

Name: \_\_\_\_\_

Block: \_\_\_\_\_

Group: \_\_\_\_\_

**IMAGINARY FLIGHTS – Pre-lab (Seattle)**

**Instructions:** You will be learning about addition of vectors in 2 dimensions by simulating real flight conditions on an obsolete Flight Navigation Chart. These charts are called “Sectional Charts” and are used by pilots to identify landmarks. Since you will be drawing displacements as well as velocity vectors on the chart, to keep confusion to a minimum, you should use two different units for your scales. It is suggested that you measure distances in *inches* and use *centimeters* for your velocity vectors.

1. Take a look at your sectional chart. Find the legend. Identify symbols used for airports, landmarks, etc. Identify the latitude and longitude lines across your chart.
2. For each flight, identify the “origin” and “destination” airports. Use the latitude and longitude numbers given. Mark them on the chart using different colors for each flight.
3. “Heading” refers to the direction you take off. You will not always be headed in the direction of the runway on the chart.
4. “Course” refers to the actual direction followed, as viewed from the ground.
5. “Air speed” is the velocity of the plane relative to the air. This is the speed at which the plane takes off. This is what the pilot sees on his or her speedometer.
6. “Wind speed” is the velocity of the wind relative to the ground.
7. “Ground speed” is the velocity of the plane relative to the ground.
8. When you want to find the direction of a course, or its heading, use the latitude and longitude lines as a compass rose. They represent the true cardinal points (North, South, East and West.)
9. Leave all your calculations on paper. Since all velocities are given in *km/h*, you will want to have all true distances in *kilometers*.
10. Your instructor will demonstrate the problems by solving the *Test Flight* for both parts. Flights on part A simulate flights in which the pilot *does nothing to compensate for the wind* (passive flying.) Those on part B simulate active corrections by the pilot, so the plane goes to the proper destination.
11. The maximum number of points for this activity is 40 points (20 points per part.)

**Sectional Chart:** *Seattle*

**Scale (distances):** \_\_\_\_\_ (from the chart)

**Scale (velocities):** \_\_\_\_\_

**Scale (distances):** \_\_\_\_\_ (true distances)

Please complete these tasks in preparation for your project/lab

1. Calculate the scale for distances in km

2. Locate the following airports on the chart. Place a small dot on the center/crossing of the runways.

|   |             |              |
|---|-------------|--------------|
| a. Seattle-Tacoma International Airport | 48° 19' N   | 122° 18.5' W |
| b. Oak Harbor Regional County Airport   | 48° 21.5' N | 122° 39.5' W |
| c. Bellingham Regional County Airport   | 48° 47.5' N | 122° 32' W   |
| d. Ephrata Airport                      | 47° 17.5' N | 119° 31' W   |
| e. Spokeane Airport                     | 47° 47.5' N | 117° 42' W   |
| f. Abbotsford                           | 49° 1' N    | 122° 23' W   |
| g. Lewinston-Nez Pierce County Airport  | 46° 22.5' N | 117° 0.5' W  |
| h. Walla Walla Regional Airport         | 46° 6' N    | 118° 17' W   |
| i. La Grande/Union County Airport       | 45° 17.5' N | 118° 0.5' W  |
| j. Astoria Regional Airport             | 46° 9.5' N  | 123° 53' W   |
| k. Portland International Airport       | 45° 35' N   | 122° 36' W   |
| l. Salem Regional County Airport        | 44° 54.5' N | 123° W       |
| m. Southwest Washington Regional Airp.  | 46° 7.5' N  | 122° 54' W   |
| n. Yakima Airport                       | 46° 34' N   | 120° 32.5' W |
| o. Tri Cities Airport                   | 46° 15.5' N | 119° 7' W    |
| p. Hermiston Airport                    | 45° 50' N   | 119° 15' W   |
| q. Eastern Oregon Regional Airport      | 45° 42' N   | 118° 20.5' W |

3. What do these symbols represent? Can you find one of these on the chart?

