Physic	es Web Quest: Torque	NamePeriod
Open t	he Physics Animations Folder	
Part I:	Torque Click the teles that the ten that seem to record	lations/sims.php?sim=Torque)
2.	Click the tab at the top that says torque Set the force equal to 1 N. Click Go let this run for at least 10 seconds	
	What is the torque on the wheel (include dir	ection).
	What eventually happens to the lady bug? From Newton's second law, a force will cau	se an
	When considering angular motion, a torque (consider both torce	will cause an
8.	What must be the centripetal force that keep	
9.	Why does this force eventually fail?	
	Reset all, and set the force back to 1 N. Observe the acceleration vector as you start.	Describe how it changes.
12.	Will the acceleration vector ever point direct Why not? (the next steps might help you ans	
14.	Reset all. Set the force back to 1 N. Hit start, wait about 2 seconds, and set the b observe. Describe the motion of the wheel:	rake force to 1 N. Hit enter and
	What happened to the acceleration vector?	Why?
18. 19.	What is the net torque? Reset all. Set the Force back to 1 N. Hit Sta After a few seconds, set the brake force equal Right after you set the break force, calculate graph):	al to 3N and hit enter.

21. Eventually the disc stops and the net torque is zero. This is because the breaking torque changed as you can see in the graph. Why did it change?

D (TT	3.6		T
Part	11.	Mom	ent ot	Inertia
ı uı ı	11.	1110111		minor tru

1. Click the Moment of Inertia Tab at the to
--

- 2. Disregard any millimeter units. They should all be meters.
- 3. To best see the graphs, set the scale of the torque graph to show a range of 20 to -20.
- 4. Set the Moment of Inertia Graph to show a range of 2 kg m² to -2 kg m²
 5. Set the angular acceleration graph to show 1,000 degrees / s² to -1000 degrees / s²

6.	Calculate the moment of Inertia for the disk with the given information.
7.	Hold the mouse over the disk so the mouse finger is pointing anywhere between the green and pink circles.
8.	Hold down the left mouse button. Move your mouse to apply a force.
9.	Look at the graph and try to apply a force that creates a torque of 10.
	Use the ruler to determine the radius at any point between the green and pink circles, r = m
11.	Calculate what the applied force must have been.
12.	Calculate the angular acceleration of the disk. Work in SI units, and then convert to degrees $/\ s^2$. Compare to the graph to check your answer.
13.	Predict what will happen to the moment of inertia if you keep the mass of the platform the same, but you create a hole in the middle (increase inner radius).
14.	Set the inner radius equal to 2. Calculate the moment of inertia for this shape. Set the disk in motion and check your answer by looking at the moment of inertia graph.

15. Even when the force on the platform changes, the moment of inertia graph remains constant. Why? __

increases, the moment of inertia ______.

16. Fill in the blanks: When the mass of an object increases, the moment of inertia . When the distance of the mass from the axis of rotation

Part III

- 1. Click the Angular Momentum tab at the top.
- 2. Set the scale of the moment of inertia and angular momentum graphs to show a range of 2 to -2.
- 3. Set the angular speed to be 45 degrees / s.
- 4. What is the SI unit for angular momentum?
- 5. Calculate the angular momentum in SI units (you should have already calculated the moment of inertia in part II).
- 6. While the disk is moving, change the inner radius to 2.
- 7. Observe the graphs.
- 8. Changing the inner radius automatically changes the angular velocity to 36 degrees / s. Why? (mention moment of inertia and angular momentum in your answer).