**Vector Treasure Hunt**

Materials: meterstick, index cards, school map, graph paper, ruler, pen/pencil.

OBJECTIVES: 1. Create a series of directions that lead to a specific location with a hidden object.

 2. Follow directions to locate another group’s treasure.

 3. Create a scale map.

Procedure

1. In this lab, you will create a set of direction cards to direct another group of students to a hidden treasure. The starting point will be facing north at the door for room 312. Have a destination in mind as to where you will tape your treasure.

2. Plot out a course from the starting point to the location where the treasure will be hidden. Remember to work quietly and to avoid disrupting classes. You may measure how many paces you take in 15 meters and use you paces/meter to measure the distance for each part of the course. Convert your pace to meters before recording the values for each distance on the direction cards.

3. You will break up the course into exactly 15 different segments. Each segment will be a distance and direction, the next segment should be a change in direction with another distance. Write each separate segment as a distance in meters and a direction (N,S,E,W) on an index card (see picture below). The direction must be specified using only these terms: north, south, east, west, up, and down. For reference, South is located directly from room 312 to Fruitland.

4. When creating the path, it can be more fun and challenging if you choose a location far from class that has a complicated winding path to get to it. DO NOT number your cards!

5. When you have completed 15 cards that give an accurate description of a path between the starting point and the chosen object, write your names on an index card and place that card on top of the rest, also include a symbol that you can write on the treasure that can be matched to your set of cards…i.e. place a diamond on your name card and draw one on your treasure so the group that finds your treasure knows it is yours and not someone elses. **On a separate piece of paper, write your names and a draw a map to scale along with a description of the location you chose and where you will tape your treasure.** Give this paper and your deck mixed cards with your name card on top to your teacher. Your teacher will keep the paper until the end of the lab.



  Analysis

  1. What was the most difficult part of plotting the path to the object?

2. Are you confident that another group will be able to find the object using your direction cards? Explain why or why not.

3. Would another group be able to find the object using your direction cards if your cards were placed out of order? Explain your answer.

4. What is your strategy for finding another groups treasure when you receive their mixed up cards?

Following directions

Procedure

1. You will receive a “treasure” to hide at the location you picked last class. Make sure to draw the symbol you put on your cards on your treasure. Then go hide your treasure.
2. Next you will receive a set of direction cards from another group and you will attempt to put them together in a logical manner so you can find their treasure. You will need to convert their distance in meters into your steps.
3. Present your plan to instructor and you will be given the green light to go find the hidden treasure.
4. When you find the treasure make sure the symbol on the treasure matches the symbol on their name card.

1. When you are sure that you have found the correct object, report your results to your teacher. Your teacher will confirm whether you have correctly identified the object. If not, review the cards and try again.

Analysis

1. Did shuffling the deck make it more difficult for you to locate the object? Explain why or why not.

2. Would you be able to place the cards in their original order? Explain why or why not.

3. Did you find the object described by the other group's cards? If not, explain what happened.

4. Explain the method you used to find the object, and include any tricks discovered while you were working.

5. Was the other group able to correctly identify the object described by direction cards?

1. Attach a map drawn to scale along with the questions. Make sure you label NSEW directions and include a key. Each direction card should have a separateMapping the course

10. In this section of the exercise, you will use the directions on a set of 15 cards to draw a map of the path from the starting point to the object. You will generate a map of the complete set of directions you used to find the object.

11. You will make the map by drawing each direction indicated on a card as an arrow. The arrow will be drawn to scale to represent the length in meters and it will point in the direction specified on the card In a scale drawing such as this, it is important for all the objects in the drawing to have the same size relation- ship as the actual objects. For example, the arrow representing 2.0 m will he drawn twice as long as an arrow representing 1.0 m.

12. Draw the first arrow so that its tail is at the starting point, the point of the arrow is pointing in the direction specified on the card, and the length of the arrow represents the distance on the card.

13. Draw the second arrow on your map so that its tail starts at the point of the first arrow. The second arrow should also point in the direction specified by the card, and its length should represent the distance on the card.

14. Continue through the entire set of 15 cards. Draw the arrows tip to tail so that each arrow begins where the preceding one ends.

15. Make sure that the map is very neat. Include a legend, or key, that gives the directions and defines the scale of the map. You may wish to indicate specific landmarks, such as rooms or doors.



Analysis

K. Does the map accurately reflect the path you took to find the object? If not, explain any differences.

L. Explain how shuffling the cards affected the way you represented the directions from the starting point to the object. Use examples from your map to support your answer.

M. Based on this exercise, describe the most efficient method of using the set of direction cards to locate the object. Would this work for any set of directions? Explain why or why not