SPH 4C

GRAPHING INVESTIGATION

THE MOTION OF A REMOTE CONTROL CAR

**Purpose:** The purpose of this investigation is to determine the speed and velocity of a remote control car using calculations and compare it to graphing distance and displacement versus time.

**Materials:**

* 4 Stopwatches
* Remote control car
* Measuring tape

**Procedure:**

1. Mark a start line on the floor using masking tape or chalk.
2. Measure out a distance of 5m and 10m from the start line and mark each measurement on the floor.
3. Have one person stand at the 5 m mark with a stopwatch to measure the time of the car on the way there.
4. Have one person stand on the 10 m mark with a stopwatch to measure the time of the car on the way there.
5. Have one person stand on the 5 m mark with a stopwatch to measure the time of the car on the way back.
6. Have someone stand at the finish line with a stopwatch to measure the time of the car on the way back.



1. Place the remote control car at the start line.
2. On the count of “3-2-1-GO!” everyone will start his or her stopwatches and the driver will begin driving the car. Once the car reaches the 40 m mark, the driver will do a U-turn and drive the car back towards the finish line.
3. As the car passes each measured mark on the floor, the person with a stopwatch will stop the time.
4. Record the times in the chart below.

**Observations:**

|  |  |  |
| --- | --- | --- |
| **Time** **(s)** | **Distance****(m)** | **Displacement** **(m [forward])** |
|  | 0 | 0 |
|  | 5 | 5 |
|  | 10 | 10 |
|  | 15 | 5 |
|  | 20 | 0 |

**Calculations:**

1. Calculate the speed of the car at each measured interval.
2. Calculate the velocity of the car at each measured interval.

**Analysis:**

1. Plot a graph of the distance of the car vs. time.
2. Calculate the slope of the line of best fit.
3. Plot a graph of the displacement of the car vs. time.

**Questions:**

1. What does the slope on a distance-time graph represent?
2. State some reasons why the dots do not form a perfectly straight line.
3. Compare the speed of the remote control car that your group used to the remote control car that other groups used. Are the speeds the same? Why or why not?
4. What quantities are measured by a car’s odometer and speedometer?
5. What instrument would your car need to measure the velocity?
6. Why do cars not have a “velocity-o-meter”?