

2007 SMILE Winter Activity
Search and Rescue/GPS Navigation

GPS Worksheet – Answer Key

Where Are They? — Note: Distances may be off by +/- 0.5 cm to make the triangulation slightly more challenging.

Name	Distance to Satellite 1 (cm)	Distance to Satellite 2 (cm)	Distance to Satellite 3 (cm)	Distance to Satellite 4 (cm)	Which State?
YOU	5.5	21	12	22	Oregon
George	5	20	13	22	Washington
Patricia	23	15	16	3	Florida
Shawn	12	14	13	15	South Dakota
Isaac	17	9	17	11	Michigan
Sarah	21	7	20	11	New York
Carla	14	15	11	12	Kansas
Oscar	17	12	14	10	Illinois
Olivia	19	11	15	8	Kentucky
Lin	9	23	9	21	California
Add more states (or other specific locations on the map) to the list:					
	17	18	8	11	Texas
	17.8	18.1	8.4	9.7	Austin

You can have students find any point on the map – just print out a map, measure, and record the distances ahead of time.

BONUS CONVERSION: The actual accuracy of typical commercial GPS receivers (with 4 satellites locked) is roughly 5 meters. On the scale of this map, that accuracy would correspond to 0.000025 cm.

~ 2.5 cm = 500,000 m and X cm = 5 m. $X = 2.5 \cdot 5 / 500,000$ or $2.5 / 100,000 = 0.000025$ ~

To visualize this, look at a 1-millimeter division on your ruler and imagine that it is divided into 4000 more divisions.