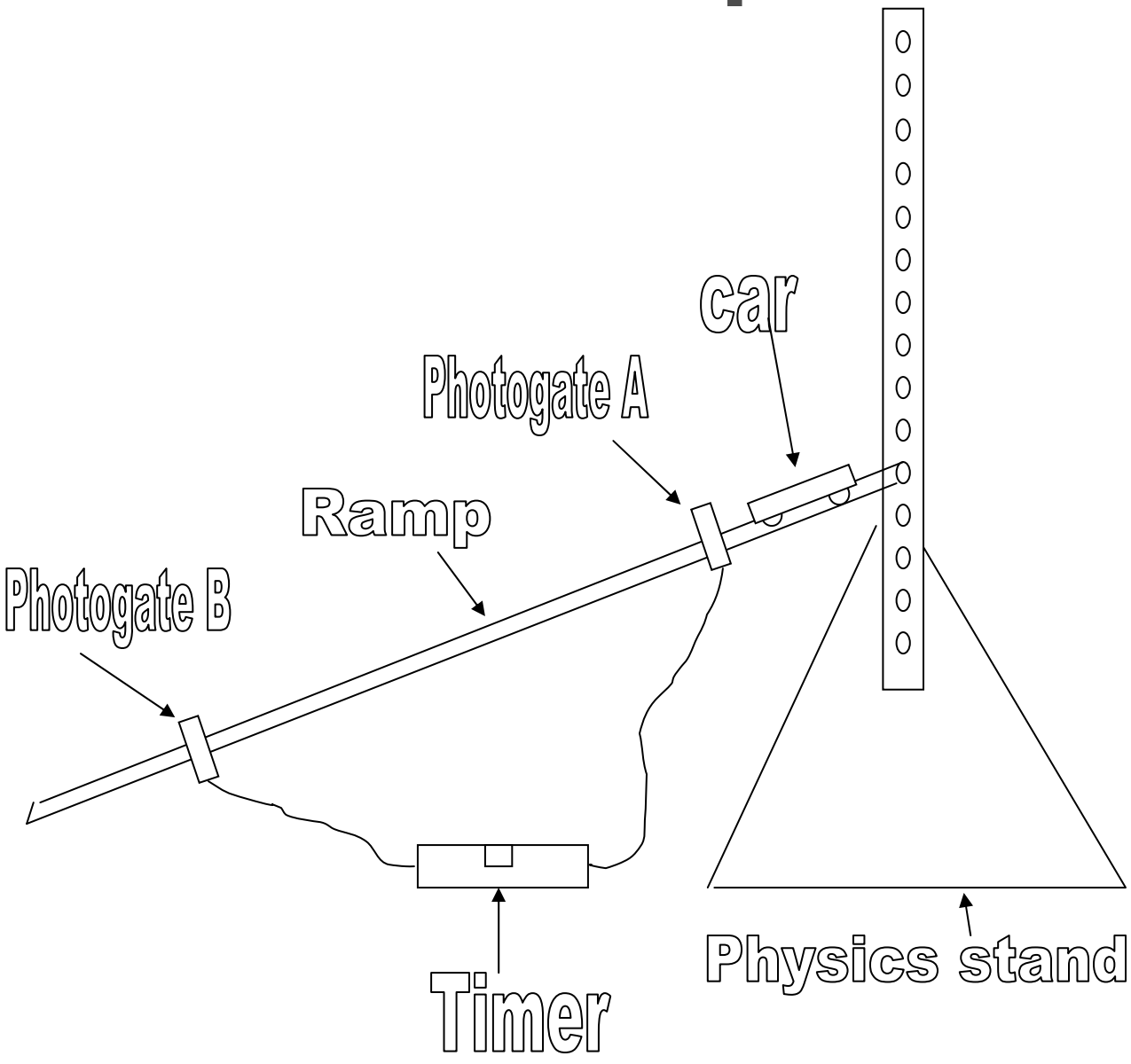
1. Use the following material to setup the investigation as shown in the diagram below

Physics stand,
Photogates, timer,
Car and ramp.



2. Set photogate clamps so that the wing on the car will pass through the clamp and block the light. Clamp photogate A on the 1st diamond and photo gate B on the last diamond.

3. Raise ramp to the 3rd hole.
Measure and record angle of slope.

4. Zero timer when car is at top of ramp and let car travel down the ramp.

5. Record the time for the car to pass photogate A

6. Record the time for the car to pass photogate B

7. Record the time for the car to travel from photogate A through photogate B.

8. Repeat steps 4 - 7 until satisfied the data is consistent.

9. Raise the ramp 3 holes and repeat steps 4-8.

10. Repeat this process until the ramp can no longer be raised.

11. Calculate an average time for each time measured at each angle.

12. Use the time to pass each point to calculate a velocity at that point.

Ex: Average Velocity at point A = avg V_A

Average time to pass point A = avg t_A

Distance at point A = the width of the wing on the car that blocked the light = 0.05 M

Therefore the equation of V = d / t would be:

Avg V_A = 0.05 M / avg t_A

13. Use the velocities at each point for each slope and the time to move from photogate A to B to calculate the acceleration of the car down the ramp.

Ex. $a = \frac{V_f - V_i}{t} = \frac{\text{avg } V_B - \text{avg } V_A}{\text{avg } t_{ab}}$

where avg V_B = the avg velocity at photogate B
and avg V_A = the avg velocity at photogate A
and avg t_{ab} = the avg time for the car to go from photogate A to photogate B

14. Record the acceleration of the toy car for each angle measured.

15. Prepare a graph of car acceleration vs. the slope of the ramp.