**GPS Lab – Flow of Energy in a Food Chain**

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**Targeted Grade Level: Grades 4-5**

**Time Needed: 2 Days**

In this activity students will be broken up into groups to learn how to navigate with a GPS unit. Each group will be given a GPS unit and need to locate a series of waypoints. The waypoints will be found by answering and completing a series of questions and problems found at each new waypoint. The goal will be to find all 5 waypoints by answering each question correctly and getting to the end of the path.

**Objectives:**

\*Students will be able to accurately identify GPS waypoints by answering a series of science and math review questions.

\*Students will be able to apply prior knowledge of science concepts relating to the flow of energy in a food chain to answer questions.

**Major Science Concepts:**

* Food Chains
* Food Webs
* Flow of energy in an ecosystem
* Flow of energy within a food chain

**Grade Level Expectations (GLE’s):**

* Strand 4: 2Aa – Grade 4
  + Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem.
* Strand 4: 2Ab – Grade 4
  + Differentiate between three types of consumers (herbivore, carnivore, omnivore)

**Prior Knowledge: DOK Level 1 and 2**

* Whole class instruction with GPS units will be covered and practiced.
* Latitude and Longitude coordinates for certain points around the school campus.
* Understanding of the flow of energy in a food chain.
* Basic knowledge of the functions of a food chain and how each level is connected.
* Basic vocabulary used with food chains and GPS units (i.e.; producer, consumer, carnivore, etc.)

**Materials:**

* 4 GPS units (varying depending on amount of students per group.)
* 10-14 Way points created before hand by teacher.
* Questions for each group created and placed at each waypoint( placed before hand by teacher.)
* Writing utensil and scratch paper for each student.
* Clipboards for each group/student

**Safety:**

* Students will need to be given a perimeter that is allowed while they travel around the school.
* Guidelines will need to be made to promote safety around traffic, crossing roads, and traveling around the school grounds without an adult.
* Students will have practiced respectful/safe ways to navigate around the school boundaries.
* Students will need to wear appropriate shoes for walking around outside, preferably tennis shoes.
* Students will need to plan accordingly for the weather, i.e.; rain coat or sun block.

**Management:**

**Prior:**

* Teacher will need to borrow six GPS units and program like Waypoints on each.
* Teacher will contact two other adult helpers (parent volunteer and/or staff members) to assist in this class activity.

**During:**

* The students will be in teams of 3-6, depending on the amount of GPS units available.
* Students will need to understand how to work the GPS unit so that they can calculate and track their waypoints during the lab.
* Students will need to be given guidelines of the perimeters and where the waypoints are located.
* A map of the school should be provided to the students.
* Extra volunteers should be available to be stationed throughout the grounds to help assist students when needed.

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