

The Fall Classic

What is this about?

All objects feel the effects of gravity even a well-hit baseball. You will learn an important idea about the way gravity works and understand the difference between gravity and air resistance.

What do I need?

You will need a baseball and a piece of notebook paper.

What will I be doing?

First you will drop the ball and the piece of paper to see which one hits the ground first. Then you will wad up the paper into a ball and repeat the experiment.

What do I think will happen?

Take a minute and write down a description of what you think will happen and why you think it. Will the baseball or the flat piece of paper hit the ground first? Will the baseball or the waded up paper hit first?

What really happened?

1. Hold the baseball in one hand and the piece of paper in the other. Hold them out at the same height above the ground.
2. Release them at the same time and see which one hits the ground first.
3. Wad the paper up into a ball and repeat the experiment.

Write a description of your results.

What did I learn?

The baseball falls faster than the paper when air resistance (often called the “drag” force or “air drag”) is important. The paper feels much more air drag than the ball, so the ball falls faster. After the paper has been waded up into a ball, the effects of air drag on the paper are much smaller. Now that the only important force that is acting on the ball and wad of paper is gravity, they reach the ground at very nearly the same time.

What else should I think about?

One of the amazing features of the force of gravity is that, if air drag can be ignored, it causes the same downward motion of all objects! Try dropping the baseball and a coin at the same time. They will land together, even though the coin is much lighter. Now try dropping a baseball and a much heavier object like a sock filled with rocks. Again, they will hit at the same time. This fascinating behavior led Einstein to develop the Theory of Relativity!



AS SMART AS HE WAS, ALBERT EINSTEIN COULD NOT FIGURE OUT HOW TO HANDLE THOSE TRICKY BOUNCES AT THIRD BASE.



Catch it in the Web!



Gravity Video From the Moon

(http://nssdc.gsfc.nasa.gov/planetary/lunar/apollo_15_feather_drop.html)

The experiment you just did was done on the moon! Apollo 15 astronaut Dave Scott dropped a hammer and a feather on the moon where there is gravity but no air.



Man Lose His Hat On A Freefall Ride

(<http://www.webtvhub.com/amazing-physics-moment-video-man-loses-and-catches-hat-on-freefall-ride/>)

Here is an amazing video where a man loses his hat on a freefall ride at an amusement park, and catches it before he hits the ground! The hat feel more air resistance than the man so it falls slower.