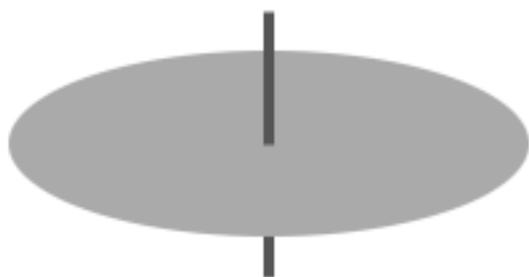




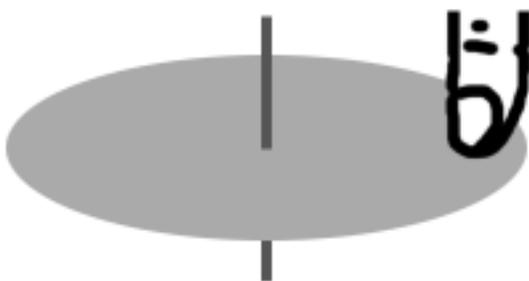
The Gyroscope Demystified — How It Works

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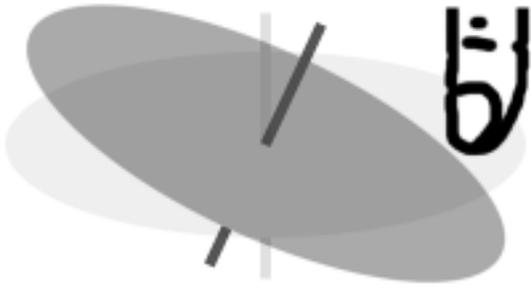
Why does a spinning object "want" to maintain its angular orientation? Many physics texts fail to explain this, and instead simply assert that it happens and you should accept it. But that always left me hungry for a real explanation. Here it is:



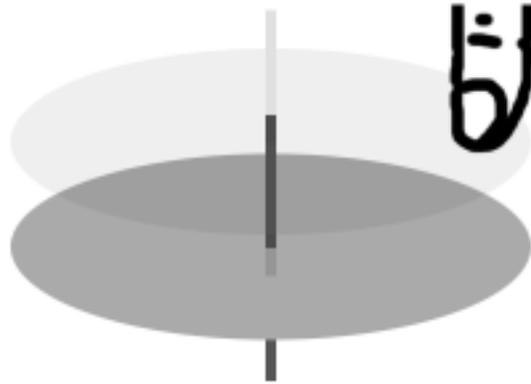
A gyroscope is at rest in a zero-gravity environment. It consists of a simple smooth (frictionless) disc, and a metal pin running through the center for giving it a spin.



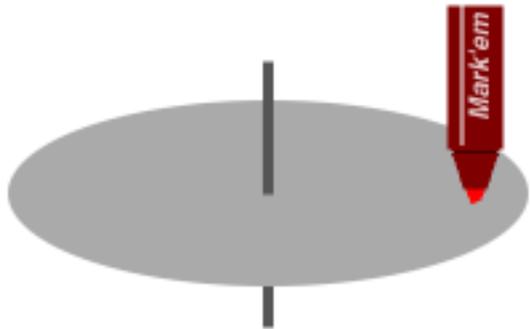
The disc is not spinning. Using your finger, you push down on a spot near the edge of the disc.



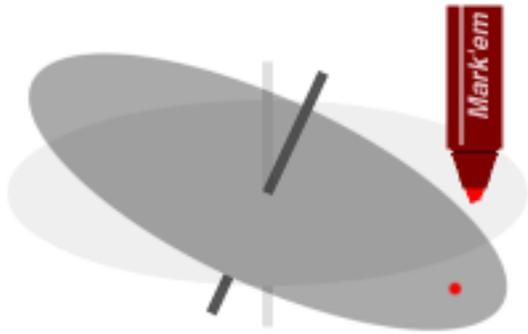
As expected, the disc tilts around its center, easily changing angular orientation.



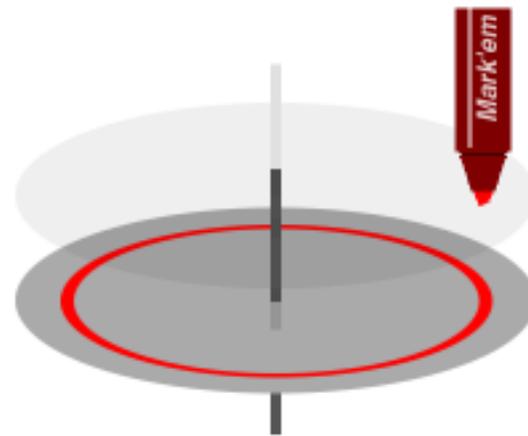
Now we get the disc spinning at a high rate, and do the same experiment again. This time the whole disc moves down, without changing orientation, even though we pushed it near the edge. How did it do that?



Now let's do the experiments again, but this time use a red marking pen. Unlike your finger, the marker leaves red ink wherever it pushes an object.



With the disc not spinning, we try the experiment. The disc changes orientation easily, as expected, and the red spot on the disc shows where it was pushed.



Now we do it with the disc rapidly spinning. As soon as the marker touches the disc, a red circle appears all the way around the disc. This red circle shows *all the points where the disc is being pushed down*. Naturally, no angular orientation change will occur when the disc is being pushed on all the points of a circular path which is centered on the disc. The whole disc will move down, just as you should expect it to move when you push it down on all points of the red circle!

Hey, that wasn't so mysterious after all, was it!

Gyroscope links:

[How Stuff Works -- How Gyroscopes Work](#)

[Gyroscopes As Propulsion Devices](#)

[How A Gyroscope Works](#)

[Operation Of A Gyroscope](#)

[The Sperry Gyroscope](#)

Other tutorial pages of mine:

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