Fantastically Free Falling **Name:**_____

Complete 16 points worth of questions. Point value is the first number in the puzzle identifier.

2-1
A fluorescent oil painting of Elvis on black velvet leans against a van in a shopping center parking lot. A pigeon art critic flying 10.0 meters above the masterpiece drops his review. How long before The King gets a new look?

2-2
A radio rests on the balcony railing of a fifth floor apartment, blaring out a Hootie and the Blowfish tune for the fourth time in one hour. A robin from a nearby nest flies into the antenna knocking the radio to the ground. 1.7 seconds later, the terrible droning sound (Hootie) is instantly muffled by a large crash and the bird goes on to be some kind of local folk hero among his fellow birds. How high above the ground was the balcony railing?

2-3
A punk kid throws a penny from the 86th floor observatory of the Empire State Building with an initial downward velocity of 10.0 ft/s. If the penny reaches a final velocity of 259.4 ft/s when it embeds itself into a hot dog stand below, how high is the 86th floor? [g = 32.0 ft/s^2, no air drag]

4-1
Joe Butterfingers Bleemzoid is working at the top of a 125 m TV transmitting tower when he drops a 12" crescent wrench (Sears model 29-04378). How much time does he have to warn the earthlings on the ground before the wrench hits? How fast will the wrench be traveling when it hits the ground?

4-2
Meanwhile in a galaxy far far away, Joe's twin brother, Byron Butterfingers Bleemzoid, a custodian at a margarine factory, drops yet another light bulb while trying to install it in a socket in the 8.0 meter high factory ceiling. The light bulb is super strong (made especially for the Bleemzoid family) and is made to withstand impact velocities of up to 9.0 m/s. If the bulb doesn't break, what is the maximum value of "g" that the planet could have?

4-3
In a juggling routine, Ben throws a ball upward and it just barely touches the ceiling 0.80 meters above his head. How fast was it traveling when it left his hand? How much time does he have before the ball comes back to his other hand, which we'll assume is at the same level?

4-4
Jackie throws a softball straight up at 30.0 m/s. After 4.00s find the position and velocity of the ball.

6-1
A stone dropped from a cliff 200.0m high. If a second stone, thrown vertically downward from the cliff 1.5 seconds after the first stone is released, hits the ground at the same instant as the first stone, with what velocity was the second stone thrown?

6-2
Imagine a bullet fired straight up at 320 m/s. A second bullet is fired 10.0 seconds later from the same gun. When the second bullet reaches its highest point, what is the velocity and position of the first bullet?