment, the NPS would be able to engage tweens in a space that is interesting and attractive to them.

### **Part 3: Online Engagement - What tweens want and how the NPS can help**

This section focuses on identifying engaging elements of science and social media that learning institutions can integrate into their online tween communities. The following themes were identified as the tweens designed aspects of a Junior Ranger virtual space that they would like be interested in.

1. **Dynamic Content** – Tweens want a site that is constantly updated and changing. They want to see a steady stream of updates from their friends, including the photos that they've taken, the badges that they've earned, and the status updates that they've posted. Through features that allow tweens to log in and easily find new content that is related to their interests and their friend, they can feel connected to the Junior Ranger community. Tweens are interested in viewing updates from the parks through live webcasts and webcams, event notifications, and park profiles constructed from tween and park professional contributed content.
2. **Personalization** – Tweens are interested in engaging in a social media environment through the ability to customize elements of the site to make it their own personal space. This involves building an avatar, saving information or media they like, and developing a profile page. The ability to personalize a virtual space allows users to develop their virtual identity as it relates to social dynamics and science interests. This also allows tweens to build their reputation and show off their accomplishments by earning accessories for their avatars which they can display to other users.
3. **Connected learning** – Tweens believe that virtual park experiences should connect to experiences at the physical parks. Tweens want to interact with the parks remotely through options to chat with a ranger, view live webcasts and webcams, and contribute to profiles of the parks online by uploading their own media. Tweens also have interest in a virtual experience where engagement across the site is fluid and that different site features should be linked. For example, earning a badge in a game should post an update to your newsfeed, allow you to decorate your ranger avatar with the new badge, or give you the option to save the achievement to your scrapbook.

Figures 1-4 present feature ideas co-designed with tweens that highlight relevant opportunities for new media and science literacy development. The science learning in action section provides an example of how a specific science topic (pollution) can be deeply explored through engagement in a variety of features. The new media and science literacies from Table 1 are referenced in these featured descriptions. Appendix B also provides a supplementary narrative to demonstrate how tweens can participate in various features of the site in a manner that promotes both social engagement and learning.

# Virtual Park

**Pl Pe Si Ci**



## Description:

The virtual park combines an interactive virtual world with gaming and socialization. Tweens are able to engage in an interactive scavenger hunt while learning about nature, play games related to park content, and earn badges and achievements which would allow them to customize their avatars. This will allow tweens to experiment, play and explore with science content; allow them to take on the roles of scientists and park rangers; interact with realistic models of science concepts; and share their knowledge with others.

## Science Learning in Action:

Tweens interact with models of the watershed to see how pollution moves from the city to the wetlands. They will experiment in real time with changes to an ecosystem, and develop identities by earning badges representing their accomplishments.

**Qu Ei Id Mo Ec**

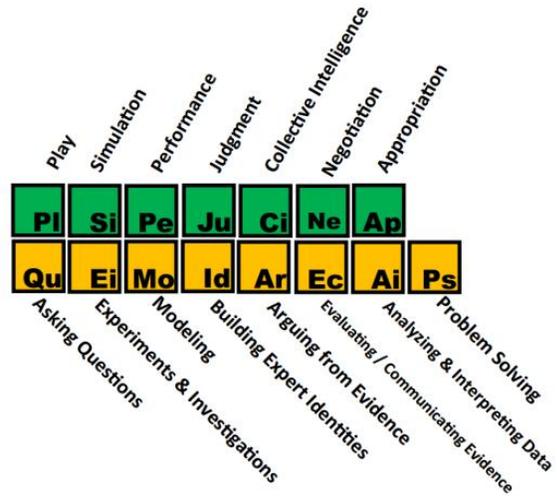


Figure 1: Virtual Game Feature

# Scrapbook



This photo contains a person. It is shared in your inner circle only.  
 This photo was taken at **Saratoga National Park** (change tag).  
 This photo has been pinned by 4 of your friends.  
 If this photo contains inappropriate material, click [here](#) to flag.

## Science Learning in Action:

Tweens can take pictures of ecosystems around their house, pointing out both healthy and polluted areas. This connects what they've learned at the parks to their personal lives. If a tween subscribed to a forum about green initiatives and someone posted an infographic about international pollution, then the tween could also save this to their scrapbook page on pollution. Tweens would be able to view and save pictures from many other tweens who are connecting science to everyday life and discuss these connections in both picture comments and in public discussion forums.

**Ec Ai Ps**

**Ci Ne Ap**

## Description:

The scrapbook lets tweens share media with one another. This includes not only pictures taken at the parks, but also screenshots from the virtual park and pictures of badges and achievements earned in games. Tweens can save items they like from other users' public scrapbook pages and comment on their friends' content. The scrapbook allows tweens to share their experiences at the parks with others, while also viewing park related media submitted by tweens around the country. Tweens can share what they've learned on the site with their friends by saving achievements that they're especially proud of as well as customizing their experience with content from the parks and from other tweens.

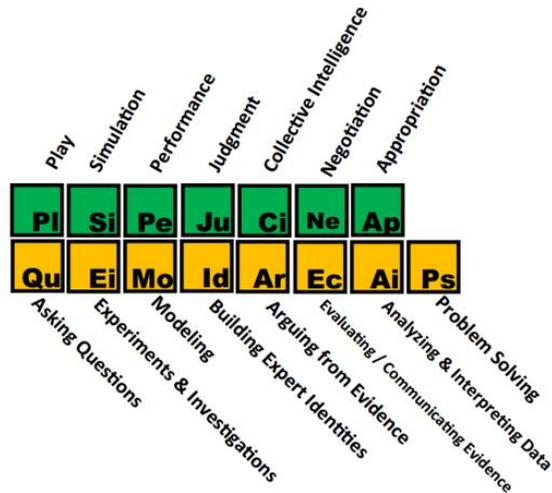


Figure 2: Scrapbook Feature

## Newsfeed

- > Kenilworth Aquatic Gardens live ranger [webcast](#) starting at 12:10 PM.
- > Harper's Ferry announces new event 6/24 at 1:00 PM, [Civil War History](#), take a tour of the town and learn about its history. Participants will be eligible for the [Young Historian badge](#). 🌟
- > You earned the [Water Conservation badge](#) in [Watershed Hero](#). 🏆
- > [lilypad23](#) (in your inner circle 🗺️) added a new photo to the [wildlife board](#) on her scrapbook, click [here](#) to view it.
- > You found a hidden Heron Statue in the [Aquatic Gardens Scavenger Hunt!](#) Click [here](#) to pin this to your scrapbook. 📌
- > A new conversation thread has just been added to the discussion board [Keeping Nature Healthy](#): "what do you do 2 help w/ pollution?" 🗨️

5 Other Notifications, Load More ▼

### Science Learning in Action:

Tweens can receive live updates from parks they subscribe to. A park can post information about a community clean-up day, where the tween can learn about what it takes to keep the environment clean while earning special badges on the site in exchange for participation in the event. A tween subscribed to a forum on pollution will get updates every time a new discussion started about that topic, such as another Junior Ranger's experience with recycling, or a park ranger's post about current events related to sustainable energy.



### Description:

The news feed is a central part of the site where tweens get updates of what they have done recently on the site, new status updates from their friends, and notifications of live streaming content from the parks, such as webcam activity or an upcoming in-person event. For example, when a tween earns a badge in a game, their friends' newsfeeds will automatically update, or if a park was having a community day with science activities, tweens subscribed to that park will receive an update. The news feed gives tweens the ability to negotiate the large amount of information on the site to find what's personally relevant to them.

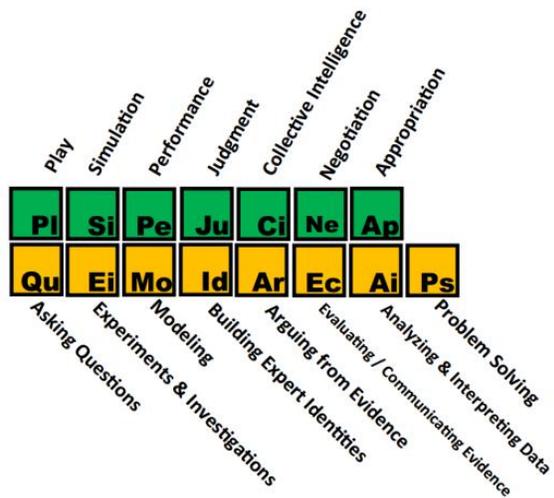
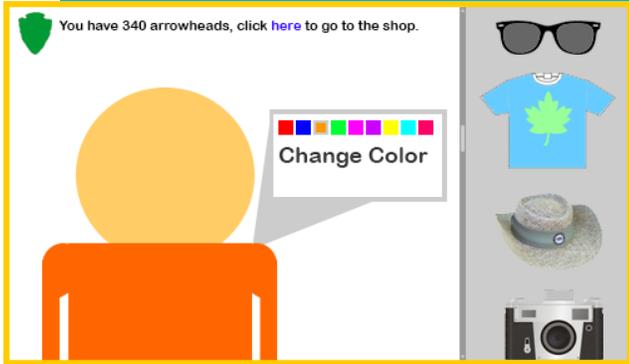


Figure 3: Newsfeed Feature

# Avatar Building

**PI Pe**



## Description:

The avatar is a feature which is present across all areas of the site: acting as a representation of the user on the virtual park, in games, and as in forums and discussion threads. The avatar is developed as the tween earns badges and accomplishes special achievement on the site (for example, reaching a certain score in a game, or uploading twenty photos to their scrapbook). This allows tweens to build virtual identities and show others what they've accomplished. By participating in the various activities across the site tweens can earn points which can be spent on accessories and other customization options.

## Science Learning in Action:

After attending a park clean-up day, a tween is rewarded with a code they can use of the Junior Rangers site which unlocks a "Go Green" badge to put on their avatar, and earns them 50 points. They also have enough to get a park ranger hat for their avatar. After hitting 100 points in a game about how the health of the wetlands is tied to the quality of seafood like oysters and crabs, a Tween user is rewarded with a "Conservationist" badge and microscope t-shirt that they can display proudly on their avatar. These features showcase the tween's identity as a budding scientist.

**Id**

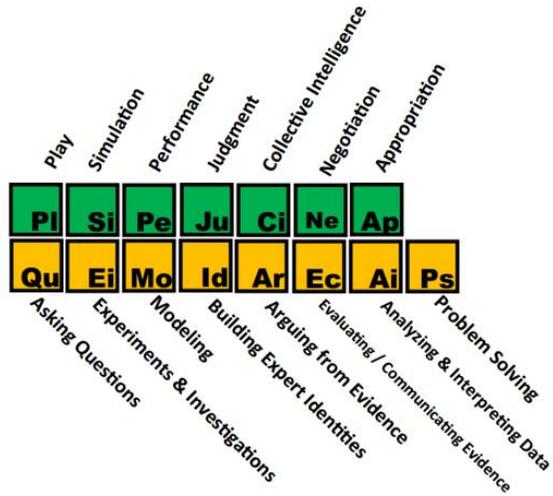


Figure 4: Avatar Building Feature

## **Part 4: Online Safety**

Privacy issues present a core concern for learning institutions seeking to engage a tween population virtually. Online safety for kids is not just an organizational consideration, but also has its own federal regulations in the form of the Children’s Online Privacy and Protection Act (COPPA) (*Children's Online Privacy Protection* (n.d.)). In order to assist learning institutions in complying with the technical aspects of COPPA, a *COPPA Compliance Checklist* is provided in Appendix A.

COPPA has intentions of protecting kids but has an unintended consequence of preventing tweens from legally participating in much of online culture until they are thirteen years old (Grimes & Fields, 2012). Furthermore, recent studies have shown that teens are sharing more personal information online than they did six years ago as a likely result of developing platforms as well as evolving social norms related to sharing information (Madden et al., 2013). Although sharing information is not necessarily harmful, it does carry its own risks and presents reasons for both tweens and teens to be cognizant of the information they make public at a young age.

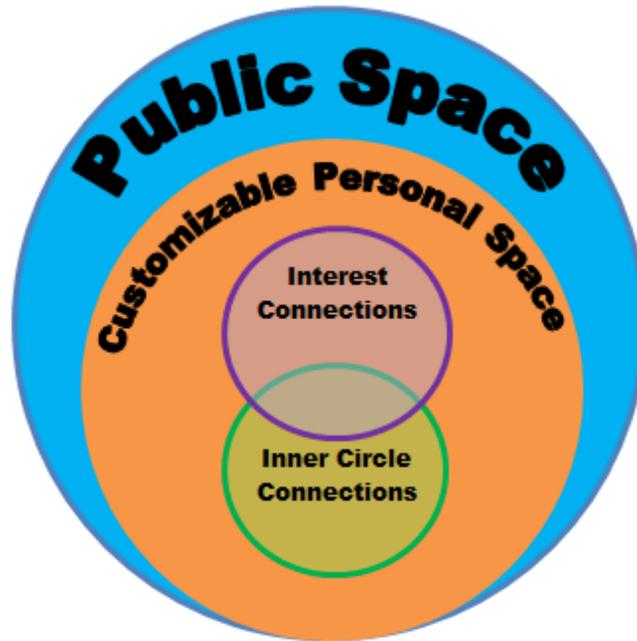
This section of the guidebook provides recommendations for keeping tweens safe while providing a critical learning environment through social media engagement. Appendix B also provides a narrative that illustrates how privacy is related to engagement and learning and privacy elements may play a role in a virtual Junior Ranger community.

### **4.1 Recommendation 1: Layer community spaces**

The main challenge in designing recommendations for a virtual tween space is balancing freedom and protection. In co-design sessions, tweens expressed frustration at being restricted from sites due to their age and stressed that a virtual space should give tweens the freedom to do what they want online. These freedoms included creating personal profiles, sharing media, interacting with peers, and having access to constantly changing site content.

By recommending both public and personal space, we intend to provide a structure that allows for interpersonal engagement on the site while promoting tween and parent engagement in safety decisions. These spaces incorporate different engagement and privacy features that will promote discretion in the sharing of information while providing a means of connecting tweens across geographic and socioeconomic differences that may otherwise separate them.

Two main spaces are recommended to impact both the safety and community dynamics of a Junior Ranger virtual space, as can be seen in figure 5: *Layered community structure*.



*Figure 5: Layered community structure*

Both spaces provide for interaction between Junior Ranger community members as well as between members and park content, but the personal space features will allow tweens to customize a newsfeed of information they receive. The newsfeed is influenced by updates on activities from their inner circle of known friends and interests that tweens choose by subscribing to park profiles, forums, topics, and people.

Figure 6: *The Privacy Ecosystem* provides a breakdown of the various types of interactions available within the layered environment of the virtual community. The subsequent sections detail each component of the proposed layered community and the privacy implications associated with these recommendations. The descriptions below describe the types of personal information and activity updates that could be visible to the public and inner circle connections, but it is also recommended that tweens and parents be able to customize their privacy setting for their public and inner circle connections.

## The Privacy Ecosystem

Each element on the site exists with certain restrictions on how information is shared. The directional lines in the diagram below represent different relationships between users and site features. Solid lines indicate a relationship where full information is shared based on a trusted relationship between the parties. Dotted lines represent limited sharing of information, like username and avatar. Arrows represent the direction in which information is flowing.

- 1. The Park Profile** - Tweens can upload media and blog posts to park profiles. Parks which the tween subscribes to will send updates to their newsfeed with a link back to the park profile page.
- 2. Discussion Forums** - Tweens can participate in discussions about different park topics (for example, wetland conservation) with only their public information visible. Updates on conversations that the user has participated in will update to their newsfeed.
- 3. Shared Interest Connections** - Tweens can connect to peers on the site that they don't know in real life by subscribing to them. This is a one way connection where the subscriber will receive updates in their newsfeed with their connection's recent public activities. Tweens can control what information is public to these connections and can manage settings so approval is needed for an interest connection.
- 4. Topic Updates** - Tweens can follow a specific topic and get notifications in their newsfeed whenever new items are added which are tagged with this topic (for example, tweens can subscribe to the tag "beavers"). This is a one way relationship and no information is shared.
- 5. Inner Circle Connections** - Real life friends who have a parent-approved connection on the site can share some personal information with one another. A tween's feed will also be populated with the activities of their inner circle connections.
- 6. The Parent Digest** - All interactions on the site are shared to the parent digest, which parents can adjust for content delivered and frequency of updates.
- 7. The Wider Web** - Some material is shared to the wider web, such as forum conversations, and park profiles. This content is subject to community community and administrative moderation.



Figure 6: The Privacy Ecosystem

### **4.1.1 Public Space**

The public space is intended to shape the Junior Ranger community as a whole. This will be a space where tweens can interact with a variety of information about the parks and park related content while having a very limited ability to disclose identifying information about themselves. As minimal personal information is collected in the suggested features for this space, participation in these sections of the site do not require parent consent, although a connected parent account is strongly recommended.

Some of the features envisioned for this space require a username for functionality purposes, such as creating an avatar that will be visible in games and other site interactions. Requiring a user to register may also prove helpful in creating a sense of accountability on the site as all registered users will be able to flag problematic content in the site as well as be flagged themselves (see section 4.2: *Empower tweens*).

Sites may also choose to make public site content visible to all site visitors without a login. Following the example of the MIT programming space, Scratch, all publicly posted content and associated username (with no identifying information) can be viewed by any visitor to the site, with or without a username. The NPS may be interested in this option in order to allow site visitors to see the type of community created by Junior Rangers and to view content such as park profiles without taking part in interactive site features. Although registration could be required for all features and user abilities, the list below indicates elements that could be visible to unregistered users.

#### **Public Features (registered user):**

- Profile – username and avatar, home park, personal interest
- Create and view public statuses – this can be customized so tweens and parents can limit status viewing to only their inner circle if they choose.
- Add stories/photos (no faces) to park profiles
- Comment on park webcams and start related forum topics
- View and contribute to all forums that will be moderated by automatic flags, peer flagging, and administrative moderation
- Ability to “mention” other usernames in forums and statuses in order to engage in public conversation
- Participate in the “Ask a ranger” forum
- Play interactive games - the game environment would be shaped by player actions and can have related forums where users discuss aspects of the game
- Tag usernames of all connections in status updates and forums

#### **Public Features (visible to non-registered users):**

- View webcams in the park

- View park profiles
- View forums
- View user avatar and username connected to park profile elements or forums

#### ***4.1.2 Customizable Personal Space***

Forums and park profiles provide public space for discussion, collaboration, and sharing of media that does not include identifying information, but may not involve all users in a personal manner. The recommendations aim to support connections between known and unknown peers through both interest connections and inner circle connections.

#### **Interest Connections:**

Recent studies show that teen friendship networks strongly reflect their local network, or people they know and interact with in real life (Madden et al., 2013). We encourage these connections in the Junior Ranger online space, particularly through the inner circle capabilities described below. We also want to provide a way for tweens to connect to those they do not know in real life in order to support each other's interest in science and the parks. In order to achieve this, the customizable personal space includes a personal newsfeed that is influenced by inner circle connections as well as subscriptions to three types of elements:

- **Subscribe to a forum**- Any registered tween can add to a forum, but tweens can also choose to subscribe to the forum in order to receive updates on new posts in their newsfeed. By subscribing, tweens can easily keep up to date on new activity in the forum.
- **Subscribe to a park** - Any user can contribute to a park profile, but if they subscribe to the park, their newsfeed will include notification of new content as well as park news, updates, and events that are posted by park professionals.
- **Subscribe to a user** - Without adding someone to the inner circle, a user can receive updates of a user's activities online by subscribing to that user. Tweens can also tag the username of their interest connections in status updates or forums. Tweens and parents can manage their settings to allow anyone to subscribe to them or to require an approval before allowing others to subscribe. A subscription is a one way connection, though two users are able to subscribe to each other. Users can also determine the types of information that will appear in others' newsfeeds, but only public (and non-identifiable) information will be released. User behavior that shows in a subscribed newsfeed may therefore include:
  - When a tween adds content and media to park profiles
  - When a tween contributes to a forum
  - When a tween posts a new status update
  - When a tween earns a badge
  - When a tween changes their avatar
  - When a tween mentions one of their connections in an update or forum post

Receiving updates on new information will contribute to the dynamic feel of the website and place an emphasis on what is new and interesting in the parks. The purpose of this community layer is to create a space in which peers can connect based on personal interests without disclosing information that they have not already made public (i.e. no identifying information). Participation in the public and interest layers of the network therefore do not legally require parent consent, but parents will still be able to and encouraged to be involved (see Section 4.3: *Creating a positive parent culture*).

### **Inner Circle Connections:**

The inner circle is intended for a close and local network of peers. As in the interest connections described above, inner circle connections' recent activities will be included in a tween's personal newsfeed. The inner circle must be a reciprocal connection: both users must accept an inner circle connection in order to become part of each other's inner circle. In addition to influencing the newsfeed, the inner circle allows tweens the freedom to interact more closely with known peers and share content that includes personal information.

This sharing of content also more closely mirrors how information is shared in mainstream social media sites than many kid-oriented site do. This will not only make the site appeal to tweens who desire social interactions online, but will better prepare tweens for interactions in mainstream sites they are legally allowed to use at age thirteen. Again, it is recommended that privacy is customizable within each community layer. Although tweens should not be permitted to share more than the information listed below, tweens and their parents can choose to share less information in any of the features.

### **Inner Circle Features:**

- Profile – additional fields
  - First Name
  - Gender
  - Age
- Personal Scrapbook – additional features
  - Save content from inner circle members
  - Upload photos with faces
  - Share photos with faces (in addition to non-identifying content) with inner circle connections
  - Tag usernames of inner circle friends in status posts and media

The inner circle environment is more secure than mainstream sites due to the parent verification and parent involvement mechanisms recommended as part of the proposed site structure.

## **4.2 Recommendation 2: Empower tweens**

Freedom online is not only related to the function and structure of the site, but also to established mechanisms for moderating site content and behavior.

Moderation can occur on both the administrative and community level. On the administrative level, for example, a site that allows tweens to post pictures may also require that every image is approved by an adult moderation team prior to being posted. Such practices are costly and time intensive. Thorough administrative moderation gives the operating institution more control over the information in the website, but it also contributes to a site culture that relies on adult surveillance to ensure a safe environment. Conversely, community moderation can be established if tween users are given responsibility for maintaining a safe and positive environment. By allowing tweens to contribute to the establishment of community rules and expectations and giving them the option to flag inappropriate content, tweens can be encouraged to take ownership over the environment. Parents in this study recognized the value and practicality of employing both administrative and community moderation techniques in a tween virtual space and also expressed interest in having tweens take responsibility for a positive site environment.

In terms of current practices, sites aimed towards kids employ a variety of administrative and community moderation mechanisms that shape the culture of engagement and empowerment on the site. Webkinz and Scratch represent two sites that include tweens as a targeted audience, but they engage the users in safety practices in different ways. Neither site collects personal information from users.

Webkinz is a site designed for kids ages six to thirteen where kids can adopt and care for a virtual pet. Kids can win accessories to give to their pet or friends' pets on the site. In the free version of the site, there is a chat feature with controlled language which prevents kids from typing information to others. Although no parent verification is necessary as the site does not collect personal information, those who report their age as under thirteen during registration are required to enter a parent email address. The parent is emailed when the account is created with the account password and information about creating an optional parent account.

Scratch on the other hand is aimed towards an older age group with a majority of users between eight and sixteen, with the largest peak in users at age twelve (Resnick et al., 2009). Scratch provides information for parents on their homepage and also asks for a parent email if the user reports an age under thirteen, but no notification is sent when the account is created and there is no option for a parent account. The user is able to create and collaborate with others and participate in community forums. All interactions on the site are moderated by a team at MIT as well as peers through flagging.

Both sites adhere to COPPA but feature different privacy environments that correspond to the different age groups the sites target. While Webkinz provides more administrative surveillance,

Scratch incorporates a mixtures of administrative and community moderation practices. These differences affect the function of each site as well as their focus on empowering users.

In order to keep tweens safe and encourage them to be active proponents of their own safety, it is recommended that the NPS employ both administrative and community moderation mechanisms. This will provide the NPS with oversight of activity and questionable behavior on the site while simultaneously empowering tweens to take ownership over the environment.

#### **Recommended administrative environment controls:**

- Restrict personal information collected (i.e. not collecting the tween's contact information other than email)
- Restrict publically viewable personal information (via default and customizable settings in public and personal spaces)

#### **Recommended administrative moderation:**

- Automatic flagging in forums of inappropriate language or strings that resemble phone numbers or addresses, excessive peer flagging
- Administrative review of automatic flags

#### **Recommended community moderation:**

- Tween input on rules facilitated through safety discussions on community forums
- Peer flagging

### **4.3 Recommendation 3: Create a positive parent culture**

In addition to the features of a site and role of peer moderation, parent participation also varied across popular sites targeting tweens and kids. Three recommendations for parent participation are parent verification, parent digests, and parent moderation.

#### ***4.3.1 Parent verification***

Most sites avoided collecting personal information from those under age thirteen, so parent verification was not required. As the recommended virtual space includes space for kids to share personal information with their inner circle in the form pictures with their faces associated with their name, a parent verification mechanism is required. In Appendix A, approved verification mechanisms are listed.

#### ***4.3.2 Parent digests***

When discussing privacy concerns, parents referenced different practices they used to ensure that their tween is safe online including not allowing them to use certain platform, sitting with their tween as they use social media, joining social networks and connecting to their tween's account

through friending, or tracking their tween's search history and logging into the tween's account to view their interactions.

Parents expressed hesitations about their child's actions online but also made efforts to allow their tweens to use social media. Still, many of these platforms do not provide a parent role where they can easily monitor their child while remaining a positive presence online.

Both Scratch and Webkinz do not collect personal information so they are not required to contact the parent at all. If the child does enter that they are under thirteen years old, however, both sites ask for a parent email address. Scratch only uses the parent address in the case that the user forgets his or her password and needs it emailed. WebKinz on the other hand emails the parent when the account is created with information about the site and privacy and presents the option to create a parent account. In order to strike a balance between the two, it is recommended that in addition to parent verification for a tween to access an inner circle that parents are encouraged to sign up with a parent account linked to their tween's account. Instead of requiring parents to frequently log in to check activity, however, customizable parent digests options are recommended. Parents will be able to decide how often they receive a digest and what updates they would like the digest to include. The digest will also contain approval options for the release of personal information within the inner circle, such as images with faces in it.

**Examples of items a parent may choose to include in their digest:**

- New interest and/or inner circle connections
- Sharing of media with or without faces
- Tween's comments and discussion in forums
- Badges earned

***4.3.3 Parent moderation***

It is also recommended that parents contribute to moderation and safety in the virtual space by having the ability to flag content. This provides parents the option to voice their concern regarding behavior online that will be reviewed by a site administrator without necessarily feeling the need to ban their tween's use of the site. This recommendation is designed with the intent to inspire a community of empowered parents in addition to empowered tweens who feel that they can legitimately and safely participate in age appropriate social media platforms. All parent related recommendations are designed to shape the online community into a family space where both tweens and their parents/guardians are comfortable with engagement in a variety of features.

## **Part 5: Conclusion**

This study and the resulting recommendations were developed specifically for the Junior Ranger community of the NPS. However, the presented approach to a virtual community for tweens and the recommendations for promoting learning, engagement, and safety were designed with the intent that they could be adapted across a variety of learning institutions.

In particular, the privacy structure modeled in the guidebook can be adopted as learning institutions plan virtual communities that span a wide array of content. Before embarking on a virtual space initiative, learning institutions will need to consider their own history of tween engagement and use of online services. Institutions should also determine how the proposed engagement features in this handbook should be modified to best fit the institution's mission and related content.

Finally, this guidebook is representative of the first stage of developing a virtual platform for the Junior Ranger community. Through further collaboration with the NPS, we plan to test the recommendations presented in this guidebook by continuing co-design practices with tweens and parents as prototypes of the technology are developed. The research team anticipates that the recommendations will be strengthened through continued research and that the NPS Junior Ranger virtual community can set the stage for more online spaces designed for tweens that focus on creating a fun, safe, and educational environment.

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## **Appendix A: COPPA Compliance Checklist**

The Children’s Online Privacy and Protection Act (COPPA) is legislation that restricts websites from collecting personal and identifying information from kids under age thirteen (Children’s Online Privacy and Protection, n.d.). This checklist communicates information that is pulled directly from COPPA with supplementary information specific to the recommendations provided in this guidebook. The full act can be found publicly online at <http://www.coppa.org/#>

### **Which sites need to adhere to COPPA?**

All commercial websites and online services that are directed at kids are required to adhere to COPPA. In addition to commercial websites, COPPA pertains to all websites or online services run by the federal government, such as the NPS.

The following factors are considered when determining if a site targets kids:

- Subject matter
- Visual and audio content
- Age of models on the site
- Language
- Whether advertising on the site is directed towards kids
- Information specifying the age of the intended audience as under thirteen
- Use of animated characters or child oriented features

Operators of the site and the collected information are identified based on the following factors:

- Who owns and controls the information
- Who pays for the collection and maintenance of the information
- What the pre-existing contractual relationship are in connection with the information
- What role the website plays in collecting or maintaining the information

### **Collecting information**

#### ***What is identifying information?***

- a first and last name
- a home or other physical address including street name and name of a city or town
- an e-mail address
- a telephone number
- a Social Security number
- any other identifier that the Commission determines permits the physical or online contacting of a specific individual
- information concerning the child or the parents of that child that the website collects online from the child and combines with an identifier described above
- Photos, videos, and audio files that contain children’s images or voices

- Geo-location data that can be used to identify street name and name of city or town
- Cookies\*
- IP address\*

\*Cookies and IP addresses are persistent identifiers that are considered personal information unless the institution is only using it for internal operations. We are recommending that the site only use this information for internal purposes, so collection of this information is not needed on the privacy policy or parent disclosure.

***An operator is allowed to collect a child’s information for the following purposes:***

- Responding directly, on a one-time basis, to a specific request from a child. In this case, an operator is allowed to collect only the child's email address, which must be deleted after its use\*
- Protecting the safety of the child
- Protecting the security and integrity of the website

\*An example of a reason a site may use this is if it has a form where users can submit a question or comment directly to the site operator without needing an account. In order to provide a mechanism for the site to respond, the site can ask for an email but this qualifies as personal information that must be deleted after it is used for answering the question through a single email.

**Provision Checklist**

The following checklist can be used by learning institutions to ensure that they have addressed provisions included in COPPA regulations.

<b>Clear and detailed privacy policy</b>		
<input type="checkbox"/>	Names and addresses of website operators	*The NPS does not plan to work with third party providers so third party information is not required.  **Although IP Address and Cookies qualify as persistent identifiers, the information will only be used internally so details about the collection of this information is not required in the privacy policy or parent disclosure.
<input type="checkbox"/>	Type of information collected from kids	
<input type="checkbox"/>	Description of how information will be used	
<input type="checkbox"/>	Notice of how information is disclosed to third parties*	
<input type="checkbox"/>	Disclosure to parents of any information collected on their children by the website.**	

<b>Visibility of privacy policy</b>		
<input type="checkbox"/>	Posted in a visible place on every page where personal information is collected	In reference to the recommendations, the privacy notice should be linked to: <ul style="list-style-type: none"> <li>• where tweens are able to log into the site</li> <li>• where tweens can post to the inner circle</li> <li>• In parent digests</li> </ul>
<input type="checkbox"/>	Clear statement that “use of the site is conditioned upon the acceptance of the privacy policy” (epic.org)	

<b>Verifiable parent consent before collecting information from kids. At least ONE of the following should be employed:</b>		
<input type="checkbox"/>	Signed parent consent forms that are mailed or faxed to the site operator	Usage of a safe harbor program that offers age and parent verification services is recommended, such as <i>Aristotle, Inc.</i> For other programs, see the <i>Safe harbors</i> section below.
<input type="checkbox"/>	Parent credit card information (a completed transaction is required)	
<input type="checkbox"/>	Parent call to a toll-free number	
<input type="checkbox"/>	Digital signature in a parent email	

<b>Provide opportunities for parents to review and approve child’s involvement</b>		
<input type="checkbox"/>	Opportunity for parents to review child’s information.	
<input type="checkbox"/>	A Right to revoke consent and have information deleted	
<input type="checkbox"/>	Ability for parent to delete certain information	

<b>Virtual Games</b>		
<input type="checkbox"/>	Enable kids to participate in online games and contest without disclosing “unnecessary” personal information	The recommendations will adhere to this provision by putting gaming and contest features in the public space

<b>Site operators must protect personal information that is collected from kids. FTC-suggested protection practices include:</b>		
<input type="checkbox"/>	Passwords to access personal information	These recommendations assume all three of these mechanisms are used
<input type="checkbox"/>	Intrusion-detection software	
<input type="checkbox"/>	Secure web servers and firewalls	

## **Safe Harbor Programs**

Safe Harbor programs include varying privacy related services that are approved by the Federal Trade Commission (FTC). Approved services include:

- *Aristotle International, Inc.*
- *Children's Advertising Review Unit*
- *ESRB Privacy Online*
- *Entertainment Software Rating Board*
- *Privo, Inc.*
- *Truste*

## **Additional Resources:**

<http://www.coppa.org/#>

<http://business.ftc.gov/documents/Complying-with-COPPA-Frequently-Asked-Questions>

<http://business.ftc.gov/content/safe-harbor-program>

## Appendix B: Narrative Description

The recommended virtual space will provide engagement in both social networking and science learning. Considering the provided recommendations, two stories are presented to illustrate how tweens might interact with the site. These narratives are based around two different tweens and assume that the new virtual space has just launched.

*Timothy: an eleven year old boy from Oregon who has been a Junior Ranger for two years and has collected 15 badges in physical parks and 40 on WebRangers.*

Timothy wakes up one morning on the weekend, and goes online to check out the latest weekly question on the WebRangers site. This has been part of his weekend routine for the past two years, ever since his parents visited Yellowstone and one of the rangers gave him his first Junior Ranger Badge and told him about the program. Timothy loves nature, and always tries to convince his family to visit a national park when they're traveling so he can get more badges. He also loves the WebRanger program, and enjoys earning virtual badges by playing games and taking quizzes. However, recently, he's been wishing it was more like the interactive world in Minecraft that he plays on the server that his friend's mom has set up for them.

Today when he goes on WebRangers he sees that the site has changed completely. He enters his username and password, and is greeted with a message "We've recently changed the WebRangers program – click here to have our virtual ranger tell you all about it." An animation explains the features of the site, finishing with, "Some of the site features are restricted until you have a parent or guardian sign up as well. This is to help keep you safe online. Doing this will open up the rest of the site, and will also earn a badge for your avatar. Have fun 😊" Timothy thinks for a moment... he's faked his age before, but that was when he wouldn't be allowed on the site even if his parents approved. He decides to go downstairs to get his mom.

After a few minutes of explaining the site to his mom, showing her that it's affiliated with the National Parks, and going through a short two minute tutorial video with her, she agrees to put in her email as a parental guide. She has a few questions to answer: how many updates does she want in her parental digest, how often would she like to get the digest, and would she like to restrict any features on the site. Each question has tool-tips that help her to make decisions, and since she trusts Timothy online she goes for a very broad overview of site activity, parent digests every 10 days, and gives Timothy open access to the site, including having an inner circle of friends with whom he can share photos of himself and others. As she's filling this out, she has a conversation with Timothy about what she expects, and how she'll be keeping an eye on him.

Now that Timothy has full access to the site, he starts exploring. He sees that the parks all have profiles that tweens who have visited them have contributed to. He remembers the pictures he took of geysers at Yellowstone 2 years ago, and uploads a few. The site uses some automated scanning processes, doesn't detect any people or questionable content in the images, and automatically adds those pictures to the park profile with Timothy's username (@ash34).

Timothy sees that someone else has uploaded a cool picture of deer in a meadow, and he clicks on it. He really likes the picture, so he adds this image to his scrapbook and writes a comment to the user (@hockey\_guy) “gr8 picture!” A notification pops up in his newsfeed “You’ve earned the Communicator badge (10 points)”. Timothy clicks on this, and sees an option to add this achievement to his scrapbook, which he does. He also sees a link to his avatar, which he clicks on. Right now he has the default, faceless, gray avatar, but decides he wants to change it. He notices that each of the badges he’s earned on the old site have transferred over, and all of them have unlocked special customization options for his avatar. He puts on a park ranger outfit, changes the avatar’s features to look like him, and uses the walkie-talkie accessory he just earned from the Communicator achievement to put a cool looking headset on his virtual self.

A notification pops up in his newsfeed “@hockey\_guy has added your picture to his scrapbook, you’ve earned the Junior Guide badge.” Timothy clicks on @hockey\_guy’s name and looks at his very limited public profile – nothing more than an avatar and a username. He decides that he seems like a cool person who might know more about the site, so he sends him a friend request. “Your request has been sent. If @hockey\_guy accepts, he will be added to your interest connections and you will be updated when he has added new content.”

Timothy realizes that he’d agreed to meet his friend Erin at the park near their house to ride bikes, so he decides it’s time to log off. Erin was also part of the WebRangers program, and Timothy can’t wait to have a friend he knows in real life on the site. Timothy turns off his computer, excited to tell Erin all about the cool new site that he discovered this morning.

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*Sally: a twelve year old girl from Baltimore. A NPS ranger recently spoke at her school, but Sally has never been to a national park.*

Two weeks ago rangers from the National Parks came to Sally’s middle school to talk about pollution, and how tweens like her could help keep the water cycle clean. They brought in animals that live in wetlands, showed the students a model of the watershed, and told them about all of the important things that clean water gives to society – like fresh seafood, drinkable water, and clean beaches. They also introduced the new online Junior Ranger community, saying that it was a social networking site where tweens could go online, learn about nature, and have fun.

Sally’s own experience with social networking had been a mixed bag. She’d been bugging her mom to let her get a Facebook account like the other girls her age (who usually lied, saying that they were 80 and lived in Denmark). Her mom, who didn’t know much about Facebook, was too nervous to allow Sally to get an account. Since they only had one shared computer in the house, and her mom checked the history regularly to keep an eye on Sally, she wasn’t able to make a fake account like her friends. She also wasn’t comfortable with lying to her mom, even if she was somehow able to make an account on a friend’s computer.

Sally and three of her friends were excited by the parks site, despite never having been to parks themselves. They agreed to all make accounts and friend one another on the site. Sally took the explanatory brochure about the site home to her mom and talked it over with her. They looked at the site together, and since her mom was able to sign up for a parent digest to make it easy to keep an eye on Sally, and Sally's mom agreed to sign up for the site with her. Sally and her friends were soon connected on the site, and they found that they really enjoyed exploring virtual parks together. They were able to take pictures of their adventures in the game world, share the screenshots among themselves, and give each other hints on earning the really tricky badges or accessing the hidden achievements located in some areas of the park. Sally had always liked playing games online, and these games made her feel like she was actually doing something instead of just wasting time by herself shooting aliens.

In just a few days Sally had a fully decked out and personalized avatar. She would regularly guide new players when her friends weren't around – showing them cool things in the game world, and giving them advice on using the site through the forums. She would also keep an eye out for tweens who would come in just to cause trouble. Each message had a little flag next to it, and if she saw someone making fun or bullying another user, which she couldn't stand in real life, she would flag them to let a moderator know. She soon had earned a rare badge called “Community Leader”, awarded to her by the rangers who provided live moderation for the site.

One day she received a notification in her newsfeed: “This weekend Kenilworth Aquatic Gardens is holding an Environmental Awareness Fair! Come by to see how you can keep our water clean, how the wetlands work, and earn access codes to get one-of-a-kind items for your avatar!” With a little bit of convincing Sally and her mom decided to go.

At the fair Sally was amazed at how much fun she had exploring nature in the park. She used a microscope to look at the tiny life you could find in just a few drops of water, she took pictures of herons and geese to upload to her scrapbook, and she exchanged usernames with other Junior Rangers that she had met during the fair, making her network that much bigger.

Her visit to the park made Sally start thinking about entering her school's science fair, which she had never considered before. She wanted to study how the water that flowed off the streets in her neighborhood affected the health of the Chesapeake Bay. Knowing that she had a huge network of friends on the site, she decided to post a new thread in the science forum asking them for advice. Sally was excited to bring what she'd been learning on the site in to real life.