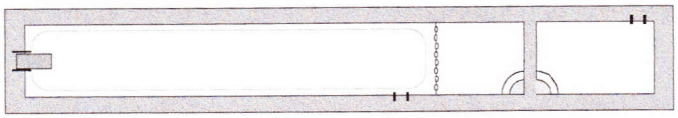
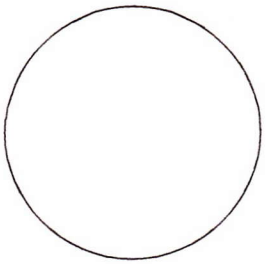
PhyzSpringboard
Uniform Circular Motion



1. MOTION
What does it mean to say an object is in **motion**?

2. CIRCULAR
What is a **circle**?



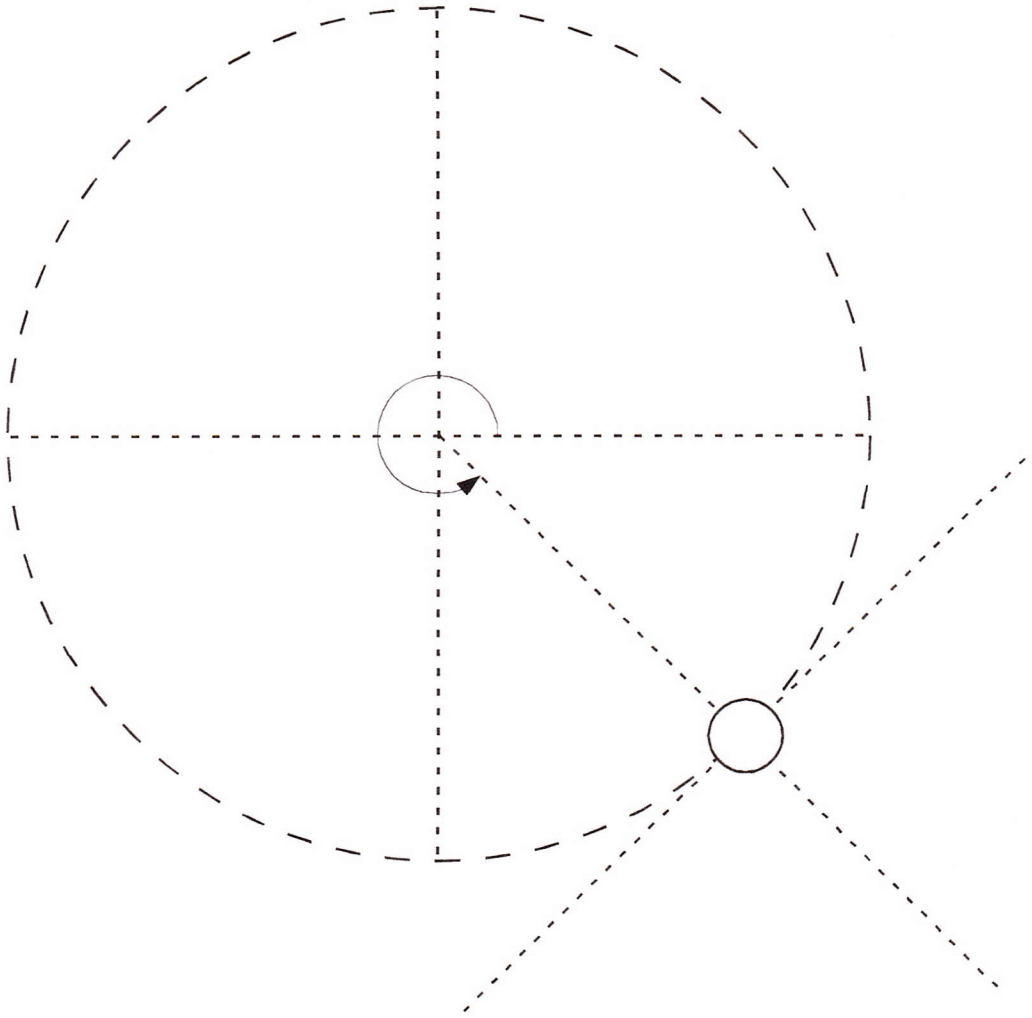
3. UNIFORM
What restrictions must be met by an object in **uniform** circular motion?

4. ORBITAL CHARACTERISTICS
a. How **far** does a body travel in one orbit of uniform circular motion?

b. How **long** does it take a body to travel in one orbit of uniform circular motion?

c. What is the **speed** of a body in uniform circular motion?

d. Is a body in uniform circular motion undergoing **acceleration**? Explain.



5. DIAGRAM

Draw and label each of the items below on the diagram of a body in UCM above.

Circle (write the words)

Center	Radial direction	Tangential direction

Body (write the symbols)

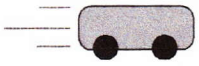
Mass (m)	Radius (r)	Velocity (v)
Acceleration (a)	Net Force (F)	

PhyzSpringboard: Forced to Go in Circles

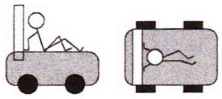
RIDING THE ICEMOBILE I: SPEEDING UP AND SLOWING DOWN

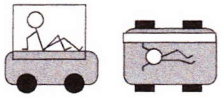
1. Suppose you were sitting on the icemobile and it suddenly accelerated to the right.
a. What would happen and why? Describe below and add to the diagram to the right.

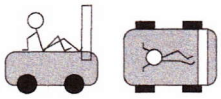
b. Which of the **three** designs shown—if any—could have prevented the outcome discussed above? Circle any that would work; cross out any that would not.



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







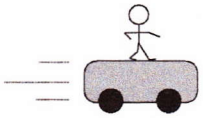
c. Why does the successful design work? (Don't use "right" in your answer.)

d. What interaction provides this amount of force?

__Drag __Friction __Normal __Rightward Force __Tension __Weight

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

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.



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.)

d. . What interaction provides this amount of force?

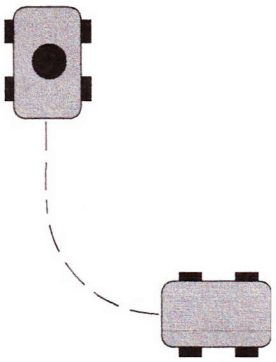
__Drag __Friction __Normal __Tension __Weight __Westward Force

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

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.



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?

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?

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