



## Using a GPS Receiver

There are many brands, makes, and models of GPS receivers. Every model of receiver is slightly different, which means you may need to consult the receiver's manual to learn how to power on, configure, and use many of the functions available. However, all GPS receivers work on some of the same principals.

### Locking on to Satellites

When you power on your GPS unit, it will attempt to locate as many available satellites as possible. Each receiver model displays something on the screen to indicate that satellites are currently being tracked. This may look like a bar graph that indicates signal strength or some graphic of satellites orbiting above the earth and connecting to a point on the earth. The graphics vary per model.

The receiver must lock on to at least three satellites in order to pinpoint your position. Sometimes, this process may take up to three or four minutes.

Things that prohibit locking on to satellites:

- Low batteries in the GPS unit
- Thick cloud cover
- Standing too close to a building
- Moving while trying to lock on

### Choosing the Units

There are several different unit systems that can be used to describe latitude and longitude. All of the following represent the same set of coordinates:

Normal GPS Coordinates (WGS84 Datum)

Decimal	32.62295 -97.14673
DDD MM.MMM	<u>N 32° 37.377 W 097° 08.804</u>
DDD MM SS.SSS	N 32° 37' 22.6200" W 97° 8' 48.2388"

UTM

14S E 673870 N 3611005

British Grid

6711648 -9616912

The type of coordinate system you use will be determined by your teacher. Normally, you will use the Normal DDD MM.MMM system (underlined above).

### Built-in Compass

Most GPS units come with some type of built-in compass to let you know which direction you are heading. Unless you have purchased a higher-end GPS model with a built-in true digital compass, this requires you to be moving at least 3 mph to determine your traveling directions. This may not be possible in heavily wooded or crowded areas, so a hand-held compass comes in very handy.

### Resetting the Odometer

Most GPS units can track your mileage as you explore. And some GPS activities require you to note your mileage at certain points in the adventure. Consult your manual to learn how to reset the odometer.

## Two Methods to Reach Your Destination

### Method #1: Entering or Downloading Waypoints

Many GPS users enter the target coordinates into the GPS unit, then walk in the direction to which the on-screen arrow points until they reach the destination. These coordinates can be entered manually using the GPS unit's buttons and menus or the "waypoint" (set of coordinates) can be downloaded to the unit on some models.

This is a good method to use to find something quickly, but can be misleading if you rely solely on the arrow to tell you which direction to travel. Also, manually entering coordinates can be difficult and time-consuming using the unit's buttons and graphic interface. Even if you can download the waypoint directly into the unit, there are occasions when you must manually enter the waypoints while in the field (like multi-caches in the game of geocaching).

### Method #2: Directional Differentiation

It's not as hard as it sounds- and it's a great skill to learn!

Using this method, a GPS user reads his/her current position from the GPS unit, then, looking at the target location, determines which direction to travel. While this method, initially, takes some brain power, it is extremely helpful and time-saving down the road. Let's take this example to see how it works:

#### Current Location:

N 32° 37.377  
W 097° 08.804

#### Target Destination:

N 32° 38.129  
W 097° 08.254

Look at the north coordinates only. And since most of the movements we make aren't across huge distances, we can usually focus in on the MM.MMM only (in this case, 37.377 for the current location).

Since we start at 37.377 and want to move to 38.129, the number is getting greater. Since this north coordinate is getting greater, this indicates we need to head northward.

Now do the same for the western coordinate: 8.804 → 8.254. This number gets smaller, indicating that we need to travel less west, meaning eastward.

Take what we found from both the northern and western coordinates and we know we need to travel in a northeastern direction to reach our target destination.

Practice 1: Which direction do we need to travel in this example? \_\_\_\_\_

#### Current Location:

N 32° 39.779  
W 097° 05.125

#### Target Destination:

N 32° 38.998  
W 097° 05.865

Practice 2: Which direction do we need to travel in this example? \_\_\_\_\_

#### Current Location:

N 32° 40.298  
W 097° 05.648

#### Target Destination:

N 32° 40.298  
W 097° 06.325

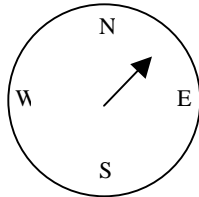
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Date: \_\_\_\_\_

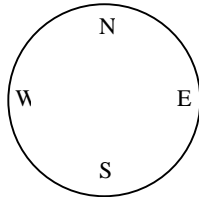
## Geocaching Practice

For each set of coordinates determine the direction you need to travel to reach the destination. Draw an arrow on the compass to reflect the direction in which you need to travel.

**Ex:**

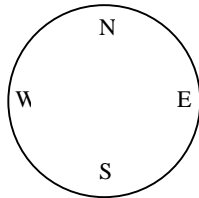


<u>Current Location</u>	<u>Destination</u>
32°41.255 N 97°03.927W	32°41.791 N 97°03.665 W



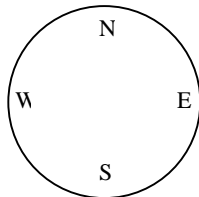
**#1**

<u>Current Location</u>	<u>Destination</u>
32°41.207 N 97°03.922 W	32°40.889 N 97°03.749 W



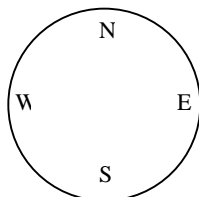
**#2**

<u>Current Location</u>	<u>Destination</u>
32°41.361N 97°03.711 W	32°41.004 N 97°04.108 W



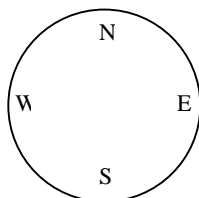
**#3**

<u>Current Location</u>	<u>Destination</u>
32°40.884 N 97°03.914 W	32°41.015 N 97°03.612 W



**#4**

<u>Current Location</u>	<u>Destination</u>
32°41.776 N 97°03.654 W	32°41.198 N 97°03.654 W



**#5**

<u>Current Location</u>	<u>Destination</u>
32°41.899 N 97°03.999 W	32°42.167 N 97°04.218 W