Name:_____

Ms. Detrixhe
Physics

DISTANCE AND DISPLACEMENT LAB ACTIVITY

Objectives

- Compare and contrast distance and displacement.
- Use a graph to determine distance and displacement of an object.
- Use the correct units for distance and displacement.
- Demonstrate a scenario where the displacement of ab object is zero, but the distance is not.

Part I

Use graph paper to draw each scenario. Fill in the correct information for distance and displacement using the correct units. The first example has been completed for you. Use this as a guide to complete the rest of the table.

(Distance) Total Meters Traveled

(Displacement) Distance traveled from starting point to ending point. Ignore the path. Draw an arrow (vector) from the starting point to the ending point and measure the length of the arrow. Don't forget to include the direction.

	First Move	Second Move	Distance (m)	Displacement
1	4 meters east	2 meters west	6	2 m east
2	4 meters north	2 meters south		
3	2 meters east	4 meters west		
4	5 meters south	5 meters west		
5	10 meters west	2 meters north		
6	3 meters east	3 meters east		
7	3 meters east	4 meters north		
8	6 meters east	8 meters south		
9	9 meters north	12 meters west		

Example 1:

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Distance = 4 m + 2 m = 6 m total distance traveled
Displacement = 2 m east (net distance from start to end, includes net direction)

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Practice Problems for Distance and Displacement

1. A truck travels to and from a stone quarry that is located 2.5 km to the east. What is the total distance traveled by the truck? _____
   What is the displacement? _____
   Explain with a diagram:

2. A whale swims due east for a distance of 6.9 km, turns around and goes due west for 1.8 km, and finally turns around again and heads 3.7 km due east.
   What is the total distance traveled by the whale? _____
   What is the displacement of the whale? _____
   Explain with a diagram:

3. A football coach pages back and forth alone the sidelines during a close rivalry game. The diagram below shows several of the coach's positions at various times. At each marked position, the coach turns and moves in the opposite direction. In other words, the coach moves from position A to B to C to D.
   What is the total distance that the coach traveled? _____
   What is the coach's final displacement? _____