Classroom Assessments

The standards for the lessons included in *Navigating By Map and Compass*, are covered by the assessment together with the practical experience gained in the field by the students. The standards are:

5.G.1, 5.G.2 : Creating the "x" and "y" axes by crossing at right angles, two equal number lines with "0" on the "x" axis intersecting with the "0" on the "y"axis (the origin). Find coordinates on a plane. Solve real world problems with this new knowledge. Instead of using x and y coordinates, these lessons will use magnitude (measured in distance traveled) and direction as measured with a protractor, in degrees, with north (the positive y-axis, or parallel to it) being zero.

6.RP.1 Understand ratio and proportion (map scale). **6.RP.3, 7.RP.2** Use ratio and rate to solve real world problems.

N-VM.1 Recognize vector quantities as having magnitude and direction. Represent vector quantities by directed line segments. **N-VM.2** Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.

N-VM.4 Add vectors. Given the magnitude and direction of two vectors, determine their sum (magnitude and direction). Understand vector subtraction.

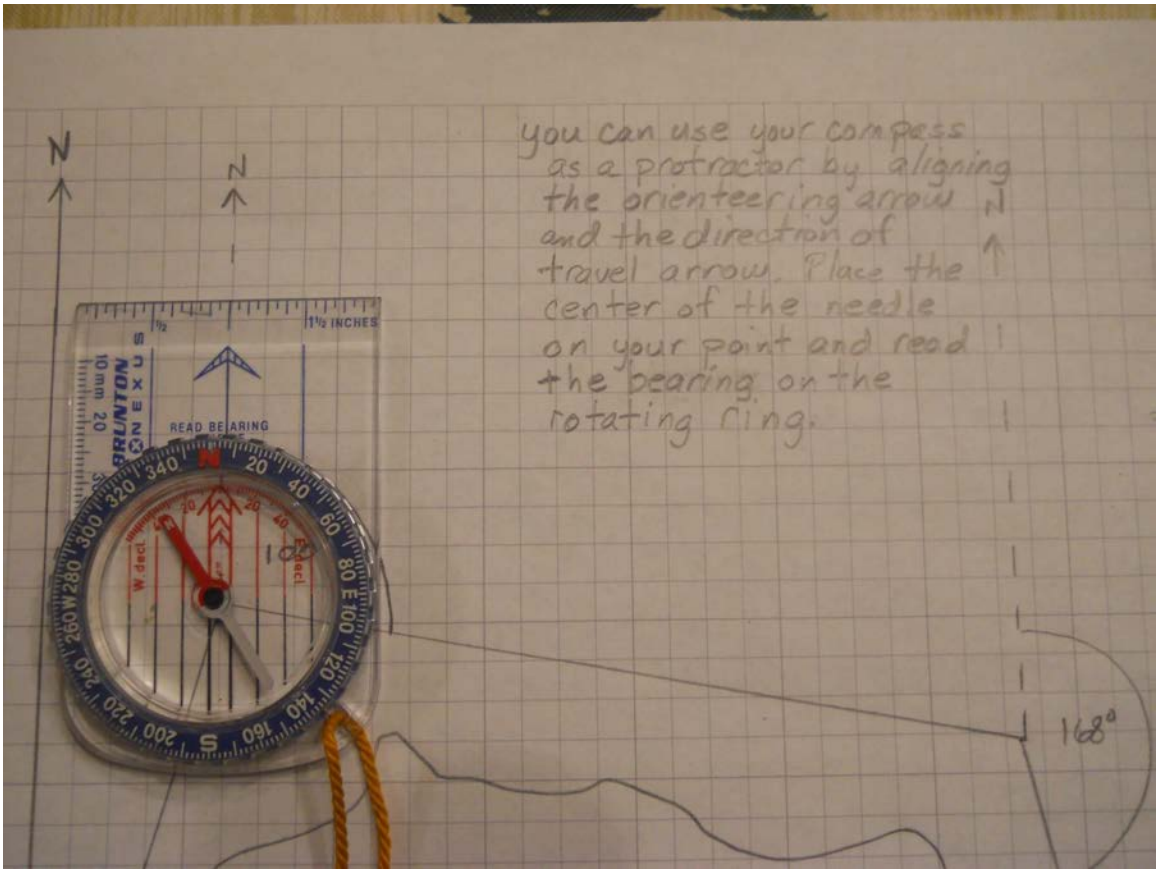
N-Q.1 Use units of measure to understand a problem. Choose and interpret units of measure. Choose and interpret the scale and origin in graphs and displays.

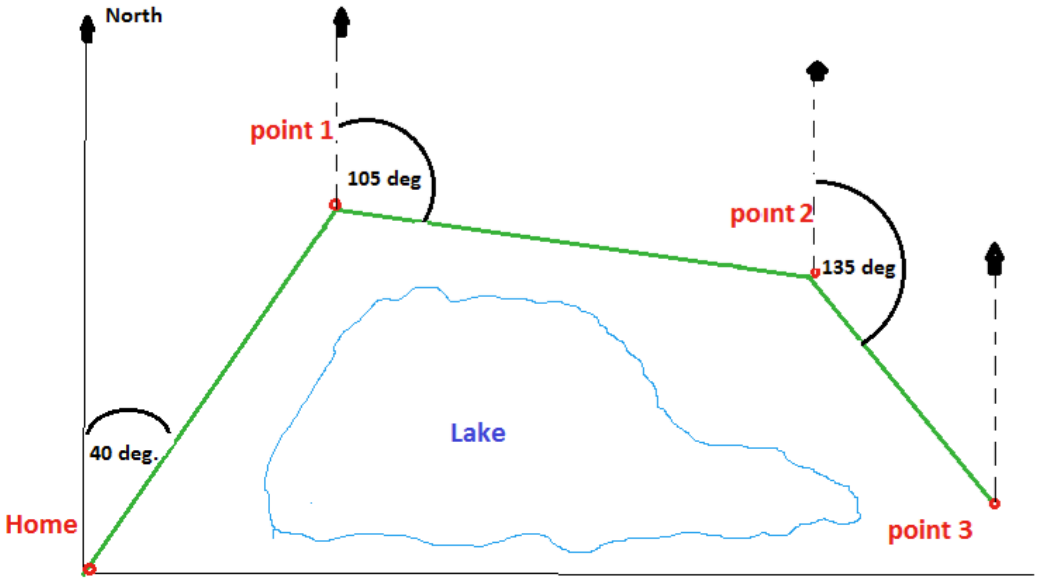
The Assessment:

After all of the field exercises have been completed and mastered, it's time to go into the classroom and do the paper assessment. This is the aspect that will cement the whole process in students' minds and give you paper proof. Their demonstrations on the board will actually improve their mathematical/geometric knowledge.

Each student will need a piece of graph paper. In the middle of the paper, they will draw large coordinate axes (emphasize using the whole piece of graph paper). Based on the length of their pace, and the estimated distance walked on the longest length of their journey, students will chose a scale for their "map". *Please see sample below.* They will consider the starting point of their journey as the origin. Knowing the bearing they used when they left the

starting point, (e.g., 60°). Students will use a protractor (or compass) and line up the zero degree line with the y-axis and measure that angle. They will draw a reference line from that angle to the origin. This was their direction of travel. All that's left is how far they walked on that line. When they've settled on a scale for the map then they will have to do the math to compute how far they walked based on how many paces they took, and the length of the pace. They will measure the proper amount on the direction of travel line, and make it as long as needed.





Note to Student: If the length of your pace is 5' (see lesson 5), then 100 paces is approximately 500'. This is the information needed to make a scale. If your hike was a long one, you might make your scale 1/4" = 500' which is 100 paces. 5 1/2 inches would represent approximately 11,000 feet, which is approximately 2.1 miles.