

Geocaching Treasure Hunt (STEM Principle: Technology)

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Hit the trail for fun and learn how to use a **GPS** – or **Global Positioning System** – to find real buried treasure on your next adventure together! **Geocaching** is a game you can play that will tell you where a secret box is hidden somewhere, filled with all kinds of goodies. To find it, the only tools you'll need are a GPS receiver or smartphone, a quick visit to www.geocaching.com, and a good day for a hike. Remember to bring some small items to leave as trade for something you take from the box (It's handy to keep a stockpile of trade items in your car or pack so you're never without options should you happen upon a cache).

First, it's important to learn how a GPS works. The Global Positioning System depends on a group of 24 satellites that orbit the earth. They send messages to your GPS receiver about how far away the satellites are, but only if the earth doesn't get in the way and block the signal. The good news is that at least four of them can see you at all times, which is enough to tell you right where you are! It will give you your exact position by *latitude*, which tells you how far North or South you are, and the *longitude* which is East and West. Since the earth is round, this number is in degrees. Find your latitude and longitude now by going to: <http://www.getlatlon.com/>. Type in your address and you'll find out your exact lat/lon.

Next, take a moment to check out www.geocaching.com and set up a free account. From there, you can just type in your zip code and follow their easy instructions to find some spots near you – there are almost two million to choose from! Pick a few your group likes, and put the info into your phone or GPS. The site will also tell you which trails to use to get there, and it may even have some hints for finding the cache.

When you're ready, head out and turn your receiver on. Show the kids the satellites coming on line – when you have at least three, the GPS can triangulate your position. Start hiking toward the location of the cache and keep an eye on how your coordinates change. Along the way, help your child identify the four cardinal directions: **North, South, East** and **West**. You can also help them remember tell direction by the sun, which rises in the east and sets in the west. If you're near the coast, you can also use the direction of the ocean to remember east or west (if you can see the water). Landmarks, such as mountain ranges or significant peaks, also help keep your bearings.

Your GPS will bring you to about 20 feet from the box. Remember the clues the website might have given for you, and look hard! A geocache is often hidden somewhere, like in a fork in a tree covered by leaves, or behind rocks. While some are as big as a shoe box, others are as small as a pack of gum. When you find it, open it and see what's inside. Usually there will be a logbook inside that other geocachers have signed, so bring a pen to add your names. When you're ready to go, leave a treasure in the box and take one for yourself. The next happy hikers to will be pleased with their find!