

## Re: Centrifugal force – real or fictitious

**Source:** <http://sci.tech–archive.net/Archive/sci.physics/2004–07/6654.html>

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**Date:** 07/21/04

Date: Wed, 21 Jul 2004 21:31:05 +0100

"Donald G. Shead" <dcshead@charter.net> wrote:

> >

> > *The problem is that nobody can explain what inertia is.*

>

> *I've been explaining it for quite a while: It's simply the measure of*  
> *a quantity of matter: The ratio of the impulse [ft] exerted on and/or*  
> *by that quantity of matter, divided by the rate of displacement [s/t]*  
> *that it causes: Most concisely written as [ft<sup>2</sup>/s]; which is equal to*  
> *the product of two times the weight [w] of the quantity of matter,*  
> *divided by the rate at which it will freefall [g = s/t<sup>2</sup> – 16'/sec<sup>2</sup>*  
> *on Earth] at the location of the scale on which it is weighed: ft<sup>2</sup>/s*  
> *= 2w/g.*

That's the usual definition that is solely based on the equivalence principle.

When you say that inertia = 2w/g (it must be w/g only, but...) you are assuming the equivalence principle, saying that inertia is equivalent to gravity, hence it is an acceleration in the field that produces the weight.

The underlying question is against what actually mass causes inertia. According to Newton's first law, bodies at rest tend to stay at rest, and bodies in motion tend to stay in motion. The question that arises is with respect to what? At rest with respect to what? In motion with respect to what? Newton advocate the answer was space itself. He thought that space itself formed an absolute frame of reference. Einstein showed that there is no preferred reference frame, and that all things are relative, as it were. Even before Einstein, many people were uncomfortable with the idea that empty space itself could serve as a frame of reference. You can't exactly hammer a nail into empty space and measure from that.

Things become much more confusing when strange forces like centrifugal force, the Coriolis effect and the gyroscope precession need to be explained.

About the gyroscope precession notice there is a new variable into play, which is the sense of rotation and the right hand rule is required.

[http://physics.nad.ru/Physics/English/gyro\\_tmp.htm](http://physics.nad.ru/Physics/English/gyro_tmp.htm)

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Notice that in the above link the weight doesn't fall. It is antigravity.  
Newton's Laws goes down the drain (no reaction force exists to balance the weight) and GRT also goes down the drain (since the equivalence principle goes too – the weight doesn't fall).  
So, the actual theories don't explain inertia on its basic mechanism.