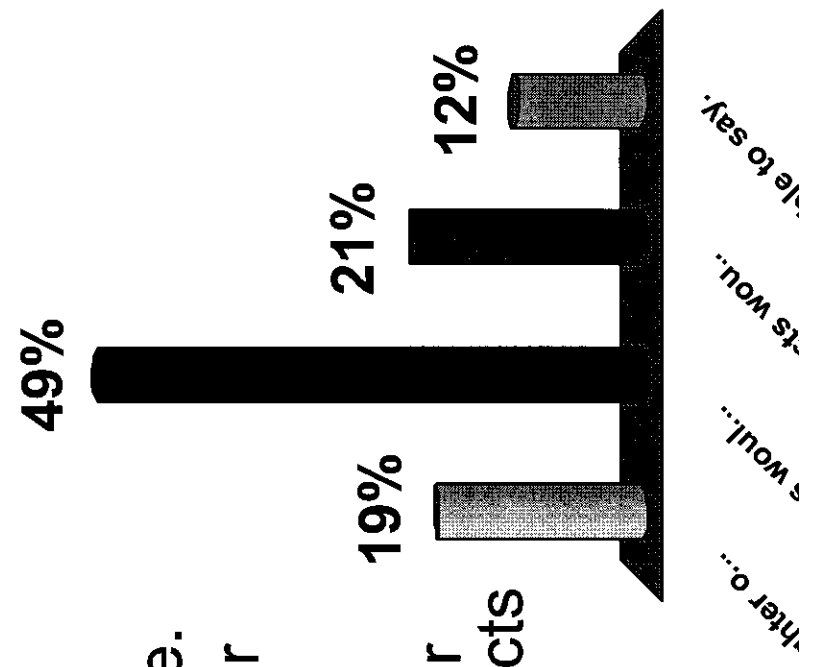


If the gravitational mass, m_G , differed from the inertial mass, m_I , by a factor, $f = (m_G / m_I) \geq 1$, which increased with mass, then

1. Heavier and lighter objects would accelerate near earth at the same rate.
2. Heavier objects would accelerate near earth at a greater rate than lighter objects.
3. Heavier objects would accelerate near earth at a lesser rate than lighter objects
4. It is not possible to say.



The correct answer is #2, because

NIJ and Newton's gravity yield:

- $F_G = m_1 a = GM_E * m_G / R_E^2$, so that
- $a = (GM_E / R_E^2) m_G / m_1 = (GM_E / R_E^2) * f = g * f$
- **Since the ratio, f , increases with increasing mass, heavier objects^{m1} will have a greater rate of acceleration near earth, so that the correct answer is #2.**