



## Try This at Home: Geocaching

Geocaching is a free worldwide scavenger hunt, fun for all ages, and a great family activity.

The geocaching app directs you to a cache hidden by a fellow geocacher and published on the [www.geocaching.com](http://www.geocaching.com) system. There are literally millions of geocaches hidden all over the world. Find one, log your name, and join the fun. Download the free or fee-based app for your smartphone and start hunting. Geocaching compares the GPS coordinates of the cache to your phone's location and directs you to the find. Good luck and happy hunting!

GPS stands for "global positioning system." This is a network of satellites that orbit the earth, providing relative location information to GPS receivers. Specialized GPS devices, vehicle navigation systems, and most smartphones have the ability to receive GPS signals from these satellites. GPS allows the user to be located very precisely and can help direct the user to another location when used for navigation.

The science behind geocaching and GPS is best for older or particularly inquisitive students.



GPS coordinates are a set of numbers that indicate the location's relative position north or south of the equator, and east or west of the prime meridian. The prime meridian is an imaginary line that runs through the town of Greenwich, England. The earth is divided into many imaginary lines that run around the globe and "up and down" the globe. The lines that run around the globe are called latitude lines. The lines that run up and down are called longitude lines. One way to remember is to think "It's a LONG (as in LONGitude) way from the North Pole to the South Pole."

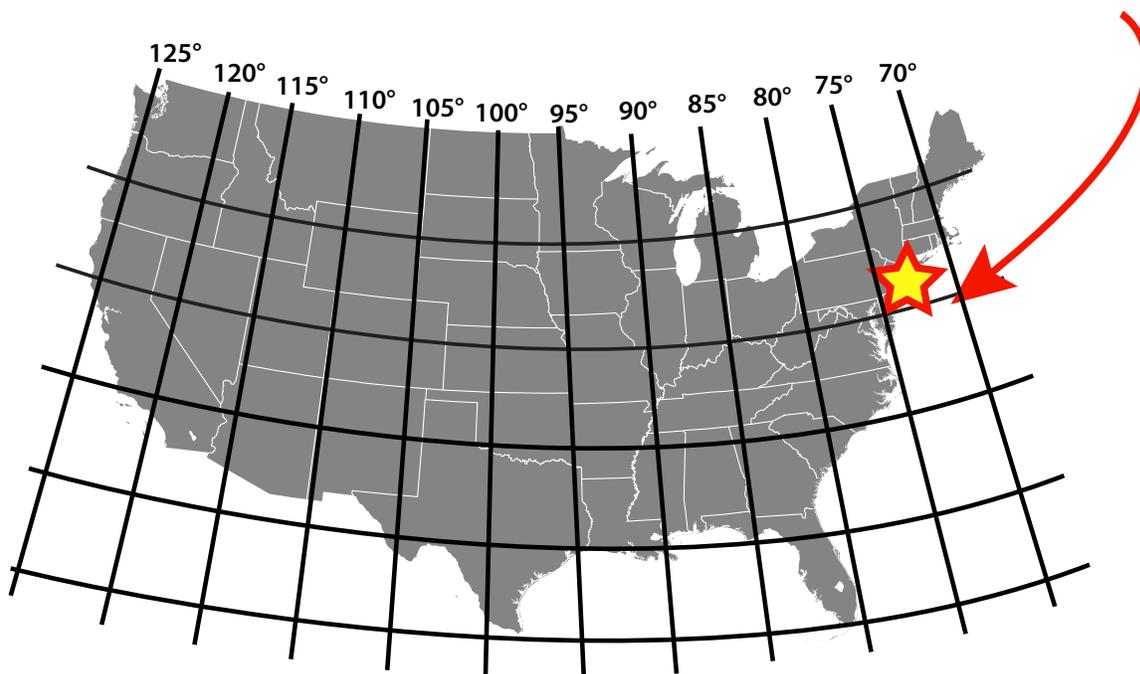
GPS coordinates are expressed in degrees (°), minutes ('), and seconds ("), plus the N/S and E/W indicators.



For example, the coordinates for New York City are:

$40^{\circ}44'54.36''\text{N}$ ,  $73^{\circ}59'08.36''\text{W}$

This means New York City is a bit more than  $40^{\circ}$  north of the Equator and a little more than  $73^{\circ}$  west of the prime meridian.



Degrees match up to the major latitude and longitude lines. Take a close look at a globe to see how the lines wrap around the earth. Minutes and seconds are finer measurements and identify the position precisely. Virtually all of the United States is contained between longitude  $65^{\circ}$ - $125^{\circ}$  and latitude  $25^{\circ}$ - $50^{\circ}$ .

$45^{\circ}$  N is exactly halfway from the equator ( $0^{\circ}$  to the North Pole ( $90^{\circ}$ N).

Can you find the major latitude and longitude lines for your town?



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