

High School Physics: Follow That Bloom

Step 3: Analyze Data

B.2) Vectors Mark the Location Worksheet

1. Look at the image on the computer and locate the dark orange vector at approximately 73:05 degrees longitude/39:40 degrees latitude.
2. Compare the color of the vector to the color scale to the right of the image, and record the velocity of the vector in cm/s.
3. On the printed page, draw a straight line from the Sandy Hook CODAR station point through the tail of the vector. Extend the line for at least 2.5 cm.
4. Label this line "A" at the Sandy Hook station and "B" at the end of the line. Label the point where the line crosses the tail of the vector as "W." Thus you have made line AWB.
5. Draw a straight line from the Loveladies station through point "W" and extend the line at least 2.5 cm beyond point "W."
6. Label this line "C" at the Loveladies station and "D" at the end of the line. Thus you have made line CWD.
7. Label the tip of the orange vector as Point "P." Now stop to check your progress with your teacher.
8. Complete the quadrilateral by drawing a straight line from point "P" to line AWB. Keep the new line parallel to CWD. Mark the point of intersection as point "Q."
9. Draw a line from Point "P" to line CWD but keep the new line parallel to AWB. Mark the intersection as point "R."
10. Lines WQ and WR are the component vectors. Determine their velocity by measuring their length in mm and multiplying by the scale. Use the scale 1 mm = 3 cm/sec. For example if the vector is 12 mm long the velocity would be 36 cm/sec (12 mm x 3 cm/sec).
11. Direction can be determined by placing a protractor on point "W." Using a circular protractor, extend the component vector lines to the end of the

protractor and read the degree headings directly. Using a semi circular protractor, measure the degrees from the top (90) and add or subtract that number from 0 or 360 depending upon whether you are going east (add to 0) or west (subtract from 360). Record the direction on the map.

12. Repeat the above steps for the orange vector located at approximately 73:35 degrees longitude/40:05 degrees latitude. The length and the velocity of the dark orange vector is known (approximately 12 mm and 36 cm/s). Are you able to calculate the component vectors as easily using the same quadrilateral method? Why, or why not?