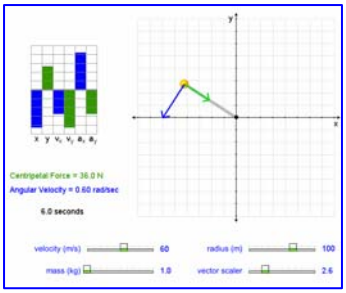

Title: Centripetal Force

Purpose:

- To explore how speed, mass, and radius influence the centripetal force of an object undergoing circular motion

Materials:

- Exploration of Physics Centripetal Force Lab

Graph Pad (http://antoine.frostburg.edu/cgi-bin/senese/graphpad.cgi)

Procedure:

Go to Exploration of Physics ….Motion….Centripetal Force

Part A: Mass

Constants
- velocity = 60 m/s
- radius = 100 m
- vector scalar = 1.0

Record
- Centripetal Force (N)
- Angular Velocity (rad/s)

Variable: mass
- start at 1.0 kg and increase at 0.5 kg intervals to 10.0 kg

Graph your data and draw line of best fit or connect dots as appropriate!

Part B: Velocity

Constants
- mass = 1,0 kg
- radius = 100 m
- vector scalar = 1.0

Record
- Centripetal Force (N)
- Angular Velocity (rad/s)

Variable: velocity
- start at 10 m/s and increase at 5 m/s intervals to 100 m/s

Graph your data and draw line of best fit or connect dots as appropriate!

Part C: Radius

Constants
- velocity = 60 m/s
- mass = 1.0 kg
- vector scalar = 1.0

Record
- Centripetal Force (N)
- Angular Velocity (rad/s)

Variable: radius
- start at 10 m and increase at 10 m intervals to 140 m

Graph your data and draw line of best fit or connect dots as appropriate!

Part D: Your Choice

Constants
- vector scalar = 1.0

Variable:

Record
- Centripetal Force (N)
- Angular Velocity (rad/s)

Graph your data and draw line of best fit or connect dots as appropriate!

Results:

Data Chart A: Mass

Mass (kg)	Centripetal Force (N)	Angular Momentum (rad/s)
1.0		
1.5		
2.0		
2.5		
3.0		
3.5		
4.0		
4.5		
5.0		
5.5		
6.0		
6.5		
7.0		
7.5		
8.0		
8.5		
9.0		
9.5		
10.0		

Data Chart B: Velocity

Velocity (m/s)	Centripetal Force (N)	Angular Momentum (rad/s)
10		
15		
20		
25		
30		
35		
40		
45		
50		
55		
60		
65		
70		
75		
80		
85		
90		
95		
100		

Data Chart C: Radius

Radius (m)	Centripetal Force (N)	Angular Momentum (rad/s)
10		
20		
30		
40		
50		
60		
70		
80		
90		
100		
120		
130		
140		

Data Table D: _____
Constants =

Variable = _____	Centripetal Force (N)	Angular Momentum (rad/s)

Discussion:

1. Summarize what you did.
2. Discuss your results…..remember to include data to support your statements.
   a. Does mass affect centripetal force and angular momentum? Is the relation direct or inverse or constant? Give examples of the data to support your statements!
   b. Does affect centripetal force and angular momentum? Is the relation direct or inverse or constant? Give examples of the data to support your statements!
   c. Does radius affect centripetal force and angular momentum? Is the relation direct or inverse or constant? Give examples of the data to support your statements!
3. Describe sources of error.
4. Suggest improvements.

Conclusion: (answer the questions)

What is the relation between mass and centripetal force? (direct, inverse, no relation)
What is the relation between mass and angular momentum? (direct, inverse, no relation)
What is the relation between velocity and centripetal force? (direct, inverse, no relation)
What is the relation between velocity and angular momentum? (direct, inverse, no relation)
What is the relation between radius and centripetal force? (direct, inverse, no relation)
What is the relation between radius and angular momentum? (direct, inverse, no relation)

Reflection: Personal Statement