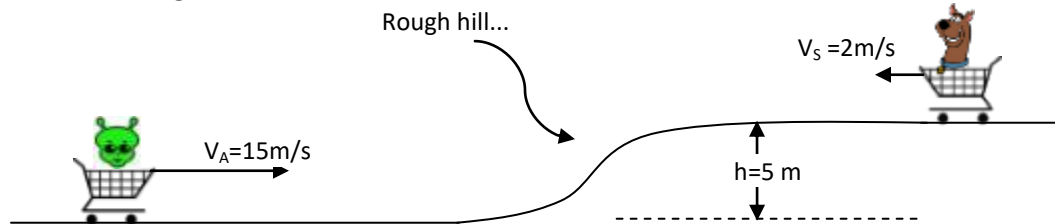


Problem Solving Using Mechanical Energy and Momentum

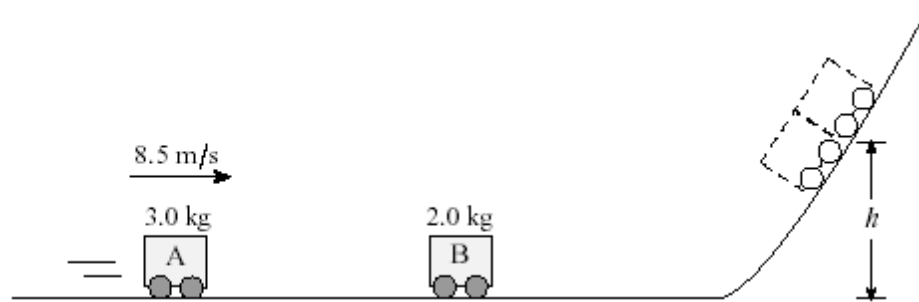
Name: _____ Date: _____

1. A 50kg cart with an alien in it is moving at a constant speed of 15 m/s across a frictionless track. It moves up a 5 m high hill which unlike the track has a rough surface which, through friction, generates 1100 J of heat. When this cart collides with the other 80kg cart (at the top of the hill), with Scooby Doo inside, that is moving to the left at 2 m/s (frictionless). The collision is inelastic. Determine the following:



- a) The final speed of the two combined carts (including the direction).

2. A 3.0 kg cart collides with a 2.0 kg cart based on the diagram you see below. The collision is inelastic.



- a) To what height, h , will the combined carts rise?
- b) The slope of the ramp is changed. See the figure below.
The carts will reach i) a greater height. ii) the same height. iii) a lesser height
- c) Use physics principles to explain your answer to part b).

