Acceleration due to gravity equation

Acceleration Due to Gravity Have you ever wondered why items always speed up when they are falling? Well it all has to do with acceleration due to gravity. Acceleration is the rate at which an object changes its velocity. Acceleration can be calculated by finding the change in velocity and dividing it over the time. The equation is: a= ? v? t (“ Acceleration”) Acceleration is also a vector because it has a direction. The units of acceleration are typically m/s2.

Gravity is the force that attracts an object toward the center of the earth, or toward any other physical body having mass. There is also the Inverse Square Law that proposes that the force of gravity acting between any two objects is inversely proportional to the square of the separation distance between the object's centers (F= Gmmr2). Gravity is the force that causes acceleration. When you use both of them you get acceleration due to gravity which is the acceleration for any object moving under the sole influence of gravity.

On earth the accepted value of acceleration due to gravity is -9. 8 m/s2 (“ Free-fall”). Gravity changes in certain places such as it is lower at the equator and higher near the poles because the earth is a slightly slanted sphere due to its spin. Gravity also decreases with altitude, since greater altitude means greater distance from the Earth's center (Gravity). The following are experiments that help find acceleration due to gravity. Free-fall Experiment| | Materials| Triple-beam balance, tennis balland Ping-Pong ball, string, and a meter stick. Data| | Mass (g)| Times for 1st Drop (s)| Times for 2nd Drop(s)| Distance at 1st Drop (m)| Distance at 2nd Drop (m)| | Tennis Ball| | | | | | | | Ping-Pong Ball| | | | | | | | Procedure| 1. Get a tennis ball and a

Ping-Pong ball (or any other similar shaped objects). 2. Then, find the mass of each of the balls. 3. Take two stop watches and have the two people with stop watches stay at the bottom and the other person will go up to an easy drop off point. 4. Then measure the distance from the drop point to the floor below. 5.

Then drop each ball while each person records the times; do this two times for each ball. 6. Then move to a higher point and record the distance. 7. Then, again drop and time the balls two times each. 8. Observe and record the data. | Equations| * F= Gmmr2 * a= ? v? t * (“ Acceleration Due to Gravity”)| Pendulum Experiment | | Materials| Tape, tape measure, mass set, string, ring stand, and motion detector. | Data| Length of the Pendulum(m)| 1st Object time (s)| 2nd Object time (s)| 3rd Object time (s)| Time Average (s)| T2(seconds)| g(m/s2)| | | | | | | | | | | | | | | | | | | | | | | | g (average)| | Procedure | 1. Assemble the pendulum using the materials. 2. Measure the length of the pendulum to the center of the mass. 3. Time the pendulum for 10 swings then divide by 10 to find the time for one swing. 4. Do this for three different masses at three different lengths. | Equations| * g= 4? 2LT2 * L = Length of the Pendulum * (“ Zak Newton”)| Work Cited

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