

# A Gamification Approach: Utilizing Citizen Science to Increase Interest in STEM



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# What is ecoEXPLORE?

- ⦿ Created by **The North Carolina Arboretum**, an affiliate of the **University of North Carolina**.
- ⦿ Goal: **Increase interest in STEM** (Science, Technology, Engineering and Math) education and careers in North Carolina's students, particularly in underserved populations.
- ⦿ Uses **gamification** to involve children and families in exploration of the outdoors and biodiversity, while providing baseline species data for research scientists and resource managers.



# Outcomes Hierarchy



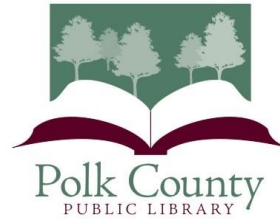
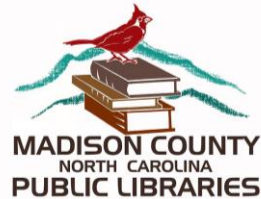
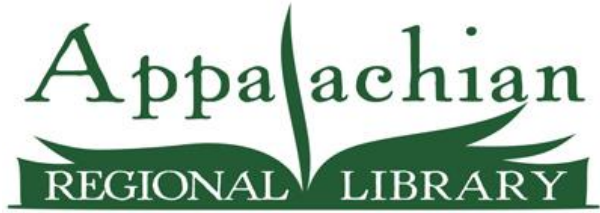
# A Model Built on Collaboration



Statewide Participating  
Institutions



# A Model Built on Collaboration



Regional Participating  
Institutions

# Knudson's Top Principles of Gamification

1. The experience **evolves with the user**.
2. Identify the “**Core Loop**”.
3. **Limited** resources.
4. Instill a sense of **ownership**.
5. Integrate **social** to your experience.



# Knudson's Top Principles of Gamification

## 1. The experience evolves with the user.

- Participants receive more valuable **Field Tools** as they earn more points by making more **Shares**.
- Participants participate in four different **Field Seasons** with new **Field Badges** and requirements each season (Botany, Herpetology, Entomology and Ornithology).
- Participants completing all Field Badges may earn **Bonus Badges**.



# Knudson's Top Principles of Gamification

## 2. Identify the “Core Loop”.

- Submitting **photo observations and data** within designated field seasons. Reinforced by:
  - **Points** are earned by submitting **photo observations**.
  - A **bonus point** is earned when organism aligns with **field season**.
  - **Website** homepage includes a **Leader Board** with top point earners.
  - All **Field Badges** and **Bonus Badges** require observations.





# Knudson's Top Principles of Gamification

## 3. Limited resources.

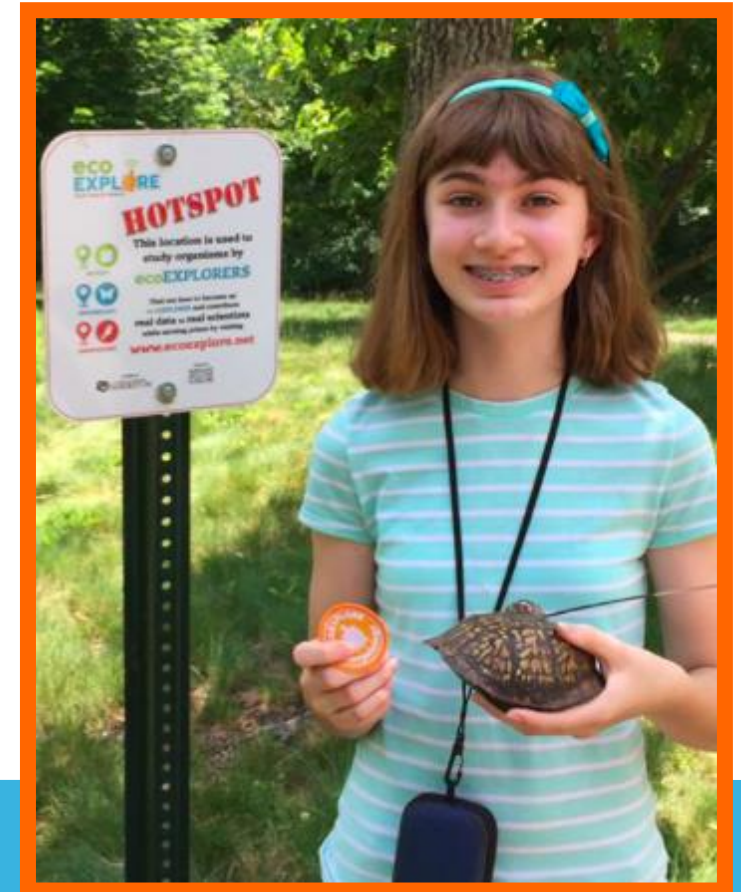
- Only **ten observations per day** are permitted.
- **Field Badges** can only be earned during the **designated season**.
- No more than **five points** can be earned for a **single observation**.
- Users must visit a **HotSpot** in order to accomplish a **five-point observation**.



# Knudson's Top Principles of Gamification

## 4. Instill a sense of ownership.

- Users choose an **ecoEXPLORE Username**.
- Each participant receives a **logo patch upon registering**.
- Each user has an **online dashboard** where they can view their **observations, point totals and digital versions of badges**.
- **Field Badges** and **Bonus Badges** can be displayed on a **field bag**.
- The leaderboard displays a **running total** of points for the top participants, regardless of their current point balance.





# Knudson's Top Principles of Gamification

## 5. Integrate social to your experience.

- Participants attend **Season Summit** programming to earn badges.
- Observations are **reviewed and commented** on by Arboretum **education staff**.
- Observations are placed on the **iNaturalist online network** where they receive **comments and additional identification** from a worldwide network of naturalists and scientists.
- An **Observation of the Week** is added to the ecoEXPLORE **Facebook page**.



# Demonstration: Three Perspectives

## ecoEXPLORE User Experience

- See It, Snap It, Share It
- View comments and iNaturalist page, revise identification

## Arboretum Staff Experience

- Review observation, comment, award points and post to iNaturalist
- Review updated ID and award additional points

## iNaturalist User Experience

- View observation on iNaturalist, suggest ID



# For More Information:

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