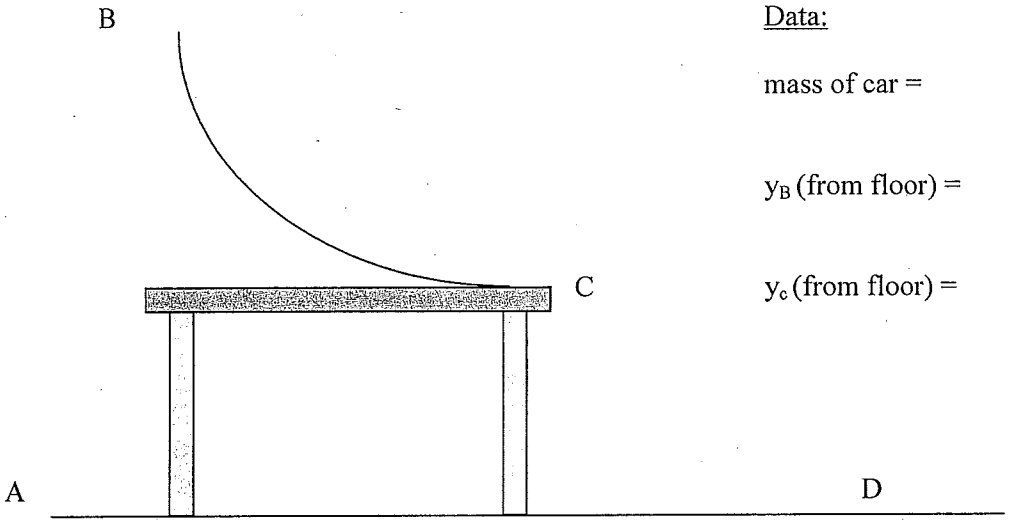
Hotwheels Energy Lab 2



Data:

mass of car =

y_B (from floor) =

y_c (from floor) =

i) The car is lifted by an outside (external) force from the ground to the top of the ramp (from A to B).

ii) The car rolls down the ramp experiencing friction (from B to C).

iii) The car experiences free fall with almost zero friction (from C to D).

Energy bar charts

From A to B (let ground be y = 0)

$K_o + U_{go} + U_{so} + \text{Work} = K_f + U_{gf} + U_{sf} + \text{Heat}$

_____ _____

From B to C (let the table top be y = 0)

$K_o + U_{go} + U_{so} + \text{Work} = K_f + U_{gf} + U_{sf} + \text{Heat}$

_____ _____

From C to D (let ground be y = 0)

$K_o + U_{go} + U_{so} + \text{Work} = K_f + U_{gf} + U_{sf} + \text{Heat}$

_____ _____

1. Find the velocity at point C (using projectile motion concepts).
height of table:

air time:

forward distance (in air):

take off velocity: v_C =

2. B to C
a) Knowing the velocity at C, find the KE at point C.

b) U_g at point B = mgy =
(Remember to measure y where the table top is y = 0)

c) Find the heat generated from point B to C.

3. C to D
Find the speed of the car at point D. (Use the energy bar chart from C to D knowing the speed and altitude at point C. Heat = 0.)