PhyzSpringboard: Forced to Go in Circles

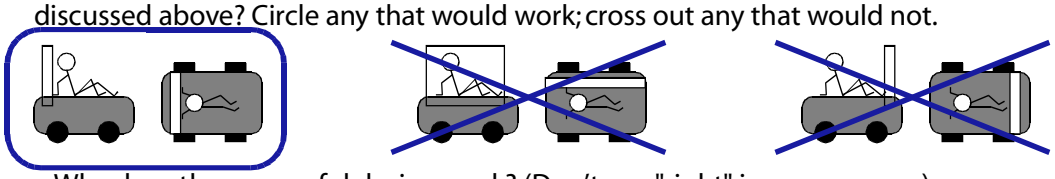
RIDING THE ICEMOBILE I: SPEEDING UP AND SLOWING DOWN

1. Suppose you were sitting on the icemobile and it suddenly accelerated to the right.
a. What would happen and why? Describe below and add to the diagram to the right.

I'd fall off as the icemobile moved out from underneath me.

b. Which of the **three** designs shown—if any—could have prevented the outcome discussed above? Circle any that would work; cross out any that would not.

The icemobile is a remote-controlled vehicle made of ice so that its smooth top is nearly frictionless.



c. Why does the successful design work? (Don't use "right" in your answer.)

It provides a force that pushes me in the direction of the acceleration.

e. What interaction provides this amount of force?

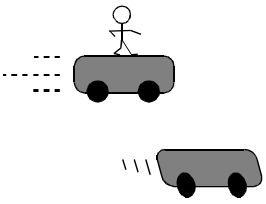
__Drag __Friction __Normal __Rightward Force __Tension __Weight

f. Which—if any—of the interactions listed above is not a real force, and what is it really the name of?

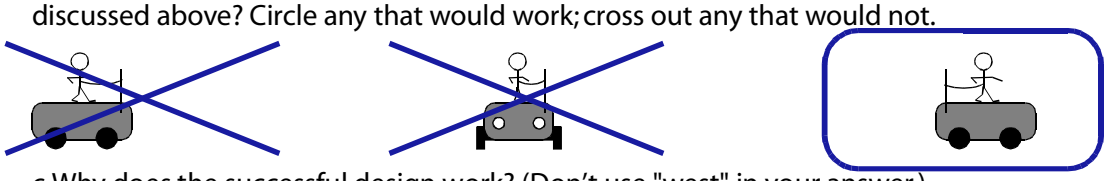
Rightward force; rightward is a direction

2. Suppose you were riding along on the icemobile with uniform motion to the east and it suddenly accelerated to the west (while continuing to move east).
a. What would happen and why? Describe below and add to the diagram to the right.

I'd keep moving forward and fly off the front of the mobile.



b. Which of the **three** designs shown—if any—could have prevented the outcome discussed above? Circle any that would work; cross out any that would not.



c. Why does the successful design work? (Don't use "west" in your answer.)

It provides a force in the direction of the acceleration.

d. . What interaction provides this amount of force?

__Drag __Friction __Normal __Tension __Weight __Westward Force

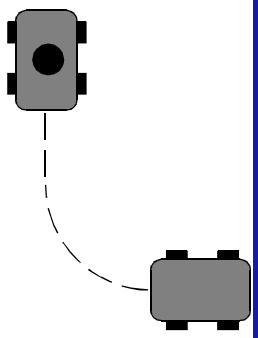
e. Which—if any—of the interactions listed above is not a real force and what is it really the name of?

Westward force; westward is the name of a direction

RIDING THE ICEMOBILE II: CORNERING

3. Suppose you were riding along on the icemobile with uniform motion and it suddenly took a turn.

a. What would happen and why? Describe below and add to the diagram to the right.



I'd keep going straight and fly off the side of the mobile due to my inertia and motion.

b. Draw a design (or designs) that could have prevented the outcome discussed above. Your design must solve only the problem described above **without** solving problems such as those encountered in parts 1 and 2.

c. Why does the design (do the designs) work?

Provides force in the direction of the acceleration.

d. What interaction provides this amount of force in your design?

__Centripetal Force __Drag __Friction __Normal __Tension __Weight

e. Which—if any—of the interactions listed above is not a real force and what is it really the name of?

Centripetal Force

4. What is meant by the term **centripetal force?**

A force directed toward the center of the circle needed to keep a body in circular motion.