

What Is Motion?

The World of Motion

When a thing changes its position it is in motion. This means it moves from one place to another. When things are in motion, people can measure them. They can measure acceleration. They can measure speed. They can measure velocity. And they can measure momentum. These are all part of a thing's motion.

Acceleration

To move, a thing must change speed. It might go faster. It might slow down. It might stop. Or, it might change direction while it moves. A change in speed or direction is called acceleration.

Speed and Velocity

When a thing moves, it has speed. Speed is how long it takes to move a certain distance. Velocity is like speed. But, it is the speed of a thing and the direction it is going.

Momentum

Momentum tells how much force a thing has to keep going the same velocity until it stops. It is made up of an object's mass and velocity. You can stop the momentum of a toy car moving 10 meters (33 feet) per hour. It is easy. But you can't stop the momentum of a big truck moving 10 meters (33 feet) per hour. The truck has more mass. So, it has more momentum than the toy car.

Not all things with great momentum are large. Sand is very small. Wind can whip it up. It can hit a person's face and sting like needles. It has great momentum because of its speed. Momentum is one reason people wear seatbelts. Sometimes cars stop suddenly. A seatbelt stops our forward momentum. It keeps us from hitting the front of the car.

Motion Formulas

Speed, velocity, and momentum can be calculated. This means that you can use a formula to figure out how fast a thing is going. You can use a formula to find its velocity. You can also use a formula to find how much momentum it has. These are the formulas for speed, velocity, and momentum:

speed = distance/time	75 km/hour	47 mph
velocity = distance/time in a certain direction	75 km/hour northeast	47 mph northeast
momentum = mass \times velocity	7,500 kg-m/s	10,340 lbs.-mph