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GEOCACHING AND ORIENTEERING

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RECOMMENDED GRADE LEVEL	9, 10, 11, & 12
ACADEMICS	MATH, SOCIAL STUDIES
TEKS ADDRESSED	Science - 7.2B, 7.4A, 6.2B, 8.2B Math - 6.12A-B, 7.3B, 7.4A-B, 7.8C
DESCRIPTION	<p>Students will use compasses and GPS units to locate their positions on the globe, and will use the GPS units to help them navigate a course and map the school.</p> <p>Orienteering Lesson Plans</p> <ol style="list-style-type: none">1. Becoming Familiar with the GPS Unit: This lesson will cover the basics of GPS use and getting to know the GPS unit. The students will learn the difference between a route and a track. They will also learn how to mark waypoints by creating a route and having another student follow it on their GPS. They will also learn how to give directions to a waypoint using bearings and distances.2. Accuracy of GPS Measurement: This lesson begins by introducing the difference between on-the-ground measurement and distance measurement using remote sensing equipment. After determining how far he or she travels with each step, the student will measure the distance around a set location. After calculating the perimeter based on their steps, the students will measure the perimeter of the location using the GPS units. We will then compare and contrast the benefits of each method of measurement.3. Introduction to Geocaching: We will begin by discussing what geocaching is and how to participate. We will set up geocaching points for each student. Each student then hides an object at his or her point and gives the coordinates to another student. The latter student then finds the location of the coordinates he or she was given and reports what was there.4. Treasure Map Creation: The first student begins with an aerial photo of his or her location and creates a treasure map showing the location of a "treasure" unknown to the second student. The first student gives a list of bearings and distances to lead the second student to the treasure location. The second student is then to return with the treasure to verify that he or she found it.5. Geocaching Final: Each GPS is preloaded with a geocaching location either at the school or at a local park. The students then use the GPSs to find the identity of the object at each location. After identifying each object, the students return to check their answers.
TIME REQUIRED	One hour per week for eight weeks
MATERIALS	One GPS unit and one compass per pair of students, and one computer
APPROXIMATE COST	\$90.00 for each GPS—total depends on number of students. Teams of two students can each use one GPS unit. Must also purchase compasses if not already available.
TEACHER TIPS	<ol style="list-style-type: none">1. Do GPS work in an open area.2. Take one weekend to familiarize yourself with the GPS units.3. Always have extra batteries on hand. The units can go through batteries quickly.4. Setting up for geocaching can be time-consuming, so plan your routes before making waypoints with your GPS.
ADAPTATIONS	<ol style="list-style-type: none">1. You can focus on just using the GPS for all activities and cut down on the math to help younger students.2. Team students up to help ESL students.3. Have a teacher-led orientation before each activity.
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