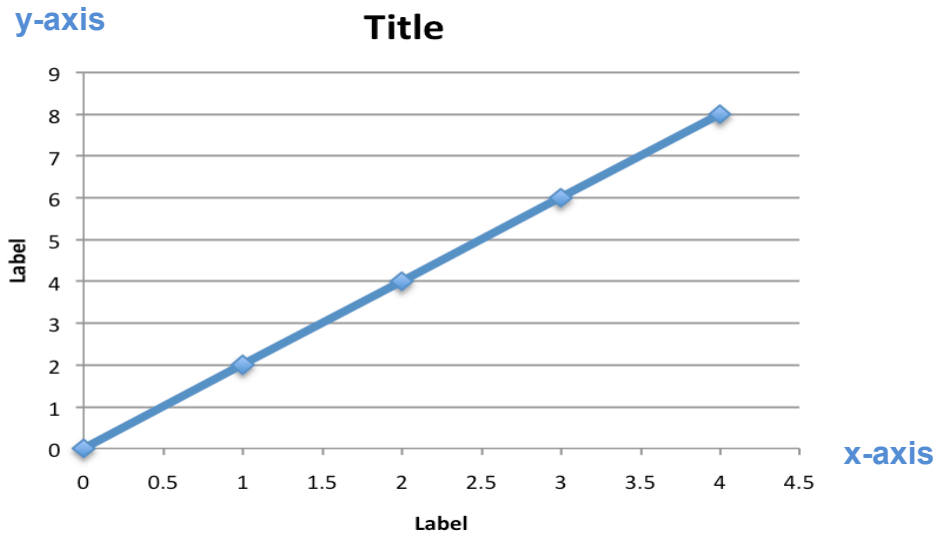
Introduction to Line Graphing

Featuring Courtney Gerstenmaier

A **graph** is a pictorial display of information. Graphs are a great way to represent data (a collection of information), interpret it, and draw conclusions. In other words, a graph is a picture of numbers that tells a story!

A graph is made with a pair of perpendicular number lines, called axes that make a **coordinate system**. The two axes are the x-axis and the y-axis. Points on a graph are defined by an **ordered pair** of numbers, called **coordinates**. These coordinates tell us where to travel on the axes. The first number in the ordered pair, or **x-coordinate** tells us how far to travel left or right on the x-axis. The second number, or **y-coordinate** tells us how far up or down to travel on the y-axis.

Let's look at the parts of a graph:

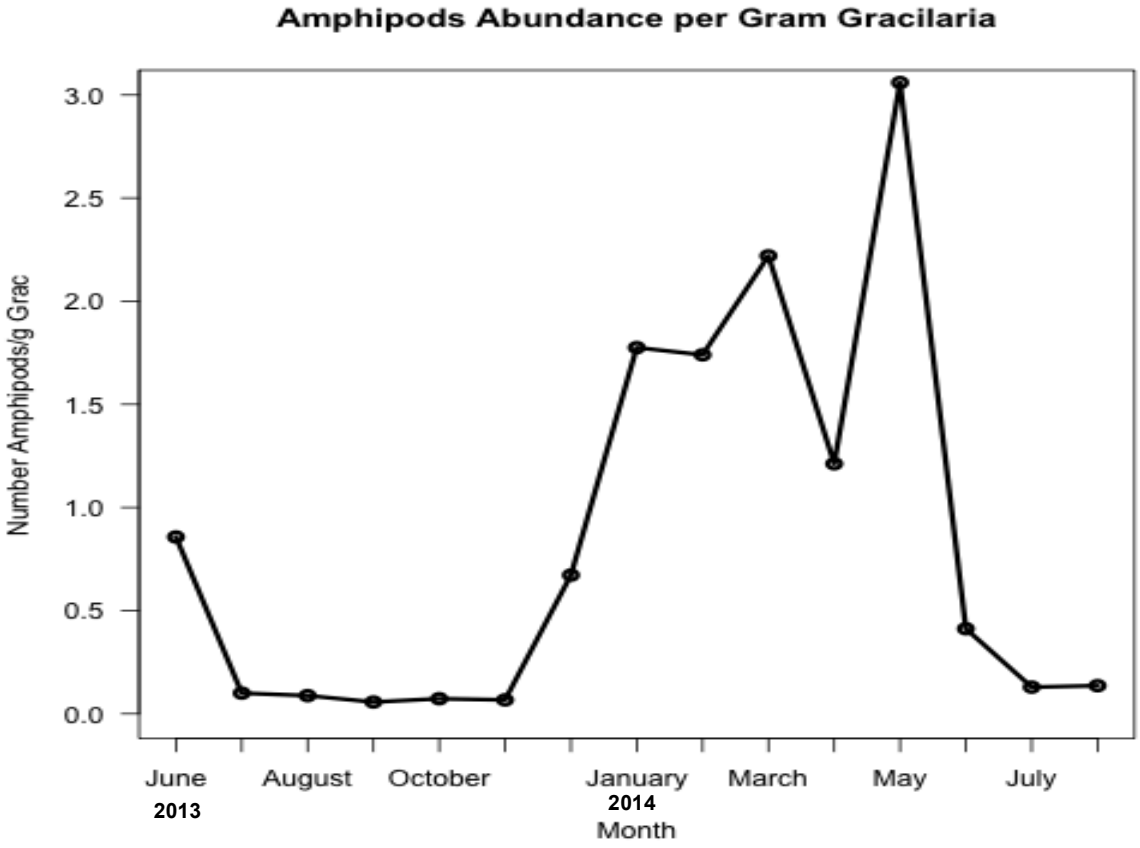


Title: a few words that explain the purpose of the graph
Labels: are titles for the axes; they are units of measurement
Points: dots on the graph where the x and y-coordinates intersect
Line: the line connects the points, it can show a pattern at a glance
Origin: Where the x & y axis meet; ordered pair (0,0)

Example:
(2,4) is an ordered pair. To plot this point, travel to the right 2 units on the x-axis, and go up 4 units on the y-axis.

GRAPHING REAL DATA: AMPHIPODS IN THE MARSH

Courtney Gerstenmaier, a marine biology graduate student from the College of Charleston has been doing research to see how *Gracilaria*, an invasive alga, acts as a habitat for local marsh life. Courtney has done several field experiments to make quantitative observations about the number of amphipods found living on *Gracilaria* in the marsh. Below you will find a graph of her data from the past year.



1. What is the x-axis showing? _____
2. What is the y-axis showing? _____
3. How many amphipods per gram *Gracilaria* were there in January? _____
4. What month had the highest number of amphipods? _____
5. Which months had the lowest number of amphipods? _____
6. Write a statement describing what happens to the number of amphipods as seasons change.

   _____

   _____

Point to Ponder:

There are less amphipods in the marsh during the summer months. Why do you think there are less amphipods in the summer and more in the fall and winter? Why would there be more amphipods in some months than others? Discuss with your classmates.

Courtney preformed another experiment looking at the predation rate of amphipods living on *Gracilaria* in the marsh. After offering dead amphipods at various locations on a mudflat, Courtney calculated the mean amount of individual amphipods consumed (predation rate) after left in the field for 24 hours. The graph below shows this predation rate over time.

1. What is the x-axis showing? _____
2. What is the y-axis showing? _____
3. What does a **negative** slope tell us? _____
4. What does a **positive** slope tell us? _____
5. In what season (summer, fall, spring, winter) is predation rate highest? _____
6. In what season is predation rate the lowest? _____
7. Circle the correct words to make this statement true:
   There are [more]/ [less] predators in the summer.

We have now looked at two different graphs. Do you see a relationship between these two graphs?

Write a statement that describes the relationship between these two graphs.

_____

_____

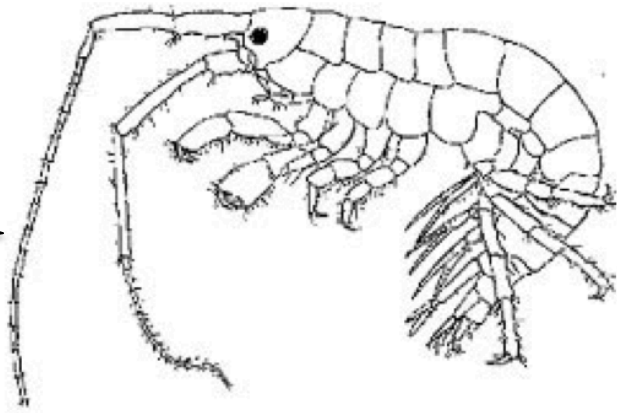
_____

“FOOD” FOR THOUGHT

What is an amphipod?

Amphipods are shrimp-like arthropods, invertebrates characterized by a jointed, segmented exoskeleton. Amphipods are marine animals that can be herbivores, omnivores, or carnivores. They are typically less than 10mm, but can be much larger in size. The largest recorded living amphipods are 280mm found in the deep sea.

What is a **millimeter**? How many millimeters are in a **centimeter**? Deep-sea amphipods can be up to 280mm! Convert 280mm to centimeters!



What is a **predator?**
A predator is an animal that lives by hunting and eating other animals.

What is **prey**?
Prey is an animal that is hunted or eaten by another animal for food.

In the marsh, amphipods are prey to animals, such as pinfish and crabs.

Can you think of any variables that would have influenced Courtney’s results?

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_____

_____

Want to learn more about Courtney’s research? Check out Patriot’s Point Science Spotlight.

http://www.patriotspointsciencespotlight.com