Alignment with STEM Framework

Investigator 🔍

Overview

How can we get to know your local/state parks? Youth will discover the layout, terrain, and inhabitants of the park using temporary geocaches, each with a different youth-led activity.

Practice Goal

- ☐ **Planning and Carrying Out Investigations**
- ☐ **Obtaining, Evaluating, and Communicating Information**

Content Goal

- ☐ **How does geolocation work?**
- ☐ **What things live within this park?**
- ☐ **What is the layout of Haw River State Park?**
- ☐ **How can I geolocate without the use of a GPS device?**

Purpose

The purpose of this activity is for youth to learn about their own local/state parks and what living things are inside using GPS, triangulation, and geocaching in three different activities.

Teacher Background Information

Teachers will need to train the youth to use the GPS devices, coordinates and park map. When attempting to locate a geocache, youth should first locate the geocache on the park map using the coordinates, ruler, and dry erase marker. Once the youth can tell the teacher which trail they should take, they can put the coordinates into the GPS device. The map helps you determine the route and the GPS device comes into play when the youth are close to the geocache.

The geocaching activities are youth-led and youth-driven. The geocaches are set up in a way so that youth open the cache and are able to complete the activity without much assistance from teachers.

Teachers and counselors should keep an eye on the time, help with clean up, encourage engagement, and ask guiding questions such as:

- Wow! What did you find?
- Why do you think it's like that?
- What could you do next?
- Are we going in the right direction?

If you have multiple groups of youth to work with...

At the end of a geocaching activity, clean up the entire activity and re-hide the container where you found it. Reference "team" schedule for an outline of time had to both conduct activity, as well as clean up and re-hide containers.

If not...

At the end of the geocaching activity, clean up the entire activity area. Reference "team" schedule even if dealing with a single group of youth, as you can still frame one groups activities around a single team schedule.

Affinity Goals

🔍 I can act like an **Investigator** by exploring your local/state parks to find out more about the park and what living things are within it.

Setting up geocache boxes for teachers:

Listed below are all materials needed which should also be found in each geocache box, specific to each activity. Compile all materials needed per activity into the boxes, and before students would go start on their first activity, have each geocache placed where teachers want at different locations within your park. Be sure to record coordinates of your geocache according to a GPS, as that's how students will be locating these caches when they are conducting the activity. Teacher discretion should be used when deciding where is best to hide geocache boxes according to the park being used.

Materials

☐ **Intro To Geocaching Activity**
- ■ USGS Quadrangle Map Bethany, printed in color & laminated (9 copies)
- ■ Slideshow with triangulation (inside)
- ■ Beach Ball globes (6)
- ■ Dry erase markers, rulers & wipe rags (1 per 2 or 3 youth) GPS devices (1 per 2 or 3 youth)
- ■ Geocaching binders (1 per group)

☐ **Check Check Geocache**
- ■ Geocache sheet
- ■ Dry erase markers
- ■ Laminated sheets for observing the park with your senses and observing to see what's in this part or the park.

☐ **Whoooo Goes There?**
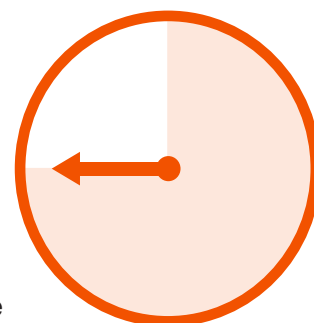- ■ Geocache sheet

☐ **Bugging out! Geocache**
- ■ Geocache sheet
- ■ Shaker boxes
- ■ Bug aspirators
- ■ Bug ID sheet
- ■ Small containers
- ■ Bigger containers for bigger creatures

☐ **Where's My Spine? Geocache**
- ■ Geocache Directions (In Geocache)
- ■ Laminated macroinvertebrate keys
- ■ Dip nets
- ■ Boots
- ■ Hand lenses

Note: Materials for each are in a container at the activity site unless noted otherwise.

Time Needed

45 Minutes

Instructional Sequence

Intro to Geocaching Activity

- ▶ Is everyone ready to get lost in the woods? Not really! Ask if youth have ever been geocaching? If anyone has, ask them to give a brief explanation.
- ▶ Explain latitude and longitude and how to count/calculate approximate latitude and longitude coordinates on the globe.
- ▶ In small groups, use the inflatable globes to find the lines or latitude and longitude closest to your local/state park.
- ▶ Introduce the GPS devices. Model how to put in the coordinates for the Protists geocache. What's the problem with only using the GPS devices? (you'd have to swim across the lake)
- ▶ Model for groups how to use the coordinates to locate the geocache on the park map and plan a route to get there
- ▶ Explain the geocaching binder of coordinates and activities.
- ▶ Teachers will give their groups the first set of coordinates. The youth will use the ruler and marker to locate the first geocache and plan a route using the park map. Then the youth will put the coordinates into their GPS device.... and off they go!

Check, Check Geocache

- ▶ Locate and open the geocache.
- ▶ Youth read the directions and observe what is in this part of the park.
- ▶ Youth check off what they find using laminated sheets and markers.
- ▶ Bring the group back together and compare what everyone found.
- ▶ When finished, place all the materials in the geocache box and rehide for the next group in the places they were found.

Bugging Out! Geocache

- ▶ Locate and open the geocache.
- ▶ Read the directions and work on the activity.
- ▶ Youth will scoop up leaf litter from the forest floor and put the leaf litter in the shaker box.
- ▶ Shake the shaker box and use the bug aspirator to suck up tiny bugs. Large bugs can be out in larger containers.
- ▶ Look at the collection. If the youth want, they can use the key to ID what they found in the leaf litter.
- ▶ When finished, place all the materials in the geocache box and rehide for the next group.