Honors Physics Mr. McMullen

Name _____ Date_____ Period _____

EXPERIMENT 3.1 Uniform Motion

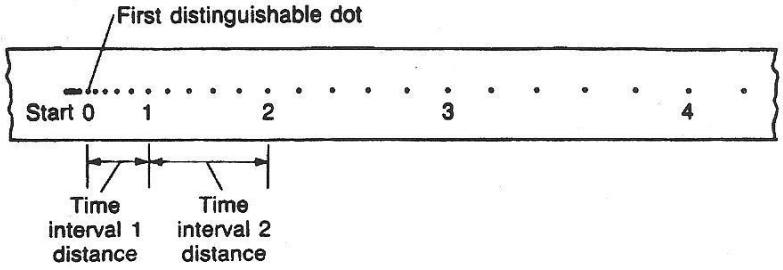

Figure 2. Measure the distance from the first distinguishable dot to the dot at the end of the first interval. Measure the distances for all other intervals.

Materials

recording timer with necessary power supply
C-clamp
timer tape
carbon paper discs
metric ruler
masking tape
constant-velocity vehicle
graph paper

Procedure

1. With your lab partner, set up the recording timer as shown in Figure 1. Insert about 1.5 m of timer tape into the timer. Make sure the tape moves freely through the timer. Using a piece of masking tape, attach the timer tape to the constant-velocity vehicle.
2. Start the timer. Then start the vehicle and allow it to pull the timer tape through the recording timer. Stop the vehicle and the timer after all the tape has been pulled through the timer. Insert another piece of recording tape into the timer and repeat the procedure so that each lab partner has a tape to analyze.
3. Write "start" at the end of the tape that was attached to the vehicle, as shown in Figure 2. Examine the dots at the "start" end of the tape. Notice that several dots are crowded close together. Find the first easily distinguishable dot and mark this dot "0." Count off five dots (spaces) from the 0 dot. Mark this dot "1." Count off five more dots from the dot marking interval 1 and label this dot "2." Continue counting five dots and marking intervals 3, 4, 5, etc. These numbers represent the intervals of time that elapsed as the vehicle traveled the distance between dot 0 and each fifth numbered dot.
4. Beginning at the "0" dot, measure in centimeters the distance on the recording tape of the first interval (between dot 0 and dot 1). Record this distance in Table 1 as the displacement during interval 1. Continue measuring the displacement of the vehicle for each successive interval and recording each value in Table 1.
5. The average velocity during a given interval is the displacement divided by one interval of time. Since the time for each measurement is one interval (t = 1 interval), the velocity will be numerically equal to the displacement during the interval. For example, a vehicle that traveled 3.5 cm during the first interval will have an average velocity of 3.5 cm/interval since 3.5 cm/ 1 interval = 3.5 cm/interval. Record each average velocity next to the corresponding time interval.
6. The total displacement of the vehicle at the end of any given interval is the sum of the displacements during each preceding interval plus the current measurement. The total displacement at the end of interval 1 is the displacement during interval 1. The total displacement at the end of interval 2 is the sum of the displacement during interval 1 plus the displacement during interval 2. The total displacement for each remaining interval is found in the same manner. Calculate the total displacement of the vehicle for each interval and record the values in Table 1.