ASSESSING THE USE OF CITIZEN SCIENCE PROJECTS TO IMPROVE HIGH SCHOOL STUDENT DATA LITERACY SKILLS AND ENGAGEMENT

by

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DEDICATION

This capstone action research project is dedicated to all of my previous teachers, professors, and educational mentors. I would not be the educator I am today, nor would I have the skills and aspirations I do, without you. I hope to continue to inspire future scientists, educators, and lifelong learners as you have inspired me.

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TABLE OF CONTENTS

TABLE OF CONTENTS CONTINUED

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Students are exposed to various interdisciplinary concepts in a science classroom including how to work with and understand data. Data literacy is becoming an ever more important skill employers look for. However, most high school students are lacking proficient data literacy skills. Data literacy involves basic statistical calculations such as mean, median, and mode as well as cleaning and organizing data into graphs and tables for analysis. The purpose of this action research project was to try to address the lack of data literacy skills in high school students by integrating a year-long citizen science project. Citizen science is an opportunity for ordinary people to contribute to the world of science through collecting data or observations for practicing scientists. Thirty-four environmental students at MHSS in Middletown NJ took a pre survey to assess student confidence levels in data skills, science activities, and citizen science. They also took a data skills pretest to assess actual student skill levels. Next, students took part in a yearlong citizen science project where they took photos and IDed observations using the iNaturalist citizen science platform. At the end of the year, students cleaned, organized, and manipulated their data into graphs for analysis. After completing the project, students took post tests and surveys to assess any changes in skill or confidence levels. The teacher recorded student progress in personal notes as well as conducted exit interviews to obtain qualitative results. It was found that in the beginning, most students had high confidence in their skills, but performed poorly on the pretest. After the duration of the project, all but four students out of 34 improved in their post test scores. The number of poor skill level individuals dropped from 60% to 29%. Data confidence levels increased slightly and student confidence in science activities improved. Exposure to raw and messy data through citizen science projects is a valuable tool that science teachers can and should be using to improve data literacy skill in high school students.

CHAPTER ONE

BACKGROUND AND INTRODUCTION

Middletown High School South, Middletown, NJ

My current teaching assignment is at Middletown High School South, a public 9-12 school servicing 1551 students in a suburban town of Middletown Township in New Jersey. Middletown, New Jersey, is located in Monmouth County close in central New Jersey. According to the US Census Bureau, in July of 2019, Middletown's population was approximately 65,305 people with 2.9% of the population being under 18 years old. 93.1% of the population identified as White. Within the population of individuals 25 years or older, 95.6% have obtained a high school degree or higher; 47.0% have obtained a bachelor's degree or higher. The median household income was $118,351. According to Zippia.com, the biggest industries and companies to work for in Middletown are grocery stores, plumbing supply, private schools, and the public school district (Zippia.com, 2022). It should be noted that with Middletown's proximity to New York City, many residents commute into New York City daily.

Middletown High School South is one of two high schools in Middletown, NJ. MHSS offers 18 science courses including biology, chemistry, physics, and other electives. Five different advanced placement science options and three honors level options are also offered. Students are required to take three years of lab science in order to graduate. Lab sciences include biology, chemistry, environmental science, marine science, or physics. I currently teach three sections of 9th grade biology and three sections of in class resource environmental science with one special education co-teacher.

During the 2018-2019 school year, 91% of students at Middletown High School South were White. Economically disadvantaged students were 6.6% of the student population. Only 28% of students in the 2018-2019 school year scored in the levels 3 and 4 (out of 4) and were considered proficient by the NJSLA science assessment. The NJSLA-Science is the NJ Student Learning Assessment for science. It is a federally required standardized test for all NJ students in grades 5, 8, and 11 to provide a snapshot of student performance. 90.4% of students enroll in a post-secondary institution after graduating. Overall, the school is a 1:1 device school (NJ School Performance Report, 2019).

Teaching science at Middletown High School South is my first teaching position. My background is in lab sciences, and I have previous experience completing field research classes and projects prior to starting teaching. Since beginning teaching, I have taught six months in a traditional style of teaching, and 12 months in a hybrid/remote model. Both models of teaching require different skills and materials. Within my first few months of teaching, I began to notice a trend in students' ability and confidence to work with data during labs, tests, and other class activities. I discussed areas for improvement with colleagues and the discussion almost always involved the topic of students struggling with data literacy skills. My colleagues and I noticed that students have poor skills when it comes to lab analyses, science skills test questions, and general class discussions. Science teachers in my department found that upperclassmen (grades 11-12) are not prepared to handle large amounts of data. This has only worsened during the COVID-19 global pandemic where students were not exposed to in-person laboratory activities and data collection. Freshman and sophomore science teachers will need to improve student data literacy skills and confidence to allow junior and senior teachers to scaffold off of previous knowledge.

Purpose and Significance

The purpose of this project is to improve student data literacy skills and confidence by allowing students to learn through the use of “messy” and authentic data found in citizen science. The term “messy” is used to describe “heterogeneous values, missing entries, and large errors” within a data set” (Udell, 2017, p. 439). Messy and authentic data is data that has not been pre-screened or formatted into tables, graphs, and charts for students. Hopefully, through this process students will also become more engaged in science and their achievement in the course will improve. Data literacy is “the intersection of data science, quantitative reasoning, and authentic context” (p. 439). It is most often thought of as the skills to create, read, and interpret graphs, figures, tables, and raw data. Individuals who have strong data literacy skills are able to manipulate raw data into visuals as well as analyze the numbers for trends.

Citizen science is a way for ordinary, nonscientist, individuals to take part in real science research projects locally and around the world. Volunteers can collect data for researchers, classify observations, and perform other tasks to assist professional researchers. These projects can help participants engage in science outside of an educational setting while promoting communication skills and helping researchers obtain their goals.

The significance of this project is that in an ever-advancing world full of data, students need to be more data literate. Students must understand how to look at a figure and understand the numbers behind it, or see numbers and be able to manipulate them into a visual to highlight information and trends. My interest in citizen science came from my time collecting data for my research professor during my undergraduate degree through independent study classes and an ecology course. Collecting, interpreting, and then analyzing data helped me to become a better scientist and a better teacher. The hands-on experience was also more engaging, and I was more invested in my learning experience. I hope this experience will have the same effect on my students. One of my goals as a science teacher is to boost students' confidence in their science skills, including data literacy skills. My interest in hands-on learning through citizen science and my goal of improving data literacy are connected through this project.

Focus Question and Statement

My primary focus question is, How will participating in citizen science projects affect student data literacy skills and data-confidence?

My sub-questions include the following:

1. How will participating in citizen science projects help students become aware of the importance of data literacy skills outside of school?
2. How will working through a citizen science project increase student engagement and enthusiasm towards science?

CHAPTER TWO

CONCEPTUAL FRAMEWORK

There are many parts to understanding data literacy, citizen science, and could work in unison to benefit the students and teacher in the classroom. Data literacy is looking at and using raw data to develop and understand trends of the real world through tables, graphs, or other figures. However, it is important to understand that data literacy is not only used in the classroom and assessments, but that it is also applicable in a wide variety of professions, jobs, and daily life. Using citizen science to develop a method of instructing, practicing, and understanding key parts of data literacy could be a useful classroom technique and tool for teachers who wish to improve data literacy skills among their students.

What is Data Literacy?

Schultheis and Kjelvik (2020) state that data literacy is “the intersection of data science, quantitative reasoning, and authentic context” (p. 439). It involves the ability to use raw data to understand trends in the real world through tables, graphs, or other figures. School age children are exposed to data literacy skills mainly through science or math classes. However, students rarely understand the importance of data literacy skills in the world outside of the classroom.

Data literacy skills involve three defined concepts. The first is understanding and producing information such as numerical data using raw numbers, percentages, averages, standard deviations, etc. Second, data literacy includes using that numerical data to create and understand visuals such as graphs and charts. Finally, data literacy can define data as information to be used in systems or algorithms to determine set factors such as compatibility between two things (Fontichiaro & Oehrli, 2016).

Elizabeth Schultheis and Melissa Kjelvik (2020) promote the idea of using "messy and authentic" data in classes to combat some of the challenges of data literacy. In their article, "Using Messy, Authentic Data to Promote Data Literacy and Reveal the Nature of Science," the authors discuss how students have the strongest learning experiences when they work with real, and oftentimes messy, data such as what is found in citizen science projects. The "messy and authentic" data opens the eyes of students to how they use and create data in their everyday lives.

There are two kinds of data presented to students in classrooms: First-hand, or student-collected data, and second-hand, data given to students that shows information from prior research. Both types of data are important when building student confidence and skills. It is important to use scaffolding methods when working on student data literacy skills. It has been suggested that exposing students first to simple, classroom use visualizations. Next, students should be given data sets with some data curation steps the students must take, such as summarizing or simple calculations. Finally, students can examine well-structured inquiry investigations and problems before being allowed to fully transition into inquiry and data collection on their own (Schultheis & Kjelvik, 2020).

Why is Data Literacy Important?

Schultheis and Kjelvik (2020) state "The overarching goal of science is to investigate the unknown, and the interpretation of authentic, easy data plays an important role in this process" (p. 441). Creating a project that uses messy and authentic data will not only increase student data literacy, but it will also help students to better understand the nature of science. The National Resource Council (2012) noted in "A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas" that "…there is a strong consensus about characteristics of the scientific enterprise that should be understood by an educated citizen" (p. 78). In order for students to be fully educated citizens of the nature of science, they must understand data and how it works in their lives.

"Why Data Literacy Matters" written by Kristin Fontichiaro and Jo Angela Oehrli (2016) highlighted six significant themes that school librarians should focus on when thinking about data literacy. I believe these themes are also applicable in science classrooms. One of the themes was statistical literacy, meaning the differences between mean, median, mode, and the potential of biases when collecting data. A second theme that was pertinent to data literacy was visualizing the data. Students need to be able to create and understand visuals such as graphs, tables, and charts. Fontichiaro and Oehrli (2016) posed the question of "Which came first? Learning how to make graphs? Or how to interpret them?"(p. 24). This was an important aspect to consider for the implementation of my project. A third theme discussed was using data in argument. Students should be able to use and understand when data is used informationally and persuasively. Data literacy is about "discerning correlation from causation" (p. 24). Finally, a fourth applicable theme was big data and citizen science. In this section, the writers discussed using citizen science as a student-friendly entry point into interacting with large amounts of data (Fontichiaro & Oehrli, 2016).

Data Literacy and NGSS

The Next Generation Science Standards (NGSS) were released in 2013 with the framework to promote three equally important dimensions of learning science: Disciplinary Core Ideas, Science and Engineering Practices, and Cross Cutting Concepts. Core Ideas are key areas and ideas in science that are important within or across many science and engineering disciplines. The Science and Engineering Practices examine what and how scientists investigate the real world and how engineers design and build systems. Cross Cutting Concepts follow connections between physical, life, and earth/space sciences along with engineering design. The Science and Engineering Practices and Crosscutting Concept dimensions require the most data literacy skills.

Within Science and Engineering Practices, different subcategories require specific data literacy skills. When students practice *Developing and Using Models* they can create mathematical models to represent real world phenomena. A student who is *Analyzing and Interpreting Data* is using different data literacy skills to organize and interpret and evaluate data; that is collected or provided, into tables and graphs to evaluate. The *Mathematics and Computation Thinking* category requires students to use mathematics and computer skills to assist with data comprehension (Anderson, 2019).

Specific examples of data literacy use in the NGSS include *HS-PS2-1 Motion and Stability: Forces and Interactions*- which requires students to look at data examples of Newton's second law. *HS-LS3-3 Heredity: Inheritance and Variation of Traits*- asks students to apply statics and probability to explain variations and distributions of traits in a population. There were several other examples listed on the NGSS website; however, all of them are connected through the Science and Engineering Practice of *Analyzing and Interpreting Data* (Figure 1). It is evident that data literacy skills are an important part in the NGSS and are key skills that students should learn while in the science classroom (NRC, 2013, p. 278).

Students who demonstrate understanding can:

HS-PS2-1. **Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.** [Clarification Statement: Examples of data could include tables or graphs of position or velocity as a function of time for objects subject to a net unbalanced force, such as a falling object, an object sliding down a ramp, or a moving object being pulled by a constant force.] [*Assessment Boundary: Assessment is limited to one-dimensional motion and to macroscopic objects moving at non-relativistic speeds.*]

Students who demonstrate understanding can:

HS-LS3-3. **Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.** [Clarification Statement: Emphasis is on the use of mathematics to describe the probability of traits as it relates to genetic and environmental factors in the expression of traits.] [*Assessment Boundary: Assessment does not include Hardy-Weinberg calculations.*]

Students who demonstrate understanding can:

HS-LS4-3. **Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.** [Clarification Statement: Emphasis is on analyzing shifts in numerical distribution of traits and using these shifts as evidence to support explanations.] [*Assessment Boundary: Assessment is limited to basic statistical and graphical analysis. Assessment does not include allele frequency calculations.*]

Students who demonstrate understanding can:

HS-ESS2-2. **Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.** [Clarification Statement: Examples should include climate feedbacks, such as how an increase in greenhouse gases causes a rise in global temperatures that melts glacial ice, which reduces the amount of sunlight reflected from Earth's surface, increasing surface temperatures and further reducing the amount of ice. Examples could also be taken from other system interactions, such as how the loss of ground vegetation causes an increase in water runoff and soil erosion; how dammed rivers increase groundwater recharge, decrease sediment transport, and increase coastal erosion; or how the loss of wetlands causes a decrease in local humidity that further reduces the wetland extent.]

Students who demonstrate understanding can:

HS-ESS3-5. **Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.** [Clarification Statement: Examples of evidence, for both data and climate model outputs, are for climate changes (such as precipitation and temperature) and their associated impacts (such as on sea level, glacial ice volumes, or atmosphere and ocean composition).] [*Assessment Boundary: Assessment is limited to one example of a climate change and its associated impacts.*]

Figure 1. NGSS (NRC, 2013, p. 278) standards that utilize Analyzing and Interpreting Data for the Science and Engineering Practices.

How Data Literacy is Used in the Classroom

Hogenboom (2011) notes that data literacy is used in different classrooms in different ways but most use data for some form of class demonstrations, lab and or assignments. However, data literacy is used in a wide variety of subject matters outside of math and science classes. Simmons (2021) states examples of areas where data analysis should be a cross-curricular concept including geography, social studies, any mathematics or statistics class and the sciences.

Anywhere that students are using graphs, pictures or data sets, they are using data literacy skills. Examples of this could be analyzing population growth or decline in human geography classes, reading stock market trends in economics, or graphing numerical points from story problems in math.

From the earliest stages of formal education, students are being exposed to concepts of data literacy as well as being taught to analyze data in different forms. Younger children, elementary school students, begin with handling data, observing patterns, and collecting information. This is then transitioned in the older grades into using digital software to analyze data and draw conclusions from data sets. The Data Education in School project is a team of educational researchers, professional learning consultants, digital skills consultants, and business development experts from Scotland working to improve the data literacy skills of school children across Scotland. They provide resources for educators to use in their classroom to work on data literacy skills. These resources include activities that combine physical activity with data, water pollution problems with data, and the challenge of providing the internet for all with data to name a few. The wealth of resources they have available can be easily integrated into the curriculum of multiple subjects to enhance the content being taught (University of Edinburgh, 2022) (Figure 2).

Figure 2. University of Edinburgh's (2022) topics and themes for using data literacy in the classroom.

<u>How to Assess Data Literacy</u>

There is a lot of research on how to teach the educator how to use data literacy to improve overall student achievement. However, not much has been written or discussed about assessing data literacy in classrooms. In reality, teachers tend to assess data literacy without putting much thought into it. Teachers assess data literacy on a daily basis through questions during presentations, discussions with students, or even more formal, summative assignments. Teachers are assessing a student's data literacy skills without thinking about it as it is oftentimes in the background when compared to the teacher's intended concept for the assessment. According to one source, data literacy can be assessed through methods used to assess understanding and knowledge of other concepts. Short answer questions, multiple choice questions, and open-ended responses are all common ways to assess literacy in students. Due to the nature of data literacy, having students analyze and interpret the meanings behind tables and figures, such as graphs or charts, is also a common way to assess data literacy (Zalles, 2006).

In 2020, a study performed in Indonesia by Mahardika (2021) determined the data literacy of high school students on physics learning. The study looked at over 60 students from five different schools. The students' data literacy skills were assessed using a written essay test. The written essay test contained six items thought to be important aspects of data literacy. Those aspects were "collecting data, assessing data quality, analyzing data, interpreting data, implementing data, and evaluating data" (Mahardika, 2021, p. 2). According to the author, these six aspects should be thoroughly assessed by any teacher looking to improve their students' data literacy skills.

Data literacy is used in different classrooms in different ways. Instructors use data for class demonstrations, labs and assignments the most (Hogenboom, 2011). Data literacy is used in a wide variety of subject matters outside of math and science classes. Examples of areas where data analysis should be a cross-curricular concept include geography, social studies, and the sciences (Simmons, 2021). Anywhere that students are using graphs, pictures or data sets, they are using data literacy skills. Examples of this could be analyzing population growth or decline in human geography classes, reading stock market trends in economics, or graphing numerical points from story problems in math.

What is Citizen Science?

Ruiz-Mallén (2016) states that citizen science is a way for ordinary citizens, or in this case students specifically, to obtain hands-on experiences collecting data for real life science research projects. Volunteers in communities are able to assist researchers by collecting data and sharing information. Citizen science projects promote science and communication skills for participants while helping researchers gain valuable knowledge and data. Examples of successful citizen science projects include the Cornell Ornithology Great Backyard Bird Count, where, since its start in 1998, over 60,000 volunteers collected more than 11.4 million bird observations to help understand trends in migration and lifestyles (Audubon et al., 2022). Another example of a successful project is the Cyanobacteria Monitoring Collaborative, where giant algae blooms are tracked to studying cyanobacteria in local water sources (Bradt, 2022). Both projects allowed the general public from around the world, an opportunity to perform hands-on science through making and recording observations.

When used in classrooms, citizen science can "engage learners in science while immersing them in science content and scientific practices" (Nugent et al., 2015, p. 11). Student participants in citizen science learning projects have the ability to be connected to real scientists and projects outside of the brick-and-mortar schools. These projects promote global awareness and engage collaboration in students as well (Nugent et al., 2015). Using the website Zooniverse, students can work on parallel activities using data from other citizen scientists. Zooniverse has over 50 active projects and over 580 million classifications made by citizen scientists. Citizen science is a powerful tool that can promote community awareness, critical thinking, problem solving, and practical experiences for student participants (Shah & Martinez, 2016).

<u>How Does Citizen Science Assist in Learning Data Literacy Skills?</u>

A common goal of citizen science programs and projects is "to increase science and environmental literacy" (Mitchell, 2017, p. 2). Many studies have shown student achievement and environmental awareness has increased through hands-on, outdoor learning (Tierney, 2019). A different study focusing on the implementation of project-based learning, citizen science included, found that student science research skills and confidence increase after completing projects. This same study found that "Data and data analysis skills […] improved by 36% in relation to the student's ability to provide strong data collection details (plot information, schematics, measurements, plant identification, further questions.)" (Langager, 2019, p. 34). The hope is that through exposure to real data sets, students will not only improve their data literacy skills for use outside of the classroom, but also gain confidence in their data literacy skills to carry with them into their post education lives.

Best Practices for Implementing Citizen Science in the Classroom

Implementing a new practice into the classroom can be a daunting task for even the experienced teacher. However, Emily Harris and Heidi Ballard (2018) stated a few key practices for educators as well as four main activity themes to assist with the implementation of citizen science projects in science classrooms. The first key practice they recommend educators do is "Position youth as people who do science" (Harris & Ballard, 2018, p. 36). How educators and teachers frame the work done in citizen science projects can influence how successful and important a young person will see themselves and their contributions to the project. The second key practice is educators can "frame the work globally and locally" (Harris & Ballard, 2018, p. 36) which can motivate students because they know they are impacting and contributing to science locally as well as globally. The final key practice Harris and Ballard recommend is to “attend to the unexpected” (Harris & Ballard, 2018, p. 36), which is a skill most teachers already possess. Nature can be spontaneous which can lead to spontaneous events and discussions which can lead to teachers needing to pivot instruction to a different topic, which in turn can lead to new student understandings.

Harris and Ballard also included core activities to help facilitate the implementation of a citizen science project within the classroom. The first activity they suggested was to develop expertise through introducing the project, learning about field guides and how to observe or sketch specimens. It is also useful to work with a local expert and practice collecting and identifying organisms for the project. The goal of this activity is to develop the interest of students and gain skills with data collections (Harris & Ballard, 2018). It is very similar to Schultheis and Kjelvik’s thoughts on scaffolding when working with data literacy skills.

The second activity centers on contributing data. Examples of these activities could be working in small groups with designated specific roles which also developing peer leaders within the groups. Students can compare and review data while investigating the site used for the project. This activity allows students to physically collect and upload data collected for the project. After they collect the data, Harris and Ballard suggest the third activity of making meaning of the data. Students can reason and reflect on their data and data collection experience through identifying specific species, describing and patterns noticed, making graphs, and investigating any questions they developed along the way (Harris & Ballard, 2018).

The final activity Harris and Ballard suggested corresponds to the final step in the scientific method: communicating results. Activity four is sharing students’ work and taking action at the end of the project helps to extend the work done during the project to outside and beyond the classroom. Students can do this by presenting to other classes, talking to other local citizen scientists, or presenting their findings to other community organizations and leaders. Even presenting to their parents would fulfill this activity (Harris & Ballard, 2018).

Assessment of Knowledge and Skills in Citizen Science Projects

One of the key roles of a teacher is to assess any student learning gains or changes in knowledge throughout a period of instruction. The two main types of assessments recognized in education are summative and formative assessments. Formative assessments are more informal and show student progress in a timeline fashion whereas summative assessments are more formal and usually given at the end of a period of time in which instruction was given.

Common tools and methods for evaluating citizen science include very standard assessments used in the social sciences. These social science assessments include surveys for self-reported data, interviews for more semi-structures questions that can still be open for interpretation, focus questions, participant observations, and self-reflections (Schaefer, 2021).

One type of formative assessment that is often used to assess knowledge and skills in citizen science projects is a survey where participants take note of their current levels of understanding and then follow up the project with a post survey assessing their level of understanding a second time. Maria Peter and her team of researchers gathered data on participants of citizen science projects and their gains in knowledge and skills by using formative assessments in the form of a survey similar to the one used in this action research project. They found that the surveys provided them with the information they needed to make claims that projects that contain ways for citizen scientists to interact with researchers and gain feedback achieved higher learning outcomes for the participants (Peter, 2021).

For this specific action research project, formative assessments such as surveys, interviews, and general observations were recorded. However, due to the duality of this project looking for changes in student engagement in science/citizen science and student data literacy skills, a summative assessment of a pre/post-test was used to assess changes in student skills. During the research for this project, assessing citizen science by summative assessments such as a pre/post-test was not heavily researched. However, after completing this project, it may be relevant to determine if a summative assessment could be devised for teachers to implement after completing projects with their classes.

How to Study the Efficacy of Citizen Science Projects

Citizen science projects are excellent ways to collect massive amounts of observations and data for scientists by utilizing individuals in the local community. However, the data collected by individuals in the community must be sufficiently accurate and reliable. Rebecca Jordan (2012) and colleagues investigated the performance of volunteers on a citizen science project regarding invasive plants on public conservation lands in their study "Evaluating the performance of volunteers in mapping invasive plants in public conservation lands." They tested the accuracy of volunteers by subsampling the original samples submitted as well as comparing them to samples obtained and categorized by professional botanists. The only discrepancy they found was that sample quality could be affected based on the location of the sample. Overall, they concluded that citizen science projects could be accurately completed by the general public and produce quality data usable by scientists.

Citizen science has the ability to influence student learning. According to Kloetzer et al. (2021) through the process of participating in a citizen science project, participants learn through a variety of methods. These methods include contributing to a task, interacting with others, using outside resources and research, sharing personal creations, and using project documentation. Participants learn things including project mechanics, pattern recognition skills, scientific literacy, and off topic knowledge and skills (Kloetzer et al., 2021). While compiling research for this project, many of the experiment based resources provided evidence that citizen science positively improves student knowledge and ability to learn due to its hands-on nature (Collins, 2014; Harris et al., 2012; Jordan et al., 2012; Langager, 2019; Mahardika et al., 2021; McAndrews, 2020; Tierney, 2019; Van Haeften et al., 2020).

CHAPTER THREE

METHODOLOGY

Introduction

The purpose of this study was to discover whether or not student data literacy skills and confidence can improve by exposing students to real data through involving them in a data-intensive citizen science project. I was also interested to see if student achievement and attitudes changed when exposed to participating in hands-on research. My primary research question was, "How will participating in citizen science projects affect student data literacy skills and data confidence in their conclusion?" Pre/Post student tests assessed students' skill levels before and after treatment implementation and surveys were used to address their confidence in science. The sub question, "Will participating in citizen science projects help students become aware of the importance of data literacy skills outside of school?" was examined by student Pre/Post tests and post interviews with a few randomly selected students. Finally, a second sub question, "Will working through a citizen science project increase student engagement and enthusiasm towards science?" was addressed using a Cornell School of Ornithology Self Efficacy survey, post-interviews and personal teacher observations were used (Table 1). Prior to any testing, the I obtained IRB approval from Montana State University which can be found in Appendix A.

Table 1. Triangulation Matrix of focus questions and data sources.

Focus Questions	Data Source 1	Data Source 2	Data Source 3
Primary Question: How will participating in citizen science project affect student data literacy skills?	Student pre-test and student post-test	Post interviews	Surveys
Sub Question: Will participating in citizen science projects help students become aware of the importance of data literacy?	Surveys	Post interviews	Teacher observations
Sub Question: Will working through a citizen science project increase student engagement and enthusiasm towards science?	Surveys	Teacher observations	Post Interviews

Student Population

The students who participated in this year-long project were 34 sophomores, juniors, and seniors taking environmental science during the 2021-2022 academic school year at Middletown High School South. The student sample pool consisted of 20 male and 14 female students. Two students qualify for free or reduced lunch. Three students identified as multiracial and the other 31 identified as white-Caucasian. All students successfully completed the freshmen biology class and some of them had completed the chemistry course offered by the school. A little under half of the participants are classified with IEPs or 504s.

Treatment

Primary research began by having students complete a pre-test that was created to assess current data literacy skills. The test consisted of questions about data literacy and citizen science. There were four parts to the pre-test. The first focused on assessing a student’s understanding of citizen science projects, their purpose, and audience. The second section asked students to manipulate a data set and create an appropriate graph. The third section had students matching different types of graphs to their uses. The fourth section required students to look at various graphs and analyze the information presented to answer questions about inferences, predictions, and general trend reading. The tests were scored as a normal assessment with an overall average. Scores ranging from 100-90 were excellent skills, 90-80 was above proficient, 80-70 was proficient, 70-60 was emerging, and below 60 was poor (Appendix B).

Following the pre-tests, students completed a self-efficacy survey to investigate their feelings and opinions towards science, nature, and citizen science (Appendix D). The data obtained from the surveys was cleaned by removing data from any individuals that only answered 25% of the questions. Any surveyed students that selected the same answer for all questions were also excluded. As a safeguard, the response points were reversed for question three and seven so the ones become fives and the fives become ones, etc. The total scores for each participant were averaged. Any individual's score below a three indicated low levels of confidence and or interest. Any scores of three and above indicated higher levels of confidence and engagement. Similarly, the different sections were individually averaged to get a deeper look at the specific concepts addressed in the survey. Any student that left the class halfway through the project or that did not complete both the survey and test in either the pre or post stage was removed from the data set. This dropped participation from 43 original students to 34.

The implementation of the citizen science project began after all pre-tests and surveys were completed. Students were instructed to download the iNaturalist app from their app store and encouraged to create a personal account using their school email. iNaturalist is designed to collect biodiversity observations, from butterflies to weeds to snails (Figure 3).

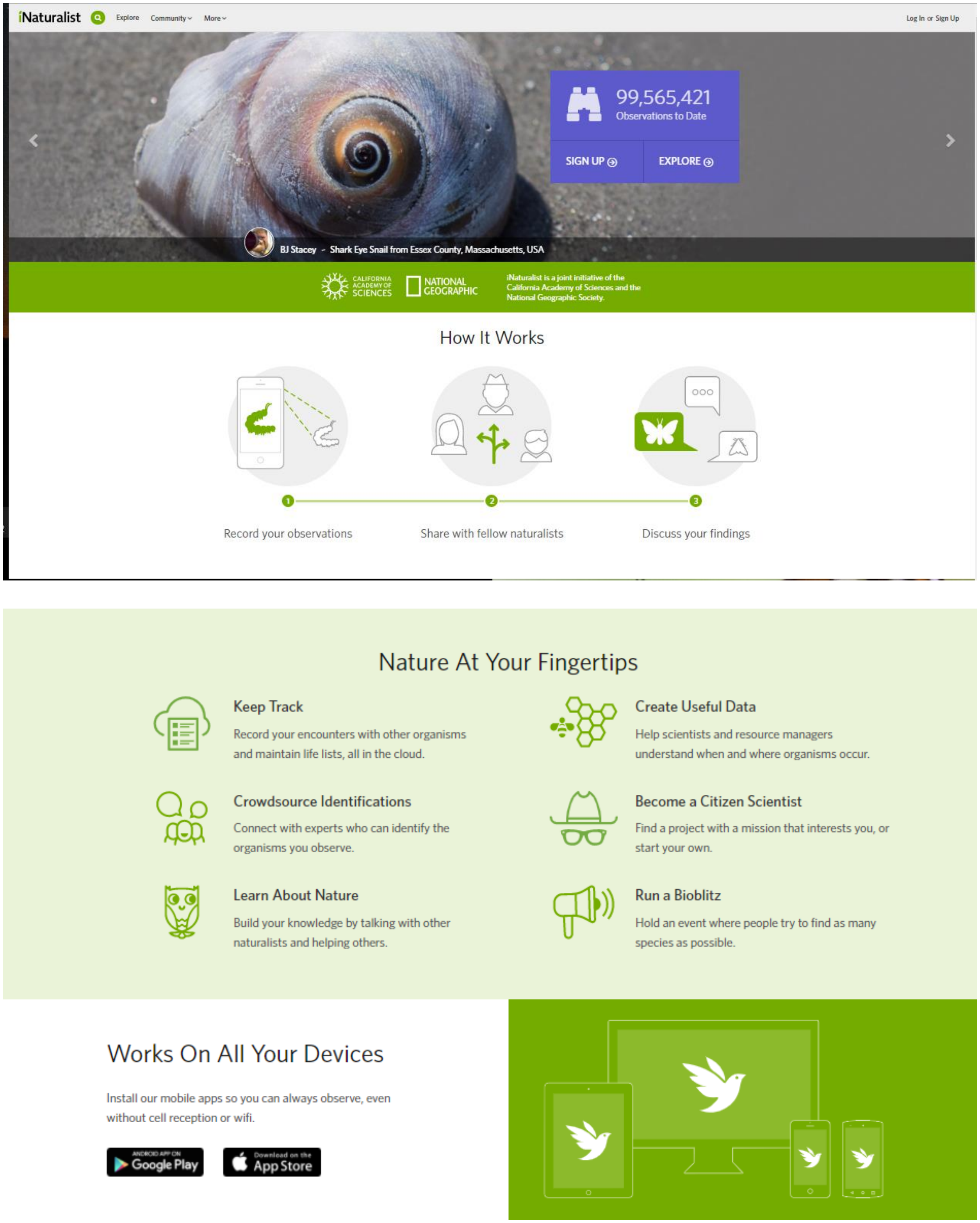

Figure 3. iNaturalist Citizen Science website.

Once accounts were created, students joined the teacher's project page set up from the teacher's account (Figure 4). This allowed students to submit and upload their observations as well as the GPS location of each observation, identification of each observation, and the student observer's account name. The project followed the guidelines of the National Geographic BioBlitz program. According to National Geographic, a BioBlitz event "focuses on finding and identifying as many species as possible in a specific area over a short period of time". Once data has been uploaded to iNaturalist, it can become part of the Global Biodiversity Information Facility which is an open source resource on local biodiversity for scientists and policy makers around the world (National Geographic Society, 2021).

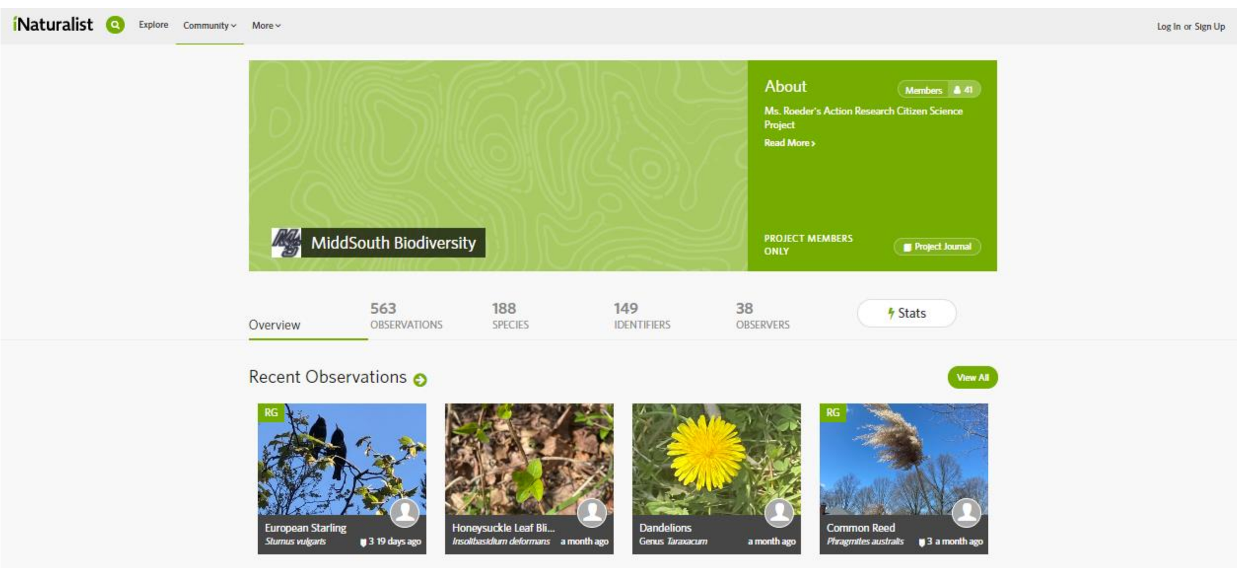

Figure 4. MiddSouth Biodiversity citizen science project website

Students were taken outside and given instructions on how to navigate the app; including how to take photos, make observations, identify observations, and upload to the project page. Students practiced using the software and program on the school property (Figure 5). The virtual iNaturalist platform kept track of the pictures and observations they make throughout the process (Figure 6).

Figure 5. Map of observations on the MiddSouth Biodiversity project page.

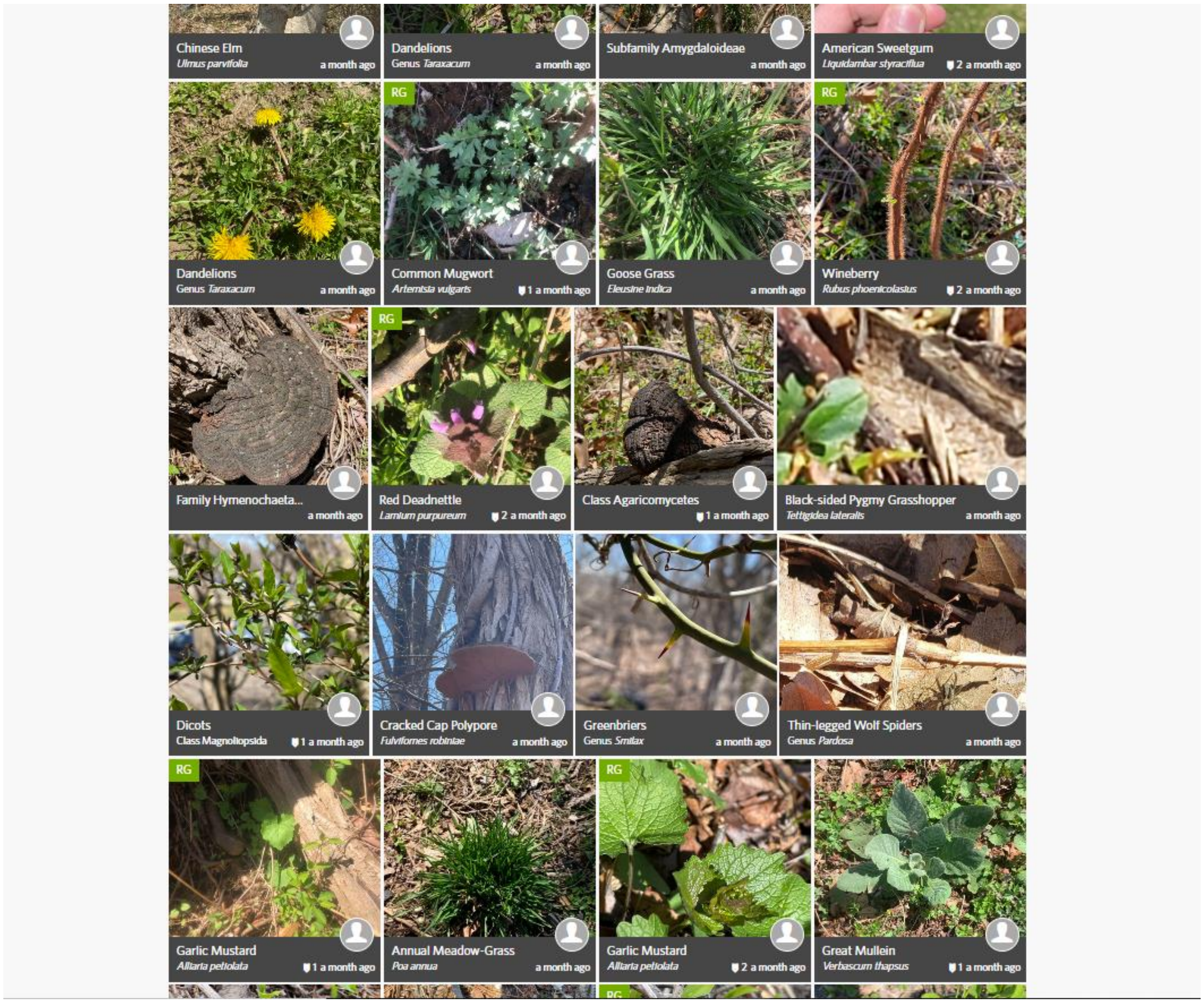

Figure 6. Example of student observations uploaded to project page.

Once students were comfortable with making observations and recording their data, they were instructed to repeat the exercise at home for five to seven species. The data was brought back to the class and stored in a spreadsheet (Appendix E). Observations were tracked through the iNaturalist teacher project page. The teacher project page sent student observations to the Global Biodiversity Information Facility database to make it available for scientists and policy makers around the world. The process was repeated during the winter months and again during the spring months to create a timeline of season species changes.

After the final spring observations were uploaded, students then received specific training on analyzing and interpreting data, creating graphs, and understanding the results of the observations in the form of data cleaning, organizing, and manipulation instructions for the data collected in the biodiversity project. Students also received training involving looking at practice data sets, graphing practice data, and practice problems for different data applications such as mean, median and mode throughout the school year. Throughout the entire process of collecting data and learning to manipulate and interpret it, the teacher made individual observations for students on their progress throughout the process.

At the conclusion of the student participation, the post-test was administered to assess any skill improvements. It should be noted that students could gain other data literacy skills and practice outside of this project and there is no feasible way to limit the outside exposure. The pre/post test assessment questions were similar to how students experience data throughout the duration of this project (Appendix C). The test was the same format and types of questions as the pre-test; however, the data numbers and graphs differed to prevent any connection to the pre-test. Students completed the same survey as they did prior to the citizen science project to record any opinion changes throughout the course of the project. Randomly selected individuals from each class were selected for a brief, individual interview focusing on their prior and current opinions, self-confidence, and knowledge of data skills, citizen science and science/data careers (Appendix F).

The pre/post tests were given on paper and stored in class file folders to compare at the conclusion of the project. The surveys were given via Google Classroom on a Google Doc to have easy access for converting into tables and figures. The progress notes were stored in a

Google Doc. Finally, conclusion interviews were recorded on a Google Doc and stored in the project's secure Google Drive for analysis.

Data Collection Matrix and Analysis

Data analysis included both quantitative and qualitative data analysis. The pre and post tests underwent two tailed T testing with an alpha coefficient of 0.05 looking for significance between the two test scores. The overall averages were calculated and shown using a box and whiskers plot. The normalized gains calculated for the class and for individual students by the Hake's normalized gains equation.

$$g = \frac{\text{class av \% post-class av \% pre}}{100\% - \text{class av \% pre}}.$$

Figure 7. Hake's normalized gains equation.

The gains for individual students were graphed to show the increases in student performance and a histogram was used to display individual average score frequencies. The purpose of the pre and post tests was to assess the effect of using a hands-on learning tool enriched with "messy and authentic data" on student data literacy skills. The tests helped determine if citizen science projects should be utilized more often to achieve NGSS goals and standards.

The overall class and individual survey scores were shown on box and whisker plots and any gains were displayed on graphs. Qualitative data found in the emergent thematic analysis were also noted by when one answer was chosen more by a high percentage of the students. The surveys provided a key insight into student opinions of learning science through citizen science projects as well as their likeness to consider a future in a science career.

Random post project interviews provided another source of qualitative data by recording student quotes and uncovering any common emergent themes from student responses. Finally, teacher observations throughout the project provided more opportunities for emergent thematic analysis and student quotes. These last two methods of data collection allowed students to express their opinions of the project and their confidence levels in their skills. Teacher observations specifically allowed the researcher to understand if the students were actively engaged and understood the material and were improving.

CHAPTER FOUR

DATA AND ANALYSIS

Introduction

The research questions posed for this action research project centered on asking if citizen science would be a useful tool for teachers to use to improve student data literacy skills. The main question was how will participating in citizen science projects affect student data literacy skills and data-confidence in their conclusion? To answer the questions asked, pre and post surveys, pre and post tests, exit interviews, and teacher observations were used to record quantitative and qualitative information.

Results: Pre Survey and Pre Test

The data collected from the pre-survey gave insight into how students perceive their data literacy skills, their confidence in science activities, and their aptitude for nature and citizen science type activities. The average survey confidence score for the whole survey was 3.2 which is slightly above the neutral score of 3 from the survey. The mean confidence in data skills was only slightly higher with 3.3. The overall aptitude for nature and citizen science activities was also 3.3. The overall average science activities score was 3.1, which happened to be the lowest of the scores. These numbers show the averages for the entire sample in terms of how students saw themselves (Table 2).

Table 2. Average scores for each pre survey section, (*N*=34).

Category	Average
Overall Average	3.2
Data Section	3.3
Science Section	3.1
Citizen Science/Nature Section	3.4

The individual student scores showed that over half of the students felt confident in all three categories. Twenty-three students felt confident in their data skills with only 11 feeling less confident. The confidence in science activities section showed 22 students felt confident with the activities and 12 did not. The confidence in citizen science and nature related activities showed a result of 26 confident students and eight less confident students (Figure 8).

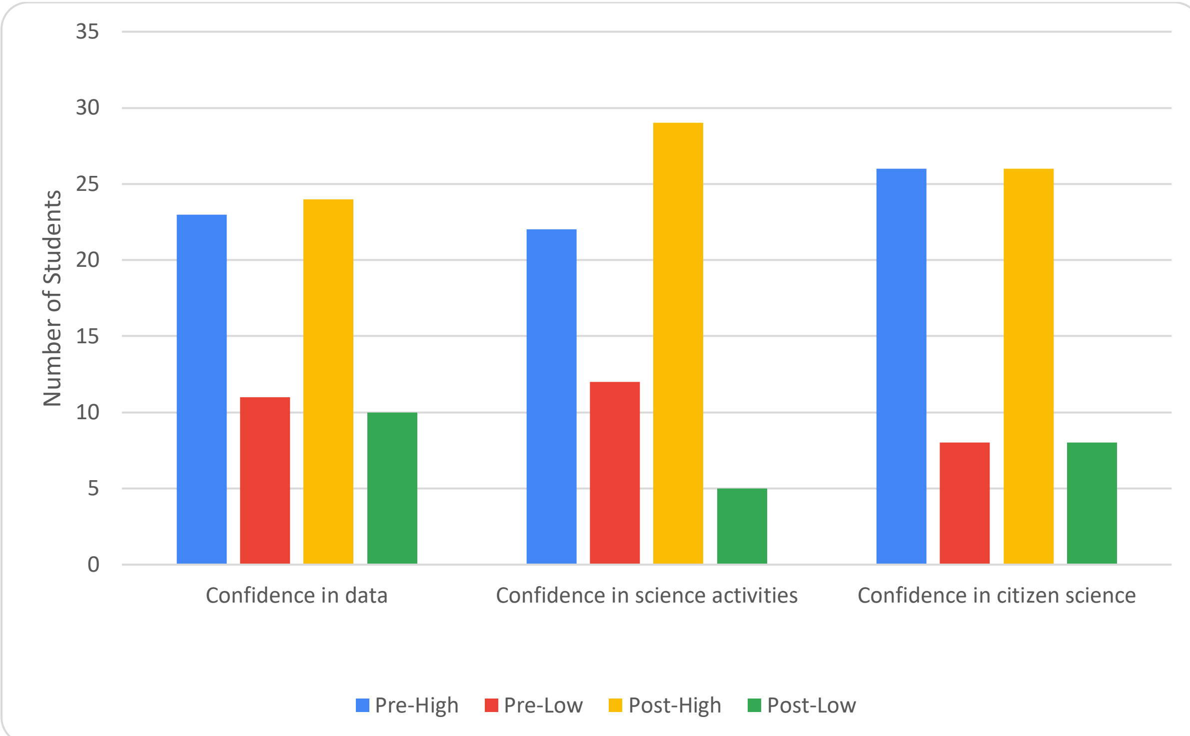

Figure 8. Number of students who exhibited high and low confidence in each pre and post survey section, (*N*=34).

The data collected from the pre-survey gave insight into how students perceive their data literacy skills, their confidence in science activities, and their aptitude for nature and citizen science type activities. The average survey confidence score for the whole survey was 3.2 which is slightly above the neutral score of 3 from the survey. The average confidence in data skills was only slightly higher with 3.3. The overall aptitude for nature and citizen science activities was also 3.3. The overall average science activities score was 3.1, which happened to be the lowest of the scores. These numbers show the averages for the entire sample in terms of how students see themselves (Table 2).

Some emergent themes that were seen through the pre-survey were that students either had full confidence in themselves and scored two or three of the three sections as high confidence and had a high overall average, or they had low confidence in all or two of the three sections and had an overall low average. Overall, eight students had a low confidence level as their average. There were 16 total students who felt confident in all categories and four that felt low confidence in all categories (Figure 9).

Figure 9. Box and whisker plot for pre survey sections, (*N*=34).

The entire survey was based on students' perceived confidence in their data skills, their ability to do science activities, and their aptitude towards citizen science and nature. The survey provided students with a scale to rate their feelings towards the questions from one to five. One was strongly disagree, three was neutral, and five was strongly agree to the questions provided. All three of the sections averaged just over the neutral three answer. This was about what I expected and shows that students as a whole were fairly neutral prior to the start of the project. The data and citizen science/nature sections scored the highest which showed that on average, students tended to have moderate confidence in their abilities in those sections. Within the data section the highest confidence average for a student was 4.5 which coincides with the high number of students who had high confidence averages for the same section. Based on this information from the data section, the students as a whole perceive their data skills with moderate confidence. Their confidence level was interesting because it did not equate to high scores on the pre-assessment to be discussed later on.

The section relating to citizen science and nature activities received the most fives for high answers because these sampled students feel comfortable and confident in science activities. Many of them answered with fives and fours. It was interesting to see that the most low score ones were from the science activity section. This was also seen with the higher number of students averaging low averages in the section. It tells us that students do not show promising levels of confidence when doing science activities. This is a problem that this study is looking to correct.

The first half of the pre-survey created a baseline to address if students' confidence in their skills increases over time while participating in the citizen science project. The surveys also provided a sense of which students enjoy science and science activities and which do not, which was important to note when assessing confidence. The purpose of the surveys was to assess student level changes over the course of the project.

The student scores on the pretest were turned into percentages and tiered as excellent (> 90%), above proficient (89.9 - 80.0), proficient (79.9 - 70), emerging (69.9 - 60) and poor (< 59.9). No students fell into the excellent category. Four students fell in the above proficient category. Six students were in the proficient category. Four students were in the emerging category and 21 students were in the poor category. While the majority of students displayed threes and above for their confidence levels, about 60% of the students sampled have poor data literacy skills (Figure 10). The difference between students' perceived skills and confidence and their actual performance of the skills are vast.

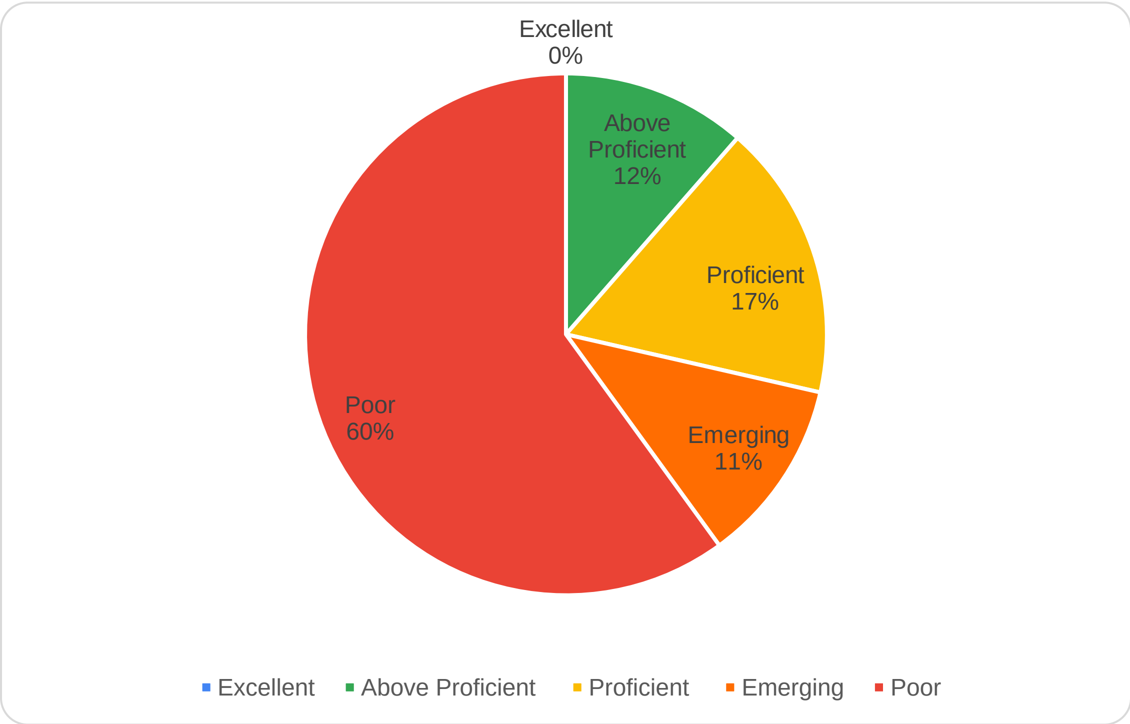

Figure 10. Student test scores on the pre-assessment, (*N*=34).

The pre-test was given to assess student skills without their perceived level of confidence. The test was scored out of 27 with most questions and components given one point. The majority of points were lost in the first section where students were tasked with looking at a set of data and asked to perform simple data manipulation skills such as mean, median, mode, and creating a graph to visually display a section of the data. Student normally learn mean, median and mode in the beginning of middle school. In addition, a majority of the students created a line graph or attempted to create a scatter plot instead of utilizing a bar graph to show the data in categories.

The results from the data literacy skills test showed that the majority of students do not have the actual skills or ability to work with data when prompted, regardless of their perceived confidence in their skills. This could be due to lack of experience or practice working with numbers in a data format outside of math classes, lack of interest, or general lack of knowledge.

Results and Discussion: Post Survey and Post Test Data

For this specific action research project, formative assessments such as surveys, interviews and general observations were recorded. However, due to the duality of this project looking for changes in student engagement in science/citizen science and student data literacy skills, a summative assessment of a pre/post-test was used to assess changes in student skills. During the research for this project, assessing citizen science by summative assessments such as a pre/post-test was not heavily researched. However, after completing this project, it may be relevant to determine if a summative assessment could be devised for teachers to implement after completing projects with their classes.

The data collected from the post-survey gave insight into how students perceive their data literacy skills, their confidence in science activities, and their aptitude for nature and citizen science type activities after completing the full year of class and citizen science project. The average survey confidence score for the whole survey was 3.4 which is slightly above the neutral score of 3 from the survey. The average confidence in data skills was only slightly higher with 3.5. The overall aptitude for nature and citizen science activities was also 3.4. The overall average science activities score was 3.4. These numbers show the averages for the entire sample in terms of how students saw themselves (Table 3). The overall average, data section, and science section scores increased by 0.2 points apiece, whereas the citizen science/nature section stayed the same at 3.4 post activity (Table 3).

Table 3. Post survey averages for each survey section, (*N*=34).

Category	Average
Overall Average	3.4
Data Section	3.5
Science Section	3.4
Citizen Science/Nature Section	3.4

The individual student scores from the post survey showed that over half of the students felt confident in all three categories again (Figure 8). Twenty-four students felt confident in their data skills with only 10 feeling less confident, this was an improvement of one student. The confidence in science activities section showed 29 students felt confident with the activities and five did not. This was a change in seven students. The confidence in citizen science and nature related activities remained constant at 26 confident students and eight less confident students (Figure 11).

Figure 11. Box and whisker plot for post survey sections, (*N*=34).

The data from the post survey suggested that the number of students who were confident in their data skills improved from 23 to 24 students showing confidence. This could have been due to the data collection, cleaning, organizing, and interpreting work completed as part of the class citizen science project. The number of students showing confidence in science activities increased from 22 to 29. This was the highest confidence level increase out of the three and can be attributed to the hands-on nature of the data collection process as compared with COVID restrictions of previous years. Students were exposed to the project and its requirements before repeating the process multiple times. The interesting portion of these results was the absence of change to the confidence level in citizen science skills. The numbers stayed the same at 26 confident and eight low confidence levels.

The post test scores showed significant improvement in proficiency for the students as a whole. Four students achieved a score in the excellent category. Eleven students fell in the above proficient category. Six students were in the proficient category. Four students were in the emerging category and 10 students were in the poor category. In contrast to the pre test, only

29% of students fell into the poor category whereas 59% of students fell into a proficient or above category. The gap between students' perceived skills and confidence and their actual performance of the skills after the completion of the citizen science project was greatly reduced (Figure 12). In some cases, it was still inflated, however in most cases the students had closed the gap between their actual skills and their perceived abilities.

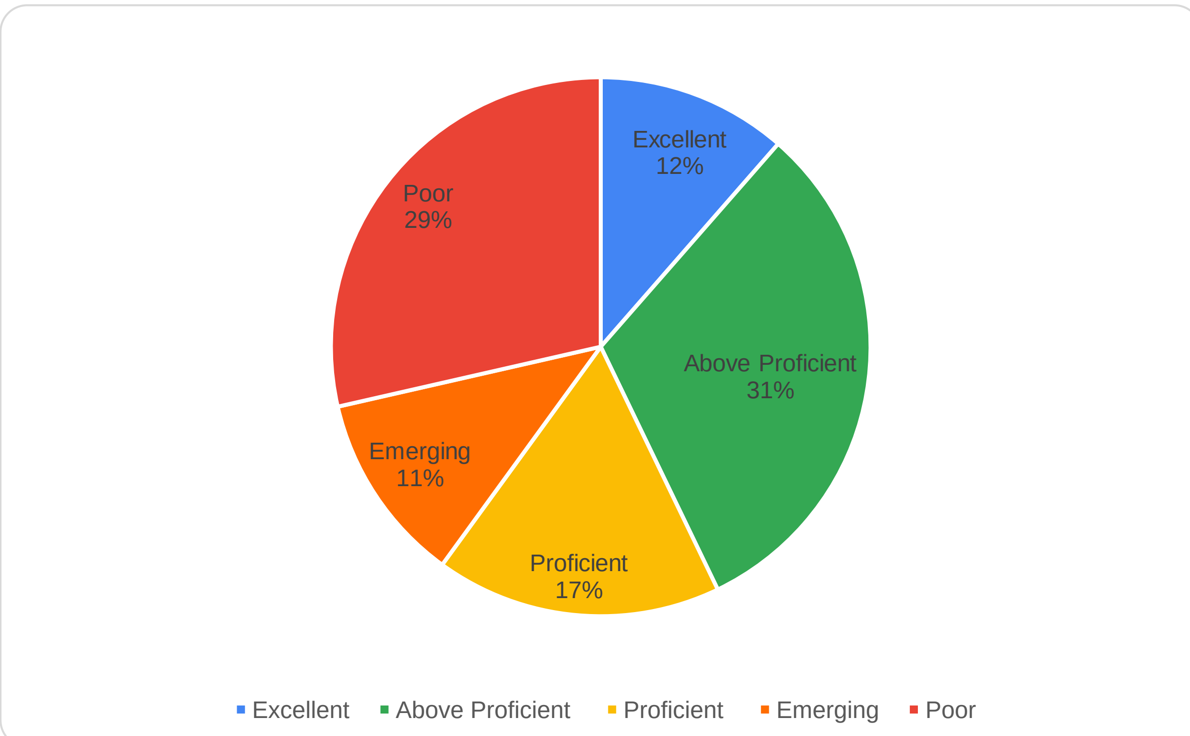

Figure 12. Student test scores on the post-assessment, (*N*=34).

The majority of the post test scores showed improvement in percentage points anywhere from 3.7% to 55.6%. Three students showed 0% improvement and two students showed negative improvement percentages and normalized gains. The lowest percentage on the pre test was 24.1% and the highest was 88.9%. The lowest percentage on the post test was 42.6% and the highest was a perfect 100% (Figures 13 & 14). The class average normalized gain was 41.2%.

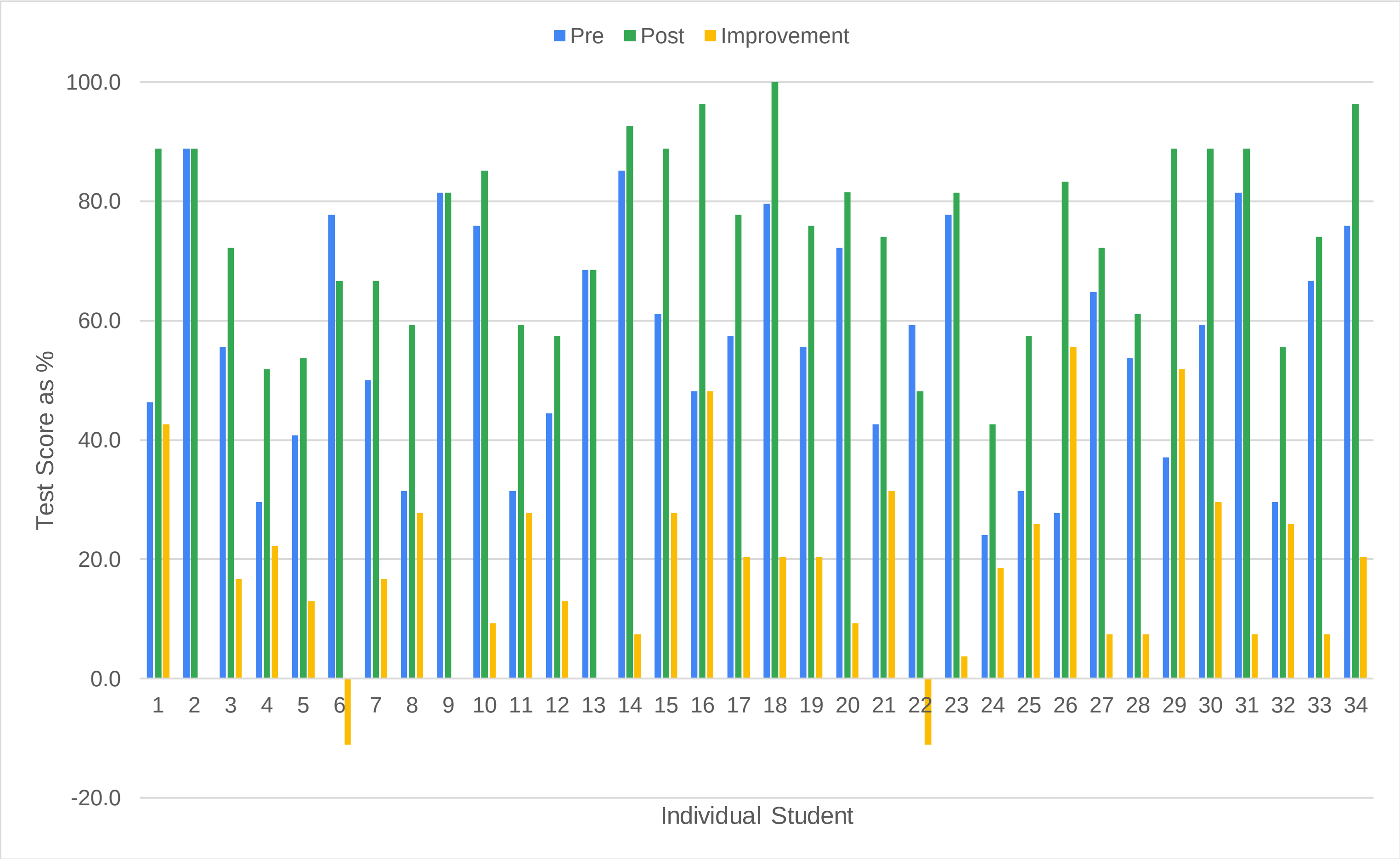

Figure 13. Student pre and post assessment scores with improvement markers, (*N*=34).

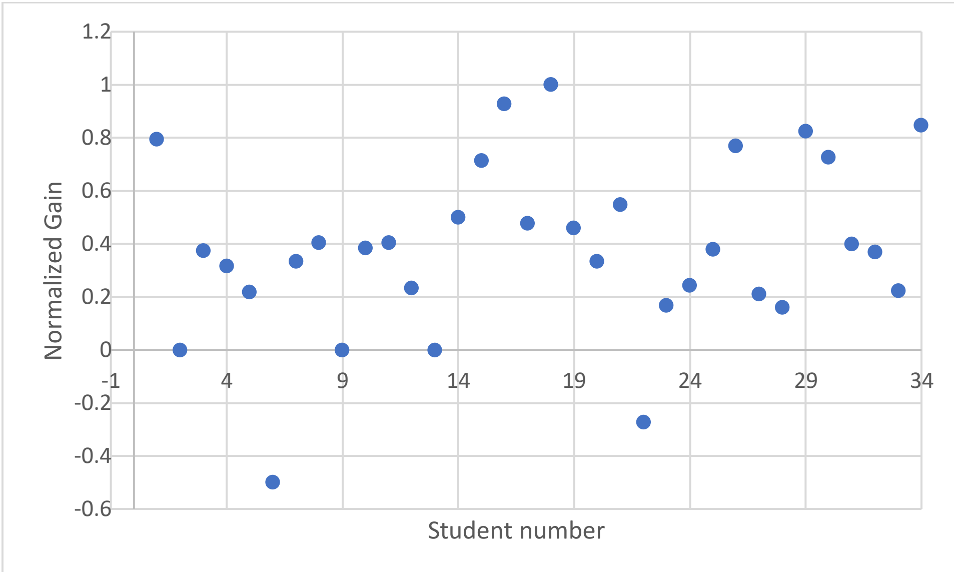

Figure 14. Normalized gains for student pre and post tests, (*N*=34).

The post test was given to assess if student skills changed throughout the school year and specifically after working with the data set compiled during the class citizen science project. The test questions were similar to the pre test, but not the exact same throughout. This was done to avoid students relying on memorizing the original questions. The majority of students did much better this time around on creating graphs on the data provided in the second section. The majority of points were lost in the first section where students forgot how to or miscalculated the median and mode numbers and in the final section where they were asked to describe what citizen science was, who can participate and why it is useful. The citizen science project that the students focused on primarily had them interacting with collecting and analyzing data. We covered the meaning behind citizen science and who can help out once or twice throughout the year, but it was not the focus like the data skills were. If students were participating in a current research project with a practicing scientist, it may have sunk in more.

The results from the data literacy post test showed improvement in skills to better match the student confidence levels from the beginning of the year. There is still a gap for many students, but there was improvement in all but four of the student scores, one of which stayed at the same score in the proficient category while another stayed in the emerging category. Two other students showed negative change which can be attributed to lack of interest and investment throughout the project, in their class grades and school in general. A two tailed T-test was conducted to determine the significance of the change in student scores. The data did not meet a perfect bell curve shape when used to create a histogram, however the calculated p value was 0.0000001884. This would indicate that the change in test scores was statistically significant. It should also be noted that this project was completed after the 2019/2020 school year that ended up being half completely virtual, and then the 2020/2021 school year which was a mix of virtual, hybrid and in person where student skills in all subjects and content areas for most students declined. This project could show the improvement in students as they bounced back from the previous difficult years.

Out of the 34 students surveyed, the pre to post test scores increased, on average, 18%. Some scores showed improvements upwards of 26 percentage points to zero percentage points. The pre and post surveys indicated on average a 0.2 point increase in the data literacy category, 0.3 point increase for science activities, and 0.1 point increase for citizen science (Table 4). All of these data indicators, while some were small, represent a growth in student achievement or student confidence levels.

Table 4. Mean improvement changes for each quantitative data indicator, (*N*=34).

Indicator	Mean Improvement Change
Pre/Post Tests	18.0%
Survey Data Literacy	0.2
Survey Science Activities	0.3
Survey Citizen Science	0.1

Overall, the results displayed student improvements in the categories examined (Table 4). The pre test scores showed low student skills with the majority being in the lowest category while at the same time, students rated themselves relatively high on the pre survey. Post test scores were significantly higher for most students and showed improvement in all but four students, two of which stayed the same while two others did worse on the post test. The post survey showed student perceived confidence increased the most in the science activity category, however the citizen science category levels did not change and the data literacy skills section only increase by one.

Results and Discussion: Teacher Observations and Exit Interviews

Qualitative data was collected in the form of teacher observations throughout the project as well as student exit interviews conducted at random. Teacher observations recorded during the first stages of the project (October) when students were introduced to the iNaturalist app. Many of the students required prompting on how to complete the project but they all enjoyed being outdoors during the class time. One student was invested enough to walk deep into the woods behind the school and into a stream. During the second outing in March, students welcomed the change of pace and went right to work when we went outside. They were excited to break the 300 observation mark and specific students fought to have the bragging rights of most species observed on the biodiversity project page. During the spring observations we found some deer bones which excited the students. When students were shown the data set, they were expected to analyze (Appendix E), many of them expressed feelings of anxiety and felt overwhelmed. After being guided on how to clean the data, students visibly showed more confidence, and some admitted to enjoying working with the functions in the spreadsheet. Some students even remarked that working with the functions in the spreadsheet was enjoyable and they felt satisfaction seeing the results at the end.

The exit interviews gave insight into how students viewed science and data before and after the project. After being asked if they could explain what data literacy was before the project and afterwards, a student said "Before I didn't know mean, median, and mode. One thing I learned afterwards was what all the graphs mean" (The student is referring to pie graphs vs line graphs vs bar graphs etc.). When another student was asked if their confidence level changed and how so, the student remarked, "Yes, caused by the activity we did with the spreadsheet. It helped me be more technical with things like that. My confidence level definitely increased. Out of ten, my confidence increased plus four. I was sitting at a 50% and it increased about 25%." When a third student was asked how their current opinion of science changed compared to their original opinion, another student said, "Just made me love it more. It's been a confidence booster since I'm doing really well in this class. It's been great for my self-esteem." The students interviewed had positive things to say about the project in general.

CHAPTER FIVE

CLAIM, EVIDENCE, AND REASONING

Claims from the Study

Several claims can be made at the conclusion of this action research study. The first claim that can be made is that hands-on experience with data is beneficial for student data skills. This helps to answer the primary research question of how will participating in citizen science projects affect student data literacy skills and data-confidence. Schultheis and Kjelvik (2020) promoted the idea of using "messy and authentic data" in classes to give students the strongest learning experience possible to improve data skills. Throughout this experiment, students were exposed to the novel concept of citizen science projects where they collected, cleaned, organized, and then interpreted their own data. Through this process, student data scores improved by anywhere from 3.7% to 55.6% (Figure 13 and 14) and the overall mean improvement was 18% points (Table 4). One student obtained a 100% on the post test. This also corresponds to Langager's (2019) study which found that a student data and data analysis skills improved by 36%.

Improving student data literacy skills is deemed important by many teachers and the NGSS standards (NRC, 2013, p. 278). During the exit interviews, students showed understanding that having the skills and knowledge to manipulate data and know how to use it would be important things to know for their future educational pursuits or career paths. Several students remarked that fields such as retail, finance, accounting, and business among others required knowledge of data literacy skills. This aligned with Simmons (2021) ideas that data analysis should and would be a cross-curricular concept.

Students were able to learn or improve these skills through small class discussions and practice about our data as we progressed through the year as well as our final activity where students took their data and cleaned, organized and interpreted it. Students could have also been working on these skills in other classes outside of their environmental science class. It should be noted that four of the 34 students showed a decline in skills by earning lower scores or the exact same score as the pre test. This could have been from lack of intrinsic motivation due to it being the end of the school year.

A secondary claim that also helps to answer the main focus question is student perceptions of their data skills increased after working with the raw data they obtained during the project. During the exit interviews, all six students interviewed said that their views of their data skills changed for the better after the completion of the project. They were less intimidated by working with large amounts of data. Some students talked about confidence in creating graphs where others said their confidence in interpreting graphs increased. The pre and post surveys also showed a single student increase in low to high confidence ratings between the pre and post survey in the data category.

Schultheis and Kjelvik (2020) wrote about the importance of using scaffolding methods when working with student data literacy skills. Through the course of the year, student participants were exposed to basic skills such as calculating mean, median, and mode as well as how to collect data before having practice using their graph building and interpretation skills which was scaffolded upon during the final data cleaning, organizing and analyzing activity. By the end of the project, most students were able to meet the four themes deemed applicable for this program from “Why Data Literacy Matters” written by Kristin Fontichiaro and Jo Angela

Oehrli (2016). The themes were statistical literacy, visualizing data, using data in argument, and big data and citizen science.

Data from the pre and post surveys showed that the confidence in skill jumped from 23 to 24 students showing confidence in their data skills (Figure 8). That was not as many as was hoped for, however through teacher observations most students were manipulating the data with ease. When taking a step back to look at the data as a whole, 24 students out of 34 felt confident in their data skills which is almost three quarters of the sample. The data section of the post survey also had the highest overall average of 3.5 out of five (Table 3).

A third claim that can be made is that through the process of making observations and uploading them to the citizen science project database, students' self confidence in their ability to perform science activities increased. This helped to answer the second sub question of how will working through a citizen science project increase student engagement and enthusiasm towards science This was evident through the pre and post survey differences in the science activities category. Prior to the project, 22 students felt confident in their ability to perform science tasks versus the 29 students who felt confident in the category after the project (Figure 8).

Students became familiar with the National Geographic Society's (2021) iNaturalist citizen science observation platform through the data collection phase. During the duration of the project, students achieved Nugent's main goal of citizen science which was to "Engage learners in science while immersing them in science content and scientific practices" (Nugent et al., 2015, p. 35). Through the increase in confidence shown by the pre/post surveys, students increased their science and environmental literacy through participating in citizen science projects as suggested by Mitchell (2017). By looking at the observations on the iNaturalist project page, the quality of the observations improved as the students became more comfortable with the program and confident in the observation collecting skills (National Geographic Society, 2021). 131 of the 563 observations made on the project were considered research grade photos.

A fourth and final claim that can be made from this project is that if high school students are not intrinsically motivated to better themselves and their skills, student participation lacks. At the beginning of the project, 47 students were enrolled in the program. The majority of the pre tests were completed in class, but a few of the pre surveys were not completed thoroughly or correctly. This caused participants to be removed from the experimental group. Similarly, throughout the project, certain students repeatedly failed to take observations while the whole class participated. At the conclusion of the project, several more students failed to complete the post test and/or post survey, even when prompted with Dunkin' Munchkins. These students were removed from the experimental group resulting in a final group number of 34. Students who failed to complete the post test and survey most likely had low intrinsic motivation to complete it, or were absent for several days.

Claims that were expected to be made but failed to come to fruition were claims around student knowledge of data literacy importance. This corresponded to the first sub question, how will participating in citizen science projects help students become aware of the importance of data literacy skills outside of school? Most students admitted to knowing that data literacy was important prior to the completion of the project and they were knowledgeable about fields that require data literacy. It was also expected that students would gain knowledge about the concept of citizen science projects through completing the project, however during the post test and exit interviews, students were unable to give accurate descriptions of citizen science, who can participate, and why it is important. This could have been from the experiment's dedication to data skills causing citizen science discussions to become part of the background instead of the focus of the project.

Looking back on the research done prior to the project as well as the results obtained, it is safe to say that hands on experience collecting, cleaning, organizing and interpreting data where students have been the driving force is a successful way to increase student data literacy skills. Using the "messy and authentic" data promoted by Schultheis and Kjelvik (2020) did give students the strongest learning experience. After the students overcame the initial anxiety of seeing a massive data set (Appendix E), they were able to rely on the scaffolding also promoted by Schultheis and Kjelvik (2020) to achieve the end result of improving data literacy skills. As stated previously, the pre and post tests showed an average improvement of 18 percentage points on the students' tests (Table 4). After the post test, 21 out of the 34 students fell into the excellent, above proficient, and proficient categories (Figure 12) whereas the pre test showed that only 10 fell into the categories of above proficient and proficient while zero students were considered to be in the excellent category (Figure 10).

Throughout the project, students also learned why data literacy matters and its interdisciplinary nature as stated by Simmons (2021) and shown in the University of Edinburgh's (2022) resource library. During the post interviews, many students made comments similar to, "I thought science was just nature and not all the numbers and technical stuff. When I think about it, it makes sense. How does someone in a lab get all their data?" or relating to the diversity of classes such as economics, history, finance, marketing, etc. in which that data literacy would be useful to know. Their confidence was also shown to increase through the pre and post surveys showing an average increase of 0.2 in scores (Table 4). While this was a small average increase, it is important to note that the actual post survey mean was 3.5, the highest out of all the categories (Table 3).

At the conclusion of the project, students had participated in a citizen science project. Through doing this, they contributed to the greater community of science while opening their eyes to science and environmental literacy which was one of the main goals of citizen science as described by Mitchell (2017). Student achievement and environmental awareness increased through the hands on, outdoor learning experience as stated by Tierney (2019). The suggestions of Harris and Ballard (2018) created a successful environment for students to complete the project while learning and improving skills and confidence along the way. The student reported confidence in citizen science activities increased, on average, 0.1 points (Table 4). This low result could have been due to the fact that we did not outright discuss citizen science as a concept as much as we focused on data literacy. This would be something to change for future years.

Value of the Study and Consideration for Future Research

The goal of this study was to determine if implementing a citizen science project into a high school science classroom where students would have the opportunity to collect, clean, organize, and interpret real world data, would have an effect on their data literacy skills and self confidence in data skills and affinity for science. Looking back on the project results and data, it was evident that a focus on data in the classroom through real data examples and use had a beneficial effect on student skills. If the project included more information and exposure to the purpose of citizen science through perhaps reading articles, talking with real scientists, or learning about other local citizen science projects, students may have learned more about the details of citizen science projects.

There was definite value found in having students work with a real and “messy” data set. It gave them the opportunity to overcome the anxiety of working with raw data and the confidence to analyze and interpret graphs. Future research could continue to assess the benefits of including authentic data work in science classrooms. An interdisciplinary approach to assessing overall data literacy outside of a science classroom could be a topic of future research. It would be interesting to see if students could make a conscious choice and take data skills obtained in a science setting and apply them to a math class setting or a finance setting. Similarly, it would be interesting to monitor student achievement through the four years of high school if students were introduced to data skills through an intense project in the early days of their high school career.

Future researchers considering completing a similar project should consider a few things when working with this population of individuals with this type of material. It should be noted that researchers working with high school students at the end of the year should expect student investment to drop significantly in the early spring through the end of the school year. A form of internal investment is needed from the students to buy-in to bettering their skills in order for the project to be successful. The self-investment level could definitely change based on student age and academic level (honors, general education, or classified learning disability) or due to general student investment in school as a whole.

Future researchers should also consider the length of the project for students as well if considering a similar experiment. It was found that students were more responsive to the project and activities earlier in the school year and closer to the start date. Participation and responsiveness lessened over the school year.

Impact of Action Research on the Author

The process of action research has been eye opening in many ways for me. As a relatively new teacher who has never taught a full year of in-person school until three years after beginning, the whole process was challenging, yet rewarding. I began the process by collaborating with my colleagues to identify a problem that we were all experiencing with our science students: data literacy skills. This was extremely important since we were coming off of a two year learning black hole where students lost a lot of valuable educational time. I was able to implement a large scale project for my students across three classes that linked up with my class curriculum throughout the year. I also saw students enjoying field work during their observations as well as watching them gain real data skills that they can use outside of the classroom. The most impactful part of the AR experience was being a model for my students. At each step of the way, I talked with my students about the process. It gave them a real, outside the classroom, example of researchers using the scientific method to complete research to answer a question and improve outcomes. Some students even regularly checked on my progress and showed investment in the outcome for me, even if the page length scared them a little. The experiences I have had during this action research project have inspired me to continue looking deeper into hands on project that will improve my students' data skills for their future use in and outside of the classroom setting.

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APPENDICES

APPENDIX A

IRB APPROVAL FORM

Principal Investigator: Ms. Grace Roeder
Faculty Advisor: Dr. Marcie Reuer; Montana State University; marcie.reuer@ecat1.montana.edu
Study Title: Assessing the use of Citizen Science Projects to Improve High School Student Data Literacy Skills and Engagement

Parents and Guardians,
I am a Masters Degree candidate at Montana State University and I am conducting a research study of improving student data literacy skills through the use of citizen science hands-on projects. Middletown High School South is familiar with, and has given me permission to conduct this research at the school. I am facilitating this communication to inform you of the study and give you an opportunity to decide that you do not want your child to participate, if that is your preference.

If you allow your child to participate, I will ask them to complete a pre-assessment and survey, and a post-assessment and survey-- one set in October and one set in June. Both surveys contain identical questions about your child's confidence in their science and data literacy skills along with their feelings towards science and science activities. The pre and post-assessments will contain questions regarding data literacy skills such as graphing and interpreting data sets. Finally, I will select a handful of students at random to interview at the end of the school year regarding their thoughts on citizen science and data literacy skills. The surveys, interviews and tests will not impact student grades. If a child indicates at any time that they do not want to participate, they will be thanked and dismissed from the study.

There are no known risks to your child from participating in this study. Their grades and class standing will not be affected in any way if they do, or do not, participate. Your child will not directly benefit from this research, however their participation may benefit others by informing the development of future instructional materials and processes designed to improve the data literacy skills of high school students.

This research is anonymous. All student names will be replaced with indicator numbers and no identifying information will be disclosed. If a report of this study is published or presented at a professional conference, only group results or anonymous responses will be communicated.

I am happy to answer any questions you have about the study. Please contact myself at roederg@middletownk12.org.

If you **do not** wish your child to participate, please fill out and sign the form below and return it to me or the Middletown South High School Front Office. Alternatively, you can send me an email with the subject line "Opt Out", and include your name and your child's name in the message. Please return the form on the next page or reply via email by October 8th.

Thank you!
Sincerely,
-Ms. Grace Roeder

APPROVED MSU 09/30/21
IRB #GR093021-EX

If you wish to allow your child to participate, please **do not** return this form – no action is necessary.

If you do not allow your child to take part in the study, do one of the following by October 8th: (1) sign and return this form to Ms. Roeder Rm 238, or the Middletown High School South Front Office,(2) email roederg@middletownk12.org with the subject line "Opt Out", and include your name and your child's name in the message.

Principal Investigator: Ms. Grace Roeder
Faculty Advisor: Dr. Marcie Reuer; Montana State University; marcie.reuer@ecat1.montana.edu
Study Title: Assessing the use of Citizen Science Projects to Improve High School Student Data Literacy Skills and Engagement

Notification of Refusal: I DO NOT give permission for my child to participate in the study described above.

____
Print Child's Name

________________________ ________________________ __________
Parent/Guardian's Signature Print Parent/Guardian's Name Date

APPROVED MSU 09/30/21
IRB #GR093021-EX

APPENDIX B

PRE TEST DOCUMENT

Name:______________________________ Block:___________

Data Literacy and Citizen Science Pre/Post-Assessment

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

Please answer the following questions to the best of your ability. Your overall grade will not be affected by your score, however you will earn participation points based on your engagement and participation.

Part 1:

A scientist is observing different types of birds found in a meadow. She has collected the data below over three days:

Species Observed	Number observed Day 1	Number observed Day 2	Number observed Day 3
Eastern Meadowlark	25	22	23
Guinea Hen	47	45	36
Grouse	4	10	6
Upland Sandpiper	35	28	29
Western Meadowlark	20	20	15
Red-winged blackbird	22	21	28
Burrowing Owl	6	13	5
Prairie Falcon	1	3	0
Lark Bunting	38	20	29

1. What is the average, or mean, number of birds the scientist saw over the three days?

2. What is the median number of Grouses the scientist observed over the three days?

3. What is the mode of the Western Meadowlark data?

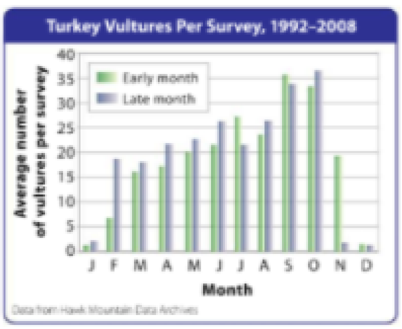
4. Graph the data by hand for the **day 1 observations** using whatever graph you think is appropriate.

Part 2:

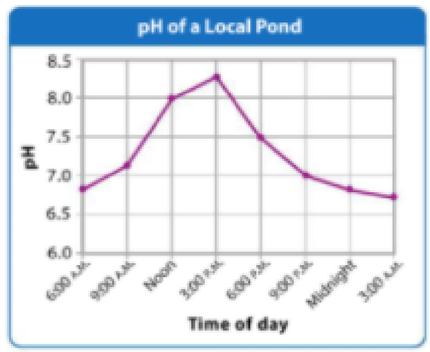
For the following questions, match the type of graph to its purpose or use:

A. The purpose of this graph is to show correlation (how closely related) between two variables.
B. This type of graph shows the proportions of one thing to the whole. Data in this type of graph is often a percentile.
C. This type of graph is used when the data set involves a sequence or a change of some kind over time.
D. This type of graph is used to display a variable that is numerical and a variable that is categorical. At a glance, this graph shows how values of a variable differ among categories.

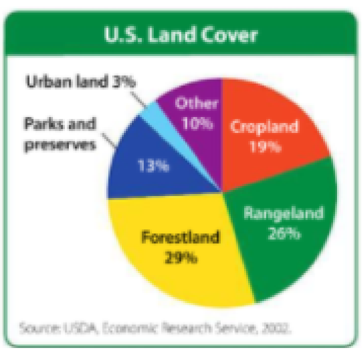
1 . Bar Graph:____________



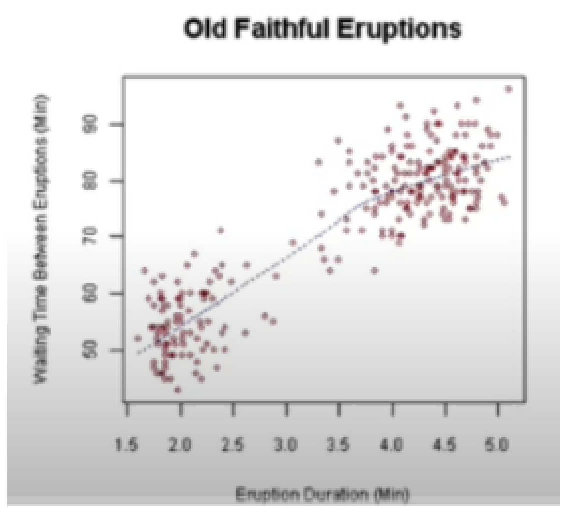
2. Line Graph:______________



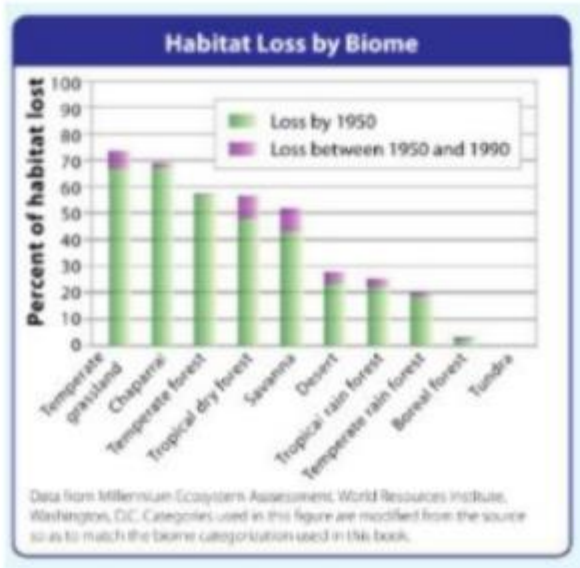
3. Pie Graph:____________



4. Scatter Plot:_______________



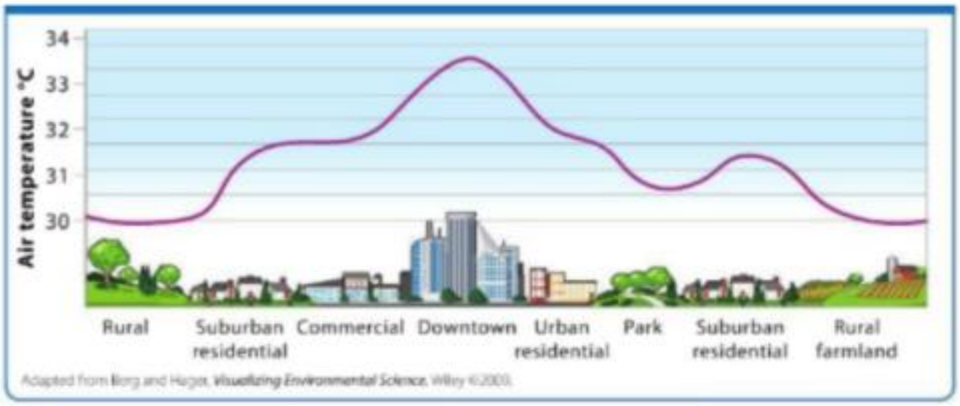
<u>Part 3</u>: Using the graphs below, answer the associated questions.



1. Which of the biomes listed lost more than 50% of their habitats by the year 1990? Write all that apply.

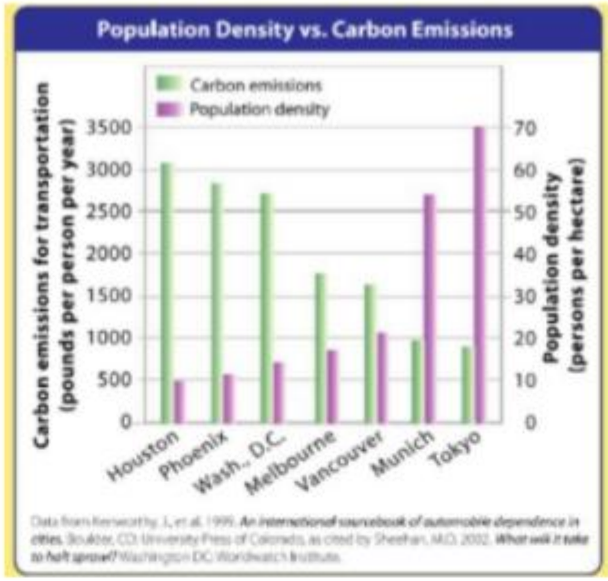
2. Which three biomes lost the most habitat by 1950?

3. What is the purpose of this graph?



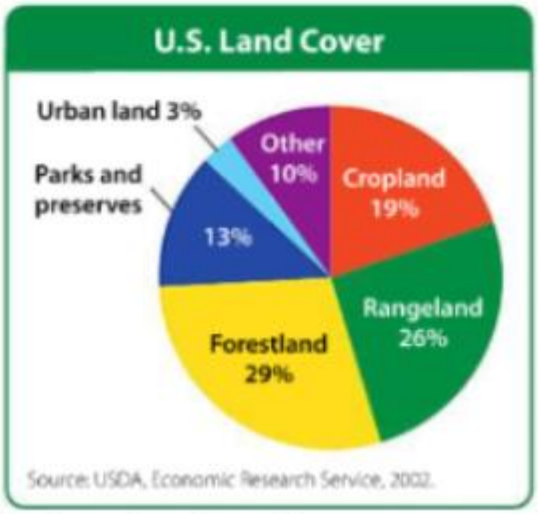
1. What can be inferred from the graph about the air temperature in different locations?

2. Using the image above, what is the approximate temperature difference between Downtown areas and Rural Farmland. Round to the nearest whole number.



1. Carbon emissions is the amount of carbon dioxide released into the atmosphere. The population density is the amount of people per hectare. Using this information, what is the main take away from the graph above?

2. Which country would be considered the most sustainable and “green” based on the data above?



1. What is the main takeaway from this graph?

2. What would you predict would happen if the Urban land increased from 3% to 5%?

<u>Part 4:</u> Answer the following questions about citizen science to the best of your ability.

1. In your own words, what do you think citizen science is? What is its purpose?

2. Who can be involved in citizen science?

3. Why is citizen science important?

APPENDIX C

POST TEST DOCUMENT

Name:___________________________ Block:_________

Data Literacy and Citizen Science Pre/Post-Assessment

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

Please answer the following questions to the best of your ability. Your overall grade will not be affected by your score, however you will earn participation points based on your engagement and participation.

Part 1:

A scientist is observing different types of amphibians found in a forest. She has collected the data below over five days:

Species Observed	Number observed Day 1	Number observed Day 2	Number observed Day 3	Number observed Day 4	Number observed Day 5
Wood frog	25	22	23	21	30
Red salamander	47	45	36	30	41
Rough skinned newt	4	10	6	15	3
Caecilians	35	28	29	35	19
Long toed salamander	20	20	15	21	20
Bullfrog	22	21	28	22	32
Dakota toad	6	13	5	10	7
Large blotched salamander	1	3	0	0	5
Leopard frog	38	20	29	27	28

1. What is the average, or mean, number of Wood frogs the scientist saw over the five days?

2. What is the median number of Red salamanders the scientist observed over the five days?

3. What is the mode of the Long toed salamander data?

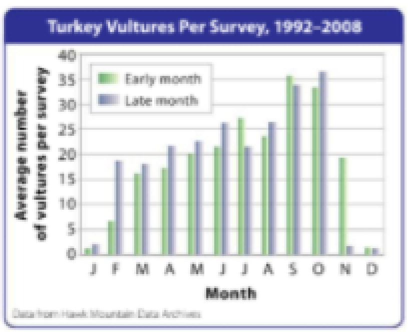
4. Graph the data by hand for the **Bullfrog observations over time** using whatever graph you think is appropriate.

Part 2:

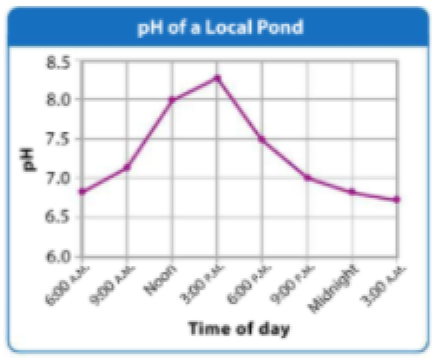
For the following questions, match the type of graph to its purpose or use:

A. The purpose of this graph is to show correlation (how closely related) between two variables.
B. This type of graph shows the proportions of one thing to the whole. Data in this type of graph is often a percentile.
C. This type of graph is used when the data set involves a sequence or a change of some kind over time.
D. This type of graph is used to display a variable that is numerical and a variable that is categorical. At a glance, this graph shows how values of a variable differ among categories.

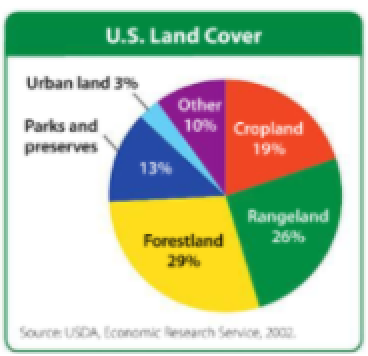
1 . Bar Graph:____________



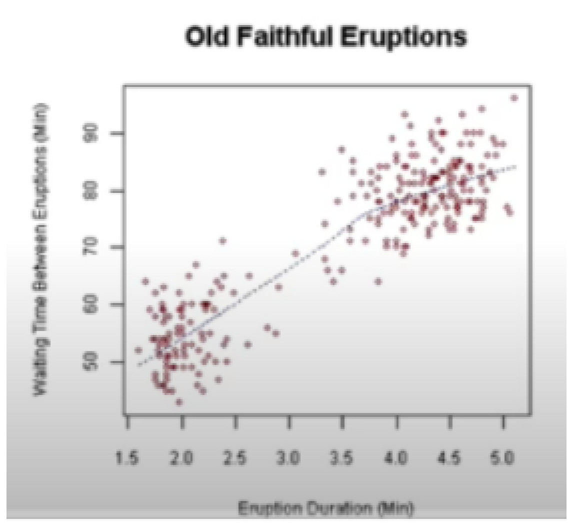
2. Line Graph:______________



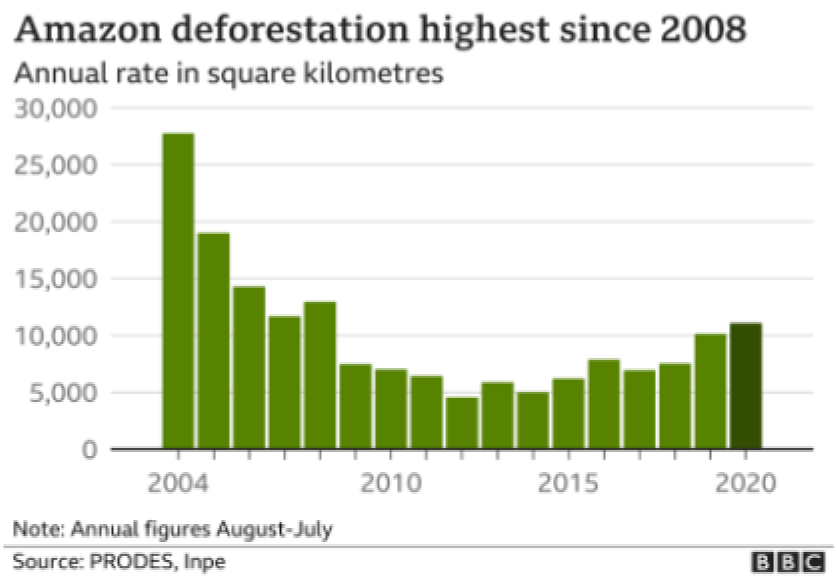
3. Pie Graph:____________



4. Scatter Plot:_______________



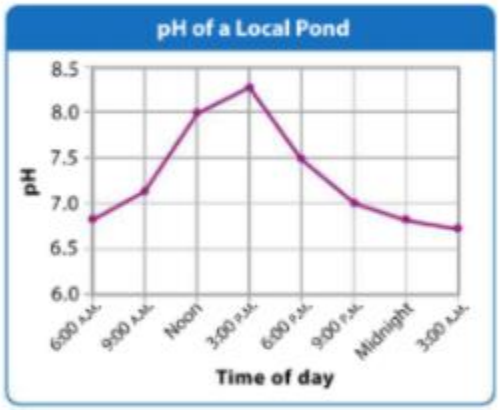
<u>Part 3</u>: Using the graphs below, answer the associated questions.



1. Which years had an annual rate of deforestation <u>above</u> 10,000 sq kilometers? Write all that apply.

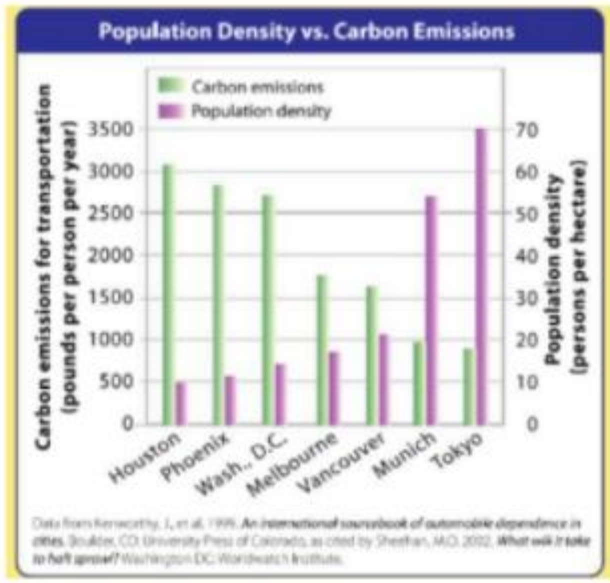
2. From 2004 to 2012, what was the general trend of the data?

3. What is the purpose of this graph?



1. Describe what is happening in this graph:

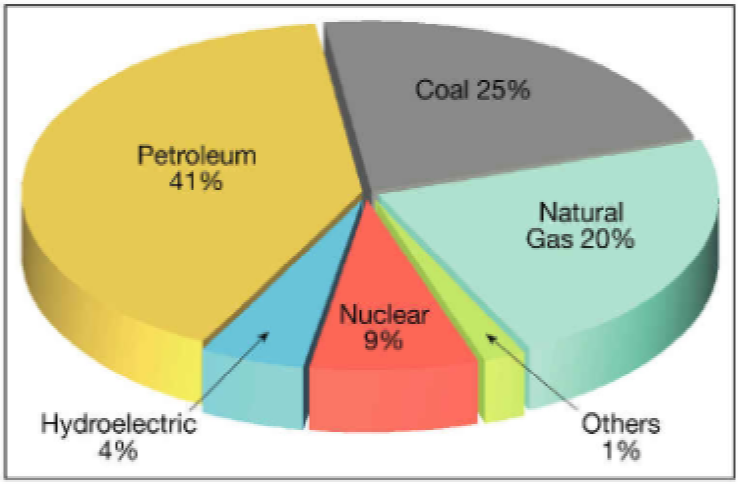
2. What is the approximate difference in pH from the highest reading to the lowest reading? Round to the nearest tenth (0.1) of a decimal.



1. Carbon emissions is the amount of carbon dioxide released into the atmosphere. The population density is the amount of people per hectare. Using this information, what is the main take away from the graph above?

2. Which country would be considered the least sustainable and "green" based on the data above?

Energy consumption sources in the United States



(Petroleum is oil)

1. What is the main takeaway from this graph?

2. What would you predict would happen to other sources if the we lowered our petroleum consumption to 35%?

<u>Part 4:</u> Answer the following questions about citizen science to the best of your ability.

1. In your own words, what do you think citizen science is? What is its purpose?

2. Who can be involved in citizen science?

3. Why is citizen science important?

<u>APPENDIX D</u>

PRE/POST CORNELL ORNATHOLOGY SURVEY

Pre/Post-Survey

Participation in this research is voluntary and participation or non-participation will not affect a student's grades or class standing in any way.

Please indicate how much you **DISAGREE** or **AGREE** with each of the following statements by circling the number in the appropriate column. Please respond as you really feel, rather than how you think "most people" feel.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I think I'm pretty good at understanding data topics.	1	2	3	4	5
2. It takes me a long time to understand new data related topics.	1	2	3	4	5
3. I feel confident in my ability to explain data related topics to others.	1	2	3	4	5
4. Compared to other people my age, I think I can quickly understand new data related topics.	1	2	3	4	5
5. It is fun to work with data.	1	2	3	4	5
6. I have confidence in my data literacy skills (graphing, interpreting graphs, analyzing data)	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
These statements are about how you feel about learning and understanding science topics					
7. I think I'm pretty good at understanding science topics.	1	2	3	4	5
8. Compared to other people my age, I think I can quickly understand new science topics.	1	2	3	4	5
9. It takes me a long time to understand new science topics.	1	2	3	4	5

10. I feel confident in my ability to explain science topics to others.	1	2	3	4	5
These statements are about how you feel about doing scientific activities					
11. I think I'm pretty good at following instructions for scientific activities.	1	2	3	4	5
12. Compared to other people my age, I think I can do scientific activities pretty well.	1	2	3	4	5
13. It takes me a long time to understand how to do scientific activities.	1	2	3	4	5
14. I feel confident about my ability to explain how to do scientific activities to others.	1	2	3	4	5
These statements are about how you feel about doing citizen science activities.					
15. I think I'm pretty good at following instructions for citizens science activities.	1	2	3	4	5
16. Compared to other people my age, I think I can do Citizen Science activities pretty well.	1	2	3	4	5
17. It takes me a long time to understand how to do Citizen Science activities.	1	2	3	4	5
18. I feel confident about my ability to explain how to do Citizen Science activities to others.	1	2	3	4	5
In general, why do you choose to learn and understand science topics?					
19. Because I like learning about science topics.	1	2	3	4	5
20. For the recognition or respect I'll get from others.	1	2	3	4	5

21. Because I'm required to understand science topics.	1	2	3	4	5
22. Because people I look up to think it's good to learn about science topics.	1	2	3	4	5
23. Because understanding science will help me achieve things that are important to me.	1	2	3	4	5
24. Because it's fun to learn about science topics.	1	2	3	4	5
25. Because I want others to think I'm good at understanding science topics.	1	2	3	4	5
26. Because I believe understanding science topics will help me in some way.	1	2	3	4	5
In general, why do you <u>engage in</u> scientific activities.					
27. Because scientific activities are fun to do.	1	2	3	4	5
28. For the recognition or respect I'll get from others.	1	2	3	4	5
29. Because I'm required to do scientific activities.	1	2	3	4	5
30. Because people I look up to think it's good to engage in scientific activities.	1	2	3	4	5
31. Because scientific activities will help me achieve things that are important to me.	1	2	3	4	5
32. Because I enjoy doing scientific activities.	1	2	3	4	5
33. Because I want others to think I'm good at doing scientific activities.	1	2	3	4	5

34. Because I believe that doing scientific activities will help me in some way.	1	2	3	4	5
Please indicate how much you **DISAGREE** or **AGREE** with each of the following statements by circling the number in the appropriate column. Please respond as you really feel, rather than how you think "most people" feel.					
Choose one answer in each row	Disagree Strongly	Disagree a Little	Unsure	Agree a little	Agree Strongly
35. It is fun to do science activities	1	2	3	4	5
36. It's fun to collect samples from the outdoors.	1	2	3	4	5
37. I like to hear about new discoveries in science.	1	2	3	4	5
38. I want to understand how phenomenon in nature work.	1	2	3	4	5
39. I like to identify how parts of nature work.	1	2	3	4	5
40. I like to observe birds, butterflies, bugs, streams, trees or other things in nature.	1	2	3	4	5
41. I enjoy watching nature shows (Planet Earth, Blue Planet, etc.)	1	2	3	4	5
42. I enjoy reading about science.	1	2	3	4	5
43. I like talking about science topics with others.	1	2	3	4	5
44. Science is one of my favorite topics.	1	2	3	4	5

APPENDIX E

STUDENT CITIZEN SCIENCE DATA SET

id	observed_on_st	observed_on	time_observed_	time_zone	created_at	captive_cultivat	species_guess	scientific_name	common_name	iconic_taxon_na	taxon_id
95864058	Thu Sep 23 2021	########	2021-09-23 15:5	Eastern Time (U	2021-09-23 16:0	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
95864089	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Physcia stellaris	Star Rosette Lich	Fungi	155090
95864161	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Asclepias	milkweeds	Plantae	47906
95864163	Thu Sep 23 2021	########	2021-09-23 15:5	Eastern Time (U	2021-09-23 16:0	FALSE	Bold Jumping Sp	Phidippus audax	Bold Jumping Sp	Arachnida	53809
95864188	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Setaria	foxtails and brist	Plantae	50055
95864234	########	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	chicories, dande	Cichorioideae	chicories, dande	Plantae	447425
95864241	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	Spotted Lantern	Lycorma delicatu	Spotted Lantern	Insecta	324726
95864304	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Trypoxylon polit	Organ-pipe Mud	Insecta	84844
95864306	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	Spotted Lantern	Lycorma delicatu	Spotted Lantern	Insecta	324726
95864323	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	Spotted Lantern	Lycorma delicatu	Spotted Lantern	Insecta	324726
95864334	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Cichorium	chicories and en	Plantae	52914
95864378	########	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	Ants	Formicidae	Ants	Insecta	47336
95864417	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	American pokew	Phytolacca amer	American pokew	Plantae	48599
95864475	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95864511	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95864557	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95864592	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95864635	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Ageratina	snakeroots	Plantae	64116
95864729	########	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
95864735	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
95864758	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Persicaria	knotweeds, sma	Plantae	61787
95864838	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Setaria parviflor	knotroot bristleg	Plantae	79068
95864886	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
95864994	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Persicaria longis	low smartweed	Plantae	143803
95865021	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Setaria	foxtails and brist	Plantae	50055
95865111	Thu Sep 23 2021	########	2021-09-23 16:0	Eastern Time (U	2021-09-23 16:0	FALSE		Commelina	dayflowers	Plantae	52893
95865268	Thu Sep 23 2021	########	2021-09-23 15:5	Eastern Time (U	2021-09-23 16:1	FALSE		Persicaria	knotweeds, sma	Plantae	61787
95865453	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Vitaceae	grape family	Plantae	50279
95865516	########	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE	Bot Flies, Blow F	Oestroidea	Bot Flies, Blow F	Insecta	356157
95865526	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Celastrus orbicu	Oriental bittersw	Plantae	64540
95865615	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Setaria	foxtails and brist	Plantae	50055
95865676	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Persicaria	knotweeds, sma	Plantae	61787
95865711	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Lecanora thysan	Mapledust Liche	Fungi	182613
95865923	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Parasola		Fungi	56311
95865936	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Parasola		Fungi	56311
95865987	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Psathyrellaceae		Fungi	56310
95866084	Thu Sep 23 2021	########	2021-09-23 16:1	Eastern Time (U	2021-09-23 16:1	FALSE		Cichorieae		Plantae	359450
95872056	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Melissa officinal	lemon balm	Plantae	59901
95872066	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Magnoliopsida	dicots	Plantae	47124
95872098	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Melissa officinal	lemon balm	Plantae	59901
95872099	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Melissa officinal	lemon balm	Plantae	59901
95872104	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Melissa officinal	lemon balm	Plantae	59901
95872106	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Artemisia	wormwoods and	Plantae	52855
95872108	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	chicory	Cichorium intybu	chicory	Plantae	52913
95872117	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Celastrus orbicu	Oriental bittersw	Plantae	64540
95872151	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Orthoptera	Grasshoppers, C	Insecta	47651
95872161	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Erigeron strigosu	daisy fleabane	Plantae	76942
95872172	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Rudbeckia hirta	black-eyed Susan	Plantae	62741
95872193	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Cichorium	chicories and en	Plantae	52914
95872194	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Erigeron strigosu	daisy fleabane	Plantae	76942
95872196	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	asters and allies	Astereae	asters and allies	Plantae	461542
95872199	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Orthoptera	Grasshoppers, C	Insecta	47651
95872202	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Erigeron strigosu	daisy fleabane	Plantae	76942
95872213	########	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	lemon balm	Melissa officinal	lemon balm	Plantae	59901
95872215	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95872228	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Ageratina	snakeroots	Plantae	64116
95872264	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Persicaria	knotweeds, sma	Plantae	61787
95872266	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Symphyotrichum	panicled aster	Plantae	79301
95872367	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Rubus	brambles	Plantae	47544
95872368	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95872372	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Cucurbita pepo	American pumpl	Plantae	76541
95872399	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95872401	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95872411	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95872419	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
95872455	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Ageratina	snakeroots	Plantae	64116
95872462	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Rubus	brambles	Plantae	47544
95872467	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
95872482	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Celastrus orbicu	Oriental bittersw	Plantae	64540

95872492	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	grasses	Poaceae	grasses	Plantae	47434
95872495	########	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
95872531	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
95872553	########	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
95872580	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
95872589	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
95872596	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	Asteroideae	Asteroideae		Plantae	632790
95872617	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Persicaria longis	low smartweed	Plantae	143803
95872649	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Solidago	goldenrods	Plantae	48678
95872653	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Solidago	goldenrods	Plantae	48678
95872688	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
95872703	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE		Cenchrinae		Plantae	1138117
95872735	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	ar‰«aãƒ§ã½	Persicaria perfol	mile-a-minute w	Plantae	131249
95872746	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:2	FALSE	tree-of-heaven	Ailanthus altissir	tree-of-heaven	Plantae	57278
95872794	Thu Sep 23 2021	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:3	FALSE		Solidago	goldenrods	Plantae	48678
95872805	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Setaria	foxtails and brist	Plantae	50055
95872807	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE	ar‰«aãƒ§ã½	Persicaria perfol	mile-a-minute w	Plantae	131249
95872831	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787
95872837	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Setaria	foxtails and brist	Plantae	50055
95872838	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Setaria	foxtails and brist	Plantae	50055
95872844	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Setaria	foxtails and brist	Plantae	50055
95872878	########	########	2021-09-23 17:2	Eastern Time (U	2021-09-23 17:3	FALSE	yellow foxtail	Setaria pumila	yellow foxtail	Plantae	48688
95872924	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Setaria	foxtails and brist	Plantae	50055
95873144	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Oxalis	woodsorrels	Plantae	47758
95873256	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Mollugo	Carpetweeds	Plantae	72241
95873300	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
95873316	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787
95873332	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787
95873352	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Cichorium intyb	chicory	Plantae	52913
95873357	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Ageratina	snakeroots	Plantae	64116
95873369	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Persicaria longis	low smartweed	Plantae	143803
95873408	########	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE	Polygonoideae	Polygonoideae		Plantae	922206
95873459	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787
95873566	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Vitaceae	grape family	Plantae	50279
95873637	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE		Paniceae		Plantae	325977
95873900	Thu Sep 23 2021	########	2021-09-23 17:3	Eastern Time (U	2021-09-23 17:3	FALSE	white clover	Trifolium repens	white clover	Plantae	55745
98596916	Mon Oct 18 202	########	2021-10-18 12:1	Eastern Time (U	2021-10-18 12:1	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
98596920	Mon Oct 18 202	########	2021-10-18 12:1	Eastern Time (U	2021-10-18 12:1	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
98596982	Mon Oct 18 202	########	2021-10-18 12:1	Eastern Time (U	2021-10-18 12:1	FALSE		Ageratina	snakeroots	Plantae	64116
98597052	Mon Oct 18 202	########	2021-10-18 12:1	Eastern Time (U	2021-10-18 12:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
98597073	Mon Oct 18 202	########	2021-10-18 12:1	Eastern Time (U	2021-10-18 12:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
98597107	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	feverfew	Tanacetum parth	feverfew	Plantae	54520
98597120	Mon Oct 18 202	########	2021-10-18 12:1	Eastern Time (U	2021-10-18 12:2	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
98597169	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Plantae	plants	Plantae	47126
98597178	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Lonicera	honeysuckles	Plantae	51874
98597192	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Erigeron annuus	annual fleabane	Plantae	76897
98597239	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	Oriental bittersw	Celastrus orbicu	Oriental bittersw	Plantae	64540
98597240	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Ageratina	snakeroots	Plantae	64116
98597241	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	snakeroots	Ageratina	snakeroots	Plantae	64116
98597272	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Solidago	goldenrods	Plantae	48678
98597312	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	snakeroots	Ageratina	snakeroots	Plantae	64116
98597345	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
98597371	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	Oriental bittersw	Celastrus orbicu	Oriental bittersw	Plantae	64540
98597377	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Leucobryum alb	white moss	Plantae	164650
98597402	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Fomitiporia robu	Robust Bracket	Fungi	485058
98597410	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Dichanthelium	rosette grasses	Plantae	128807
98597422	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Dichanthelium c	deertongue	Plantae	131000
98597427	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	Butternut	Juglans cinerea	Butternut	Plantae	54792
98597446	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	American holly	Ilex opaca	American holly	Plantae	60749
98597469	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
98597502	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	common hackbe	Celtis occidental	common hackbe	Plantae	54857
98597532	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Acrididae	Short-horned Gr	Insecta	47649
98597549	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Faboideae		Plantae	507502
98597595	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
98597617	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE		Juglans	Walnuts	Plantae	54405
98597632	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2021-10-18 12:2	FALSE	Oriental bittersw	Celastrus orbicu	Oriental bittersw	Plantae	64540
98597799	Mon Oct 18 202	########	2021-10-18 12:3	Eastern Time (U	2021-10-18 12:3	FALSE	Cepaea	Cepaea		Mollusca	48587
98597809	Mon Oct 18 202	########	2021-10-18 12:3	Eastern Time (U	2021-10-18 12:3	FALSE		Setaria pumila	yellow foxtail	Plantae	48688
98597937	Mon Oct 18 202	########	2021-10-18 12:3	Eastern Time (U	2021-10-18 12:3	FALSE		Rosoideae		Plantae	415343
98598066	Mon Oct 18 202	########	2021-10-18 12:3	Eastern Time (U	2021-10-18 12:3	FALSE		Ageratina altissi	white snakeroot	Plantae	119048

98598081	Mon Oct 18 202	########	2021-10-18 12:3	Eastern Time (U!	2021-10-18 12:3	FALSE		Dichanthelium	rosette grasses	Plantae	128807
98598100	Mon Oct 18 202	########	2021-10-18 12:3	Eastern Time (U!	2021-10-18 12:3	FALSE		Symphyotrichum	panicled aster	Plantae	79301
98598210	2021-10-18 08:3	########	2021-10-18 12:3	Atlantic Time (C.	2021-10-18 12:3	FALSE		Celtis	hackberries	Plantae	54858
98598297	Mon Oct 18 202	########	2021-10-18 12:3	Eastern Time (U!	2021-10-18 12:3	FALSE		Persicaria longis	low smartweed	Plantae	143803
98710152	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE		Persicaria	knotweeds, sma	Plantae	61787
98710173	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	common mugwc	Artemisia vulgar	common mugwc	Plantae	52856
98710204	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	Perching Birds	Passeriformes	Perching Birds	Aves	7251
98710212	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE		Persicaria longis	low smartweed	Plantae	143803
98710227	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	American pokew	Phytolacca amer	American pokew	Plantae	48599
98710256	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	Scarites	Scarites		Insecta	82720
98710272	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE		Setaria pumila	yellow foxtail	Plantae	48688
98710273	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE		Lentinus tigrinus	Tiger Sawgill	Fungi	351365
98710278	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	Isabella Tiger M	Pyrrharctia isab	Isabella Tiger M	Insecta	59675
98710327	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	cheeseweed ma	Malva parviflora	cheeseweed ma	Plantae	58202
98710398	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
98710405	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE		Oxidus gracilis	Greenhouse Mill	Animalia	143390
98710415	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
98710441	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	Isabella Tiger M	Pyrrharctia isab	Isabella Tiger M	Insecta	59675
98710492	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	knotweeds, sma	Persicaria	knotweeds, sma	Plantae	61787
98710534	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE	knotweeds, sma	Persicaria	knotweeds, sma	Plantae	61787
98710546	Tue Oct 19 2021	########	2021-10-19 16:0	Eastern Time (U!	2021-10-19 16:0	FALSE		Artemisia vulgar	common mugwc	Plantae	52856
98710592	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Persicaria longis	low smartweed	Plantae	143803
98710605	########	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	ar‰oaf㎝â½ʼ	Persicaria perfol	mile-a-minute w	Plantae	131249
98710628	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Persicaria	knotweeds, sma	Plantae	61787
98710640	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Setaria	foxtails and brist	Plantae	50055
98710666	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Persicaria longis	low smartweed	Plantae	143803
98710698	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Cenchrinae		Plantae	1138117
98710705	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	Oriental bittersw	Celastrus orbicu	Oriental bittersw	Plantae	64540
98710721	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Hypercompe		Insecta	63030
98710757	########	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	knotweeds, sma	Persicaria	knotweeds, sma	Plantae	61787
98710765	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Ampelopsis glan	Porcelain Berry	Plantae	204237
98710779	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	Peach Root Wee	Pseudoedophrys	Peach Root Wee	Insecta	533769
98710786	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Cladonia cristate	British soldier lic	Fungi	119669
98710832	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Amaranthus spin	spiny amaranth	Plantae	62917
98710854	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Coprinopsis lago	hare's foot inkca	Fungi	55605
98710934	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
98710976	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Persicaria longis	low smartweed	Plantae	143803
98710988	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Persicaria longis	low smartweed	Plantae	143803
98710993	########	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	Spotted Lantern	Lycorma delicat	Spotted Lantern	Insecta	324726
98711019	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
98711020	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
98711029	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
98711055	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Parthenocissus t	Japanese creepe	Plantae	166162
98711105	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Lepidoptera	Butterflies and M	Insecta	47157
98711123	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Coprinopsis lago	hare's foot inkca	Fungi	55605
98711129	########	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	Ants	Formicidae	Ants	Insecta	47336
98711204	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE	Isabella Tiger M	Pyrrharctia isab	Isabella Tiger M	Insecta	59675
98711260	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Hypercompe		Insecta	63030
98711302	Tue Oct 19 2021	########	2021-10-19 16:1	Eastern Time (U!	2021-10-19 16:1	FALSE		Coprinopsis lago	hare's foot inkca	Fungi	55605
98711364	Tue Oct 19 2021	########	2021-10-19 16:2	Eastern Time (U!	2021-10-19 16:2	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
98711371	Tue Oct 19 2021	########	2021-10-19 16:2	Eastern Time (U!	2021-10-19 16:2	FALSE	ground-ivy	Glechoma heder	ground-ivy	Plantae	55830
98711474	Tue Oct 19 2021	########	2021-10-19 16:2	Eastern Time (U!	2021-10-19 16:2	FALSE		Vaccinium coryn	Northern highbu	Plantae	52740
98716628	Mon Sep 27 202	########	2021-09-28 03:2	Eastern Time (U!	2021-10-19 17:2	FALSE	ãŀ§ã‹ãŀŀ"	Limax maximus	Leopard Slug	Mollusca	62470
98717587	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
98717599	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787
98717607	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Flavoparmelia b	rock greenshield	Fungi	148365
98717619	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787
98717644	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Magnoliopsida	dicots	Plantae	47124
98717652	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
98717663	########	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE	low smartweed	Persicaria longis	low smartweed	Plantae	143803
98717664	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Ageratina	snakeroots	Plantae	64116
98717686	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE	fireweed	Erechtites hierac	fireweed	Plantae	130888
98717698	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787
98717705	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787
98717738	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Asteraceae	sunflowers, dais	Plantae	47604
98717752	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
98717759	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Ceanothus amer	New Jersey tea	Plantae	129315
98717788	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Eupatorieae	bonesets, blazin	Plantae	153419
98717789	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
98717826	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U!	2021-10-19 17:3	FALSE		Persicaria	knotweeds, sma	Plantae	61787

98717839	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:3	FALSE	Đ'Ñ(Đ´Ñ€Đ' Đ¿Đ	Glechoma heder	ground-ivy	Plantae	55830
98717871	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:3	FALSE	yellow foxtail	Setaria pumila	yellow foxtail	Plantae	48688
98717873	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:3	FALSE	Oriental bitterw	Celastrus orbicu	Oriental bitterw	Plantae	64540
98717895	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:3	FALSE	Oriental bitterw	Celastrus orbicu	Oriental bitterw	Plantae	64540
98717927	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:3	FALSE		Solidago	goldenrods	Plantae	48678
98717936	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:3	FALSE	ground-ivy	Glechoma heder	ground-ivy	Plantae	55830
98717960	########	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:3	FALSE	silver birch	Betula pendula	silver birch	Plantae	83992
98718025	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE	ground-ivy	Glechoma heder	ground-ivy	Plantae	55830
98718026	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:4	FALSE		Setaria	foxtails and brist	Plantae	50055
98718035	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:4	FALSE		Ageratina	snakeroots	Plantae	64116
98718042	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:4	FALSE		Persicaria longis	low smartweed	Plantae	143803
98718057	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE		Melissa officinal	lemon balm	Plantae	59001
98718066	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE	early meadow-r	Thalictrum dioic	early meadow-r	Plantae	81748
98718070	########	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:4	FALSE	Fallopia	Fallopia		Plantae	72133
98718107	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE		Polygonoideae		Plantae	922206
98718132	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE		Urtica dioica	stinging nettle	Plantae	51884
98718243	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE	mile-a-minute w	Persicaria perfol	mile-a-minute w	Plantae	131249
98718250	Tue Oct 19 2021	########	2021-10-19 17:3	Eastern Time (U	2021-10-19 17:4	FALSE		Quercus	oaks	Plantae	47851
98718255	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE		Vitis vinifera	wine grape	Plantae	79519
98718262	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
98718334	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE		Fragaria Ã— ana	garden strawber	Plantae	55366
98718359	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE	ground-ivy	Glechoma heder	ground-ivy	Plantae	55830
98718511	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE	Đ'Ñ(Đ´Ñ€Đ' Đ¿Đ	Glechoma heder	ground-ivy	Plantae	55830
98718523	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE		Setaria	foxtails and brist	Plantae	50055
98718556	Tue Oct 19 2021	########	2021-10-19 17:4	Eastern Time (U	2021-10-19 17:4	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
98719802	Thu Sep 23 2021	########	2021-09-23 18:3	Eastern Time (U	2021-10-19 17:5	FALSE		Stagmomantis c	Carolina Mantis	Insecta	119989
98722691	Tue Oct 19 2021	########	2021-10-19 18:3	Eastern Time (U	2021-10-19 18:3	FALSE		Magnoliopsida	dicots	Plantae	47124
98739784	Tue Oct 19 2021	########	2021-10-19 21:5	Eastern Time (U	2021-10-19 21:5	FALSE		Bambusoideae	bamboos, canes	Plantae	201656
98739908	Tue Oct 19 2021	########	2021-10-19 21:5	Eastern Time (U	2021-10-19 21:5	FALSE	American pokew	Phytolacca amer	American pokew	Plantae	48599
98740020	Tue Oct 19 2021	########	2021-10-19 21:5	Eastern Time (U	2021-10-19 21:5	FALSE		Berberis	Barberries	Plantae	58728
98740090	Tue Oct 19 2021	########	2021-10-19 21:5	Eastern Time (U	2021-10-19 21:5	FALSE		Podocarpaceae	Yellowwood fam	Plantae	70279
98740116	Tue Oct 19 2021	########	2021-10-19 21:5	Eastern Time (U	2021-10-19 21:5	FALSE	Border Forsythia	Forsythia Ã— int	Border Forsythia	Plantae	411276
98744630	Fri Sep 03 2021	9/3/2021	2021-09-03 15:4	Eastern Time (U	2021-10-19 22:5	FALSE	Largemouth Bas	Micropterus salı	Largemouth Bas	Actinopterygii	49587
98744732	Fri Sep 10 2021	########	2021-09-10 20:5	Eastern Time (U	2021-10-19 22:5	FALSE	Channel Catfish	Ictalurus puncta	Channel Catfish	Actinopterygii	81554
98744822	Wed Feb 24 202	########	2021-02-24 14:3	Eastern Time (U	2021-10-19 22:5	FALSE	Eastern Gray Sq	Sciurus caroliner	Eastern Gray Sq	Mammalia	46017
98744904	Tue Sep 07 2021	9/7/2021	2021-09-07 19:5	Eastern Time (U	2021-10-19 23:0	FALSE	Groundhog	Marmota monax	Groundhog	Mammalia	46095
98745151	Tue Oct 19 2021	########	2021-10-19 23:0	Eastern Time (U	2021-10-19 23:0	FALSE		Rhododendron	rhododendrons	Plantae	49487
98748070	Tue Oct 19 2021	########	2021-10-19 23:4	Eastern Time (U	2021-10-19 23:4	FALSE		Ilex crenata	Japanese holly	Plantae	133240
98748174	Tue Oct 19 2021	########	2021-10-19 23:4	Eastern Time (U	2021-10-19 23:4	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
98748316	Tue Oct 19 2021	########	2021-10-19 23:4	Eastern Time (U	2021-10-19 23:5	FALSE		Hedera	ivies	Plantae	55883
98748327	Tue Oct 19 2021	########	2021-10-19 23:4	Eastern Time (U	2021-10-19 23:5	FALSE		Hedera hibernic	Atlantic Ivy	Plantae	163549
98748480	Tue Oct 19 2021	########	2021-10-19 23:4	Eastern Time (U	2021-10-19 23:5	FALSE		Hedera helix	common ivy	Plantae	55882
98884762	Thu Oct 21 2021	########	2021-10-21 14:5	Eastern Time (U	2021-10-21 14:5	FALSE		Taxus	yews	Plantae	47555
98884823	Thu Oct 21 2021	########	2021-10-21 14:5	Eastern Time (U	2021-10-21 14:5	FALSE		Koelreuteria par	golden rain tree	Plantae	58320
98885283	Thu Oct 21 2021	########	2021-10-21 14:5	Eastern Time (U	2021-10-21 14:5	FALSE	Western Honey	Apis mellifera	Western Honey	Insecta	47219
98971145	Fri Oct 22 2021	########	2021-10-22 12:1	Eastern Time (U	2021-10-22 12:1	FALSE		Persicaria	knotweeds, sma	Plantae	61787
98971194	Fri Oct 22 2021	########	2021-10-22 12:2	Eastern Time (U	2021-10-22 12:2	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
98971363	Fri Oct 22 2021	########	2021-10-22 12:2	Eastern Time (U	2021-10-22 12:2	FALSE		Eupatorium	bonesets	Plantae	52935
98971414	Fri Oct 22 2021	########	2021-10-22 12:2	Eastern Time (U	2021-10-22 12:2	FALSE		Asteroideae		Plantae	632790
98971903	Fri Oct 22 2021	########	2021-10-22 12:3	Eastern Time (U	2021-10-22 12:3	FALSE		Cepaea nemoral	Brown-lipped Sn	Mollusca	48586
99102951	Fri Oct 22 2021	########	2021-10-22 20:2	Eastern Time (U	2021-10-23 16:4	FALSE	Eastern Gray Sq	Sciurus caroliner	Eastern Gray Sq	Mammalia	46017
99103059	Fri Oct 22 2021	########	2021-10-22 20:2	Eastern Time (U	2021-10-23 16:4	FALSE	Blue Jay	Cyanocitta crista	Blue Jay	Aves	8229
99103124	Wed Oct 20 202	########	2021-10-21 03:3	Eastern Time (U	2021-10-23 16:4	FALSE	Harpalinae	Harpalinae		Insecta	202104
99103302	Wed Oct 20 202	########	2021-10-21 03:2	Eastern Time (U	2021-10-23 16:4	FALSE		Thanatus		Arachnida	153863
99237266	Sun Oct 24 2021	########	2021-10-24 17:2	Eastern Time (U	2021-10-24 17:2	FALSE		Abelia	Abelias	Plantae	155567
99237775	Sun Oct 24 2021	########	2021-10-24 17:2	Eastern Time (U	2021-10-24 17:2	FALSE	Eastern Gray Sq	Sciurus caroliner	Eastern Gray Sq	Mammalia	46017
99357001	Mon Oct 25 202	########	2021-10-25 16:0	Eastern Time (U	2021-10-25 16:0	FALSE		Dysphania pumi	Clammy goosefo	Plantae	76751
99357088	Mon Oct 25 202	########	2021-10-25 16:0	Eastern Time (U	2021-10-25 16:0	FALSE	broad-leaved do	Rumex obtusifol	broad-leaved do	Plantae	63371
99357142	Mon Oct 25 202	########	2021-10-25 16:0	Eastern Time (U	2021-10-25 16:0	FALSE		Quercus phellos	willow oak	Plantae	119983
99357299	Mon Oct 25 202	########	2021-10-25 16:0	Eastern Time (U	2021-10-25 16:1	FALSE	Formicine Ants	Formicinae	Formicine Ants	Insecta	244834
99357452	########	########	2021-10-25 16:1	Eastern Time (U	2021-10-25 16:1	FALSE	hairy crabweed	Fatoua villosa	hairy crabweed	Plantae	51636
99357561	########	########	2021-10-25 16:1	Eastern Time (U	2021-10-25 16:1	FALSE	Bacterial Speck	Pseudomonas sy	Bacterial Speck		337405
99357646	Mon Oct 25 202	########	2021-10-25 16:1	Eastern Time (U	2021-10-25 16:1	FALSE		Reynoutria Ã— I	Bohemian Knotv	Plantae	850784
99357915	Mon Oct 25 202	########	2021-10-25 16:1	Eastern Time (U	2021-10-25 16:1	FALSE	Isabella Tiger M	Pyrrharctia isabe	Isabella Tiger M	Insecta	59675
99357982	Mon Oct 25 202	########	2021-10-25 16:1	Eastern Time (U	2021-10-25 16:1	FALSE	fireweed	Erechtites hierac	fireweed	Plantae	130888
99365771	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE	fireweed	Erechtites hierac	fireweed	Plantae	130888
99365803	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE		Magnoliopsida	dicots	Plantae	47124
99365834	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE		Prunus serrulata	Japanese Cherry	Plantae	125742
99365905	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE					
99365909	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227

99365936	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
99365957	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
99366012	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE		Asteraceae	sunflowers, dais	Plantae	47604
99366036	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE		Ageratina	snakeroots	Plantae	64116
99366081	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE		Magnoliopsida	dicots	Plantae	47124
99366105	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE		Setaria	foxtails and brist	Plantae	50055
99366128	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
99366338	Mon Oct 25 202	########	2021-10-25 17:3	Eastern Time (U	2021-10-25 17:3	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
99366609	Mon Oct 25 202	########	2021-10-25 17:4	Eastern Time (U	2021-10-25 17:4	FALSE	Porcelain Berry	Ampelopsis glan	Porcelain Berry	Plantae	204237
99366810	Mon Oct 25 202	########	2021-10-25 17:4	Eastern Time (U	2021-10-25 17:4	FALSE		Deroceras reticu	Milky Slug	Mollusca	124432
99389479	Mon Oct 25 202	########	2021-10-25 21:1	Eastern Time (U	2021-10-25 21:1	FALSE		Diplocarpon rosa	Black Spot	Fungi	354898
99392605	Mon Oct 25 202	########	2021-10-25 21:4	Eastern Time (U	2021-10-25 21:4	FALSE		Plantae	plants	Plantae	47126
99392839	Mon Oct 25 202	########	2021-10-25 21:4	Eastern Time (U	2021-10-25 21:4	FALSE		Asteraceae	sunflowers, dais	Plantae	47604
99393339	Mon Oct 25 202	########	2021-10-25 21:4	Eastern Time (U	2021-10-25 21:4	FALSE		Myosotis	Forget-me-nots	Plantae	49131
99393716	Mon Oct 25 202	########	2021-10-25 21:5	Eastern Time (U	2021-10-25 21:5	FALSE		Picea abies	Norway spruce	Plantae	63567
99394342	Mon Oct 25 202	########	2021-10-25 21:5	Eastern Time (U	2021-10-25 21:5	FALSE	spruces	Picea	spruces	Plantae	63573
99395003	Mon Oct 25 202	########	2021-10-25 22:0	Eastern Time (U	2021-10-25 22:0	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
99491818	Tue Oct 26 2021	########	2021-10-26 21:2	Eastern Time (U	2021-10-26 21:2	FALSE	Common Stripec	Philoscia muscor	Common Stripec	Animalia	48292
99491938	Tue Oct 26 2021	########	2021-10-26 21:2	Eastern Time (U	2021-10-26 21:2	FALSE		Acer	maples	Plantae	47727
99491971	Tue Oct 26 2021	########	2021-10-26 21:2	Eastern Time (U	2021-10-26 21:2	FALSE	Eastern Gray Sq	Sciurus caroliner	Eastern Gray Sq	Mammalia	46017
99501062	Mon Oct 25 202	########	2021-10-25 19:4	Eastern Time (U	2021-10-26 23:3	FALSE	Mexican tea	Dysphania ambr	Mexican tea	Plantae	76746
99501206	Mon Oct 25 202	########	2021-10-25 19:4	Eastern Time (U	2021-10-26 23:4	FALSE	woodsorrels	Oxalis	woodsorrels	Plantae	47758
99501469	Tue Oct 26 2021	########	2021-10-26 23:4	Eastern Time (U	2021-10-26 23:4	FALSE		Plantae	plants	Plantae	47126
99501581	Tue Oct 26 2021	########	2021-10-26 23:4	Eastern Time (U	2021-10-26 23:4	FALSE		Plantae	plants	Plantae	47126
99501665	Sun Sep 05 2021	9/5/2021	2021-09-05 14:2	Eastern Time (U	2021-10-26 23:4	FALSE	fireweed	Erechtites hierac	fireweed	Plantae	130888
99602316	Wed Oct 27 202	########	2021-10-28 03:0	Eastern Time (U	2021-10-28 04:0	FALSE	Eastern Cottonta	Sylvilagus florida	Eastern Cottonta	Mammalia	43111
99602336	Thu Oct 28 2021	########	2021-10-28 04:0	Eastern Time (U	2021-10-28 04:0	FALSE		Forficula		Insecta	61525
99647286	Thu Oct 28 2021	########	2021-10-28 19:0	Eastern Time (U	2021-10-28 19:0	FALSE	white snakeroot	Ageratina altissi	white snakeroot	Plantae	119048
99647310	Thu Oct 28 2021	########	2021-10-28 19:0	Eastern Time (U	2021-10-28 19:0	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
99647391	Thu Oct 28 2021	########	2021-10-28 19:0	Eastern Time (U	2021-10-28 19:0	FALSE	Japanese pachys	Pachysandra ter	Japanese pachys	Plantae	142928
99647529	Thu Oct 28 2021	########	2021-10-28 19:0	Eastern Time (U	2021-10-28 19:0	FALSE		Persicaria	knotweeds, sma	Plantae	61787
99653420	Thu Oct 28 2021	########	2021-10-28 20:1	Eastern Time (U	2021-10-28 20:2	FALSE	dogwoods	Cornus	dogwoods	Plantae	47193
99653534	Thu Oct 28 2021	########	2021-10-28 20:2	Eastern Time (U	2021-10-28 20:2	FALSE		Magnoliopsida	dicots	Plantae	47124
99653561	Thu Oct 28 2021	########	2021-10-28 20:2	Eastern Time (U	2021-10-28 20:2	FALSE		Plantae	plants	Plantae	47126
99655130	Thu Oct 28 2021	########	2021-10-28 20:4	Eastern Time (U	2021-10-28 20:4	FALSE		Cupressoideae	Cypresses, Ceda	Plantae	1150915
99655289	Thu Oct 28 2021	########	2021-10-28 20:4	Eastern Time (U	2021-10-28 20:4	FALSE		Rudbeckia	black-eyed Susar	Plantae	62742
99664559	Thu Oct 28 2021	########	2021-10-28 22:5	Eastern Time (U	2021-10-28 22:5	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
99664599	Thu Oct 28 2021	########	2021-10-28 22:5	Eastern Time (U	2021-10-28 22:5	FALSE		Rubus	brambles	Plantae	47544
99664637	Thu Oct 28 2021	########	2021-10-28 22:5	Eastern Time (U	2021-10-28 22:5	FALSE		Oxalis stricta	upright yellow w	Plantae	53183
99664662	Thu Oct 28 2021	########	2021-10-28 22:5	Eastern Time (U	2021-10-28 22:5	FALSE		Salix babylonica	weeping willow	Plantae	58316
99664679	Thu Oct 28 2021	########	2021-10-28 22:5	Eastern Time (U	2021-10-28 22:5	FALSE	Stech-Fichte	Picea pungens	blue spruce	Plantae	119092
99680530	########	########	2021-10-03 02:3	Eastern Time (U	2021-10-29 04:0	FALSE	White-tailed Dee	Odocoileus virgi	White-tailed Dee	Mammalia	42223
99970841	Sun Oct 31 2021	########	2021-10-31 17:4	Eastern Time (U	2021-11-01 12:4	FALSE	Westliche Honig	Apis mellifera	Western Honey	Insecta	47219
99988420	Mon Nov 01 202	########	2021-11-01 16:3	Eastern Time (U	2021-11-01 16:5	FALSE	Brown Anole	Anolis sagrei	Brown Anole	Reptilia	116461
1.00E+08	Tue Nov 02 2021	########	2021-11-02 18:1	Eastern Time (U	2021-11-02 20:4	FALSE	New World Banc	Myzinum	New World Banc	Insecta	136465
1.00E+08	Wed Nov 03 202	########	2021-11-03 12:5	Eastern Time (U	2021-11-03 12:5	FALSE	Common Pill Wc	Armadillidium v	Common Pill Wc	Animalia	56083
1.00E+08	Wed Nov 03 202	########	2021-11-03 18:2	Eastern Time (U	2021-11-03 18:3	FALSE	House Sparrow	Passer domestic	House Sparrow	Aves	13858
1.00E+08	Wed Nov 03 202	########	2021-11-03 20:5	Eastern Time (U	2021-11-03 22:4	FALSE	Laughing Gull	Leucophaeus atr	Laughing Gull	Aves	144514
1.00E+08	Wed Nov 03 202	########	2021-11-03 21:3	Eastern Time (U	2021-11-03 22:4	FALSE	Laughing Gull	Leucophaeus atr	Laughing Gull	Aves	144514
1.00E+08	Wed Nov 03 202	########	2021-11-04 00:5	Eastern Time (U	2021-11-04 01:2	FALSE	Ã¡vÃ¡b americkÃ	Periplaneta ame	American Cockr	Insecta	82231
1.00E+08	Wed Nov 03 202	########	2021-11-04 00:0	Eastern Time (U	2021-11-04 01:2	FALSE	Turtles and Tort	Testudines	Turtles and Tort	Reptilia	39532
1.00E+08	Wed Nov 03 202	########	2021-11-04 00:0	Eastern Time (U	2021-11-04 01:2	FALSE		Avicennia germi	black mangrove	Plantae	62853
1.00E+08	Wed Nov 03 202	########	2021-11-03 23:5	Eastern Time (U	2021-11-04 01:2	FALSE		Zamia		Plantae	67326
1.00E+08	Wed Nov 03 202	########	2021-11-03 23:5	Eastern Time (U	2021-11-04 01:2	FALSE		Galphimia		Plantae	131505
1.00E+08	Wed Nov 03 202	########	2021-11-03 23:5	Eastern Time (U	2021-11-04 01:2	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
1.00E+08	Thu Nov 04 202	########	2021-11-04 19:2	Eastern Time (U	2021-11-04 20:4	FALSE	Eastern Amberw	Perithemis tene	Eastern Amberw	Insecta	59776
1.00E+08	Thu Nov 04 202	########	2021-11-04 19:2	Eastern Time (U	2021-11-04 20:4	FALSE		Anartia jatropha	White Peacock	Insecta	49761
1.00E+08	Thu Nov 04 202	########	2021-11-04 19:2	Eastern Time (U	2021-11-04 20:5	FALSE	Black Vulture	Coragyps atratu	Black Vulture	Aves	4765
1.00E+08	Thu Nov 04 202	########	2021-11-04 19:1	Eastern Time (U	2021-11-04 20:5	FALSE	Anhinga	Anhinga anhinga	Anhinga	Aves	5063
1.00E+08	Thu Nov 04 202	########	2021-11-04 19:1	Eastern Time (U	2021-11-04 20:5	FALSE	Tricolored Heror	Egretta tricolor	Tricolored Heror	Aves	4938
1.00E+08	Thu Nov 04 202	########	2021-11-04 19:1	Eastern Time (U	2021-11-04 20:5	FALSE	White Ibis	Eudocimus albu	White Ibis	Aves	3751
1.00E+08	Thu Nov 04 202	########	2021-11-04 22:3	Eastern Time (U	2021-11-05 04:5	FALSE	Black Skimmer	Rynchops niger	Black Skimmer	Aves	4406
1.00E+08	Fri Nov 05 2021	########	2021-11-05 18:3	Eastern Time (U	2021-11-05 20:4	FALSE	White Ibis	Eudocimus albu	White Ibis	Aves	3751
1.00E+08	Fri Nov 05 2021	########	2021-11-05 22:1	Eastern Time (U	2021-11-05 22:2	FALSE		Casuarina equise	Beach Sheoak	Plantae	62888
1.00E+08	Sat Nov 06 2021	########	2021-11-06 17:2	Eastern Time (U	2021-11-06 17:2	FALSE		Casuarina	Beefwoods	Plantae	62891
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Robinia	Locust Trees	Plantae	56089
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Hedera hibernica	Atlantic Ivy	Plantae	163549
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Trametes hirsuta	Hairy Bracket	Fungi	116605
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Magnoliopsida	dicots	Plantae	47124
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Hedera hibernica	Atlantic Ivy	Plantae	163549

1.08E+08	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2022-03-02 12:3	FALSE	common mugwc	Artemisia vulgar	common mugwc	Plantae	52856
1.08E+08	Mon Oct 18 202	########	2021-10-18 12:2	Eastern Time (U	2022-03-02 12:3	FALSE		Eupatorium	bonesets	Plantae	52935
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Trametopsis cervina		Fungi	485771
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Ulmus parvifolia	Chinese elm	Plantae	79462
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE	ivies	Hedera hibernic	Atlantic Ivy	Plantae	163549
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE	American sycam	Platanus occider	American sycam	Plantae	49662
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Fabaceae	legumes	Plantae	47122
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE	ivies	Hedera hibernic	Atlantic Ivy	Plantae	163549
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE	ivies	Hedera hibernic	Atlantic Ivy	Plantae	163549
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE	ivies	Hedera	ivies	Plantae	55883
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Hedera	ivies	Plantae	55883
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Pinus	pines	Plantae	47561
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Ageratina altissi	white snakeroot	Plantae	119048
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Pinus	pines	Plantae	47561
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:3	FALSE		Quercus	oaks	Plantae	47851
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:4	FALSE	ivies	Hedera hibernic	Atlantic Ivy	Plantae	163549
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:4	Eastern Time (U	2022-03-02 12:4	FALSE		Ulmus parvifolia	Chinese elm	Plantae	79462
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:4	FALSE		Trametes conchi	little nest polypc	Fungi	880970
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:4	Eastern Time (U	2022-03-02 12:4	FALSE		Hedera	ivies	Plantae	55883
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:3	Eastern Time (U	2022-03-02 12:4	FALSE		Pinus	pines	Plantae	47561
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:4	Eastern Time (U	2022-03-02 12:4	FALSE	Efeu	Hedera	ivies	Plantae	55883
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:4	Eastern Time (U	2022-03-02 12:4	FALSE		Fulvifomes	Phellinus rimosu	Fungi	179097
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:4	Eastern Time (U	2022-03-02 12:4	FALSE		Ganoderma app	artist's bracket	Fungi	48473
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:4	Eastern Time (U	2022-03-02 12:4	FALSE		Ilex	hollies	Plantae	53854
1.08E+08	Wed Mar 02 202	3/2/2022	2022-03-02 12:4	Eastern Time (U	2022-03-02 12:4	FALSE		Ilex	hollies	Plantae	53854
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE	American Robin	Turdus migratori	American Robin	Aves	12727
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE	American Robin	Turdus migratori	American Robin	Aves	12727
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE	American Robin	Turdus migratori	American Robin	Aves	12727
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Barbarea verna	land cress	Plantae	71136
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Plagiomnium cu	Woodsy Thyme-	Plantae	141535
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Odocoileus virgi	White-tailed Dee	Mammalia	42223
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Chenopodium al	Common Lambs	Plantae	58127
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Verbascum	mulleins	Plantae	56165
1.08E+08	########	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE	Calyptrate Flies	Calyptratae	Calyptrate Flies	Insecta	342767
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Odocoileus virgi	White-tailed Dee	Mammalia	42223
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE	honeysuckles	Lonicera	honeysuckles	Plantae	51874
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Odocoileus virgi	White-tailed Dee	Mammalia	42223
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE	red deadnettle	Lamium purpure	red deadnettle	Plantae	55851
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Pinus	pines	Plantae	47561
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Robinia	Locust Trees	Plantae	56089
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Pinus	pines	Plantae	47561
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:2	FALSE		Pinaceae	pine family	Plantae	47562
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:3	FALSE		Setaria faberi	giant foxtail	Plantae	79067
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:2	Eastern Time (U	2022-03-03 16:3	FALSE		Pinus echinata	shortleaf pine	Plantae	49396
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE		Populus deltoide	Eastern Cottonw	Plantae	52119
1.08E+08	########	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE	goose poop	Vertebrata	Vertebrates	Animalia	355675
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE		Pinus	pines	Plantae	47561
1.08E+08	########	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE	Chinese elm	Ulmus parvifolia	Chinese elm	Plantae	79462
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE	Agaricomycetes	Agaricomycetes		Fungi	50814
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE		Fabaceae	legumes	Plantae	47122
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE	eastern white pi	Pinus strobus	eastern white pi	Plantae	52391
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE		Asclepias	milkweeds	Plantae	47906
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:3	Eastern Time (U	2022-03-03 16:3	FALSE		Branta canadens	Canada Goose	Aves	7089
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 16:4	Eastern Time (U	2022-03-03 17:1	FALSE	hemlocks	Tsuga canadensi	eastern hemlock	Plantae	48734
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	grasses, sedges,	Poales	grasses, sedges,	Plantae	47162
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Scleroderma pol	Many-rooted Ea	Fungi	118146
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Acer saccharinu	silver maple	Plantae	54762
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	bear poop	Mammalia	Mammals	Mammalia	40151
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	Life	Life			48460
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	ZweikeimblÃttr	Magnoliopsida	dicots	Plantae	47124
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Magnoliopsida	dicots	Plantae	47124
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Callicladium imp	brocade moss	Plantae	1278022
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	red deadnettle	Lamium purpure	red deadnettle	Plantae	55851
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Bryoandersonia	spoon-leaved m	Plantae	159409
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	Purpurrote Taub	Lamium purpure	red deadnettle	Plantae	55851
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	garlic mustard	Alliaria petiolata	garlic mustard	Plantae	56061
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Pinus	pines	Plantae	47561
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Quercus	oaks	Plantae	47851
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Allium vineale	wild garlic	Plantae	75371

1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Lamiaceae	mint family	Plantae	48623
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Setaria	foxtails and brist	Plantae	50055
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	Birds	Aves	Birds	Aves	3
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Entodon seductr	seductive entod	Plantae	128029
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	Eastern Teaberry	Gaultheria proc	Eastern Teaberry	Plantae	62376
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Rubus	brambles	Plantae	47544
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Salix discolor	pussy willow	Plantae	54844
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Magnoliopsida	dicots	Plantae	47124
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	pines	Pinus	pines	Plantae	47561
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	White-tailed Dee	Odocoileus virgi	White-tailed Dee	Mammalia	42223
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE	deadnettles	Lamium	deadnettles	Plantae	55460
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Pinus	pines	Plantae	47561
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Fungi	Fungi Including I	Fungi	47170
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 17:5	FALSE		Pinus resinosa	red pine	Plantae	52383
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 18:0	FALSE		Platanus	planes	Plantae	49664
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 18:0	FALSE		Allium vineale	wild garlic	Plantae	75371
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 17:5	Eastern Time (U	2022-03-03 18:0	FALSE		Lamiaceae	mint family	Plantae	48623
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE		Mammalia	Mammals	Mammalia	40151
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE		Juglans	Walnuts	Plantae	54405
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE	eastern black wa	Juglans nigra	eastern black wa	Plantae	54504
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE		Pinus strobus	eastern white pi	Plantae	52391
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE	pines	Pinus	pines	Plantae	47561
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE		Trametes		Fungi	47378
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE	eastern white pi	Pinus strobus	eastern white pi	Plantae	52391
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE		Bryophyta	mosses	Plantae	311249
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE		Tracheophyta	vascular plants	Plantae	211194
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE		Lecanoromycete	common lichens	Fungi	54743
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:0	FALSE		Pinus strobus	eastern white pi	Plantae	52391
1.08E+08	Thu Mar 03 202	3/3/2022	2022-03-03 18:0	Eastern Time (U	2022-03-03 18:1	FALSE		Odocoileus virgi	White-tailed Dee	Mammalia	42223
1.11E+08	2022-04-11 07:5	########	2022-04-11 11:5	Atlantic Time (C	2022-04-11 11:5	FALSE		Poaceae	grasses	Plantae	47434
1.11E+08	2022-04-11 07:5	########	2022-04-11 11:5	Atlantic Time (C	2022-04-11 12:0	FALSE		Cardamine hirsu	hairy bittercress	Plantae	55829
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Miscanthus sine	Chinese silver gr	Plantae	165474
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Brachythecium r	Rough-stalked Fe	Plantae	159407
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Rumex obtusifol	broad-leaved do	Plantae	63371
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE	clovers	Trifolium	clovers	Plantae	51876
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Rubus occidenta	black raspberry	Plantae	125489
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Poa pratensis	Smooth Meadow	Plantae	60307
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Tracheophyta	vascular plants	Plantae	211194
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Forsythia Ã— int	Border Forsythia	Plantae	411276
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Rubus	brambles	Plantae	47544
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Taphrina betulin	Birch Witch's-br	Fungi	384484
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE	Pitrus	Juncus effusus	Soft Rush	Plantae	56153
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Ilex	hollies	Plantae	53854
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE	garlic mustard	Alliaria petiolata	garlic mustard	Plantae	56061
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Lindera benzoin	northern spiceb	Plantae	54793
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE	eastern skunk ca	Symplocarpus fo	eastern skunk ca	Plantae	48961
1.11E+08	2022-04-11 08:0	########	2022-04-11 12:0	Atlantic Time (C	2022-04-11 12:0	FALSE		Rosa multiflora	multiflora rose	Plantae	78882
1.11E+08	2022-04-11 08:1	########	2022-04-11 12:1	Atlantic Time (C	2022-04-11 12:1	FALSE	eastern skunk ca	Symplocarpus fo	eastern skunk ca	Plantae	48961
1.11E+08	2022-04-11 08:1	########	2022-04-11 12:1	Atlantic Time (C	2022-04-11 12:1	FALSE		Pyrus calleryana	Callery pear	Plantae	119793
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Pyrus	pears	Plantae	58736
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Cichorieae		Plantae	359450
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	red deadnettle	Lamium purpure	red deadnettle	Plantae	55851
1.11E+08	########	########	2022-04-12 15:5	Eastern Time (U	2022-04-12 15:5	FALSE	Cichorieae	Cichorieae		Plantae	359450
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Veronica arvensi	corn speedwell	Plantae	55748
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	common mugwo	Artemisia vulgar	common mugwo	Plantae	52856
1.11E+08	2022-03-03 11:3	3/3/2022	2022-03-03 16:3	Bogota	2022-04-12 15:5	FALSE	Life	Life			48460
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	garlic mustard	Alliaria petiolata	garlic mustard	Plantae	56061
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	Purpurrote Taub	Lamium purpure	red deadnettle	Plantae	55851
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	great mullein	Verbascum thap	great mullein	Plantae	59029
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Fulvifomes	Phellinus rimosu	Fungi	179097
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	mints, plantains,	Lamiales	mints, plantains,	Plantae	48151
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	great mullein	Verbascum thap	great mullein	Plantae	59029
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Taraxacum offici	common dandel	Plantae	47602
1.11E+08	########	########	2022-04-12 15:5	Eastern Time (U	2022-04-12 15:5	FALSE	Common Dewbe	Rubus flagellaris	Common Dewbe	Plantae	69717
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	red deadnettle	Lamium purpure	red deadnettle	Plantae	55851
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Dicranum scopa	broom moss	Plantae	123134

1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Cymbopogon cit	Lemon Grass	Plantae	123728
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Dicranum scopa	broom moss	Plantae	123134
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	common mugwc	Artemisia vulgar	common mugwc	Plantae	52856
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Psilotum nudum	skeleton fork fer	Plantae	167517
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	garlic mustard	Alliaria petiolata	garlic mustard	Plantae	56061
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Berberis thunbe	Japanese barber	Plantae	58727
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Pinus strobus	eastern white pi	Plantae	52391
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	garlic mustard	Alliaria petiolata	garlic mustard	Plantae	56061
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	great mullein	Verbascum thap	great mullein	Plantae	59029
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	garlic mustard	Alliaria petiolata	garlic mustard	Plantae	56061
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Taraxacum	dandelions	Plantae	47603
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	Canada mayflow	Maianthemum c	Canada mayflow	Plantae	67748
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Pinus	pines	Plantae	47561
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE					
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	great mullein	Verbascum thap	great mullein	Plantae	59029
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	garlic mustard	Alliaria petiolata	garlic mustard	Plantae	56061
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Poa annua	Annual Meadow	Plantae	52808
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE	ÐšÐµÑ€Ð½Ð¾Ñ	Alliaria petiolata	garlic mustard	Plantae	56061
1.11E+08	########	########	2022-04-12 15:5	Eastern Time (U	2022-04-12 15:5	FALSE	Thin-legged Wol	Pardosa	Thin-legged Wol	Arachnida	47415
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Smilax	greenbriers	Plantae	60748
1.11E+08	2022-04-12 11:5	########	2022-04-12 15:5	Atlantic Time (C	2022-04-12 15:5	FALSE		Fulvifomes robir	Cracked Cap Pol	Fungi	1145488
1.11E+08	2022-04-12 12:0	########	2022-04-12 16:0	Atlantic Time (C	2022-04-12 16:0	FALSE					
1.11E+08	########	########	2022-04-12 15:5	Eastern Time (U	2022-04-12 16:0	FALSE	Black-sided Pygr	Tettigidea lateral	Black-sided Pygr	Insecta	207544
1.11E+08	2022-04-12 12:0	########	2022-04-12 16:0	Atlantic Time (C	2022-04-12 16:0	FALSE		Globifomes grav	Sweet knot	Fungi	204106
1.11E+08	2022-04-12 12:0	########	2022-04-12 16:0	Atlantic Time (C	2022-04-12 16:0	FALSE	red deadnettle	Lamium purpure	red deadnettle	Plantae	55851
1.11E+08	2022-04-12 12:0	########	2022-04-12 16:0	Atlantic Time (C	2022-04-12 16:0	FALSE		Hymenochaetaceae		Fungi	57518
1.11E+08	2022-04-12 12:0	########	2022-04-12 16:0	Atlantic Time (C	2022-04-12 16:0	FALSE	wineberry	Rubus phoenicol	wineberry	Plantae	84227
1.11E+08	2022-04-12 12:0	########	2022-04-12 16:0	Atlantic Time (C	2022-04-12 16:0	FALSE		Eleusine indica	Goose Grass	Plantae	76790
1.11E+08	2022-04-12 12:0	########	2022-04-12 16:0	Atlantic Time (C	2022-04-12 16:0	FALSE	common mugwc	Artemisia vulgar	common mugwc	Plantae	52856
1.11E+08	2022-04-12 13:1	########	2022-04-12 17:1	Atlantic Time (C	2022-04-12 17:1	FALSE		Taraxacum	dandelions	Plantae	47603
1.11E+08	2022-04-12 13:1	########	2022-04-12 17:1	Atlantic Time (C	2022-04-12 17:1	FALSE	American sweet	Liquidambar sty	American sweet	Plantae	49658
1.11E+08	2022-04-12 13:1	########	2022-04-12 17:1	Atlantic Time (C	2022-04-12 17:1	FALSE		Amygdaloideae		Plantae	922110
1.11E+08	2022-04-12 13:1	########	2022-04-12 17:1	Atlantic Time (C	2022-04-12 17:1	FALSE		Taraxacum	dandelions	Plantae	47603
1.11E+08	Tue Apr 12 2022	########	2022-04-12 17:1	Eastern Time (U	2022-04-12 17:2	FALSE		Ulmus parvifolia	Chinese elm	Plantae	79462
1.11E+08	2022-04-12 13:1	########	2022-04-12 17:1	Atlantic Time (C	2022-04-12 17:2	FALSE		Taraxacum offici	common dandel	Plantae	47602
1.11E+08	2022-04-12 13:1	########	2022-04-12 17:1	Atlantic Time (C	2022-04-12 17:2	FALSE		Cichorieae		Plantae	359450
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Miscanthus sine	Chinese silver gr	Plantae	165474
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	red deadnettle	Lamium purpure	red deadnettle	Plantae	55851
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Taraxacum offici	common dandel	Plantae	47602
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Quercus acutissi	Sawtooth oak	Plantae	167634
1.11E+08	Tue Apr 12 2022	########	2022-04-12 17:2	Eastern Time (U	2022-04-12 17:2	FALSE		Calamagrostis	Reedgrasses	Plantae	52713
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE					
1.11E+08	2022-04-12 14:2	########	2022-04-12 17:2	Brasilia	2022-04-12 17:2	FALSE		Asteraceae	sunflowers, dais	Plantae	47604
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Amygdaloideae		Plantae	922110
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	red deadnettle	Lamium purpure	red deadnettle	Plantae	55851
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Solidago patula	Swamp Goldenr	Plantae	145721
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Taraxacum eryth	red-seeded danc	Plantae	79317
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	Orontioideae	Orontioideae		Plantae	706195
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	garlic mustard	Alliaria petiolata	garlic mustard	Plantae	56061
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Rosa multiflora	multiflora rose	Plantae	78882
1.11E+08	Tue Apr 12 2022	########	2022-04-12 17:2	Eastern Time (U	2022-04-12 17:2	FALSE	dicots	Magnoliopsida	dicots	Plantae	47124
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Calamagrostis ep	Bushgrass	Plantae	204260
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Cardamine hirsu	hairy bittercress	Plantae	55829
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Poaceae	grasses	Plantae	47434
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Taraxacum	dandelions	Plantae	47603
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE					
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	Amygdaloideae	Amygdaloideae		Plantae	922110
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	Callery pear	Pyrus calleryana	Callery pear	Plantae	119793
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	dandelions	Taraxacum	dandelions	Plantae	47603
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	common reed	Phragmites aust	common reed	Plantae	64237
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	flowering plants	Angiospermae	flowering plants	Plantae	47125
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Rosa	roses	Plantae	53438
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	Fungi Including l	Fungi	Fungi Including l	Fungi	47170
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Rosa	roses	Plantae	53438
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Digitaria ischaem	smooth crabgra	Plantae	76658
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE					
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	Callery pear	Pyrus calleryana	Callery pear	Plantae	119793
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE	Callery pear	Pyrus calleryana	Callery pear	Plantae	119793
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (C	2022-04-12 17:2	FALSE		Carex peduncula	long-stalked sed	Plantae	160059

1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (G	2022-04-12 17:2	FALSE		Cichorieae		Plantae	359450
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (G	2022-04-12 17:2	FALSE	Trzcina pospolita	Phragmites aust	common reed	Plantae	64237
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (G	2022-04-12 17:2	FALSE		Taraxacum	dandelions	Plantae	47603
1.11E+08	2022-04-12 13:2	########	2022-04-12 17:2	Atlantic Time (G	2022-04-12 17:2	FALSE		Insolibasidium d	Honeysuckle Lea	Fungi	379839

APPENDIX F

EXIT INTERVIEW QUESTIONS

Interview Questions:

1. Before you started this project, did you know what data literacy or citizen science were?
2. After this project, can you explain what data literacy and citizen science are?
3. At the beginning of this school year, what was your level of confidence in your data skills?
    A. Have you felt your confidence level change?
    B. How so?
    C. What caused this change?
4. Outside of the math classroom, can you think of any other examples of where data skills would be important?
    A. Any possible careers/jobs in particular?
5. What was your opinion about science before this project?
    A. How does that opinion compare to your current opinion?
6. At the beginning of the school year, were you considering any jobs/careers that focused on STEM/ data analysis?
    A. Any current considerations or interests?