# Summary of Citizen Science Research and

# Ideas to Support the Ripple Project

# What is Citizen Science?

Citizen Science is a collaboration between researchers and everyday citizens to solve everyday questions. Both parties work together to gather, identify, and analyze data. Citizen Science is a unique branch of science because it lacks boundaries in that it allows for international coordination and discussion with the prevalence of the internet.

Citizen Science involves everyone, any age, any education and simply asks for participants to have curiosity or a desire to contribute in some way. It is quickly growing as a means of research and being adapted by more researchers in their projects. The development of the internet has vastly helped this trend because it allows a community of scientists to communicate via the internet and erase previously established boundaries of location and distance.

It is important to realize the citizen scientists are not necessarily formally trained in the field of study, but have some investment in the topic being studied and feel motivated to help out in any way they can.

*Interesting fact to note:* Citizen Science is in no way a *new* form of science, but rather it is a shift back towards the old. Science as a profession is a relatively new idea and became an offshoot of the humanities in the mid-19th century. Strange to think the humanities were once joined and the thinkers of the time labeled themselves as philosophers.

## Why relevant?!

Science has always been driven by a curiosity and traditionally involved an average person (not necessarily science related) asking questions and taking steps to have it answered through trial and error. Citizen Science brings science back to the community and allows for a far larger pool of data collection as well as more human thought considering the question at stake.

Citizen Science is relevant now in this day and age for multiple reasons:

1. Over the last century (even last 10 years!) technology has developed and more data and information then ever needs to be processed and analyzed.
2. Despite the computer advancements, human ingenuity continues to be superior and able to notice patterns or details computer algorithms cannot.
3. Participants can ask questions and make observations that researchers may not have seen/considered.
4. Observations, classifications, and transcribing can be completed on a large scale in a fraction of the time with the help of citizen scientists
5. It involves the community in the present concerns/problems facing scientists today.

## Citizen Science for Citizens:

Citizen scientists are driven by an interest in a specific topic/project and are motivated to become engaged in the project. They, as citizen scientists, have an opportunity to feel a part of something and help uncover information. Many citizen science projects ask participant to make observations and classify what they see, so that bigger questions can be answered (ie. Biology, astronomy, geography/weather, etc.). Pattern recognition drives a lot of the projects out there and participants are motivated to participate because they feel like they are contributing and helping out scientists. People are curious and are generally just as intrigued by the project as the researcher.

Citizen scientists interest and motivation level are key and something to discuss when developing the project. A primary goal and challenge for citizen involvement is to keep users engaged and excited about the projects (read more below).

## Demographics

The target demographic for Ripple is high school and college age (16-24).

Research has shown that demographics for citizen science has a wide range (from young kids to elder adults) and is driven more by interest then age and gender. The several articles I read did say primarily men and the average age seems to be lates 20s/early 30s. I find that data unreliable however due to the large noted age range in several of the studies (anywhere from 3-93).

In any case, I think it is apparent that there has not yet been a citizen site developed to specifically target the 16-24 aged demographic we are looking at, but that doesn’t mean there isn’t an interest in citizen science. I think it lies more toward a lack of knowledge and awareness. The college demographic has not been targeted in previous studies.

**Importance of marketing/promotion and motivational development**

Marketing strategy will be very important in engaging this age group. Ripple will need to consider various options in letting the demographic know Citizen Science is out there. High school and incoming freshmen students will be more open I think due to the transitional time they’re going through. They are looking for ways to get involved and exploring various interests they might have. Upper classmen in college will take time to participate if it is of interest to them or a group collaboration they are a part of (ie. Student organiztions)

* Residence Halls, Student Councils, Student organizations, Exponent and BGR are great resources for explaining Ripple and encouraging participation.
* Professors in department of project may be asked to share with their class for people who might be interested.
* Social Media utilized (Facebook,Twitter, etc)

### Why should participants (ages 16-25) be interested AND motivated

### to participate in Ripple?

Ripple has chosen to focus on a younger age group (16-25) and develop projects that would be of interest to them. Motivation temporally will be present if the projects are engaging, the site is easy to navigate, and they feel their participation is worth something to the project.

I think the 16-25 demographic is a great age to get involved in citizen science because during those post-high school years through college students generally have an open mind and are looking to become involved in some way. They are familiar with the web media and will feel comfortable participating in an online community.

Reasons for interest:

1. If it’s a game/challenge they participate in users will learn and understand a previously complicated idea (DNA, galaxies, etc).\
2. Open to the challenge, some projects can only be completed by human ingenuity.
3. Curiosity in the field

Long term motivation to participate will be the challenge. Ripple will need to consider motivational factors and how they can encourage continued participation in that age group.

I think the focus will need to be more geared towards intrinsic motivation factors (creating community, levels, status of research) rather than extrinsic factors (such as physical rewards)

## Citizen Science for Researchers

Citizen Science or researchers is a means of investigating a large scale problem and educating the community on said problem/concern. They also allow potential scientists a chance to engage in real research and generate other questions that the researchers may not have considered.

From the articles read, the main concern researchers tend to have is the reliability of their data compiled by citizen scientists. By participating in Citizen Science they are putting their research out there and depending on strangers not involved in the scientific community to analyze it.

However on the other side, they also are given an opportunity to have huge quantities of data analyzed in a lessened time frame that then allows them more flexibility in continuing their project and not getting bogged down in the incoming data.

Citizen Science also stands as a means of educating people outside of the scientific community and get them invested in their cause/field of study. It gains community attention and could help facilitate change (specifically in animal/plant conservation fields).

### Why should researchers be interested AND motivated to participate in Ripple?

Being located on the Purdue campus, Ripple is surrounded by various research from all fields and has a large student population as well. Researchers are familiar with students and would be comfortable collaborating with them in their research.

Several reasons why researchers would become involved:

1. Their data can be classified and analyzed in a much faster way, opening up the research to other aspects. Data analysis would otherwise take years to process.
2. Educate the community and make it their cause/concern/interests
3. Free participation in sifting through data
4. Funding- more grants look favorably at community involvement
5. Create a community that collaborates to word through the data
6. Human ingenuity continues to recognize patterns/problems more effectively then computers
7. More projects are emerging that are utilizing citizen science

Challenges (in convincing) Researchers:

1. Community and conversation is a crucial aspect in motivating Citizen Scientists to continue and will require researchers take the time to interact with their participants- it means a lot to participants to feel like they’re involved and the researchers are invested in their work.
2. Engage participants and keep them motivated long term
3. Containing project and keeping in mind its trajectory
4. Data reliability/accuracy/usability (multiple studies show most results being accurate even from young children and becoming more universally accepted as viable means of research)

## Means of Appreciation and Motivation

Motivation is a crucial consideration in Citizen Science, how will Ripple keep participants interested? I spent a ton of time this week reading about motivation and things to consider:

1. Intrinsic vs. extrinsic factors- Intrinsic is an inside motivator (ie. meaningfulness in work) while extrinsic are outside motivators (ie. pay). I think Ripple’s focus should focus on inward motivation factors.
   1. Youth culture lives in an engagement culture and are strong communicators online.
   2. They need to see meaningfulness in the work and have a choice in their involvement, that more than physical rewards will fuel motivation
   3. Show progress- they need to feel like they are accomplishing something (badges/progress bar, etc)
   4. If physical rewards are given they should be given in surprise and not be an expectation
2. Researcher need to make their goals clear to the participants and lay out what the end game is from the beginning. This should include research expectations, goals, resources, and a choice in user participation, in other words a level of transperancy
3. Researchers should approach Citizen Science as a partnership with their citizen scientist users
4. The projects should be real and relevant to the participants so they feel a sense of belonging and community within the project
5. Projects encourage users based on level of interest (NOT background/degree)

There are various reasons behind users’ motivation to keep in mind (multiple articles looked into this)

* Engage in conversation
* Sense of community
* Part of a legacy
* Raising awareness
* Questions and curiosity

There are also 2 points of motivation to keep in mind 1) initial commitment and 2) long term commitment. Engagement plays a large role in retaining participation.

# How does Ripple fit into the Citizen Science field?

## Ripple’s role in Citizen Science, what is the project hoping to accomplish

## Why Ripple (the name)?

The impact of one Ripple and its growth outward

## Site Ideas:

Simple, grayscale design with splashes of color, Image driven, mapped options (clearly labeled and navigable), transparent (easy to find info and goals)

Ease of use is essential

* Smart phone compatible
* Social media connection
* Login present, but optional- ask after a few minutes
* No cost
* Immediate start- no time delay

Open site up to accept ideas from users (possible future projects), have a forum to develop a community

Have a launch site that lists other project