

Explore Activity - Data Visualization and Analysis

Objectives:

- Students will be able to define carrying capacity and limiting factors
- Students will use modeling techniques to convert raw scientific data into graphs and charts
- Students will make inferences about scientific trends based on scientific data

Materials:

- Provided data sets

Background

As [urbanization](#) accelerates and human populations continue to grow and impact ecosystems around the world, it becomes increasingly important for scientists to study plant and animal populations. Florida is a prime example of how human beings are affecting these systems. With over 500 [exotic](#) species now calling the state home, the diversity and abundance of [native species](#) are declining. Gathering data on our state's plants and animals helps scientists determine the [relative abundance](#) of different plants and animals, what a system's [carrying capacity](#) is, what variables act as [limiting factors](#) for different populations, and how these organisms are responding to factors such as [climate change](#) and competition for [natural resources](#).



However, practicing the best science and gathering high quality data is not enough. If scientific data is not communicated effectively, other people will not be able to understand critical research being done all over the world. Raw data can be extremely difficult and sometimes impossible to understand. Clear data visualization like bar graphs, pie charts, and scatter plots, is a primary tool for communicating science effectively. Even non-scientists can harness these principles to explain scientific concepts to classmates, friends, and family. Today, you will practice creating and interpreting data visualizations to become a better science communicator.

Activity Instructions and Questions:

1. Researchers sampled a 1 acre suburban backyard for ground-dwelling arthropods and brown anoles. To do so, they performed visual surveys for anoles in 5 random [quadrats](#) near perches and 5 random quadrats out in the open. They sampled the area's arthropods using 10 square quadrats within these same study areas. Here is the data they collected:

■ SITE 1 - perch	anoles - 7	ants - 23	non-ants - 31
■ SITE 2 - perch	anoles - 9	ants - 16	non-ants - 37
■ SITE 3 - perch	anoles - 4	ants - 30	non-ants - 18
■ SITE 4 - perch	anoles - 6	ants - 23	non-ants - 29
■ SITE 5 - perch	anoles - 3	ants - 19	non-ants - 17
■ SITE 6 - open	anoles - 1	ants - 41	non-ants - 12
■ SITE 7 - open	anoles - 2	ants - 37	non-ants - 18
■ SITE 8- open	anoles - 5	ants - 29	non-ants - 22
■ SITE 9 - open	anoles - 5	ants - 25	non-ants - 24
■ SITE 10- open	anoles - 3	ants - 38	non-ants - 16

2. This dataset can be accessed [here](#). From that dataset page on Google Sheets, follow [these steps](#) to create your own data visualizations.
3. Now, choosing either a pie chart, bar graph, or scatter plot, create a graphic that shows the [relative abundance](#) of ants vs non-ants in this system. Copy and paste this image into your science journal.
4. Now using a different one of these three visualizations, create a graphic that compares the abundance of anoles at each site, making sure to use different colors for sites in the open and sites near a perch. Copy and paste this image into your science journal.
5. Now using one of these three visualizations, create a graphic that depicts the relationship between anole abundance and non-ant arthropod abundance at each site. Copy and paste this image into your science journal.